

Design Options

Ti Rakau Drive Bridge to Botany Town Centre

The Eastern Busway has been planned and designed to give people high quality and sustainable transport options.

A busway is where buses have their own lanes away from traffic, providing fast, frequent and reliable services similar to the Northern Express on Auckland's North Shore.

The next stage of the Eastern Busway will extend the recently completed Panmure to Pakuranga section and will form a continuous 7km busway with separate walking and cycling facilities. When it's completed, the busway will carry more than 30,000 passengers every day and give 24,000 more people access to a bus station within 1km walking distance of home.

In 2018 Auckland Transport (AT) shared a draft busway design for community feedback that showed a wider Ti Rakau Drive and the busway running along the middle of the road to Botany. Several issues were identified with the design in the commercial area of Ti Rakau Drive including safety, cutting access to commercial properties, permanent impacts to businesses, increased cost, unreliable travel times

for buses and delays to freight due to congested intersections, and disruption while the busway is built.

AT is considering feedback received in late 2021 on a revised draft busway design near the commercial area. The design proposes that the route goes 'offline' or away from Ti Rakau Drive on a two-lane separate road behind China Town with a station at Burswood. This option requires the removal of some residential homes, impacting a community and is a big decision for AT to consider. A summary of the feedback received from the community is available on easternbusway.nz

AT and the project team have assessed several options through the commercial area of Ti Rakau Drive, including those suggested by the community during the 2021 consultation. Each option has different challenges and benefits. This document provides a summary of them and the considerations involved in each one.

Artist impression of the proposed busway and station near Burswood.



14 design options considered

A range of options through the commercial area of Ti Rakau Drive has been considered by AT and the project team. The following design options from 2021/2022 form two groups; online or on Ti Rakau Drive, and offline or away from Ti Rakau Drive.

ONLINE OPTIONS – ON TI RAKAU DRIVE

1 Centre running busway with opposing platforms (consulted on in 2018)

- widening both sides of Ti Rakau Drive
- issues with safety, access to commercial properties, cost, congested intersections, travel time and freight delays and disruption while the busway is built
- see pages 4-5 for detailed analysis

2 Centre running busway with narrow lanes and offset ('displaced') platforms

- similar challenges to option 1 and reduced customer experience
- impacts to properties and access to them remain an issue because some widening on both sides of Ti Rakau Drive is still required

3 Busway on north side of Ti Rakau Drive

- widening of Ti Rakau Drive only on the north side
- significant impact to commercial properties
- similar challenges to option 1 and increased cost

4 Busway on south side of Ti Rakau Drive

- widening of Ti Rakau Drive only on the south side
- significant impact to commercial properties
- similar challenges to option 1 and increased cost

5 Viaduct along Ti Rakau Drive

- elevated two-lane busway and station along the centre of Ti Rakau Drive
- provided reliability and fast travel time for buses
- high cost, environmental and visual impact, reduced access to the busway for local bus services

6 Centre running busway with narrow lanes, moving to the north side of the bus depot

- centre running from Gossamer Drive to Burswood Drive (east and then behind the bus depot)
- similar outcomes to option 2, with impact to wetlands in Burswood Reserve

7 Centre running busway with onroad cycling facilities

- similar to option 1 with the exception of providing onroad cycle lanes as an alternative to a two-way cycleway on the north verge
- impacts to properties and access to them remain an issue because some widening of Ti Rakau Drive is still required
- reduced safety outcomes for walking and cycling

8 Centre running busway with offline walking and cycling facilities

- similar to option 1 with the exception of an offline cycleway through the narrow buffer area between the commercial and residential properties in Burswood
- impacts to properties and access to them remain an issue because some widening on both sides of Ti Rakau Drive is still required
- additional costs of acquiring land in the buffer area

9 Split direction bus lanes

- relocating the eastbound busway lane to the north of the commercial properties, with the westbound lane running along on Ti Rakau Drive
- impacts to properties and access to them remain an issue because some widening on both sides of Ti Rakau Drive is still required
- additional property costs for eastbound lane
- significant impacts on customer experience and ease of use

10 Tidal flow (dynamic lane)

- a central running busway to safely maintain access to the commercial properties with a dynamic lane that changes direction to cater for peak traffic
- see pages 4-5 for detailed analysis

11 Reallocation of road space through road pricing

- road pricing or congestion charging on major roads in Auckland
- modelled to see if it would be possible to use some of the existing lanes on Ti Rakau Drive for the busway
- see pages 4-5 for detailed analysis

OFFLINE OPTIONS – AWAY FROM TI RAKAU DRIVE

Several other offline options have been considered and discounted. Options 12 to 14 are being considered in 2021/2022.

12 Residential alignment with Burswood station (consulted on in 2021)

- separate road behind China Town requiring removal of some residential properties, rejoining Ti Rakau Drive before the bus depot
- see pages 4-5 for detailed analysis

13 Commercial alignment with Burswood station and behind bus depot

- separate road behind China Town mostly through the narrow buffer between commercial and residential properties, continuing through Burswood Reserve behind the bus depot
- requires acquisition of some residential and commercial properties, impacts on commercial operations
- very narrow corridor that would result in the busway being within 1m of some residential homes - this was deemed unfeasible
- lack of space for walking and cycling facilities and poor urban outcomes
- impact to wetlands within Burswood Reserve

14 Residential alignment with Burswood station and behind bus depot

- separate road behind China Town requiring removal of some residential properties, continuing through Burswood Reserve behind the bus depot
- similar challenges to option 12
- impact to wetlands within Burswood Reserve

Options 1, 10, 11 and 12 have been given focused thought based on the community's feedback and request for consideration of existing road space to be reallocated to the busway. An analysis of the four options is provided on pages 4 and 5.

Options analysis

During consultation in 2021, the community asked the project team to reconsider options for the busway to continue on Ti Rakau Drive through the commercial area and to use existing lanes or road space. The team has reviewed the options detailed on this page and has given the analysis to AT for consideration.

When the busway opens, there is expected to be a big increase in people using public transport from 7% of all trips now, to 25% in 2028 and 31% by 2048. Although that is a significant increase, it is not enough to support reallocation of traffic lanes for the busway. The project team has analysed different lane use possibilities through tidal flow (dynamic lanes) and road pricing. A summary of the analysis is provided here in options 10 and 11, and compares them alongside the options that were consulted on in 2018 and 2021.

When the busway opens, there is expected to be a big increase in public transport mode share



Option 1 – Online, centre running busway with opposing platforms (consulted on in 2018)

Widening both sides of Ti Rakau Drive for two-lane busway, stations and walking and cycling facilities.

TRANSPORT

- Uses existing road corridor for busway
- Reduced access to the busway for residents and neighbouring communities
- Journey time and reliability for buses and general traffic impacted by intersections on Ti Rakau Drive. Buses required to pass through five heavily congested signalised intersections, impacting bus operations
- Removes right turn access into and out of commercial properties
- Safety issues for walking and cycling facilities with multiple driveways along Ti Rakau Drive in/out of commercial properties

CONSTRUCTION

- Longest construction period on a regionally significant arterial road
- Upgrades required to major intersections
- Difficult to maintain access to all commercial properties
- Disruption to businesses along Ti Rakau Drive for an extended time during construction
- Requires complex construction staging, and high cost of Ti Rakau Drive Bridge upgrade with bridge widening on both sides
- Significant risk to Transpower high voltage cables connected to Ti Rakau Drive Bridge during widening of existing bridge

PROPERTY

- Requires acquisition of commercial properties along both sides of Ti Rakau Drive
- Creates ongoing access issues for commercial properties due to height difference between Ti Rakau Drive and some properties

URBAN DESIGN AND ENVIRONMENT

- Reduced future land use opportunities in line with the government's policies on urban development when compared to other routes

COST

- Highest, compared to other options

Option 10 – Tidal flow (Dynamic lane)

A central running busway (to safely maintain access to the commercial properties) with a dynamic lane that changes direction to cater for peak traffic.

Note that a tidal flow arrangement with the busway on the north or south side is not feasible. General traffic would need to cross the busway to access commercial properties

TRANSPORT

- Reduced access to the busway for residents and neighbouring communities
- Journey time reliability impacted by intersections on Ti Rakau Drive
- safety issues for pedestrians and cyclists due to potential conflicts with motorists entering and exiting commercial properties

CONSTRUCTION

- Long construction period on a regionally significant arterial road
- Upgrades required to major intersections
- Difficult to maintain access to all commercial properties
- Disruption to businesses along Ti Rakau Drive for an extended period during construction

PROPERTY

- Requires acquisition of commercial properties along both sides of Ti Rakau Drive – tidal flow requires same width for transport infrastructure as Option 1
- Creates ongoing access issues for commercial properties

URBAN DESIGN AND ENVIRONMENT

- Reduced future land use opportunities in line with the government's policies on urban development when compared to other routes

COST

- High, compared to other options

Option 11 – Road pricing / reallocation of road space

Road pricing or congestion charging on arterial and high use roads. Modelled to see if this reduces traffic demand enough so that some of the existing lanes on Ti Rakau Drive could be used for the busway.

TRANSPORT

- Road pricing of 20c/km reduces traffic demand between 4% and 17%. To allow removal of one general traffic lane in each direction, traffic reduction of between 41% and 47% is required. Unsustainable road pricing would be required to meet traffic demand reduction
- Reduced access to the busway for residents and neighbouring communities
- Journey time reliability impacted by intersections on Ti Rakau Drive
- safety issues for pedestrians and cyclists due to potential conflicts with motorists entering and exiting commercial properties
- Significant delays to general traffic and particularly freight

CONSTRUCTION

- Long construction period on a regionally significant arterial road
- Upgrades required to major intersections
- Disruption to businesses along Ti Rakau Drive for an extended period during construction

PROPERTY

- Requires acquisition of commercial properties along one side of Ti Rakau Drive – approx. 2.3m is required

URBAN DESIGN AND ENVIRONMENT

- Reduced future land use opportunities in line with the government's policies on urban development when compared to other routes

COST

- Lowest, compared to other options

Option 12 – Offline, Residential alignment with Burswood station (consulted on in 2021)

Two-lane busway on a separate structure behind China Town and Bunnings, with walking and cycling facilities.

TRANSPORT

- Increased access to the busway for residents and nearby communities
- Journey time and reliability further improved with buses removed from heavily congested Ti Rakau Drive between Guys Reserve and Gossamer Drive
- Impact on freight traffic through commercial area including removal of loading and unloading operations
- Access to commercial properties along Ti Rakau Drive maintained including existing right turn accesses into and out of commercial properties
- Safe and separated walking and cycling facilities

CONSTRUCTION

- Shorter construction period with less disruption to travelling public, freight operators and businesses along Ti Rakau Drive.
- No works to existing Ti Rakau Drive Bridge removing all risks to Transpower high voltage cables during construction.

PROPERTY

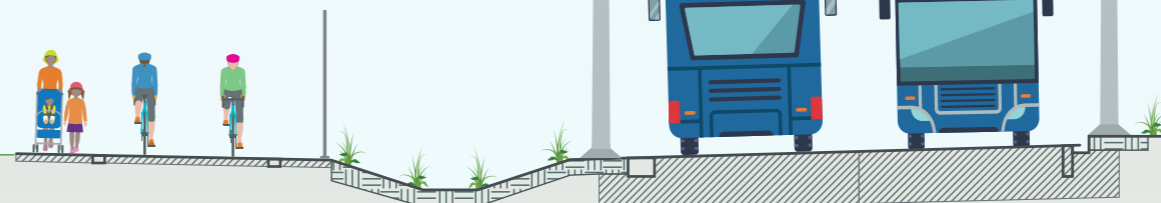
- Requires acquisition of residential properties

URBAN DESIGN AND ENVIRONMENT

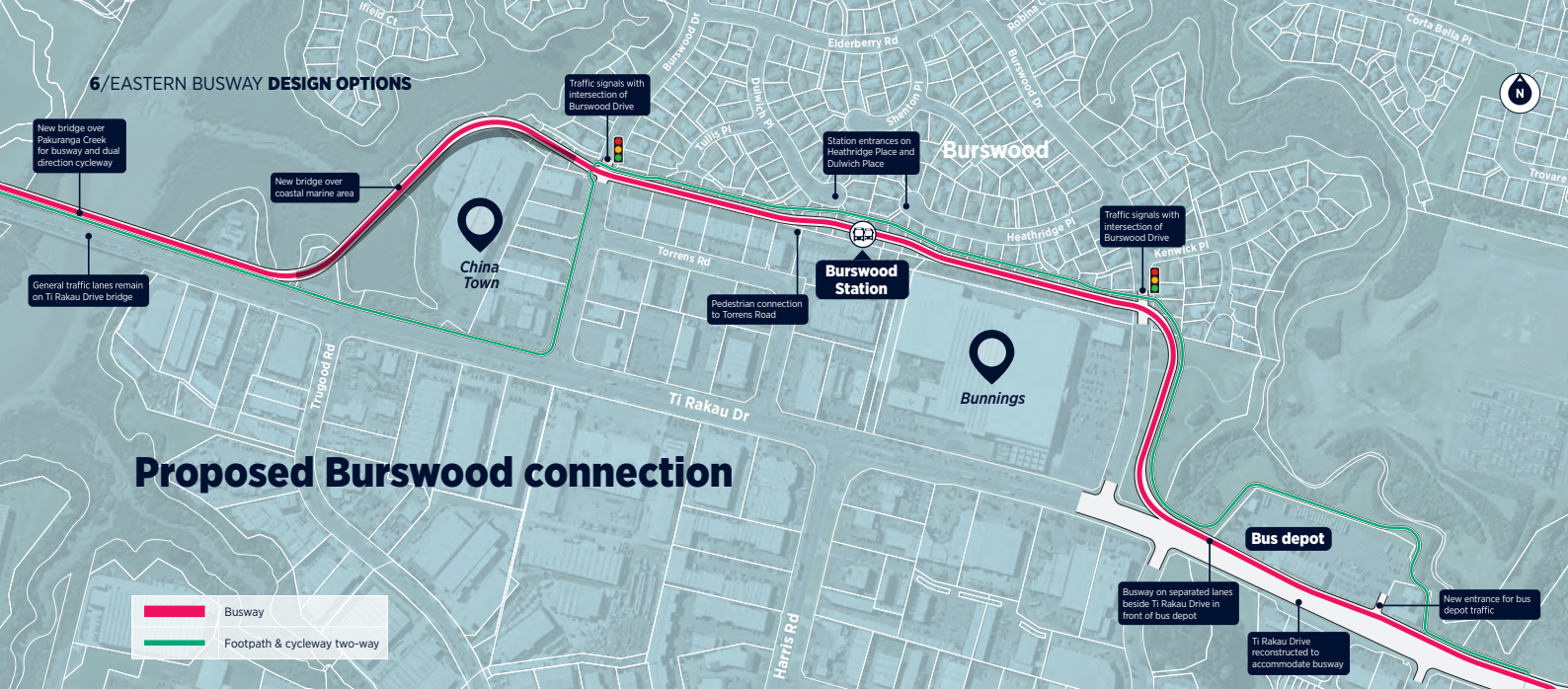
- Creates space between homes and busway for landscaping, walking and cycling facilities
- Increased future land use opportunities in line with the government's policies on urban development
- Space created to enable water treatment and improve water quality
- No impact to wetlands within Burswood Reserve
- Reduced footprint within Burswood Reserve

COST

- Low, compared to other options



Artist impression of proposed busway at Burswood, in cross-section.



Rationale and reducing emissions


There are many considerations to weigh up when building significant transport infrastructure in an urban environment.

The options considered for the Eastern Busway have been developed and assessed by technical and environmental specialists against the project objectives and key result areas. Several options performed well in some areas and poorly in others. AT and the project team have tried to balance the different considerations to make the best decision for longterm benefits.

Ti Rakau Drive is a regionally significant arterial route providing a vital link and connection to East Auckland. The introduction of the busway and more travel options mean that a network wide approach can be put in place to help reduce emissions and make best use of road space, including for Ti Rakau Drive.

It will help to ensure that additional road capacity created by the busway does not lead to an increase in traffic and supports the use of different modes or forms of transport. Auckland Council and Auckland Transport are currently working on some of the network wide initiatives and will provide more information in the coming months.




Modelling has indicated that CO₂ emission levels from the transport system in Auckland will reduce from 9.2 tonnes per day now to 6.5 tonnes per day by 2048. That's a reduction of 29% from people choosing more efficient forms of transport such as the Eastern Busway, and an increase in electric buses, bikes, cars and commercial vehicles.



Modelling has indicated that CO₂ emission levels from transport in Auckland will reduce from 9.2 tonnes per day now to 6.5 tonnes per day by 2048.



To find out more, receive regular project updates or provide feedback, you can contact us on:

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