TE TUPU NGĀTAHI
SUPPORTING GROWTH

Northwest Infrastructure Funding and Financing Study (NWIFF)
Transport Assessment

June 2022

Version 1.0

WAKA KOTAHI NZ TRANSPORT AGENCY

New Zealand Government

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Appendices

Executive Summary

Purpose and Scope

This report presents the transport assessment element of the Northwest Infrastructure Funding and Finance study (NWIFF), being undertaken by Auckland Council. The transport assessment seeks to identify a potential Staging Schedule of transport infrastructure upgrades to support the growth proposed in Whenuapai, Redhills and Westgate, as identified in the Future Urban Land Supply Strategy (FULSS) and associated regional land use forecasts.

The primary purpose of this work is to:

- Enable integrated and timely transport infrastructure delivery that supports growth in Redhills, Whenuapai and Westgate, using current and alternative financing, funding and delivery opportunities
- Integrate land use, infrastructure and financing & funding solutions.

The purpose and context of the resulting Staging Schedule is important to note, including that:

- It is for the purpose of Council considering funding and financing options, and as such has not explicitly considered funding constraints or delivery mechanisms
- It is based on transport facilities to serve the full release of the anticipated land use forecasts in Whenuapai, Redhills and Westgate, using the FULSS land use timing and assumed regional land use forecasts. It therefore has not considered land use approval, funding, network, economic or other constraints on growth, or the outcomes of more recent policy direction (and how that my impact growth timing in the Auckland Region and study area)
- It is based on application of Te Tupu Ngātahi transport planning principles and processes in this context and hence does not reflect a committed infrastructure staging plan by Auckland Transport, Auckland Council or Waka Kotahi (i.e. there are therefore differences to the Regional Land Transport Plan (RLTP))
- While the ultimate corridor forms are based on the SGA work, opportunities for potential interim stages remain conceptual options only, with the design, form and timing of any works remaining for agreement between developers and the relevant road controlling authority
- The Staging Schedule therefore does not have the status of committed projects endorsed by Auckland Transport or Waka Kotahi and is subject to change in response to funding methods, delivery mechanisms, land use decisions and regional investment priorities. Nor does the Staging Schedule reflect specific projects that Auckland Transport or Waka Kotahi would deliver.

In summary, the Staging Schedule reflects how the identified long-term network for the study area could be delivered to support the currently identified FULSS staging and associated regional land use forecasts, based on the Te Tupu Ngātahi transport planning (timing and design) principles. The Staging Schedule is not an implementation plan of the Te Tupu Ngātahi future network.

By design, given the approach above, this assessment has not considered design, planning or submission detail related to any current or emerging plan changes in the NWIFF area. It has focussed on a more strategic assessment of the bulk transport infrastructure needs. There has been no liaison with the proponents and advisors for any current or emerging plan changes. Private or Council-led Plan Changes can be considered in subsequent refinement and sensitivity testing work.

The scope of projects considered in this assessment are new or upgraded transport infrastructure within the Whenuapai, Redhills and Westgate area needed to support the full build-out of these areas. Some of the projects included in the assessment also have wider growth or strategic transport functions, such as the rapid transit network projects. The local street network design also has a key role in supporting the urban form and mode shift objectives sought for this area, however, those elements were not included in this assessment as they are assumed to be the responsibility of developers for delivery. This work has not included construction traffic effects, maintenance, rehabilitation, renewals or services and omits transport projects needed for growth outside of Whenuapai, Redhills and Westgate.

Approach

The Staging Schedule was developed based on the application of Staging Principles (timing and design principles), which sought the following outcomes:

- Transport systems that support quality, compact urban form, including through higher density around major public transport corridors
- Mutually supportive transport and land use systems that:
    - provide safe travel across all modes
    - provide a transformation in mode share to more sustainable modes, such as public transport, walking and cycling to support decarbonisation goals
    - provide improved choices of travel
    - provide efficient freight movement
    - provide high levels of accessibility to social and economic opportunities
- A resilient transport system.

A key component of this approach is transport infrastructure that supports high mode shift to more sustainable modes, as well as supporting the land use activities and place function. A heavy emphasis was therefore placed on the provision of quality walking, cycling and public transport (PT) infrastructure from the outset of development.

The methodology adopts a 'baseline' of land use assumptions based on:

- Future Urban Land Supply Strategy (FULSS) and I11v5 and I11v6 land use forecasts
- Whenuapai Structure Plan and Plan Change 5 staging
- Redhills and Westgate Precinct Plans staging.

The Timing & Design Principles considers, adopted from DIFF workstream:

- DIFF principles were slightly modified for conciseness / lessons learned
- Review of Redhills Precinct development triggers.

Collector Road Principles are also used to provide guidance in identifying key collector roads. ‘Key’ collector roads are identified to important for overall network operation or critical role in supporting planned land use. The DIFF workstream included all collectors. NWIFF currently includes only ‘key' collectors. Appendix A includes more information on collector roads and the associated principles.

Growth Inputs and Assumptions

Assumptions on the total yield and build-out rate for Whenuapai, Redhills and Westgate were based on land use scenarios i11v5 and i11v6 data. This assessment was based on the regional transport model (Macro Strategic Model (MSM)) zones, which is approved by Auckland Council. This provides a 'baseline' assessment for the purposes of this report.

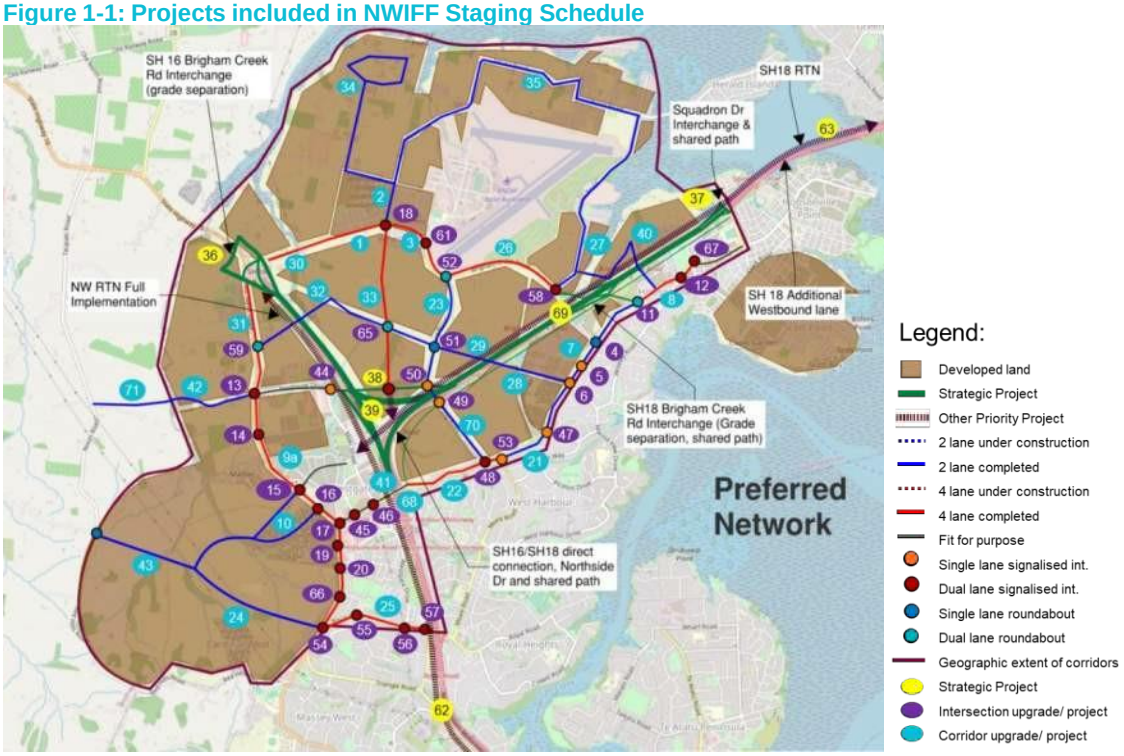
Since the commencement of this workstream, there have been emerging changes in terms of how the National Policy Statement for Urban Development (NPS:UD) and the Medium Density Residential Standards (MDRS) will impact the timing of growth in existing urban and future urban areas in Auckland. The assumptions around the timing of land use will continue to evolve, which results in uncertainty. Te Tupu Ngātahi are actively monitoring the situation with Auckland Council and acknowledge the level of uncertainty around land use. Once the initial 'baseline' assessment has been completed, it is expected that there will be further refinement / sensitivity testing.

Staging Schedule

A Staging Schedule has been developed with indicative time horizons and identifying the growth areas they support. As noted above, there are significant uncertainties as to the roll out of the development and the timing of key transport infrastructure. As such, this Staging Schedule provides one potential scenario for such development, to assist Council develop infrastructure funding methods. While this Staging Schedule is subject to change based on other decisions and economic or other drivers, the key principles applied and outcomes sought are considered to remain valid under the various possible scenarios of how this area will develop into a new urban community, particularly the relative timing of the regional / larger scale transport infrastructure to support an assumed timing / scale of residential / employment growth.

The detailed Staging Schedule is provided later in this report, based on the network elements below.

Figure 1-1: Projects included in NWIFF Staging Schedule



Review Process

The development of the 'baseline' assessment and Staging Schedule has been informed by workshop engagement with representatives from Auckland Council, Auckland Transport and Waka Kotahi.

In addition, Te Tupu Ngātahi has undertaken technical review of the staging assessment and reporting. Feedback has been provided by Auckland Council, Auckland Transport, and Waka Kotahi. Feedback and comments have been addressed and incorporated in reporting, where necessary. Some feedback relates to the ongoing funding and financing considerations by Auckland Council, beyond the scope of this current reporting, and has been noted and will be reviewed subsequently.

Conclusions

Key conclusions of this work include:

- The Whenuapai, Redhills and Westgate areas constitute a significant scale of urban growth, which is a sub-set of the total growth planned and expected in the north west parts of Auckland, including surrounding existing urban areas, as well as the Kumeu, Huapai and Riverhead area.
- This scale of growth requires an extensive network of new or upgraded transport corridors, both within the immediate growth area and on the surrounding receiving environment. This network will need to comprise both strategic network and local network elements in order to deliver on the mode change aspirations
- The long-term arterial and strategic network to support this growth has been identified through the Te Tupu Ngātahi Detailed Business Case, plus previous business cases. The local network has been assumed to be represented by the current information relating to structure and precinct plan networks in the study area.
- Some opportunities for the staged implementation of the new or upgraded corridors has been identified in this assessment, however, the feasibility, design and timing of any such interim upgrades will remain to be agreed directly with the appropriate road controlling authority
- The Staging Schedule reflects how the identified long-term network for the study area could be delivered to support the currently identified FULSS staging and associated regional land use forecasts, based on the Te Tupu Ngātahi transport planning (timing and design) principles. The Staging Schedule is not an implementation plan of the Te Tupu Ngātahi future network by the relevant road controlling authority.
- The location of the NWIFF area means there are movements between different parts of Auckland and beyond the region that pass through this area, meaning that the transport networks have been scaled for local, regional and inter-regional growth. This means it is not feasible to fully isolate the projects needed to support just the NWIFF areas from growth in the wider network. This assessment has focussed on the projects needed for Whenuapai, Redhills and Westgate, but includes elements that accommodate wider growth and wider-network projects which will benefit the NWIFF area.

1 Purpose, Context and Scope

1.1 Purpose and Background

This report documents an assessment of the transport infrastructure needed to support the planned growth in Whenuapai, Redhills and Westgate, with the desired land use and transport outcomes.

Auckland Council are undertaking the Northwest Infrastructure Funding and Financing Study (NWIFF), which seeks to:

"Enable integrated and timely transport infrastructure delivery that supports growth in Redhills, Whenuapai and Westgate, using current and alternative financing, funding and delivery opportunities"

Council commissioned Te Tupu Ngātahi Supporting Growth Alliance (SGA), to undertake the transport infrastructure component of that study. Specifically, it requested SGA to identify sequencing/ staging of transport infrastructure to support progressive urban development of the inner Northwest (Whenuapai, Redhills and Westgate only). This work also enables Council to identify, if possible, a funding and financing solution to the funding gap.

This work adopts the same approach as the Drury Infrastructure Funding and Financing Study (DIFF), which was also undertaken by Council.

1.2 Relationship to Private Plan Change Regulatory Processes

This work is primarily targeted at Council's consideration of funding options and is not intended to duplicate or replace any later detailed assessment by the Council, Auckland Transport or Waka Kotahi for emerging or later Private Plan Changes.

In regard to a separate Plan Change process, this work:

- Has a broader-network focus than just an individual plan change, looking at the cumulative growth across both the various plan changes and the wider growth pressures
- Has a focus on the 'strategic' rather than local elements of the network, and especially does not cover local street design or delivery
- Is not considering detailed plan change provisions or submission points
- Is focussed on 'bulk' transport infrastructure, not detailed provisions (e.g. parking policy, local street design, staging triggers etc)

1.3 Scope of Transport Elements Considered

The approved SGA Detailed Business Case (DBC) for the Northwest Growth area of Auckland provides a range of projects and interventions in Whenuapai, Redhills, plus Kumeū-Huapai and Riverhead, to accommodate the long-term planned growth in this area, including inter-regional growth. The scope of projects included in this assessment are a sub-set of those projects involving new or upgraded transport infrastructure. It is however noted that growth in adjacent and wider areas is still considered when estimating the required timing and scale of projects.

In addition to the SGA arterial and strategic projects, this study also includes key collector roads in the area, but not all collector roads, and does not include local streets. Some of the projects included also have wider growth or strategic transport functions. The local street network design also has a key role in supporting the urban form and mode shift objectives sought for this area. However, those elements were not included in this assessment as they are assumed to be the responsibility of developers for delivery. Appendix A includes more information on Collectors.

The report focusses on new or upgraded transport infrastructure needed to improve access, safety or capacity (by any mode), but has not considered any consideration of construction related traffic effects. There has not been any assessment on the existing carriageway quality to support the anticipated traffic flows.

This assessment represents a technical assessment by SGA for a specific purpose and based on key assumptions. It therefore, does not represent a formal endorsement by Council, Auckland Transport or Waka Kotahi for any specific staging or sequencing of transport infrastructure. It identifies how the identified long-term network for the study area could be delivered to support the currently identified FULSS staging and associated regional land use forecasts, based on the SGA transport planning (timing and design) principles. The Staging Schedule is not an implementation plan of the Te Tupu Ngātahi future network by the relevant road controlling authority.

1.4 Stakeholder Liaison

Workshops were carried out to engage with the following representatives from Auckland Council, Auckland Transport and Waka Kotahi. These workshops sought agreement on timing and design principles and the land use ‘baseline’ assumptions. The staging assessment of infrastructure and reporting was also reviewed by these parties.

The below members and stakeholders were involved and consulted with throughout this workstream.

Auckland Council (AC) members:

- Pieter Human
- Ian Kloppers
- Alina Wimmer
- Brigid Duffield
- Eryn Shields

Auckland Transport (AT) members:

- Lorraine Stone
- Rory Power
- Lloyd Johnson
- Kelly Seekup
- Alastair Lovell

Waka Kotahi (WK) members:

- Nita Chhagan
- Deepak Rama
- Brendan Clarke
- Brian Waddell
- Allan McGregor

The scope for this SGA assessment does not include detailed consideration of Plan Change proposals, or submissions, or liaison with any key parties to emerging or current plan changes.

1.5 Report Structure

The remainder of his report is structured as follows:

Chapter 2: Describes the approach to this assessment

Chapter 3: Outlines the growth in this area

Chapter 4: Outlines the high-level transport modelling sensitivity test undertaken for this assessment

Chapter 5: Discusses the purpose, form and opportunities for staging each key element of the network and presents the resulting Staging Schedule

Chapter 6: Provides key conclusions.

2 Assessment Approach

This Chapter describes the overall approach to this assessment, including the ongoing land use and transport system planning context. Detail on growth inputs are included in the subsequent chapter.

2.1 Full System Solution and Role of SGA

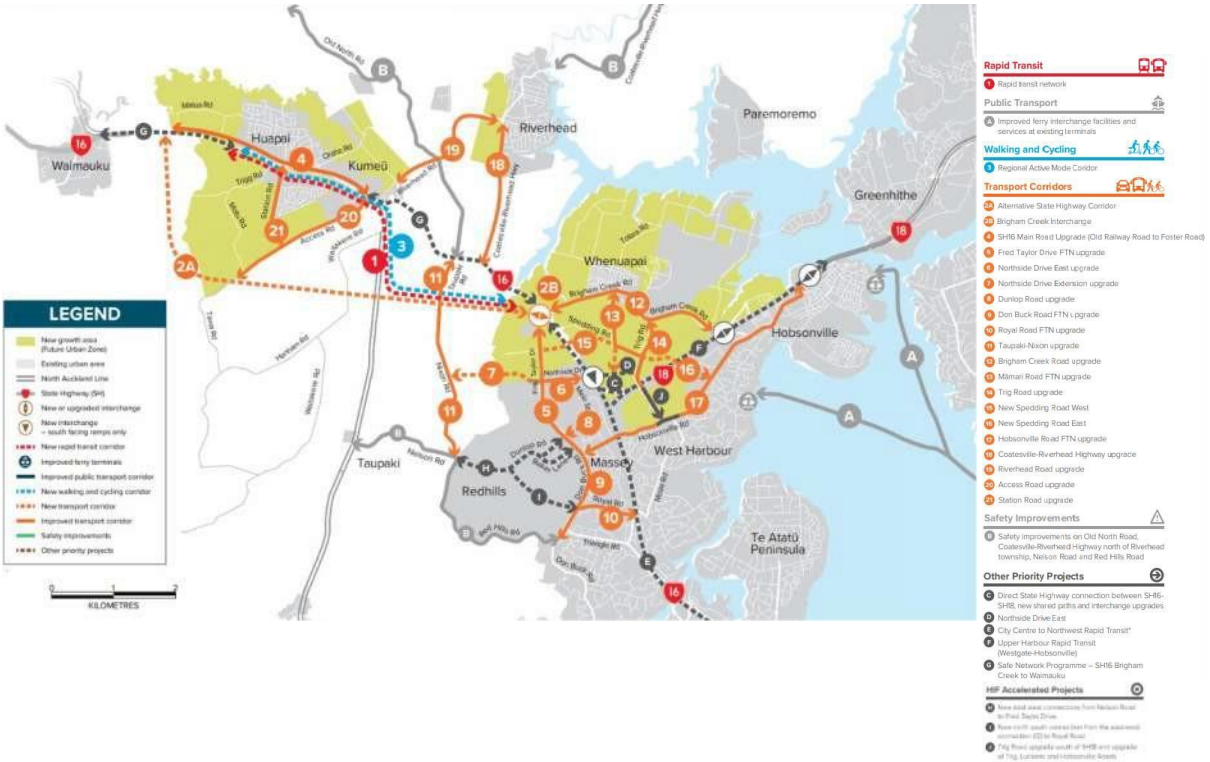
The SGA DBC identified a full system solution to support the planned growth in the Northwest, as indicated in Figure 2-1 below.

The projects identified in the SGA network are supported by other planned infrastructure projects that were the subject of earlier business cases. In addition to the infrastructure projects shown in the Map, the business case identified the need for supporting initiatives related to demand management and land use-transport integration. The land-use-transport integration work has included continuous liaison between SGA and Council on planning for both the transport projects and the land use planning.

The role of SGA is to achieve long-term route protection of the recommended networks, with subsequent project implementation decisions and processes remaining with Auckland Transport and Waka Kotahi. This means that the SGA work is focused on identifying required corridor footprints and does not imply any specific implementation status. SGA are progressing Notices of Requirement (NoRs) for elements of the network.

The SGA DBC work and the Council planning documents therefore form the key basis for the planned growth, desired outcomes and strategic projects used in this work.

Figure 2-1 SGA IBC/DBC Northwest Network

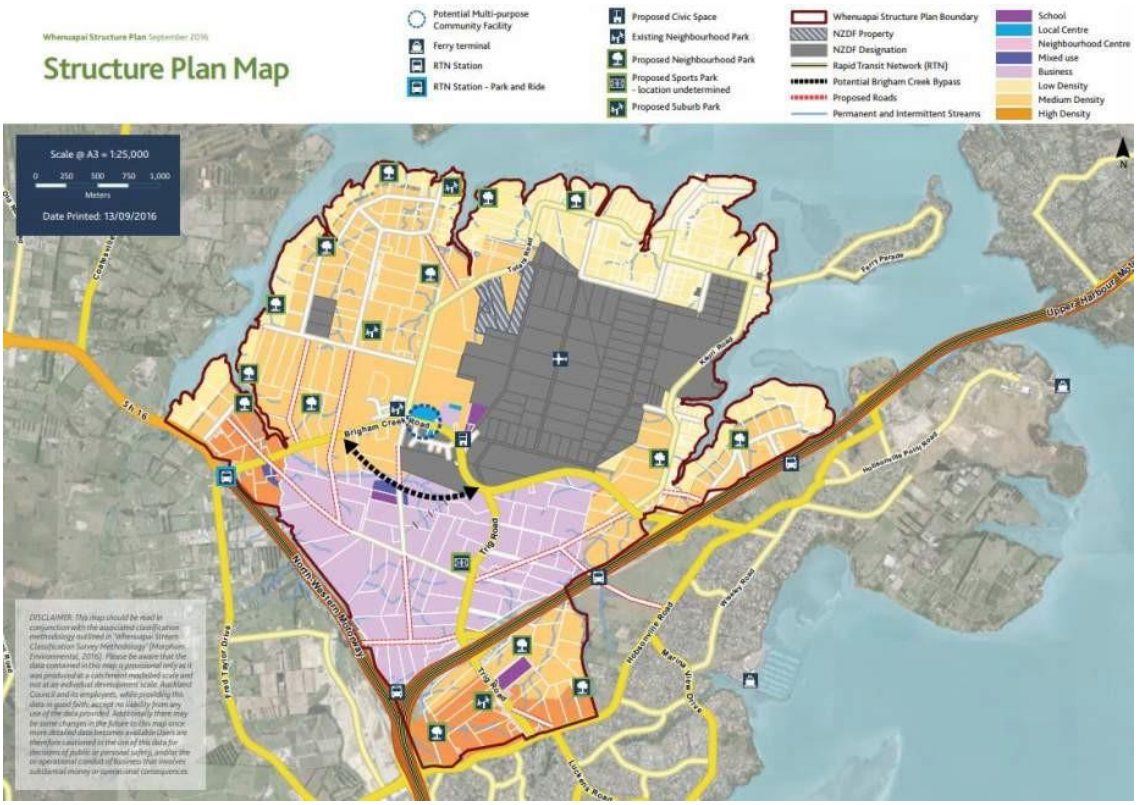


2.2 Approach to Plan Changes

This assessment has not considered emerging or current Plan Changes, other than that regarding the potential land use sequencing for Plan Change 5, which is broadly consistent with the Whenuapai Structure Plan.

The Council completed Structure Planning for the Whenuapai area in 2016. The Whenuapai Structure Plan is shown in Figure 2-2, indicating both the expected pattern of urban development and the future transport projects (subject to planning and funding approvals).

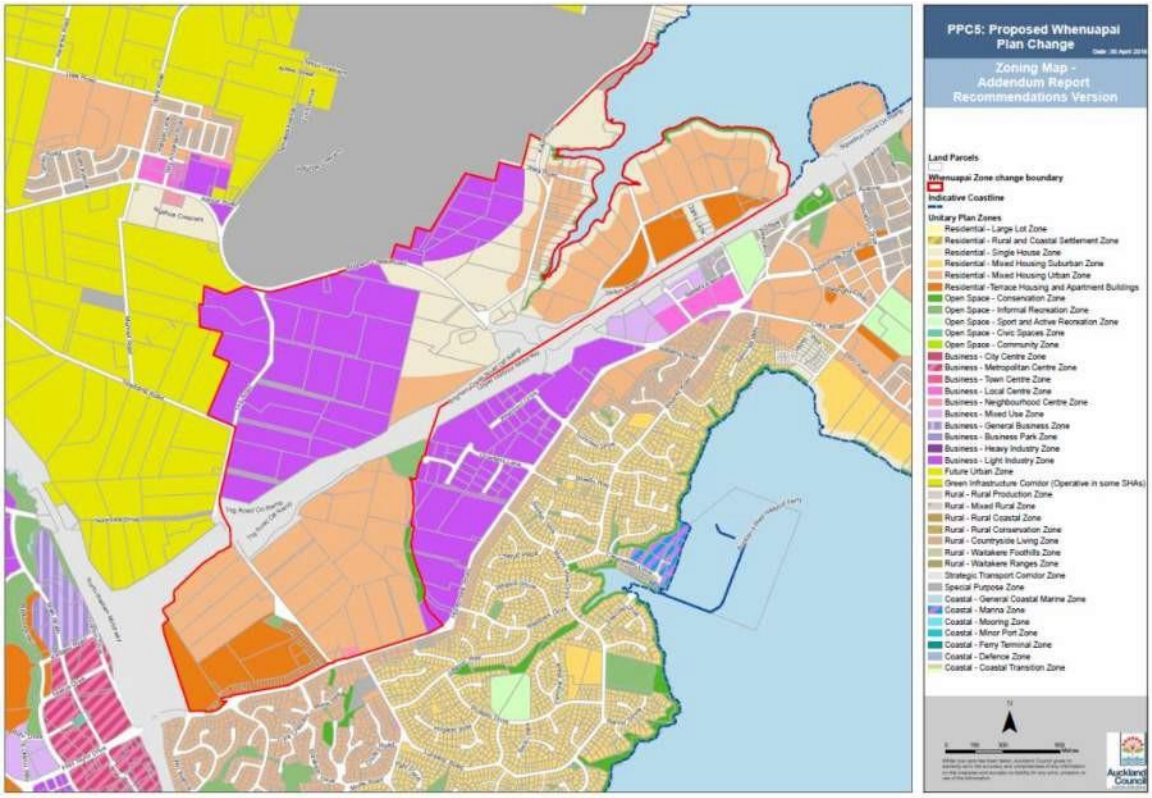
Figure 2-2: Expected pattern of urban development and the future transport projects in Whenuapai



Subsequent to this Structure Planning, Council proceeded with Plan Change 5, which proposed to change 360 ha of future urban land to a mix of business and residential land. This is shown below in Figure 2-3 below. The Plan Change 5 process is still underway and live-zoning has not yet been confirmed.

Since this workstream commenced, Plan Change 69 has become further advanced in comparison to Plan Change 5. Whilst recognising this, this baseline assessment has been guided by the planned land use release under the FULSS, which places the growth areas within Plan Change 5 ahead of Plan Change 69 area. It was agreed as part of this workstream that active Plan Changes would not be specifically considered. As such, it is recognised that Plan Change 69 will to be addressed in further refinement and sensitivity testing subsequent to this work. Refinement and sensitivity testing is further mentioned in Section 3.

Figure 2-3: Expected pattern of urban development in Whenuapai – Plan Change 5



This work has not considered the detailed planning provisions proposed in the documents to manage transportation effects or specific transport policies, nor provided a view on the appropriateness of the proposals.

2.3 Transport Outcomes Sought

The transport and land use planning for this Northwest area has identified the need for a move away from low density, car-dependent developments in order to minimise adverse outcomes in terms of:

- Inefficient use of scarce land
- Poor environmental outcomes, including carbon emissions from car-dominated travel
- Poor urban form outcomes from dispersed development with car and movement-dominated transport systems
- Poor safety outcomes from conflicts with and between walking/cycling and high traffic flows in urban areas
- Poor economic outcomes from inefficient freight movement and poor business accessibility
- Poor social and economic outcomes from poor accessibility to social and economic opportunities and limited travel options
- Poor economic outcomes through a lack of resilience in the transport system.

The key outcomes sought through the SGA business cases to address these issues include:

- Transport systems that support quality, compact urban form, including through higher density around major public transport corridors
- Mutually supportive transport and land use systems that:
    - provide safe travel across all modes
    - provide a transformation in mode share to more sustainable modes, such as public transport, walking and cycling to aide decarbonisation goals
    - provide improved choices of travel
    - provide efficient freight movement
    - provide high levels of accessibility to social and economic opportunities
- A resilient transport system.

These outcomes are used in the SGA business cases and have also been used for this assessment.

2.4 Approach to Staging Assessment

This assessment is substantially based on design and timing principles that will help deliver the desired outcomes, particularly regarding mode shift and safety. It is acknowledged that there is significant uncertainty in growth planning in greenfield areas, including:

- The outcome of land use planning decisions, such as Plan Changes
- The exact sequencing of how each site will develop, which is complicated by the large area and multiple land-owners
- The rate of development
- The timing of key infrastructure to support growth
- The growth demands that impact this area from other locations, such as Kumeu, Huapai and the inter-regional trips along the SH16 corridor.

Due to these uncertainties, it has not been possible to predict or model all possible interim scenarios. Instead, the assessment needed to consider general principles that would apply to growth in a specific area, a range of scenarios for provision of new connections or major infrastructure and the potential cumulative effects of growth across many areas.

The broad approach to this work is therefore as follows:

- Apply design and timing principles to identify key transport elements needed to support each area, especially regarding PT, walking and cycle facilities
- Consider key constraints to access to Whenuapai, Redhills and Westgate
- Use traffic data and models where needed to identify access strategies/ needs under different scenarios for key infrastructure
- Consider the cumulative effect of growth in both Whenuapai, Redhills and Westgate, including on the key connections
- Identify opportunities for interim stages of needed upgrades
- Develop indicative project sequencing strategy.

The assessment is based on provisions of high-quality walking/cycling and PT facilities from the outset of development, to support compact urban form, high mode shift and associated demand management and climate objectives.

2.5 Staging Principles Overview

Due to the uncertainty regarding the timing and form of specific land-use activities staged over two decades or more in the North West, a principle-based approach is regarded as the best way to manage and deliver the desired transport and land use outcomes consistently.

The 'Timing and Design Principles' is intended to provide guidance to stage transport infrastructure to achieve balanced growth, that aligns with the long-term outcomes and achieved optimum land use and transport integration over time. These principles have previously been agreed with AT and Waka Kotahi for the DIFF workstream.

2.5.1 Timing and Design Principles

These principles are based on the desired transport outcomes and reflect the need to stage the upgrades in an integrated way with land use development. The principles related to early provision of mode-shift and demand management initiatives are a key element of strategies to decarbonise the transport system.

The 'Timing and Design Principles' inform development of the staging transport infrastructure, based on similar principles used for the DIFF with changes to recognise any NW-specific context. The DIFF 'Timing' principle 1 was slightly modified for conciseness by joining two of the three DIFF sub-principles into one sub-principle (refer below).

The fundamental principle definition and the application of the principle in considering timing of the projects remains the same as the DIFF workstream.

Timing Principles:

1. On sites where urban development is occurring:
    a) Urbanise existing corridors within and adjacent to development concurrently with that development
    b) Provide interim facilities as part of the development and where transport improvements are provided in an interim form, ensure alignment with the full build-out network
2. Beyond sites where development is occurring, stage the form and capacity of the transport network progressively to match both development stages and system needs, including cumulative effects of urban development on transport demands on the network.
3. Provide safe and efficient public transport and active mode facilities from the outset of urban development to support a shift to more sustainable travel.
4. Sequence the provision of rapid transit systems/stations and facilities for gaining access to rapid transit to coincide with and support:
    a) A commitment to adjacent land use of significant scale within walking distance
    b) The need to serve as a strategic PT hub to service a wider catchment with poor PT options
    c) Support significant mode shift to PT from early in the development cycle
    d) Noting a need to find a balance between criteria (4a and 4c).

Design Principles:

1. Include elements to support place function, not solely movement function (i.e. design standards change based on place value)
2. Provide safe travel by all modes
3. Provide walk and cycle connections from the start of residential development to the following key destinations/attractors within walk/cycle catchments:
    a) Closest rapid transit station
    b) Nearby education facilities
    c) Closest major centre
    d) Existing centre
    e) Major employment area
4. Provide walk and cycle connections from the start of non-residential development to the following key locations within walk/cycle catchments:
    a) Closest rapid transit station
    b) Existing centre
    c) Adjacent residential areas
5. FTN services & infrastructure provisions when needed to provide reliable, efficient & attractive frequent public transport
6. Provide local bus services and associated facilities to respond to timing, scale and location of urban development
7. General traffic improvement when needed for:
    a) Safety
    b) Wider network resilience
    c) Accessibility to key destinations
    d) Inter-peak reliability & LoS for all modes
    e) Alleviation of severe peak-period congestion
    f) Alleviation of impact on public transport services
8. Coordination of adjacent projects for the purpose of practical construction staging.

It is considered that there is strong alignment between these timing and design principles and the current AT and Waka Kotahi strategic and policy documents. These strategic and policy documents include; GPS (Government Policy Statement) on land transport 2021-24, ATAP (Auckland Transport Alignment Project), TDM (Transport Design Manual), Better Travel Choices, Toitū te taiao (Sustainability action plan), Emissions Reduction Plan, and Te Taruke a Tawhiri: Auckland's Climate Plan.

This process seeks opportunities to stage upgrades to match specific growth or system needs. However, it is noted that such opportunities for interim stages may add to costs or difficulty in subsequent future upgrades. It is beyond the scope of this assessment to quantify and determine the economically optimal strategy for every part of the network, particularly given the uncertainty in how the various growth areas will indeed develop.

2.6 Transport Modelling

High level transport modelling has been used to confirm elements of this work. However, due to inherent uncertainties noted above, traffic modelling has not been the primary method to determine the recommended strategy.

Modelling sensitivity testing was undertaken to provide a more robust basis for decision making of the timing of certain transport infrastructure to help see the impacts on the overall network.

Key points to note with the modelling include:

- Recommendations on walk/cycle and PT facilities have been driven by the Staging Principles, alignment with desired outcomes and considerations for long-term integration of land use and transport, and not directly by modelling
- The traffic models have been used to identify/assess the impact of potential new access links, rather than as specific forecasts of the future
- Transport modelling, especially in greenfield growth areas, has quite high levels of uncertainty, including the type and rate of growth, timing of infrastructure, the influence of policy decisions and the design and performance of key parts of the system. In such circumstances the models are considered least accurate at a disaggregate level (e.g. hourly turning flows and delays at key locations), and more likely to be accurate at aggregate levels (e.g. daily 2-way traffic flows)
- Data was used from both the regional demand (MSM) and the local traffic (S3M) models.

A number of scenarios were used to test the effects of various network changes. Due to the significant number of potential combinations of network and land use inputs that could be considered, these tests were kept at a simple level to understand key effects. This included using fixed demand patterns for some tests with/ without key links, rather than fully re-running both the regional demand and local traffic models in all cases.

The limitations of this approach were acknowledged and various other methods used to inform the analysis, including use of existing traffic count data, outcomes of similar corridors elsewhere and high-level assessments of the daily flows likely to want to head in each direction.

2028 and 2038 MSM model scenarios were used for the high-level sensitivity tests carried out. Section 4 contains more information around the high-level transport modelling undertaken for this work.

3 Growth Inputs

This chapter outlines the key growth inputs and assumptions used in this assessment. It provides an overview of the planned land use and the currently planned land use release, as identified in the FULSS, as well as some context around current plan changes.

It is noted the FULSS remains the current forecast for land release in the Auckland Region. However, there have been delays in delivery of key elements of the strategic transport network (including rapid transit and state highway components). In addition, Council is currently considering how the NPS:UD and the MDRS will impact the timing of growth in existing urban and future urban areas in Auckland, plus there will be changes resulting from climate change strategy and policy, which is now in place (such as the Emissions Reduction Plan, Arataki, Waka Kotahi sustainability action plan and Te Taruke a Tawhiri: Auckland's Climate Plan). These drivers result in the assumptions around the timing of land use continuing to evolve, which results in uncertainty.

Te Tupu Ngātahi are actively monitoring the situation with Auckland Council and acknowledge the level of uncertainty around land use. Once the initial 'baseline' assessment has been completed, it is expected that there will be further refinement / sensitivity testing.

3.1 Auckland Unitary Plan and Structure Plan

The North West area has been signalled to undergo significant urban growth in the Auckland Unitary Plan Operative in Part (AUP(OP)) via the provision of future urban zoning and rezoning of areas from rural to urban in Redhills. Land use changes are in various stages of change and are explained further geographically in the below figures, including the Westgate and Redhills precincts, and the Whenuapai Structure Plan.

Figure 3-1 Auckland Unitary Plan Zoning and Precincts

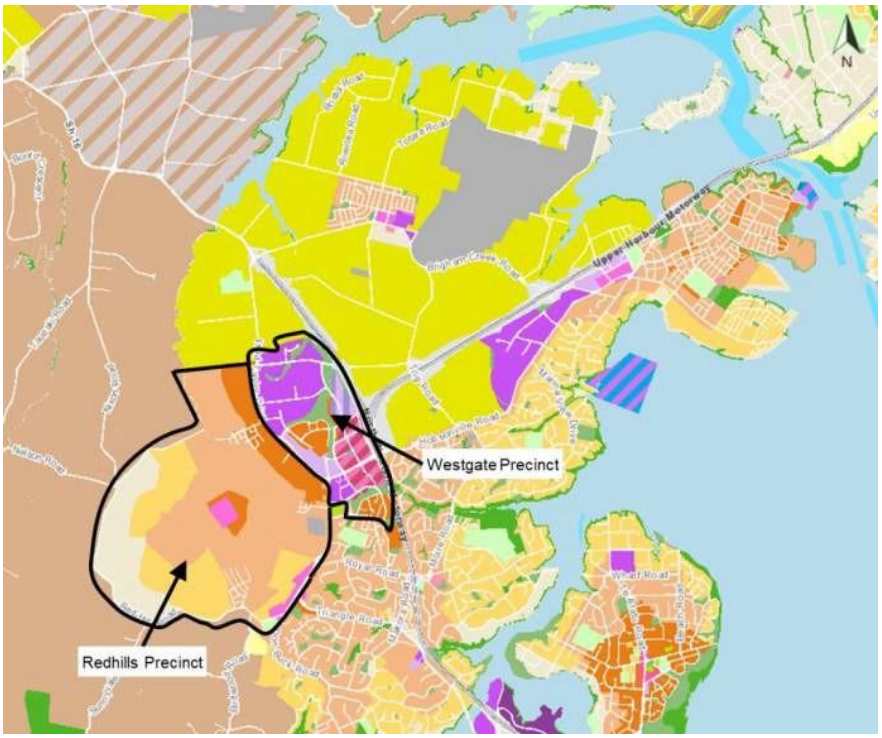


Figure 3-2 Whenuapai Structure Plan

3.2 FULSS

A key land use planning document that informs both the SGA work and this assessment is Council's Future Urban Land Supply Strategy (FULSS, 2017). That strategy indicates the preferred sequencing of greenfield (Future Urban Zone) land. Relevant to this area is the staged sequencing of new urban areas indicated in Figure 3-3 below.

Of relevant in this area is the following:

- Redhills and Whenuapai (special housing area) is indicated for the earliest development by 2017, which is already underway
- Whenuapai Stage 1 is indicated for being development ready by 2022 and is complete
- Whenuapai Stage 2 and Redhills North is indicated for being development ready by 2032.
- This assessment has not considered emerging or current plan changes and has instead focussed on the timing identified in the FULSS and associated Structure and Precinct Plans in terms of relative timing of growth. As such, the growth assumptions in the area remain generally aligned with the FULSS (as reflected in the regional land use forecasts).

In terms of 'development ready' assumptions, the FULSS provides indicative timing for the North West area. A summary of the timing and the anticipated dwellings are in Table 3-1 below.

Figure 3-3 FULSS

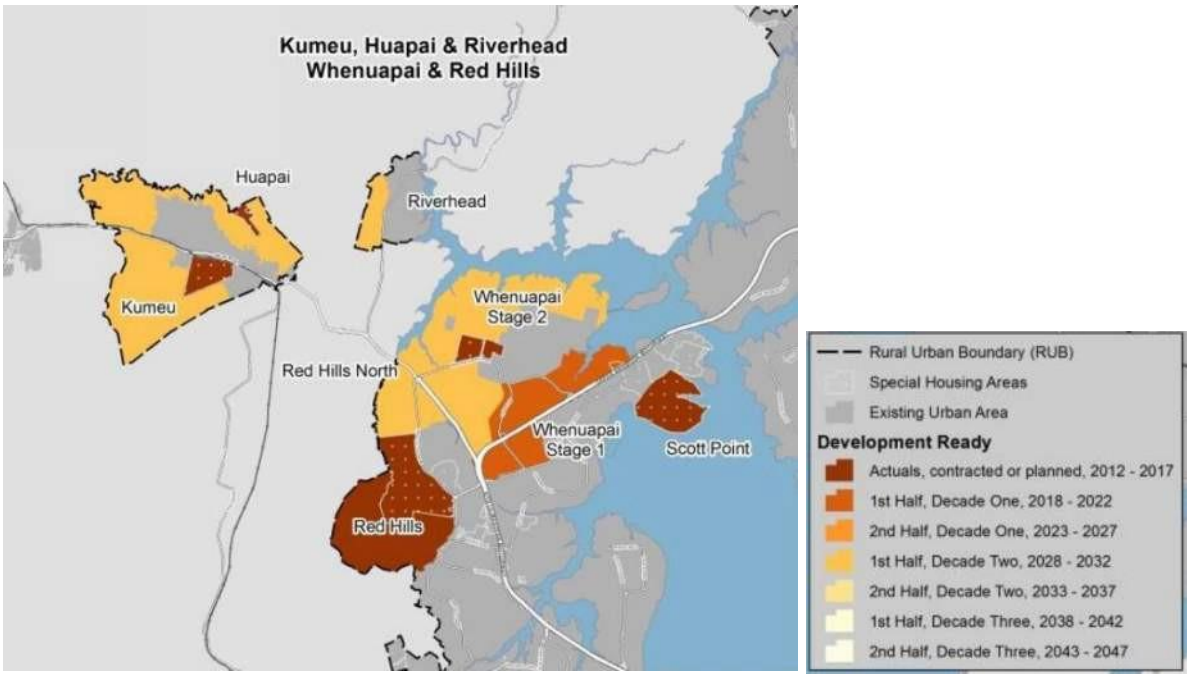


Table 3-1: Future Urban Land Supply Timing for the North West (2017)

Proposed Timing – Development Ready	Area	Anticipated dwelling (FULSS)
Actuals, Contracted or Planned (2012 – 2017)	Redhills	3,600 (SHA) + 7,050 (live zone)
	Kumeū – Huapai (Special Housing Area)	1,400
	Whenuapai (Special Housing Area)	1,150
Decade One 1st Half (2018 – 2022)	Whenuapai Stage 1	6,000
Decade Two 1st Half (2028 – 2032)	Whenuapai Stage 2	11,600
	Redhills North	1,400
	Kumeū Huapai Riverhead	6,600

It is noted that there are some differences between the land use forecasts in the FULSS (developed in 2017) and the more recent regional land use forecasts used in this assessment. The FULSS has therefore been used indicatively in terms of timing of development-ready land and the sequence of that land release, but with the more recent land use forecasts. Details of the land use scenarios (I11.5 and I11.6) approved by Auckland Council and used in the regional transport models are provided in Appendix B.

3.3 Regional Growth Forecasts

Auckland Council, in liaison with Auckland Transport and Waka Kotahi[1], regularly update their regional land use forecasts. Those forecasts are estimates of long-term regional growth undertaken at a strategic level. They are not intended to provide precise predictions of future land use activities in all areas. Forecasting future land use activities has inherent uncertainty, particular in greenfield growth areas subject to such significant change.

The forecasts are developed from Statistics NZ population forecasts, and reflect various known developments, unitary plan zoning and strategies such as FULSS. The forecasts are used in the transport forecasting undertaken for the regional and sub-regional transport planning, including that undertaken by SGA. The SGA assessments are based on forecast Scenario I11.5, albeit with an additional horizon added with full build-out of the FUZ (Future Urban Zone) areas (and referred to as the 2048+ forecast).

Scenario I11.6 was released in mid-2020 and is being progressively introduced into new SGA business cases, but was not used for the North West DBC. The updated regional scenarios typically reflect changes in the predicted rate of growth in various areas, with total yields in greenfield areas not typically changing unless subject to refined structure planning or plan changes. The Scenario I11.6 forecasts were created in 2020, with prevailing high levels of uncertainty regarding post-COVID economic and growth conditions.

This NWIFF study has relied solely on the regional forecasts. While the timing of development, remains uncertain, the use of Scenario I11.5 rather scenario I11.6 is not considered likely to significantly impact the conclusions of this assessment.

3.4 Structure and Precinct Plans

3.4.1 Whenuapai

The Council completed Structure Planning for the Whenuapai area in 2016. The Whenuapai Structure Plan is shown in Figure 3-4 below, indicating both the expected pattern of urban development and the future transport projects (subject to planning and funding approvals).

[1] This collaboration of agencies is reflected through the jointly owned Auckland Forecasting Centre

Figure 3-4: Expected pattern of urban development and the future transport projects in Whenuapai

Subsequent to this Structure Planning, Council proceeded with Plan Change 5, which proposed to change 360 ha of future urban land to a mix of business and residential land. This is shown below in Figure 3-5 below. The Plan Change 5 process is still underway and live-zoning has not yet been confirmed, so detailed consideration of this Plan Change 5 is not part of this work. In addition, the private plan change for land in the Spedding Block (Plan Change 69) has also been progressed by Oyster Capital and is currently proceeding to a Council hearing, but this has also not been considered.

For this 'baseline' assessment, it is the planned sequencing consistent with the Whenuapai Structure Plan, that has informed this NWIFF work. Further refinement / sensitivity testing is anticipated.

3.4.2 Redhills

The southern part of the Redhills area was given live zoning as part of the AUP hearings process. The land is largely undeveloped, but recent housing developments have been progressed. The supporting road network in this area was confirmed through Environment Court mediation, resulting in the precinct plan for Redhills as shown in Figure 3-6 below.

Figure 3-5: Expected pattern of urban development in Whenuapai – Plan Change 5

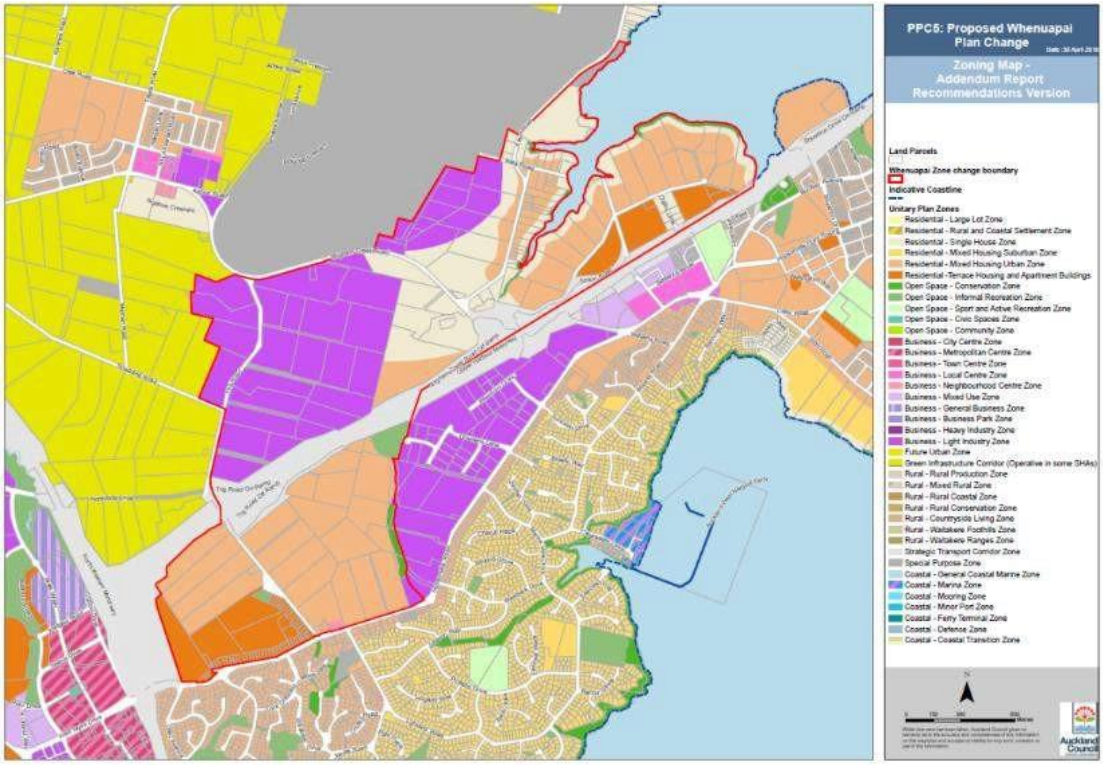
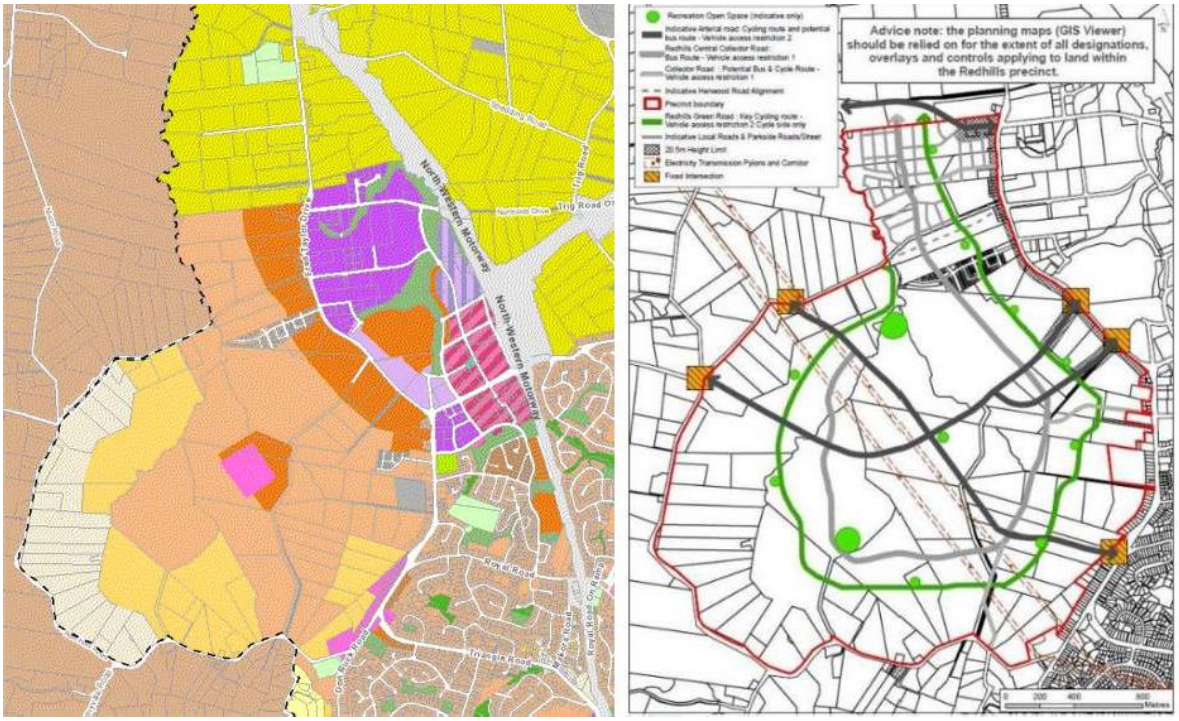


Figure 3-6: Expected pattern of urban development and the future transport projects in Redhills



In terms of the Redhills area, there are also a set of precinct provisions that identify relevant criteria for infrastructure to be provided as development 'triggers' are reached. These are summarised below and have informed this work in terms of the potential sequencing and timing of the strategic projects identified below, but not in terms of specific dwelling / development triggers.

I610.6.1. Infrastructure Upgrades and Timing of Development – Transport

(1) The number of dwellings within the precinct may not exceed the following dwelling thresholds in Table I610.6.1.1 until such time that the identified infrastructure upgrades are constructed:

Table I610.6.1.1 Threshold for Development - Transport

Dwelling threshold	Infrastructure Work Required to Exceed the Dwelling Threshold
1	Provision of signals at Don Buck Road/Westgate Drive intersection Upgrade to Don Buck Road/Triangle Road intersection
1,800	Widening of Don Buck Road between Fred Taylor Drive and Westgate Drive: a) 2 exit lanes from Fred Taylor / Don Buck intersection in southbound direction reducing to one lane; and b) 2 exit lanes from Don Buck / Westgate intersection in northbound direction reducing to one lane.
	Urbanisation of Fred Taylor Drive between Northside Drive and Don Buck Road (50km/hr speed limit, with pedestrian and cycle facilities along and across road)
	Link from Redhills Centre to Redhills Road
3,600	Upgrade to Fred Taylor Drive/Don Buck Road intersection to signalised layout (with full pedestrian/cycle crossing facilities)
	Widening of Don Buck Road between Fred Taylor Drive and Westgate Drive: 2 lanes from Fred Taylor Drive to Westgate Drive, and 2 lanes between Westgate Drive and Fred Taylor Drive increasing to 3 approach lanes at the intersection in northbound direction
5,400	North-western busway and bus station at Massey North
	Widening of full length of Fred Taylor Drive from Brigham Creek Road to Don Buck Road to two lanes in each direction with widening at intersections
	Widening of Don Buck Road from Royal Road to Redhills Road to two lanes in each direction
	Northside Drive East overbridge

I610.6.2. Infrastructure Upgrades and Location of Development- Transport

(1) The infrastructure upgrades in Table I610.6.2.1 must be constructed or be proposed to be constructed at the time the trigger is met:

Table I610.6.2.1 Trigger for Development – Transport

Trigger	Infrastructure upgrade
In advance of development accessing the Northside Drive intersection	Fourth arm at Fred Taylor Drive/Northside Drive signalised intersection
When fourth arm to Dunlop Road is provided	Signalise Fred Taylor Drive/Dunlop Road intersection
In advance of development accessing Baker Lane	Upgrade to Fred Taylor Drive/Baker Lane intersection
In advance of development in the area adjacent to Henwood Road extension / Fred Taylor Drive intersection.	Upgrade Fred Taylor Drive/Kakano Road/Henwood Road signalised intersection to incorporate fourth arm into signals

4 Transport Modelling Assessment

A key aspect of the transport infrastructure in relation to the growth within the Whenuapai is relationship with the timing and implementation of strategic projects, such as the full implementation of the North West Rapid Transit Network (NWRTN) and the State Highway 16 (SH16) to State Highway 18 (SH18) Connections (SH16/18 Connections) project.

The implementation of these projects influences, in particular, the strategic function and demand on Brigham Creek Road. This is particularly important in terms of understanding the need for these projects to support the intensification and growth of Whenuapai, as a high quality and well-functioning urban centre. As such, in addition to previous modelling undertaken for the SGA DBC, some other sequencing scenarios were considered.

4.1 Brigham Creek Road – Sensitivity Testing

Modelling sensitivity testing was undertaken to provide a more robust basis for decision making of the timing of certain transport infrastructure to help see the impacts on the overall network and, in particular, Brigham Creek Road. The specific purpose of the sensitivity testing undertaken was to understand the timing of SH16/18 Connections project (particularly motorway-motorway ramps) in relation to providing for improved place function within Whenuapai and resilience of the network.

High level modelling sensitivity tests were undertaken to understand the implications of the assumed NWRTN and SH16/18 Connections implementation. The North West S3M model, used for the North West DBC, was used to assess the impact of earlier delivery of the NWRTN, prior to the development of the SH16/18 Connections. The sensitivity test specifically looked at whether there would be increased pressure on surrounding local arterials in the network, and the timing of 4-laning on these corridors (particularly Brigham Creek Road). The scenarios modelled are described in Table 4-1**.**

Table 4-1 Model Scenarios

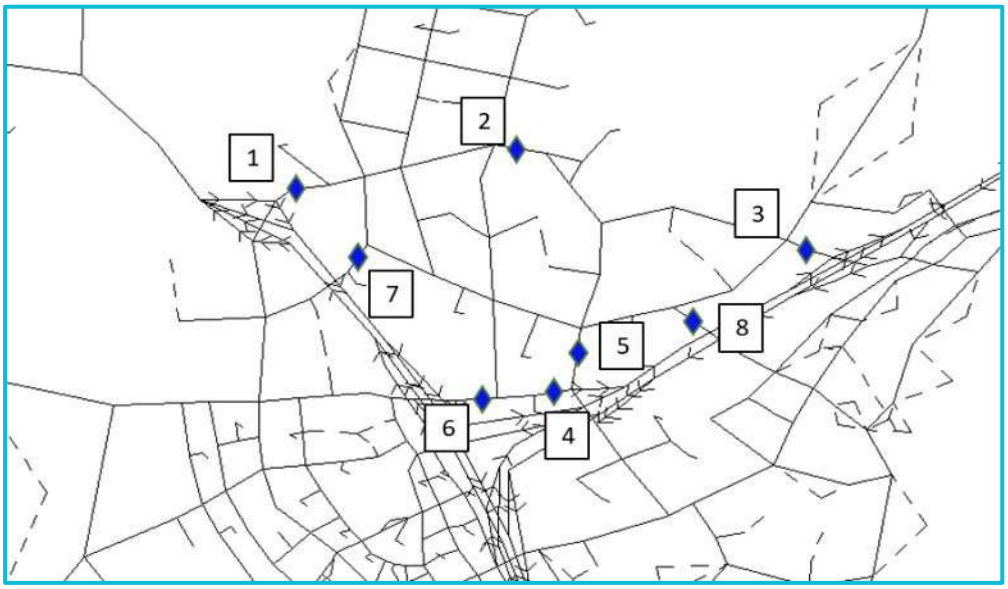
Scenario	Description	Purpose
2028 Models		
Do minimum	No SH16-18 motorway-to-motorway connection	To understand traffic demands on Brigham Creek Road and other local roads
2038 Models		
Do minimum	With SH16-18 motorway-to-motorway connection, but new Spedding Road corridors are not implemented: – Spedding Road (East) over SH18, between Hobsonville Road and Trig Road – Spedding Road (West) over SH16, between Trig Road and Fred Taylor Drive	To understand traffic demands on Brigham Creek Road and other local roads

Scenario	Description	Purpose
Do Minimum + No SH16/18 Connections	As above, but assume no SH16-18 motorway-to-motorway connections	To understand any resulting impacts of traffic demands diverting to other corridors, including Brigham Creek Road
Reference case	With SH16-18 motorway-to-motorway connection and new Spedding Road corridors are also implemented	To understand traffic demands on Brigham Creek Road and other local roads
Reference Case + No Spedding Rd	As above, but assume no SH16-18 motorway-to-motorway connections	To understand any resulting impacts of traffic demands diverting to other corridors, including Brigham Creek Road

The locations where traffic model flows were recorded are presented in Figure 4-1 and were:

1. Brigham Creek Rd West:
2. Brigham Creek Rd Central:
3. Brigham Creek Rd East:
4. Northside Dr east
5. Trig Rd Interchange
6. Northside Dr west
7. Spedding west
8. Spedding East

Figure 4-1: Location of Selected Model Flows in North West



The resulting daily flows at these key locations are summarised in Table 4-2.

Table 4-2 Estimated Daily Traffic Flows

Location	Direction	2028 Do Minimum	2038 Do Minimum	2038 Do Minimum + No SH16/18	Difference	2038 Reference Case	2038 Reference Case + No SH16/18	Difference
1	Both Directions	21,240	22,860	26,610	3,750	12,210	13,090	880
2	Both Directions	16,380	11,770	17,940	6,170	7,730	8,810	1,080
3	Both Directions	21,120	19,540	23,220	3,680	18,080	19,680	1,600
4	Both Directions	120	11,660	14,300	2,640	6,580	8,290	1,710
5	Both Directions	6,770	14,420	14,380	-40	8,190	11,660	3,470
6	Both Directions	n/a	11,420	13,970	2,550	18,020	19,600	1,580
7	Both Directions	n/a	n/a	n/a	n/a	7,330	13,340	6,010
8	Both Directions	n/a	n/a	n/a	n/a	5,210	6,580	1,370
All Locations (1-8)		49,250	79,900	92,480	12,580	75,620	92,240	16,620

It is noted that pushing the SH16/18 Connections back, after the NWRTN, which was tested by considering the removal of the SH16/18 motorway-to-motorway connection, was identified to increase pressure on certain sections of some arterials, particularly Brigham Creek Road and Trig Road. This identified that there was an inter-dependency between the timing of this element of the SH16/18 Connections and the implementation of four-laning on Brigham Creek Road, particularly the western section, which would then be required at an earlier stage in the land use sequencing.

An inter-dependency between the timing of the SH16/18 Connections and the implementation of Spedding Road (west) corridor was also identified, particularly without four-laning on the western part of Brigham Creek Road. Without the direct SH16/18 motorway-to-motorway connection, this route would assist in reducing pressure on Brigham Creek Road, by enabling an alternative to access the Trig Road west-facing ramps for movements between SH16 and SH18.

5 Infrastructure Project Assessments

This section provides commentary on the main corridors, followed by presentation of the recommended staging schedule.

5.1 Corridor Form and Function

Figure 5-1 indicates the relevant corridors and the project elements referred to in the Staging Schedule are then illustrated in Figure 5-2.

Table 5-1 summarises the intended function, form, staging opportunities and inter-dependencies of each corridor.

Figure 5-1: Long-term Preferred Outcome (2048+)

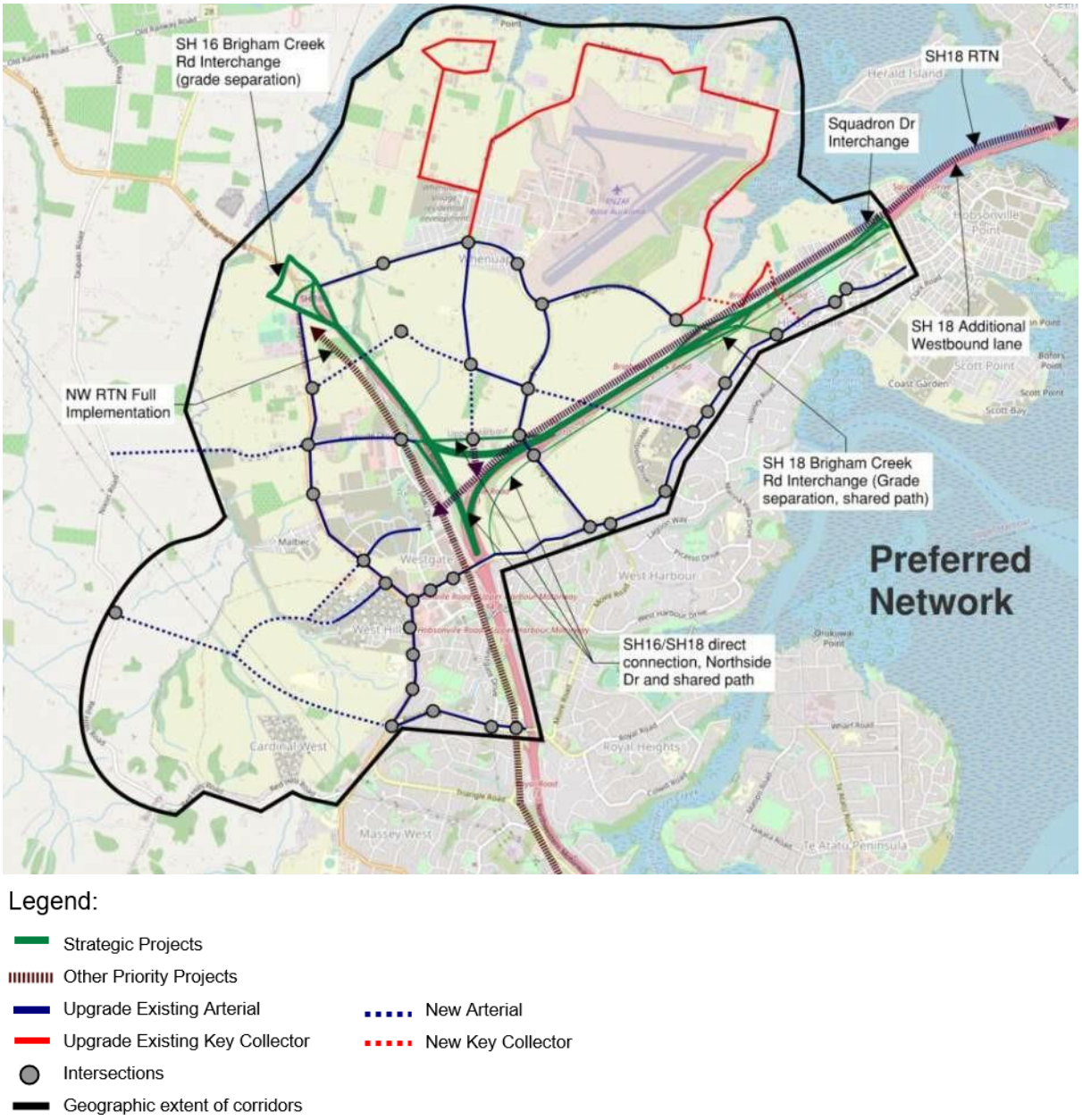


Figure 5-2 Corridors and Project Numbers

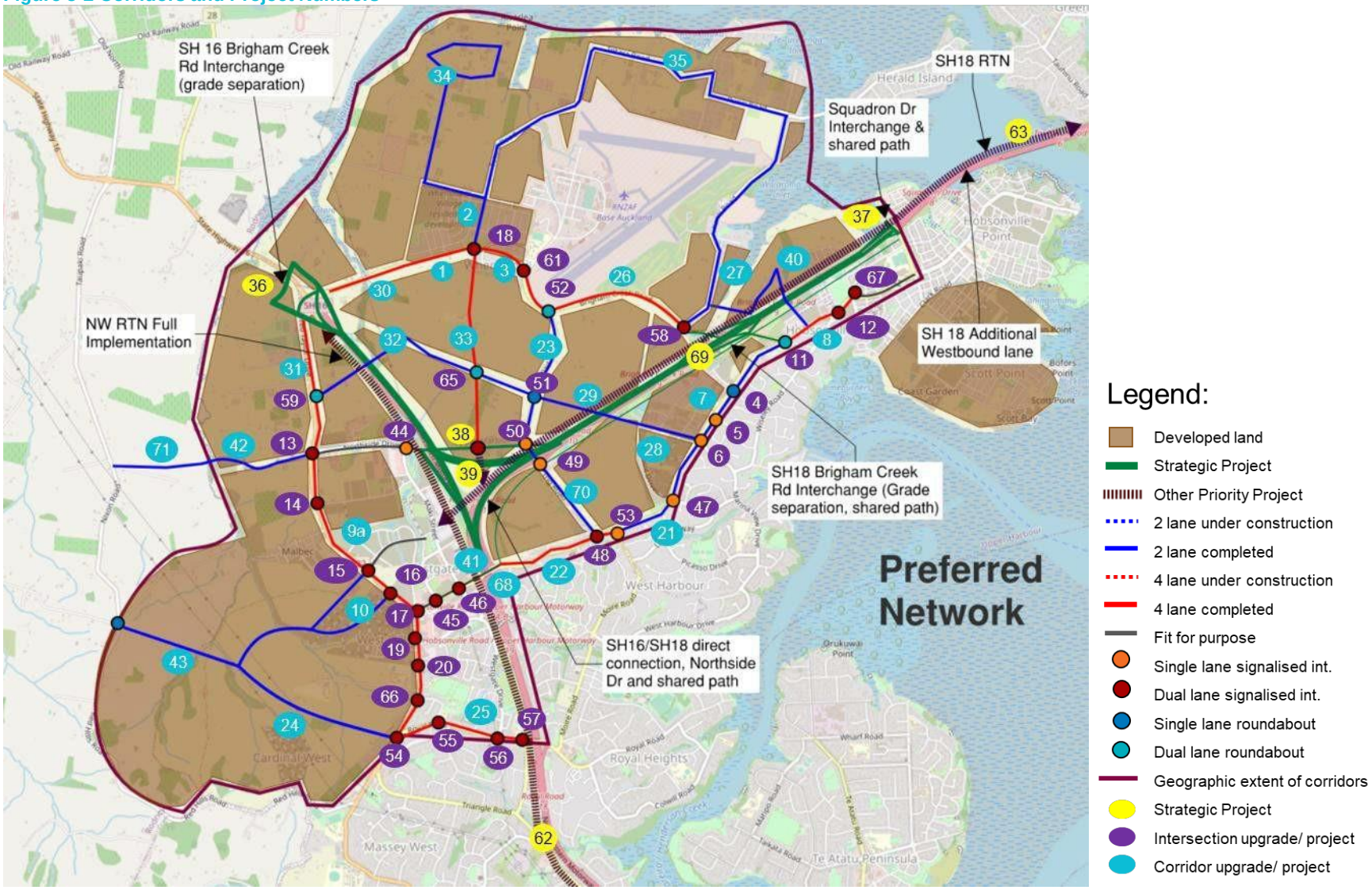


Table 5-1 Corridor Form and Function

No	Corridor	Future Function	Ultimate form[2] and staging opportunities	Inter-dependencies
NW Strategic Projects				
62, 60 *(interim project – not shown on Figure 5-2)*	NW RTN	• A RTN corridor (mode to be confirmed) between the City Centre and Westgate / Whenuapai, improving access and mode choice	• Full implementation of the RTN corridor (mode to be confirmed) has been identified through the NWRTN IBC from the City Centre to a future Brigham Creek station, including potential stations at Westgate and Royal Road. • Opportunity for initial implementation of interim NW short term bus improvements. This includes extending bus shoulders on the North-western motorway between Westgate and Newton Road with a new bus interchange at Westgate.	• Mamari Road FTN • Brigham Creek Road • Spedding Road West • Royal Road FTN • Fred Taylor Drive
63	SH18 RTN	• A RTN corridor on SH18 between Westgate and Constellation Drive (SH1), improving access and mode choice	• RTN corridor on SH18 between Westgate and Constellation, including stations near Spedding Road East and Hobsonville centre.	• SH16/18 Connections • Mamari Road FTN • Hobsonville Road FTN • Trig Road • Spedding Road East
36, 38, 39, 69	SH16/18 Improvements	• A package of improvements has been identified through the previous SH16/SH18 SSBC, to improve local connections and form a key part of the Western Ring Route.	• Opportunity for initial implementation of interim roundabout signalisation at SH16/ Brigham Creek Roundabout. Later, this interchange becomes grade separated and the ultimate form is identified as a split fork interchange with implementation of the Alternative State Highway.	• Trig Road Interchange ramp intersection upgrades • ASH (Alternative State Highway) • NW RTN • NW DBC RTC (North West Detailed Business Case Rapid Transit Corridor) • SH18 RTN

[2] Note: While the proposed form of the arterial roads has been developed by SGA, the specific form of Collector and local streets will be determined between developers and Auckland Transport.

No	Corridor	Future Function	Ultimate form[2] and staging opportunities	Inter-dependencies
			• Other staged elements include; SH16/18 motorway to motorway ramps, Northside Dr East Interchange incl. south facing ramps, SH18 Brigham Creek Interchange upgrade, and associated active modes facilities	
37	Squadron Drive Interchange	• Squadron Drive Interchange & SH18 Shared Path (Squadron Dr to BCR) to improve local connections to and alongside SH18	• Squadron Drive ramps in RLTP 2021-31 and shared path part of SH16/18 Connections	• Hobsonville Rd (Hobsonville Pt Road to Brigham Creek Road)
68	SH16 Active Modes Overbridge	• Fred Taylor Drive to Hobsonville Road - SH16 active modes overbridge, improving access and mode choice	• Active modes overbridge in addition to existing vehicle overbridge	• Hobsonville Rd upgrade
Whenuapai				
26	Brigham Creek Road Eastern section (SH18 to Trig Rd)	• Support local safe travel choices for active modes, as well as access to Whenuapai centre • Support imminent urban growth adjacent to the corridor	• Opportunity for initial implementation of interim 24m cross section and later 30m cross section to respond to timing and scale of medium / longer-term growth in Whenuapai.	• SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections.
3, 26	Brigham Creek Road Central section (Trig Rd to Māmari Rd FTN)	• Already completed in some sections • Support local safe travel choices for active modes, as well as access to and 'place' function of Whenuapai centre • Support current and imminent urban growth adjacent to the corridor	• Opportunity for initial implementation of interim 24m cross section and later 30m cross section to respond to timing and scale of medium / longer-term growth in Whenuapai.	• SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections.
30, 1	Brigham Creek Road	• Two-lane upgrades already completed in some sections adjacent to live-zoned / completed development	• Opportunity for initial implementation of interim 24m cross section and later 30m cross section to respond to timing and	• SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections.

No	Corridor	Future Function	Ultimate form[2] and staging opportunities	Inter-dependencies
	Western section (Māmari Rd FTN to SH16)	• Support local safe travel choices, including for active modes and PT, as well as access to Whenuapai centre • Support current and future urban growth adjacent to the corridor	scale of medium / longer-term growth in Whenuapai.	• ASH including Brigham Creek Interchange – Western section (west of Totara Creek) requires realignment to enable Brigham Creek Interchange, so may need to brought forward, if interim Interchange upgrade progressed.
33	Māmari Road	• Support mode choice / climate change outcomes • Enables active mode and strategic PT (FTN corridor) between Whenuapai and Westgate, including access to Westgate NWRTN station (either Interim or Full Implementation) • Potential to influence urban form and catalyst for growth • Implementation supports timing and scale of urban development of Whenuapai residential and employment areas • Reduces demand and development pressures on the Brigham Creek / SH16 connection, providing an alternative connection to the Westgate metropolitan centre.	• Four lane corridor – 30m cross section	• NWRTN (Short-term / Full implementation) – Supports local PT access to RTC • SH16 / SH18 Connections – Requires completion of the Northside Dr connection (Trig Road and Maki Street) over SH16 • SH18 RTN – Provides opportunity for later direct dedicated 'bus only' connection from southern end of Māmari Rd FTN and Westgate.
23	Trig Road SH18 to Brigham Creek Road	• Support local safe travel choices for active modes, as well as access to SH18 shared path • Support future urban growth adjacent to the corridor.	• Two lane corridor – 24m cross section	• SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections • SH18 RTN – Form and function relies on medium / long-term delivery of SH18 RTN.

No	Corridor	Future Function	Ultimate form[2] and staging opportunities	Inter-dependencies
32, 33	New Spedding Road West Māmari Road to Fred Taylor Drive	• Support local safe travel choices, including for active modes and PT, plus access to NWRTN and SH16 Cycleway • Support future urban growth adjacent to the corridor	• Opportunity for initial implementation of 24m cross section cross section with adjacent urban development.	• NWRTN (Full implementation) - Supports east-west access to NWRTN Brigham Creek station. • ASH including Brigham Creek Interchange – To provide for full implementation of Brigham Creek Interchange.
29, 33	New Spedding Road East Māmari Road to SH18	• Support local safe travel choices, including for active modes and PT, plus access to SH18 RTN and SH18 shared path • Support future urban growth adjacent to the corridor	• Opportunity for initial implementation of 24m cross section cross section with adjacent urban development.	• SH16 / SH18 Connections – Opportunity to construct SH18 bridge with delivery of SH16 / SH18 Connections • SH18 RTN – Supports east-west access to SH18 RTN station.
8	Hobsonville Road Eastern section (Hobsonville to Brigham Creek Rd)	• Already completed in some sections • Support local safe travel choices, including for active modes and PT, and medium / long-term access to SH18 RTN stations • Support current and imminent urban growth adjacent to the corridor.	• 30m cross section to enable efficient bus services and safe active modes facilities	• SH16 / SH18 Connections – Completion of Squadron Dr west facing ramps by 2031 in RLTP, so short-term improvements necessary • SH18 RTN – Form and function relies on medium / long-term delivery of SH18 RTN.
7, 21	Hobsonville Road Central section (Brigham Creek to Luckens Rd)	• Already completed in some sections • Support local safe travel choices for active modes, and medium / long-term access to SH18 RTN stations • Support current and imminent urban growth adjacent to the corridor.	• 24m cross section to enable safe active modes facilities	• SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections • SH18 RTN – Form and function relies on medium / long-term delivery of SH18 RTN.

No	Corridor	Future Function	Ultimate form[2] and staging opportunities	Inter-dependencies
22	Hobsonville Road Western section (Luckens Rd to SH16)	• Support local safe travel choices, including for active modes and PT, and medium / long-term access to SH18 RTN stations, as well as access to the Westgate metropolitan centre • Support imminent urban growth adjacent to the corridor.	• 30m cross section to enable efficient bus services and safe active modes facilities	• SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections • SH18 RTN – Form and function relies on medium / long-term delivery of SH18 RTN.
Redhills				
9	Fred Taylor Drive Southern section (Don Buck Rd to Northside Dr)	• Already completed in some sections • Support local safe travel choices, including for active modes and PT, as well as access to Westgate metropolitan centre • Support current and imminent urban growth adjacent to the corridor	• Opportunity for initial implementation of interim 24m cross section and later 30m cross section to respond to timing and scale of Redhills / Westgate urban growth.	• SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections.
31	Fred Taylor Drive Northern section (Northside Dr to SH16)	• Tie-in with Interim Brigham Creek Interchange upgrade • Support local safe travel choices, including for active modes and PT, as well as access to NWRTN Brigham Creek station and Westgate metropolitan centre • Support imminent and future urban growth adjacent to the corridor in the Redhills North area	• Opportunity for initial implementation of interim 24m cross section and later 30m cross section to respond to timing and scale of Redhills / Westgate urban growth, with planned overall urban growth (36% by 2033).	• RTC / RAMC (Rural section) – Requires realignment and grade separation to accommodate RTC / RAMC • Brigham Creek Interchange interim upgrade – Requires realignment and grade separation to accommodate Brigham Creek Interchange • NWRTN (Full implementation) – Form and function supports access to NWRTN Brigham Creek station • SH16 / SH18 Connections – Form and function relies on medium / long-term delivery of SH16 / SH18 Connections.

No	Corridor	Future Function	Ultimate form[2] and staging opportunities	Inter-dependencies
42, 71	New Northside Drive West From Fred Taylor Drive to Nixon Road	• Support local safe travel choices for active modes and longer-term system resilience • Support future urban growth adjacent to the corridor in the Redhills North area.	• Two lane corridor – 24m cross section	• N/A
9	Don Buck Road Fred Taylor Drive to Redhills Road	• Support local safe travel choices, including for active modes and PT, as well as access to Westgate metropolitan centre • Support current and imminent urban growth adjacent to the corridor	• Opportunity for initial implementation of interim 24m cross section and later 30m cross section to respond to timing and scale of Redhills / Westgate urban growth.	• N/A
25	Royal Road	• Support mode choice/ climate change outcomes • Enables active mode and strategic PT (FTN corridor), plus access to NWRTN and SH16 Cycleway • Potential to influence urban form and catalyst for growth • Support future urban growth in Redhills	• Four lane corridor – 30m cross section	• NWRTN (Full implementation) – Supports active mode and PT (FTN) access to NWRTN Royal Road station and SH16 Cycleway.
10	Dunlop Road & Baker Lane arterials	• Support local safe travel choices, including for active modes and PT, plus FTN corridor • Support current urban growth adjacent to the corridor	• New 2-lane urban arterials	• N/A
43	Redhills N-S Arterial Nixon Road to Redhills Local Centre	• Support local safe travel choices, including for active modes and PT, plus FTN corridor • Support future urban growth adjacent to the corridor	• New 2-lane urban arterial with active modes on both sides and local intersection improvements	• N/A

No	Corridor	Future Function	Ultimate form[2] and staging opportunities	Inter-dependencies
24	Redhills N-S arterial (Redhills Local Centre to Royal Road) & Redhills E-W arterial (Dunlop Road to local Centre)	• Support local safe travel choices, including for active modes and PT, plus FTN corridor • Support future urban growth adjacent to the corridor	• New 2-lane urban arterial with active modes on both sides and local intersection improvements	• N/A

5.2 Recommended Staging Schedule

5.2.1 Purpose and Context

An indicative staging schedule for Whenuapai, Redhills and Westgate projects has been developed from the preceding information. The context for this assessment is important, in that:

- It is for the purpose of Council considering funding and financing options, and as such has not explicitly considered funding constraints or delivery mechanisms
- It is based on transport facilities to serve the full release of the anticipated land use forecasts in Whenuapai, Redhills and Westgate, using the FULSS land use timing and assumed regional land use forecasts. It therefore has not considered land use approval, funding, network, economic or other constraints on growth, or the outcomes of more recent policy direction (and how that my impact growth timing in the Auckland Region and study area)
- It is based on SGA transport planning principles and processes, and hence does not reflect committed staging agreed by Auckland Transport, Auckland Council or Waka Kotahi
- The ultimate corridor forms are based on the SGA work or other earlier business cases. Opportunities for potential interim stages remain conceptual options only, with the design, form and timing of any works meaning for agreement between developers and relevant authority (Auckland Transport or Waka Kotahi).

In summary, the Staging Schedule reflects how the identified long-term network for the study area could be delivered to support the currently identified FULSS staging and associated regional land use forecasts, based on the Te Tupu Ngātahi transport planning (timing and design) principles. The Staging Schedule is not an implementation plan of the Te Tupu Ngātahi future network.

The Staging Schedule is therefore likely to change in response to funding methods, delivery mechanisms, land use decisions and regional investment priorities. As such, as discussed previously, whilst the FULSS has been used to inform the 'baseline' scenario considered herein, there is opportunity for alternatives to be considered, once the initial outcomes are understood.

5.2.2 Definitions

The proposed Staging Schedule provides the following information:

- Name of project/ stage
- The key growth areas/ developments for which the projects are needed
- Transport Project interfaces
- Transport Project interdependencies
- Description of ultimate or potential interim stage
- Corridor hierarchy
- An indicative timeframe for the works being needed.

Development areas for which the projects are needed are defined as follows:

- Whenuapai Stage 1 (S1) East, S1 West and S1 South
- Whenuapai Stage 2 (S2) Central (live-zoned), S2 North and S2 South
- Whenuapai Airbase
- Redhills Planned (live-zoned), Redhills SouthWest and Redhills North
- Westgate
- West Harbour.

These refer to areas for which the project is needed to provide the outcomes identified in the Staging Principles. It is noted that the need, cause or beneficiary of the works may not be equal across all areas. That complexity could be addressed through funding mechanisms.

Timing is intended to be indicative rather than being specific to any year, as follows:

- Under construction / 'Completed'
- '2022' refers to being needed now, given known / current development
- '2026' refers to within the first 5 years of development
- '2031' refers to within the first 10 years of development
- '2036' refers to within the first 15 years of development
- '2046' refers to within the first 25 years of development to support the full build-out anticipated.

5.2.3 Staging Schedule

The Staging Schedule is provided in Table 5-2 alongside staging maps which are presented from Figure 5-3 to Figure 5-8.

Table 5-2 Staging Schedule

No	Area	Project	Transport Project iinterfaces	Transport Project iinterdependenoies	Project Stage	Project Description	Hierarchy	Indicative limiing
Ib	WH	Brigham Creek Road - Joseph McDonald Drive to Totara Road	BCR / 5H16 interim interchange upgrade	5HI6/I8 Connections	Ultimate	4-lane **urban-** upgrade,2-lane,urban with active modes on hoth sides (SGA design)	Arterial	2031
3b	**WI-I**	Brigham Creek Road - Totara Road to Tamatea Ave			Ultimate	4-lane **urban-** upgrade,2-lane,urban with active modes on hoth sides (SGA design)	Arterial	204!6
7	**WI-I**	Hobsonvi11e,Road - Westpark Drive,to Williams Road			Ultimate	2.-l'ane urban-with active modeson both sides+ local in ersection improvemen s	Arterial	202.2
Ba	**WI-I**	Hobsonville Road - Williams Road to Hobsonville Point Road			Interim	2.-llane urban-with active modeson both sides+ local int,ersection improvements	Arterial	202.2
Sb	**WI-I**	I-Iobsonville Road - Williams Road to Hobsonville Point Road		Squadron **DrW** Facing Ramps	Ultimate	**4-lane urban-** upgrade 2-lane urban with active modes on both sides (SGA design)	Arterial	2026
9a	**RH**	Fred Taylor Drive/ Don Buck Rd - Kakano Road to Beauchamp Dr			Interim	2.-llane **urban-with** active modeson both sides+ local int,ersection improvements	Arterial	2022
9b	**RH**	Fred Taylor Drive/ Don Buck Rd - Kakano Road to Beauchamp Dr		NWRTN and 51-116/18 Connections	Ultimate	4-lane urban- upgrade 2-lane urban with active modes on both sides (SGA design) FTN Upgrade	Arterial	2031
10	**RH**	Dunlop Road and Baker Lane Arterials			Ultimate	**New** 2.-llane **urban** art,erials	Arterial	202.2
11	**WI-I**	Intersection upgrade on Hoh onville Road/ Brigham Creek Road	Hob onville Rd 2-lane section upgrade	Squadron **DrW** Facing Ramps	Ultimate	Upgrade intersection to Dual lane roundahou	Arterial	202.2
I6a	**RH**	Intersection upgrade,on Fr,ed Taylor Drive/ Baker Lane	Fred Taylor Dr 2-lane section upgrade		Int,erim	Upg ade iintersection to Single lane signalised intersection	Arterial	2022
17	**RH**	Intersection upgrade,on Fr,ed Taylor Drive/ Don Buck Road	Fred Taylor Dr 2-lane section upgrade		Ultimate	Upgrade intersection to Dual lane signalised in ersection	Arterial	202.2
I9a	**RH**	Intersection upgrade,on Fr,ed Taylor Drive/Westgate Drive	Fred Taylor Dr 2-lane section upgrade		Int,erim	Upg ade iintersection to Single lane signalised intersection	Arterial	2022
20a	RI-I	Intersection upgrade,on Fr,ed Taylor Drive/ Rush Creek Drive	Fred Taylor Dr 2-lane section upgrade		Int,erim	Upg ade iintersection to Single lane signalised intersection	Art,erial	202.2
12b	**WI-I**	Intersection upgrade,on Hohsonville Road/ Memorial Park Lane	Hobsonville Rd 2-lane section upgrade	Squadron **DrW** Facing Ramps	Ultimate	**Upgrade intersection** to Dual lane signalised in ersection	Arterial	2031

No	Area	Project	Iransport Project interfaces	Iransport Project iinterdependenoies	Project Stage	Project DescripUon	Hierarchy	Indicative Timiing
13b	RH	Intersection upgrade on Fred Taylor Drive/ North.side Dr	Fred Taylor Dr 4-lane section upgrade,		Ultimate	**Upgrade** iintersectlon to Dual lane signalised int,ersection	Arterial	2031
14b	RH	Intersection upgrade on Fred Taylor Drive/ Kakano Road	Fred Taylor Dr 4-lane section upgrade,		Ultimate	Upgrade iinternection to Dual lane signalised int,ersection	Arterial	2031
15b	RH	Intersection upgrade on Fred Taylor Drive/ Dunlop Road	Fred Taylor Dr 4-lane section upgrade,		Ultimate	Upgrade intersection to Dual lane signali.sed int,ersection	Arterial	2031
16b	RH	Intersection upgrade on Fred Taylor Drive/ Baker Lane,	Fred Taylor Dr 4-lane section upgrade,		Ultimate	Upgrade iintersection to Dual lanesignali.sed int,ersection	Arterial	2031
19b	RH	Intenection upgrade,on Fred Taylor Drive/ Westgate Drive	Fred Taylor Dr 4-lane section upgrade,		Ultimate	Upgrade iintersection to Dual lane signalised int,ersection	Arterial	2031
20b	RH	Intenection upgrade,on Fred Taylor Drive/ Rush Cr,eek Drive	Fred Taylor Dr 4-lane section upgrade,		Ultimate	Upg ade iintersection to Dual lane signalised int,ersection	Arterial	2031
21	WH	1-lobsonvi11e Road - We.stpark Dr to Luckens Road			Ultimate	2 1ane **urban-** with active modes on both sides+ local inter,ection improvements	Arterial	2026
2.2	WH	1-lobsonville,Road - Fr,ed Taylor Dr to Luckens Road	Trig Rd Upgrade - BCR to 1-lob onville Rd	Trig Rd Upgrade - BCRto 1-lob onville Rd	Ultimate	4-l'ane urban- upgrade,2-lane urban with active, mode.son both side.s(SGA design)	Arterial	2026
41	RH	Upgrade Fred Taylor Drive **'fit-for-** purpose' section between Don Buck Road and 1-lobsonville Road		4-lane upgrade of Hob onville Rd (No. 22)	UI ima e	**Upgrade corridor** to provide walking and cycling facili ies.	Arterial	2026
23	WH	Trig Road - Brigham Creek Rd to SHlB		**NW** Short Term Bu.s Improvements and 51-116 Northside Dr Bridge	Ultimate	2 1ane **urban-** with active modes on both sides+ local intersection improvements	Arterial	2026
70	WH	Trig Road -SH18 to Hobsonville Rd	1-lobsonvi11e Road - Fred Taylor Dr to Luckens Road (Ultimate)	NWShortT,erm Bu.s Improvements	Ultimate	Hane **urban-** with active modes on both sides+ local inter,ection improvements	Arterial	2026
24	RH	Redhill.sN-S arterial (Redhills Local Centre to Royal Road) & Redhills E-W arterial (Dunlop Road to locad entre)			Ultimate	**New 2.-lane urban-with** active,mode.son both sides+ local int,ersection improvements	Arterial	2026
25	RH	Royal Road upgrade		NWRTN	Ultimate	4-llane **urban-** upgrade 2-lane urban with active mode.son both side.s(SGA design) FTN Upgrade	Arterial	2031
26a	WH	Brigham Cr,eek Road - Tamate,a Ave to Kauri Road	Trig Rd Upgrade - BCRto 1-lobsonville Rd	**NW** Short T,erm Bu.s Improvements	Int,erim	2. lane **urban-** with active modes on both sides+ local intersection improvements	Arterial	2026
26b	WH	Brigham Cr,eek Road - Tamate,aAve to Kauri Road			Ultimate	4-l'ane **urban-** upgrade,2-lane urban with active, mode.son both side.s(SGA design)	Arterial	2046

No	Area	Project	Iransport Project interfaces	Iransport Project iinterdependenoies	Project Stage	Project Descrip,ti:on	Hierarchy	Indicative Timing
23	WH	Trig Road - Brigham Creek Rd to SH18		**NW** Short T,erm Bu5 Improvements and Sf-116 Northside Dr Bridge	Ultimate	2-slane **urban-** with active modes on both sides+ local inter,ection improvements	Arterial	2026
70	WH	Trig Road -SH18 to Hobsonville Rd	I-lob onville Road - Fr,ed Taylor Dr o Luckens Road (Ultimate)	**NW** Short Term Bu5 Improvements	UI ima e	Hane **urban-** with ac ive modes on both sides+ local intersection improvements	Arterial	2026
2.4	RH	Redhill5 N-S arterial (Redhills Local Centre to Royal Road) & Redhills E-W arterial (Dunlop Road to local Centre)			UI ima e	New 2-lane urban-with active mode5 on both ,ides+ local int,ersection improvements	Arterial	2026
25	RH	Royal Road upgrade		NWRTN	Ultimate	4-llane **urban-** upgrade,2-lane urban with active, mode5 on both side5 (SGA design) FTN Upgrade	Arterial	2031
26a	WH	Brigham Cr,eek Road - Tamate,aAve to Kauri Road	Trig Rd Upgrade - BCR to I-lob onville Rd	**NW** Short T,erm Bu5 Improvements	Int,erim	Hane **urban-** with active modes on both sides+ local intersection improvements	Arterial	2026
26b	WH	Brigham Cr,eek Road - Tamate,a Ave to Kauri Road			Ultimate	4-llane **urban-** upgrade,2-lane urban with active, mode5 on both side5 (SGA design)	Art,erial	204!6
2.7	WH	Kauri Road - Brigham Cr,eek Rd to Rata Rd			UI imate	Hane **urban-** with active modes on both sides+ local in ersection improvemen *S*	Collector	2026
28	WH	Spedding Road Ea5t-SH18 to Hobsonville Rd			UI imate	2-slane **urban-** with active modes on both sides+ local intersection improvements Connects to item 29 to form an overbridge across Sl-I 18	Arterial	2026
36a	WH	51-116 / Brigham Creek roundabout interim improvement5 - signali5ation		51-116/18 Connections	Int,erim	Roundabout signalisation Part of the SH16/ SH18 SSBC	Strat,egic	2026
37	WH	Squadron Drive Interchange & Sl-118 Shared Path (Squadron Dr to BCR)		I-lob onville Rd (I-lobsonville pt Rd to BCR)	Ultimate	Squadron Dr ramps in RLTP and Shared path part of SH16/18 Connections	Strategic	2026
38	WH	Northside Drive East Upgrade (part of Si-116/18 Connections)	Trig Rd Interchange Ramp Int,ersections	Sl-ll6/18 Connections	Ultimate	Part ofthe 51-116/18 Connectiom project 4-lane arterial road wit,hdedicated walking and cycling facilities. ExcludesSH16 Northside Dr Interchange City facing ramps	Strategic	2031
29	WH	Spedding Road East - Trig Rd to Sl-118	Spedding Road Ea5t-SH18 to Hobsonville Rd	51-116/18 Connections	Ultimate	New 2-lane urban-with active,mode5 on both sides+ local int,ersection improvements. Includes SH18 overbridge	Art,erial	2031
30	WH	Brigham Creek Rd -Sl-l16 interchange to overlap with Ib	BCR / SH16 interim interchange upgrade	Sl-ll6/18 Connections	UI imate	4-llane **urban-** upgrade 2-lane urban with active mode5 on both side5 (SGA design)	Arterial	2031

No	Area	Project	iransport Project iinterfares	iransport Project interdependencies	Project Stage	Project Descriiption	Hierarchy	Indicative mmiing
31	RH	Fred Taylor Drive- 5I-I16 in,erchange to Northside Dr	BCR / 51-116 interim int,erchange,upgrade,	SH16/I8 Connections	Ultimate	4-lane urban- upgrade 2.-lane urban wi h active modes on both sides (SGA design)	Arterial	2031
32	RH/WH	Spedding Road West- Fred Taylor Drive to Trig Road	**NWRTN**	**NWRTN**	Ultimate	New 2-lime **urban-** with active modeson both sides+ local int,ersection improvements	Arterial	2036
33	**WH**	Mamari Road	**NWRTN**	**NWRTN**	Ultimate	New 4 I'ane **urban** - with active modes on both sides+ local int,ersection improvements	Arterial	2036
36b	**WH**	51-116 / Brigham Creek Road interchange (grade separation)	ASH/ NWRTN / NW DBC RTC	ASH	Ultimate	Split Fork Interchange	Strategic	2036
39	**WH**	51-116/18 Motorway-Motorway Ramps, 51-116 Northside,Dr Int,erchange,Ramps, 51-116 Shared path and SH Shared path (BCRto Hobsonville Rd), 51-118 BCR Int,erchange,	NWRTN / 51-118 RTN		UI imate	SH16/5HI8 improvements & shared path	Strategic	2036
69	**WH**	51-118 BCR Interchange grade,separation	NWRTN / 51-118 RTN		Ultimate	SHI,8 BCRInt,erchange,grade,separation	Strategic	204!6
4!0	**WH**	Sinton Road Collector from Kauri Road to Hobsonville Road	51-118 RTN		Ultimate	Road overbridge,across 5HI8, supplementing existing pedestrian/ cycle bridge	Collector	**2031**
34!	**WH**	Key Collector Rd Network: Dale Road, Riverlea Rd, Bristol Rd, Rope Rd			UI imate	2JIlane **urb,an-wi** h active modes on both sides+ local int,ersection improvements	Collector	2.04!6
35	**WH**	Key Collector Rd **Network** through Whenuapai North: Trig Rd and Kauri Rd			Ultimate	2 I1ane urb,an-with active modes on both sides+ local int,ersection improvements	Collector	2.04!6
4!2	RH	Northside Drive West from Fred Taylor Dr to Str,e,am			Ultimate	new 2-lane arterial road with dedicated walking and cycling facilities. 24m	Arterial	**2031**
71	RH	Northside Drive West from Fred Taylor Dr to Stream			UI imate	new 2-lane arterial road with dedicat,ed walking and cycling facili ies. 24m	Arterial	2.04!6
4!3	RH	Redhills N-5 Arterial Nixon Road to Redhills Local Gent re			Ultimate	new 2-lane urban- with active modeson both sides+ local int,ersection improvements	Arterial	**2031**
4!7	**WH**	Intenection upgrade,on Hobsonville, Road/ Westpark Drive	Hobsonville Rd 2-lane section upgrade		Ultimate	Single lane,signalised int,ersection	Arterial	2022
4!8	**WH**	Intenection upgrade,on Hobsonville, Road/Trig Road	Hobsonville Rd 4!-lane section upgrade		Ultimate	Dual lane signalised int,ersection	Arterial	2026
4!9	**WH**	Int,ersection upgrade,on Trig Road/ **51-118** Off-ramp	Trig Rd upgrade		UI imate	Single lane signalised int,ersection	Arterial	2026
50	**WH**	Int,ersection upgrade on Trig Road/ 51-118 On-ramp	Trig Rd upgrade		UI imate	Single lane signalised intersection	Arterial	2026

No	Area	Project	iransport Project iinterfares	iransport Project interdependencies	Project Stage	Project Descriiption	Hierarchy	Indicative mmiiing
51	WH	Intersection upgrade on Trig Road/ Spedding Road Ea'>I:	Spedding Road East	Spedding Road East	Ultimate	Single,lane roundaiJ.out	Arterial	2031
52a	WH	Int,ersection upgrade on Trig Road/ Brigham Creek Rd	HoiJ.sonville Rd & Trig Rd upgrade	Trig Rd IJpgrade - BCRto Hobsonville Rd	Int,erim	Single,lane roundaiJ.out	Arterial	2026
521J.	WH	Int,ersection upgrade,on Trig Road/ Brigham Creek Rd		Brigham Creek Rd 4-laning	Ultimate	Dual lane,roundaiJ.out	Arterial	204!6
53	WH	Intenection upgrade,on Hobsonville, Road/ Luckem Road	Hobsonville Rd upgrade		Ultimate	Single lane signalised int,ersection	Arterial	2026
54!a	RH	Intersection upgrade on Don Buck Road/ Royal Road	Don Buck Rd upgrade	Redhills **N-S**arterial	In erim	Single lane signalised intersection	Arterial	2026
66a	RH	Intersection upgrade on Don Buck Road/Beauchamp Dr	Don Buck Rd upgrade		In erim	Single lane signalised intersection	Arterial	2026
541J.	RH	Intersection upgrade on Don Buck Road/ Royal Road	Don Buck Rd upgrade		Ultimate	Dual lane signalised intersection	Arterial	2031
55	RH	Intersection upgrade on Royal Road/ Beauchamp Dr	Royal Rd upgrade	**NWRTN**	Ultimate	Dual lane signalised int,ersection	Arterial	**2031**
56	RH	Inte,rsection upgrade,on Royal Road/ Westgat,e Dr	Royal Rd upgrade	**NWRTN**	Ultimate	Dual lane signalised int,ersection	Arterial	**2031**
57	RH	Inte,rsection upgrade,on Royal Road/ Makora Rd	Royal Rd upgrade	**NWRTN**	Ultimate	Dual lane signalised int,ersection	Arterial	2031
661J.	RH	Intersection upgrade on Don Buck Road/Beauchamp Dr	Don Buck Rd upgrade		UI ima e	Dual lane signalised in ersec ion	Arterial	**2031**
58a	WH	Intersection upgrade on Brigham Creek Rd/ Kauri Road	HoiJ.sonville Rd & Kauri Rd upgrades		In erim	Single lane signalised intersection	Arterial	2026
581J.	WH	Intersection upgrade on Brigham Creek Rd/ Kauri Road	Hobsonville Rd upgrade		Ultimate	Dual lane signalised intersection	Arterial	2.04!6
59	RH	Intersection upgrade on Fred Taylor Dr/ Spedding Road West	Spedding Rd West	Spedding Rd West	Ultimate	Dual lane,roundaiJ.out	Arterial	2036
6!a	WH	Intersection upgrade on Brigham Cr,eek Rd/ Tamatea Ave	Brigham Creek Rd upgrade	Brigham Creek Rd upgrade	Int,erim	Single lane,signalised int,ersection	Arterial	2026
611J.	WH	Intersection upgrade on Brigham Cr,eek Rd/ Tamatea Ave	Brigham Creek Rd upgrade	Brigham Creek Rd upgrade	UI imate	Dual lane signalised int,ersection	Arterial	204!6
65	WH	Intersection upgrade,on Mamari Rd/ Spedding Rd West	Mamari Rd	New Mamari Road Arterial	UI imate	Dual lane roundabout	Arterial	2036
671J.	WH	Intersection upgrade on HoiJ.sonville Rd/ Buckley Ave	Hobsonville Rd upgrade	HoiJ.sonville Rd upgrade	Ultimate	Dual lane signalised int,ersection	Arterial	**2031**

No	Area	Project	Transport Project interfaces	Transport Project interdependencies	Project Stage	Project Description	Hierarchy	Indicative Timing
60	RH	NW short term bus improvements			Ultimate	Extending bus shoulders on the Northwestern motorway between Westgate and Newton Road with a new bus interchange at Westgate	Strategic	2022
62	RH & WH	North West RTN Full Implementation			Ultimate	Full implementation of the RTN corridor (mode to be confirmed) has been identified through the NWRTN IBC from the City Centre to a future Brigham Creek station, including potential stations at Westgate and Royal Road.	Strategic	2031
63	WH	State Highway 18 RTN	SH16/18 Connections	SH16/18 Connections	Ultimate	RTN corridor on SH18 between Westgate and Constellation, including stations near Spedding Road East and Hobsonville centre	Strategic	2036
68	RH & WH	Fred Taylor Drive to Hobsonville Road - SH16 active modes overbridge		Hobsonville Rd upgrade (41)	Ultimate	Active modes overbridge in addition to exisitng vehicle overbridge	Strategic	2026

Figure 5-3 Completed Projects

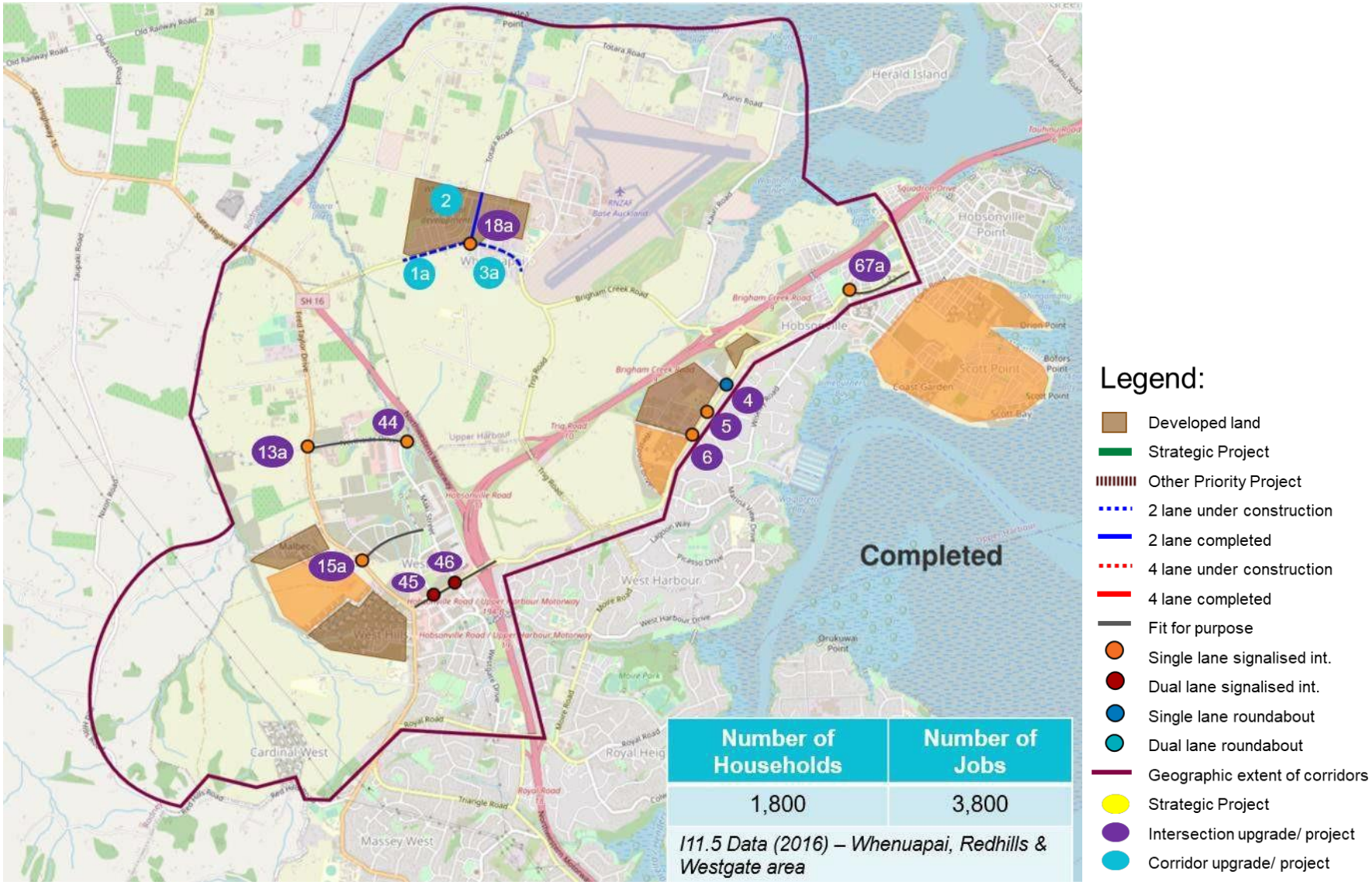


Figure 5-4 2022 Projects

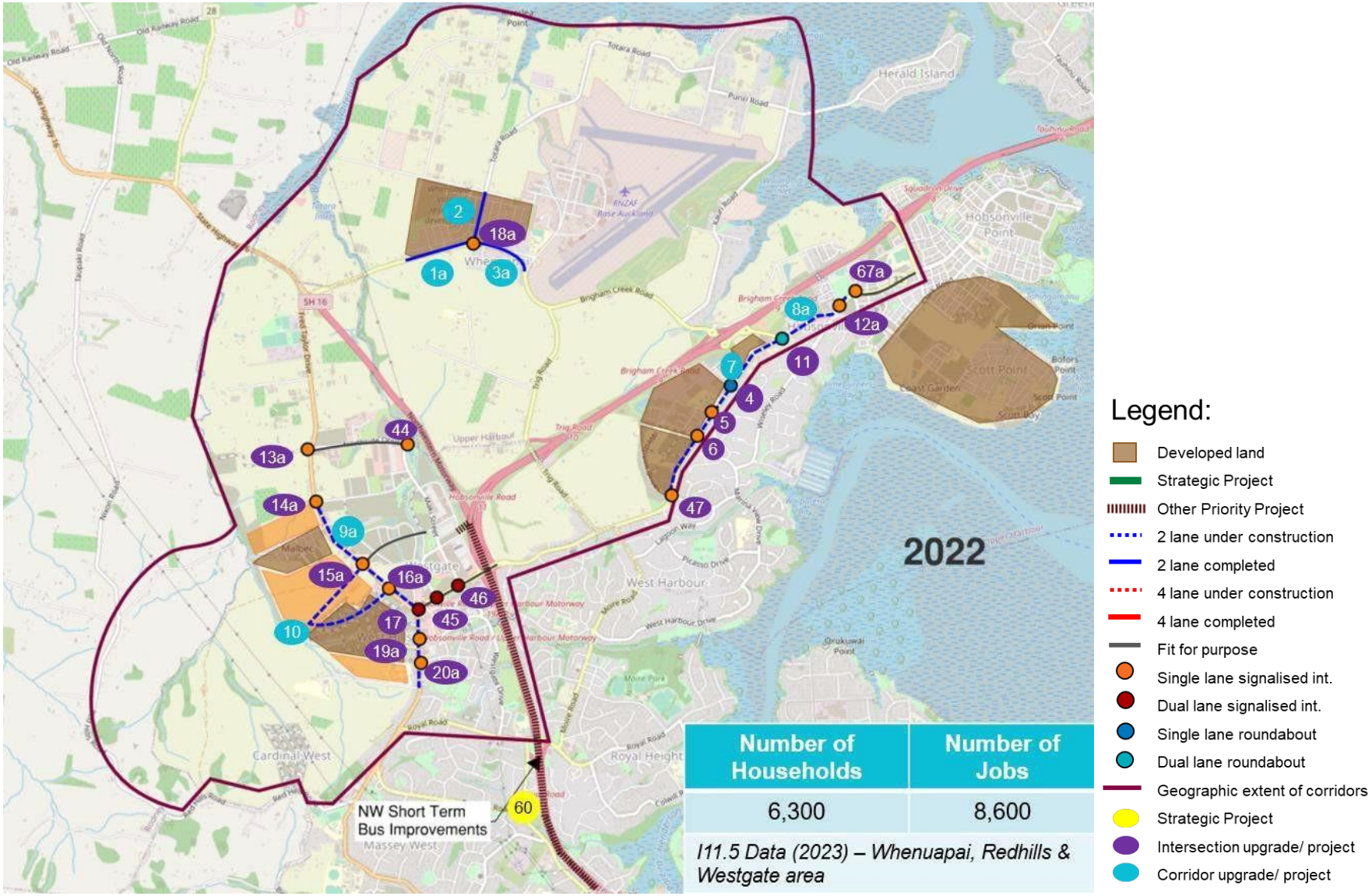


Figure 5-5 2026 Projects

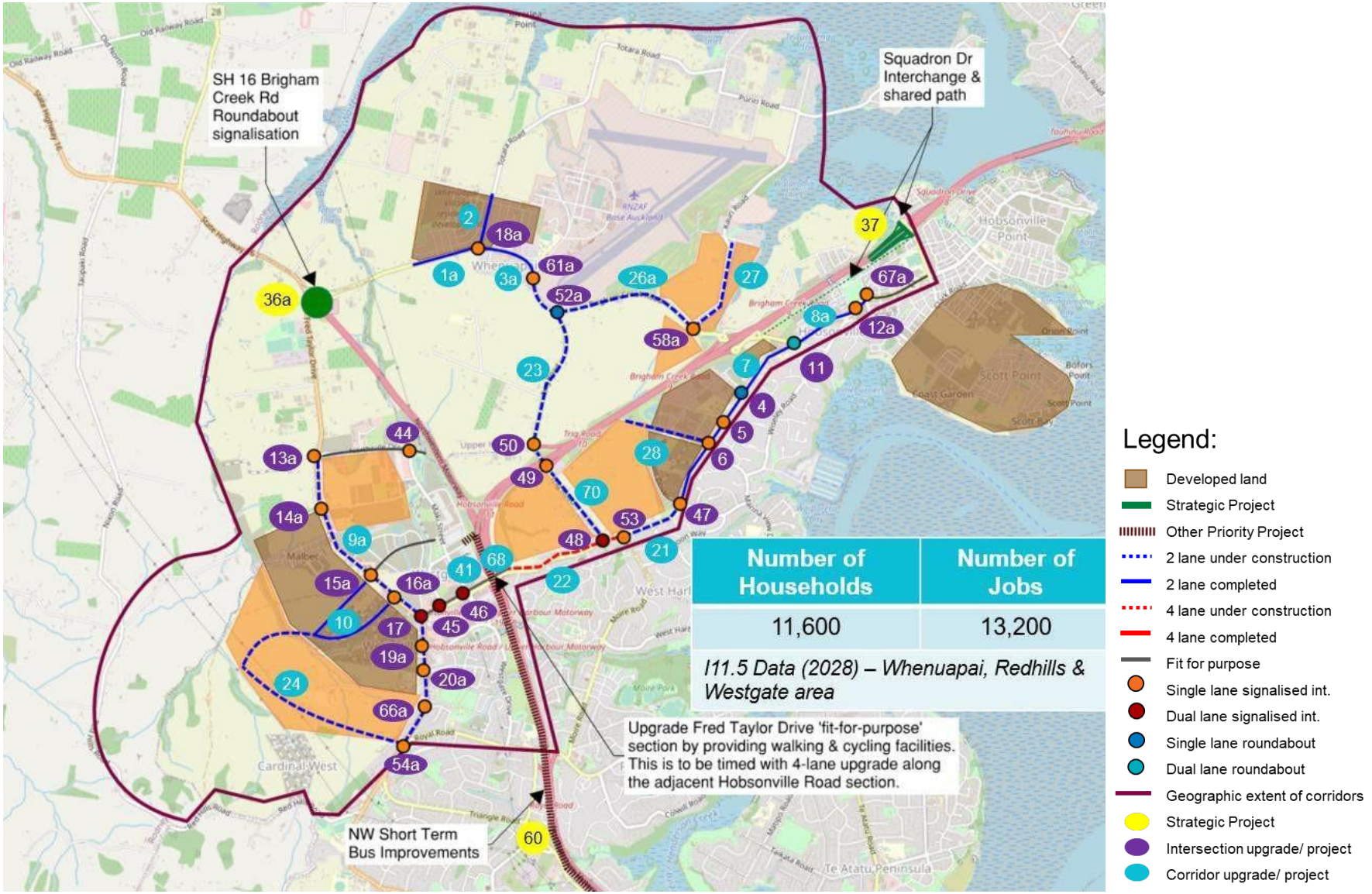


Figure 5-6 2031 Projects

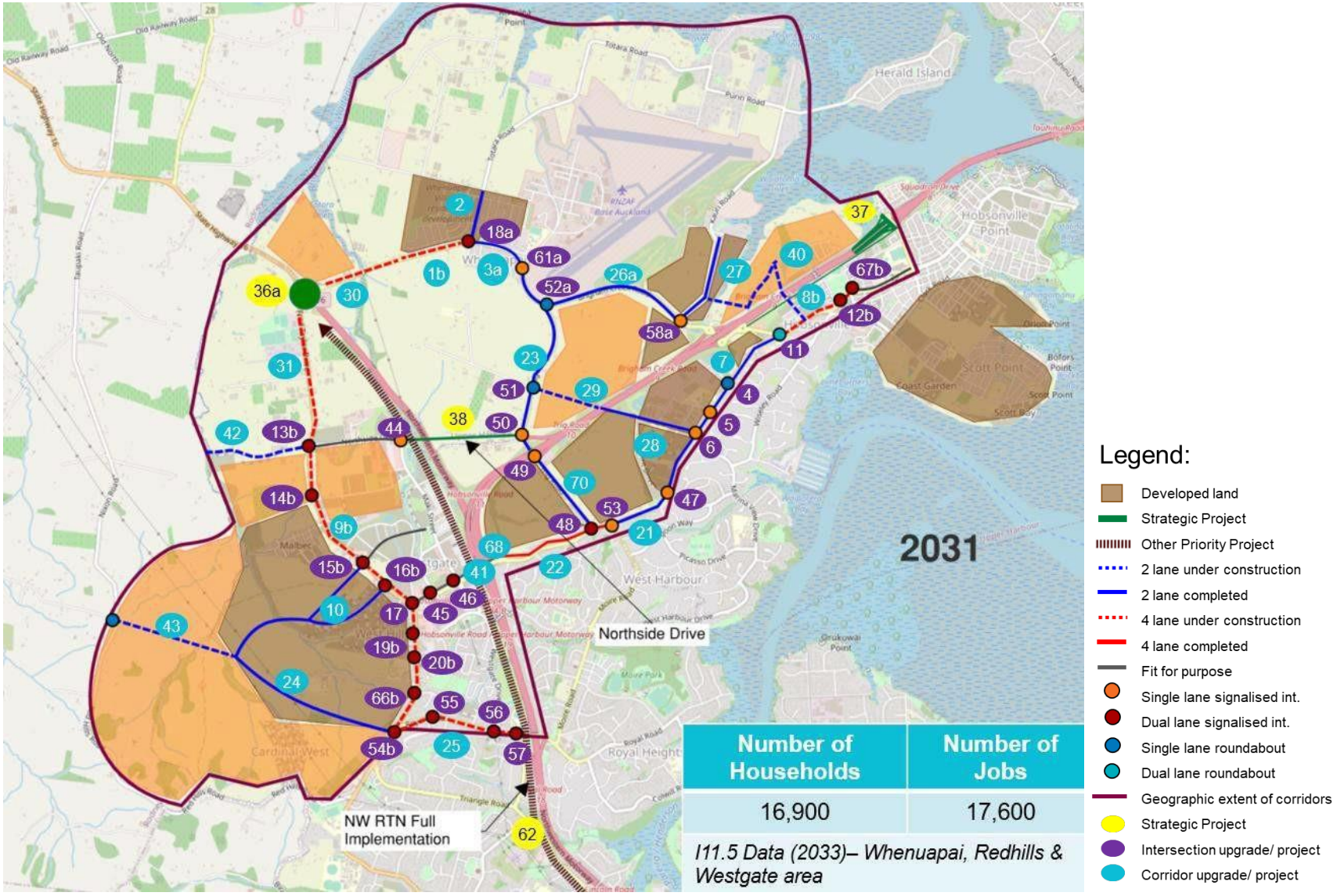


Figure 5-7 2036 Projects

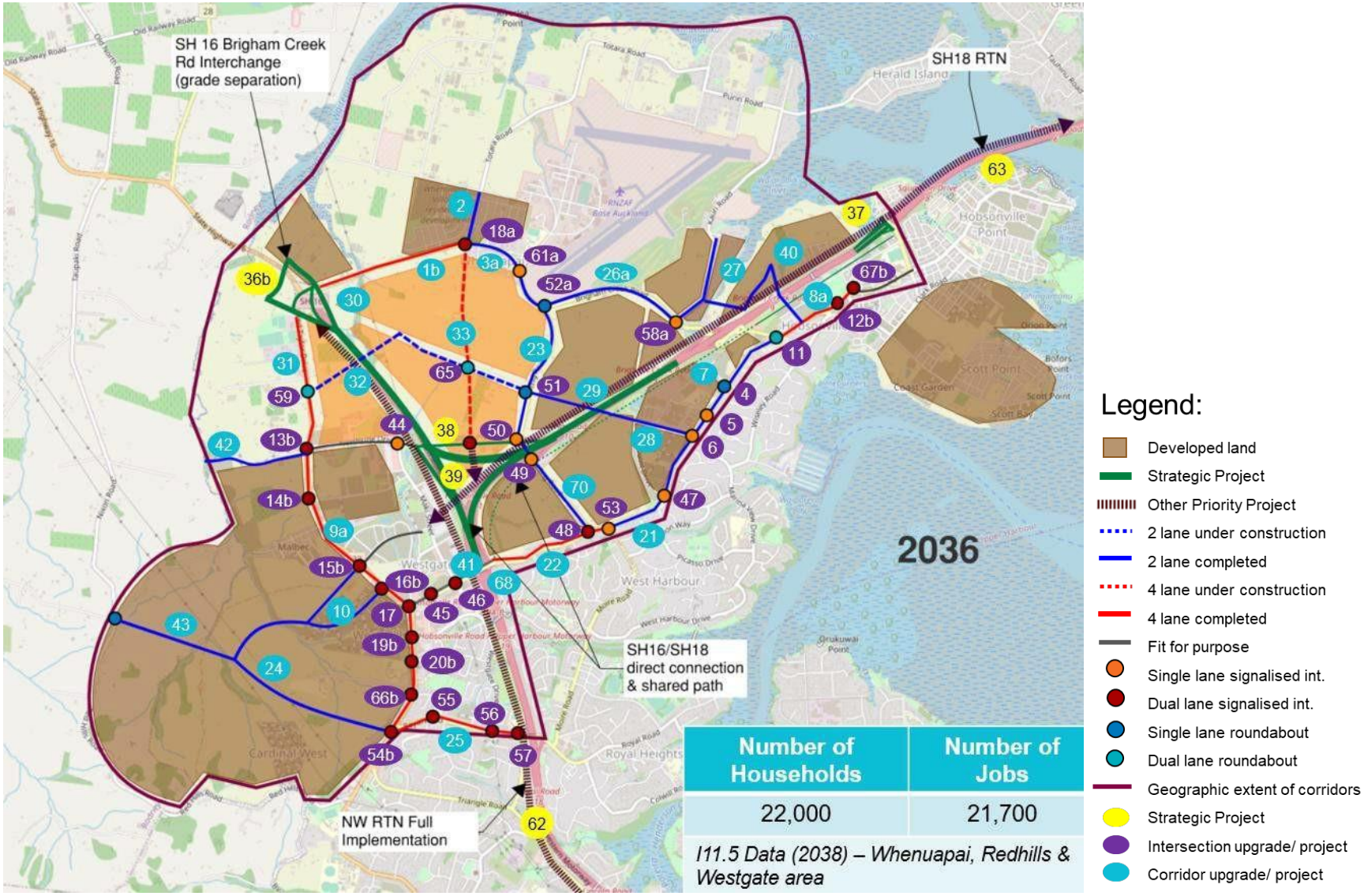
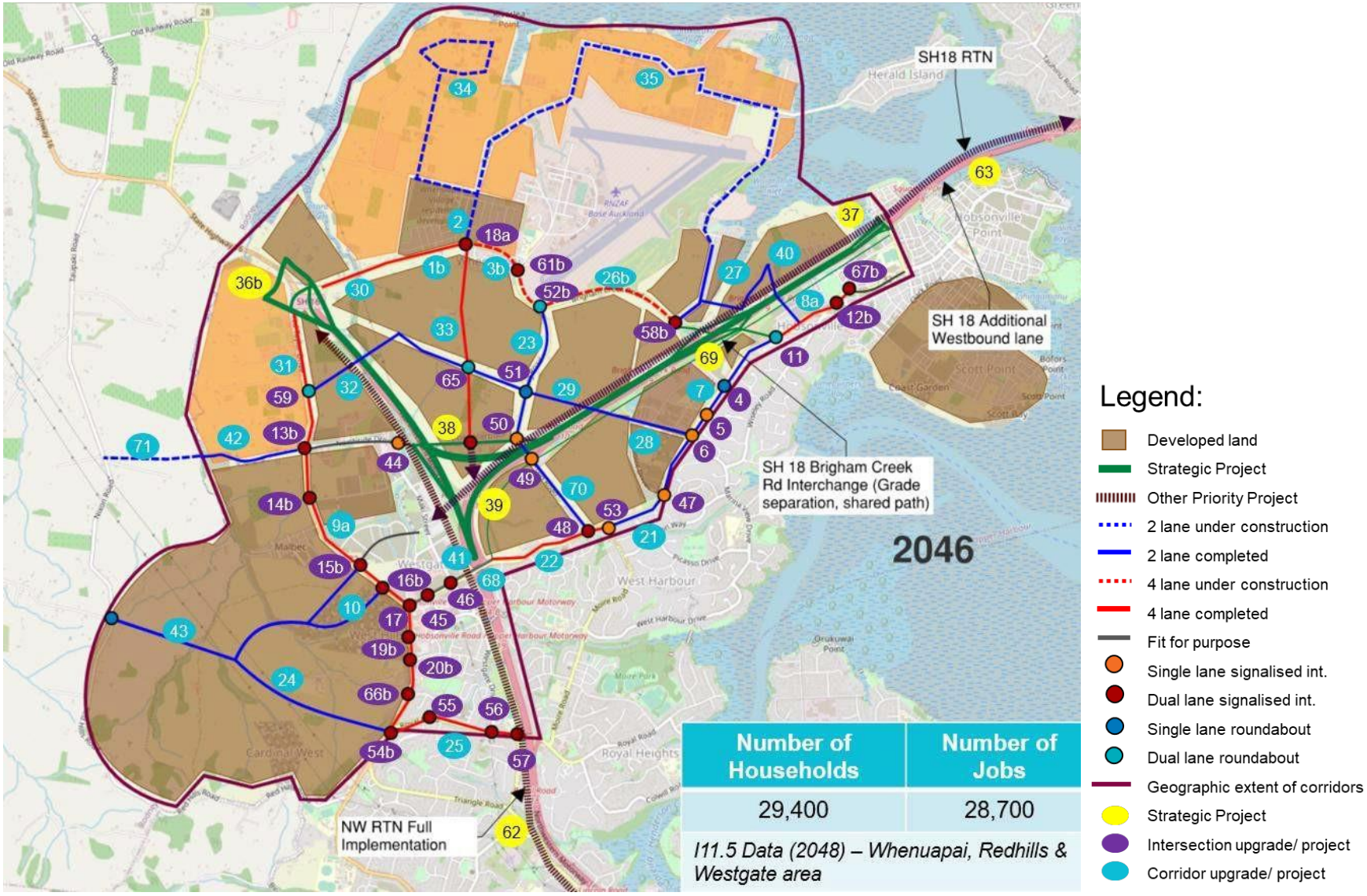


Figure 5-8 2046 Projects (Full Build-Out)



6 Conclusions

This assessment has identified a potential transport infrastructure Staging Schedule to support the full build-out of the anticipated growth in Whenuapai, Redhills and Westgate.

This has been developed with awareness of the uncertainties inherent in the timing of both the roll out of the development and the timing of major transport infrastructure. This assessment is to assist Council to consider funding and financing options, and as such has relied on inputs and assumptions that are subject to change.

The Staging Schedule is therefore a technical assessment to inform subsequent decision making and should not be viewed as a committed programme of projects for delivery. In summary, the Staging Schedule reflects how the identified long-term network for the study area could be delivered to support the currently identified FULSS staging and associated regional land use forecasts, based on the SGA transport planning (timing and design) principles. The Staging Schedule is not an implementation plan of the SGA future network.

The Staging Schedule is therefore likely to change in response to funding methods, delivery mechanisms, land use decisions and regional investment priorities. As such, as discussed previously, whilst the FULSS has been used to inform the 'baseline' scenario considered herein, there is opportunity for alternatives to be considered, once the initial outcomes are understood.

In reviewing this Schedule, the purpose, scope and approach to the work should be kept in mind.

In summary, the key conclusions of this work include:

- The Whenuapai, Redhills and Westgate areas constitute a significant scale of urban growth, which is a sub-set of the total growth planned and expected in the north west parts of Auckland, including surrounding existing urban areas, as well as the Kumeu, Huapai and Riverhead area.
- This scale of growth requires an extensive network of new or upgraded transport corridors, both within the immediate growth area and on the surrounding receiving environment. This network will need to comprise both strategic network and local network elements in order to deliver on the mode change aspirations
- The long-term arterial and strategic network to support this growth has been identified through the SGA Detailed Business Case, plus previous business cases. The local network has been assumed to be represented by the current information relating to structure / precinct plan networks.
- Some opportunities for the staged implementation of the new or upgraded corridors has been identified in this assessment, however the feasibility, design and timing of any such interim upgrades will remain to be agreed directly with the appropriate road controlling authority
- The location of the NWIFF area means there are movements between different parts of Auckland and beyond the region that pass through this area, meaning that the transport networks have been scaled for local, regional and inter-regional growth. This means it is not feasible to fully isolate the projects needed to support just the NWIFF areas from growth in the wider network. This assessment has focussed on the projects needed for Whenuapai, Redhills and Westgate, but includes elements that accommodate wider growth and wider-network projects which will benefit the NWIFF area.

TE TUPU NGĀTAHI
SUPPORTING GROWTH

Appendix A:
NW IFF Stage 1 Report

TE TUPU NGĀTAHI
SUPPORTING GROWTH

Technical Note

Date Prepared: 8/06/2022

Prepared by: Ayesha Weerappulige

Transport Assessment

NW IFF Purpose

The overall purpose of the North West Infrastructure Funding and Finance (NWIFF) work is to:

- Support Auckland Council in determining staging and sequencing of transportation infrastructure and associated funding requirements associated with accelerated urban development of Auckland's North West (Whenuapai and Redhills only)
- Enable Council to identify, if possible, a funding and financing solution to the funding gap.

NW IFF – Stage 1 Purpose

Identify the **transport and land use assumptions –** To define and confirm the transport and land use assumptions to be used to inform the sequencing of transport infrastructure, including the long-term networks and sequencing of land use.

Identify the **timing and design principles** – To inform development of the staging transport infrastructure, based on principles used for the Drury IFF, with changes to recognise any NW-specific context.

Document Status

Responsibility	Name
Author	Ayesha Weerappulige
Reviewer	Joe Phillips
Approver	Andrew Murray

Revision Status

Version	Date	Reason for Issue
0.1	04/06/2021	Draft for Comment
0.2	22/06/2021	Revised Draft for Comment
0.3	06/07/2021	Draft – Post Workshop 1
0.4	26/11/2021	Draft – Appendix to NW IFF pack for Comment
0.5	14/03/2022	Draft – Appendix to NW IFF Transport Assessment
0.6	03/06/2022	Final - Appendix to NW IFF Transport Assessment

Transport & Land Use Assumptions

Te Tupu Ngātahi (Supporting Growth Alliance) [the Alliance] are working with Auckland Council to determine the impact upon the transportation network of accelerated urban development of North West.

A key component of this work is the transport and land use assumptions, which is a critical input to inform the sequencing of transport infrastructure, specifically for the purpose of supporting the Inner North West Infrastructure Funding and Finance (NWIFF) workstream.

Transport Assumptions

The future transport projects in North Western growth areas are summarised below. It is noted that the focus of this work is related to the Redhills, Westgate and Whenuapai areas, so information on Kumeū–Huapai and Riverhead is provided only for wider context. The overall network is shown on Figure 1 below.

Supporting Growth / Housing Infrastructure Fund (HIF) – Redhills

- Don Buck Road FTN upgrade
- Royal Road FTN upgrade
- Fred Taylor Drive FTN upgrade
- New East West Links in Redhills including Dunlop Road and Baker Lane
- New North South Link in Redhills connecting to Royal Road
- New Northside Drive Extension
- Taupaki – Nixon upgrade

The following corridors have been identified as potentially requiring upgrades or a reallocation of space within the corridor to support walking and cycling. Additional land requirements were not considered necessary or would have resulted in significant land use impacts counter to the outcomes sought.

- Fred Taylor Drive from Don Buck Road to Hobsonville Road
- Don Buck Road South from Royal Road to Redhills Road
- Northside Drive East

Supporting Growth – Whenuapai

- Brigham Creek Road upgrade
- New Māmari Road FTN corridor
- Trig Road upgrade
- Hobsonville Road FTN upgrade
- New Spedding Road East including a bridge connection over SH18 to Hobsonville Road
- New Spedding Road West including a bridge connection over SH16 to Fred Taylor Drive

The following corridors were identified as part of the North West network – in Redhills and Whenuapai – however, via the North West DBC investigations, these links were found to currently provide sufficient corridor to enable transport facilities to support growth in the North West and, as such, no upgrades have been identified by Supporting Growth:

- Dunlop Road Extension
- Hobsonville Point Road.

Supporting Growth – Kumeū- Huapai / Riverhead

- Coatesville–Riverhead Highway upgrade to include walking and cycling facilities
- Riverhead Road upgrade to include walking and cycling facilities
- Access Road upgrade
- Station Road upgrade

Supporting Growth – Strategic Projects

- Rapid Transit Corridor (RTC) from Westgate to Kumeū–Huapai including SH16 upgrades
- Alternative State Highway (ASH) extending the existing SH16 motorway to bypass Kumeū-Huapai township and reconnect to the SH16 network east of Waimauku, including an upgraded interchange at SH16 / Brigham Creek Road.
- Regional Active Mode Corridor (RAMC) connecting Westgate to Kumeū-Huapai adjacent to the other strategic corridors.

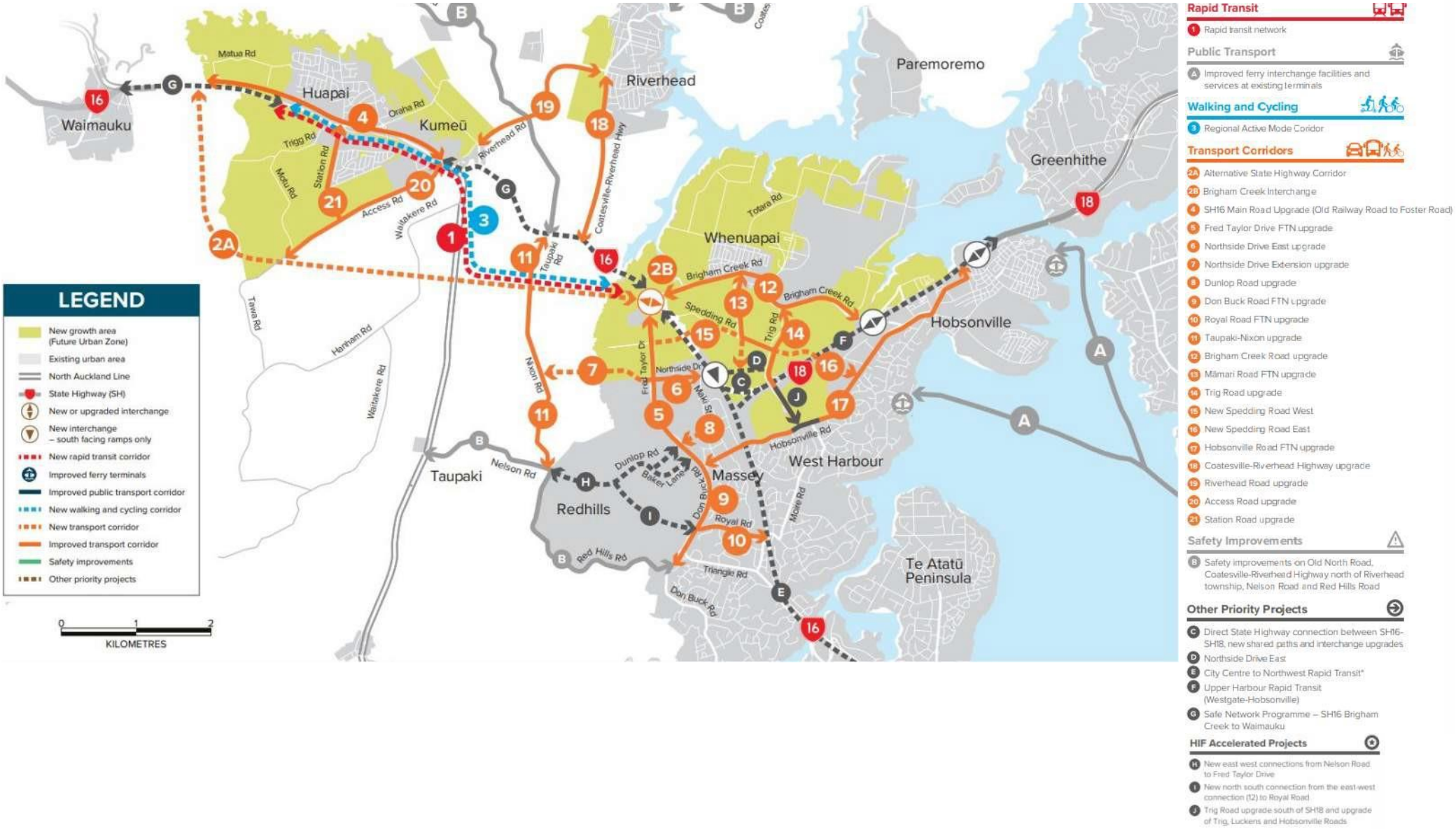
Other North West Projects

- SH16 Improvements including safety, efficiency and walking / cycling upgrades on the existing rural sections of SH16 between Brigham Creek Road and Kumeū, plus Huapai and Waimauku
- Squadron Drive west facing ramps
- State Highway 16 to 18 Connections project, including upgraded SH18 and SH16 interchanges with Brigham Creek Road and Northside Drive East Interchange and its city facing ramps[3]
- North West Rapid Transit full implementation between the City Centre and Brigham Creek
- SH18 Rapid Transit Network Westgate to Hobsonville.

Collector networks in all future urban areas are generally assumed to be funded and delivered via developers. However, it is noted that several key collectors have been identified for investigation as part of the NWIFF workstream. Further details on the principles for selecting these collector roads are provided in the Collector Road Principles section of this appendix.

[3] This project included an upgraded interchange with SH16 at Brigham Creek Road – which is now included with the Alternative State Highway project

Figure 1: SGA North West Projects



The State Highway 16 to 18 connections single staged business case included indicative staging and sequencing of the project as shown in Figure 2.

As part of the SH16-18 SSBC (Aug 2019). The recommended option comprises multiple interventions including a system interchange between SH16 and SH18, other new and upgraded motorway interchanges along with local road improvements and new shared paths. Specifically:

- SH16/SH18 motorway to motorway connection
- Northside Drive south-facing ramps
- Northside Drive East widening and connection across SH16 and to Trig Road
- Squadron Drive west-facing ramps with signalised intersections
- Enhanced Brigham Creek (SH18) interchange to full diamond configuration
- Grade-separated Brigham Creek (SH16) interchange
- Additional lanes on SH16 and SH18
- Shared paths on the western side of SH16 and the southern side of SH18, alongside protected cycle lanes and footpath upgrades
- Bus shoulder lanes on SH16 and SH18 and future proofing for RTN services.

Figure 2: SH16-18 SSBC indicative staging and sequencing overview

Stage	Element	Construction start	Construction end
1	Squadron Drive, shared path (between SH18 Brigham Creek Road and Squadron Drive)	April 2020	September 2021
2	SH16 Brigham Creek roundabout interim improvements	April 2021	December 2021
3	SH16/SH18 motorway connections and Northside Drive south facing ramps, shared path (between Westgate Footbridge to SH16 Brigham Creek Road (north) and SH18 Brigham Creek road (east)), NSDE	April 2032	April 2035
4	SH16 Brigham Creek interchange grade separation	October 2032	April 2035
5	SH18 Brigham Creek interchange grade separation, shared path (connection between Stages 1 and 3)	January 2044	December 2045

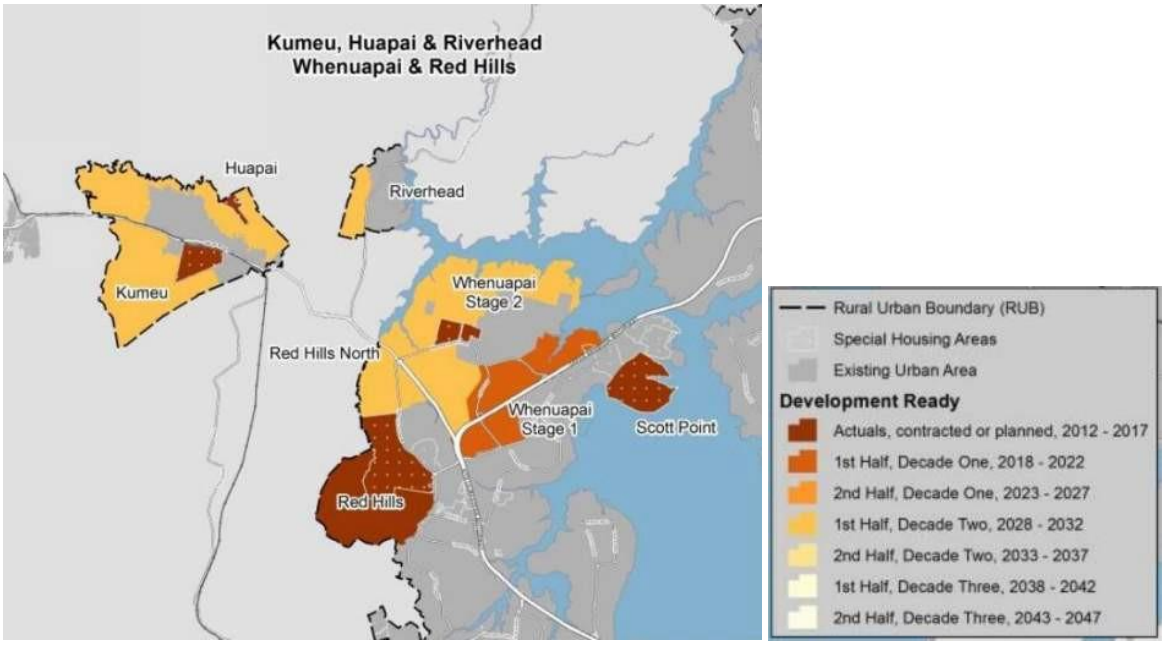
Land Use Assumptions

The North West area has been signaled to undergo significant urban growth in the AUP via the provision of future urban zoning and rezoning of areas from rural to urban in Redhills. Land use changes are in various stages of change and are explained further geographically.

In terms of development ready assumptions, the Future Urban Land Supply Strategy (FULSS) provides indicative timing for the North West area. A summary of these timings and the anticipated dwellings are shown below in Table 1. Details of the land use scenarios (I11.5 and I11.6) approved by Auckland Council and used in the regional transport models are provided in Appendix B.

Table 1: Future Urban Land Supply Timing for the North West (2017)

Proposed Timing- Development Ready	Area	Anticipated dwelling (FULSS)
Actuals, Contracted or Planned (2012 – 2017)	Redhills	3,600 (SHA) + 7,050 (live zone)
	Kumeū – Huapai (Special Housing Area)	1,400
	Whenuapai (Special Housing Area)	1,150
Decade One 1st Half (2018 – 2022)	Whenuapai Stage 1	6,000
Decade Two 1st Half (2028 – 2032)	Whenuapai Stage 2	11,600
	Red Hills North	1,400
	Kumeū Huapai Riverhead	6,600



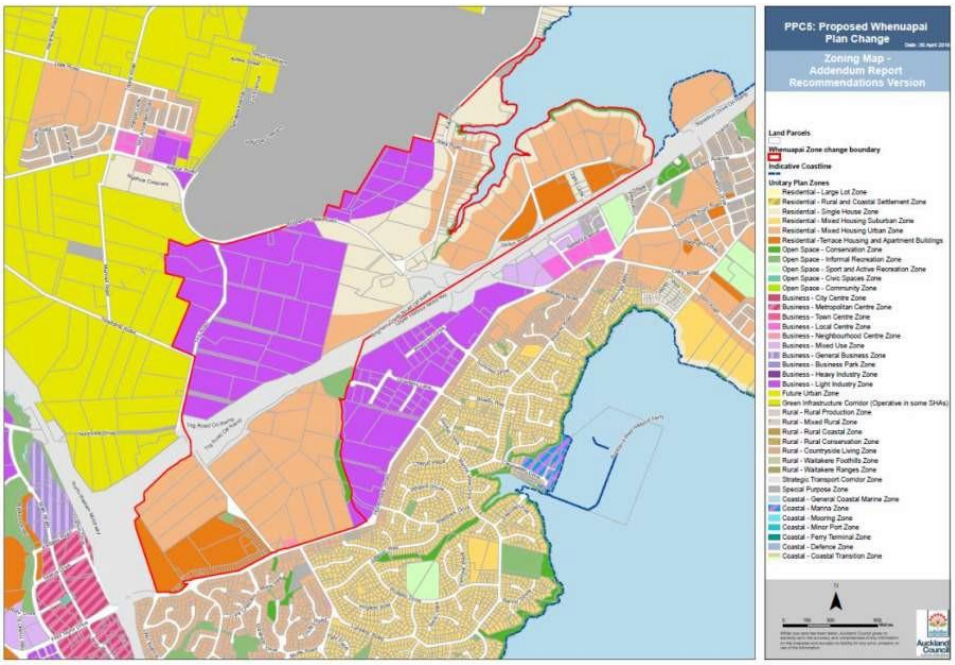
Whenuapai

The Council completed Structure Planning for the Whenuapai area in 2016. The Whenuapai Structure Plan is shown in Figure 3, indicating both the expected pattern of urban development and the future transport projects (subject to planning and funding approvals).

Figure 3: Expected pattern of urban development and the future transport projects in Whenuapai

Subsequent to this Structure Planning, Council proceeded with Plan Change 5, which proposed to change 360 ha of future urban land to a mix of business and residential land. This is shown below in Figure 4. The Plan Change 5 process is still underway and live-zoning has not yet been confirmed.

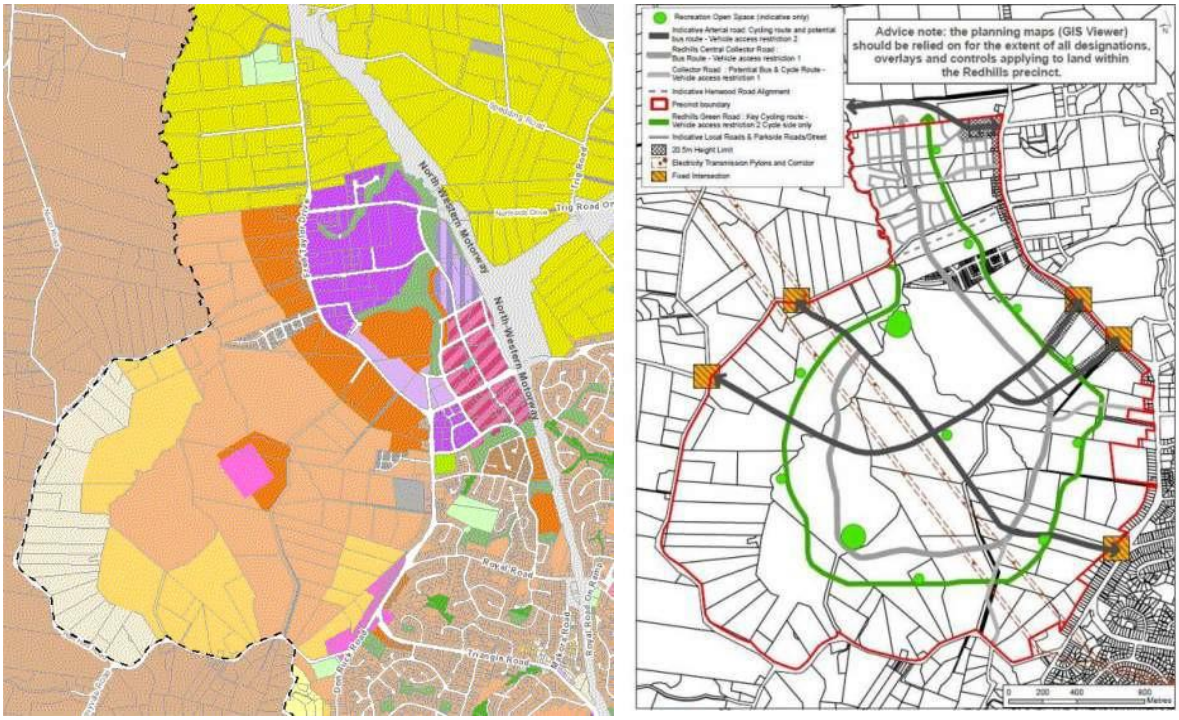
Figure 4: Expected pattern of urban development in Whenuapai – Plan Change 5



Redhills

In the Redhills area, this area was given active zoning as part of the Auckland Unitary Plan process. The land is largely undeveloped but recent housing developments have been progressed. The supporting road network in this area was confirmed through Environment Court mediation, resulting in the precinct plan for Redhills as shown in Figure 5.

Figure 5: Expected pattern of urban development and the future transport projects in Redhills



In terms of the Redhills area, there is also a set of precinct provisions that identify relevant criteria that are to be provided as development triggers are reached. These are summarised below.

I610.6.1. Infrastructure Upgrades and Timing of Development – Transport

(1) The number of dwellings within the precinct may not exceed the following dwelling thresholds in Table I610.6.1.1 until such time that the identified infrastructure upgrades are constructed:

Table I610.6.1.1 Threshold for Development - Transport

Dwelling threshold	Infrastructure Work Required to Exceed the Dwelling Threshold
1	Provision of signals at Don Buck Road/Westgate Drive intersection Upgrade to Don Buck Road/Triangle Road intersection
1,800	Widening of Don Buck Road between Fred Taylor Drive and Westgate Drive: a) 2 exit lanes from Fred Taylor / Don Buck intersection in southbound direction reducing to one lane; and b) 2 exit lanes from Don Buck / Westgate intersection in northbound direction reducing to one lane.

	Urbanisation of Fred Taylor Drive between Northside Drive and Don Buck Road (50km/hr speed limit, with pedestrian and cycle facilities along and across road)
	Link from Redhills Centre to Redhills Road
3,600	Upgrade to Fred Taylor Drive/Don Buck Road intersection to signalised layout (with full pedestrian/cycle crossing facilities)
	Widening of Don Buck Road between Fred Taylor Drive and Westgate Drive: 2 lanes from Fred Taylor Drive to Westgate Drive, and 2 lanes between Westgate Drive and Fred Taylor Drive increasing to 3 approach lanes at the intersection in northbound direction
5,400	North-western busway and bus station at Massey North
	Widening of full length of Fred Taylor Drive from Brigham Creek Road to Don Buck Road to two lanes in each direction with widening at intersections
	Widening of Don Buck Road from Royal Road to Redhills Road to two lanes in each direction
	Northside Drive East overbridge

I610.6.2. Infrastructure Upgrades and Location of Development- Transport

(1) The infrastructure upgrades in Table I610.6.2.1 must be constructed or be proposed to be constructed at the time the trigger is met:

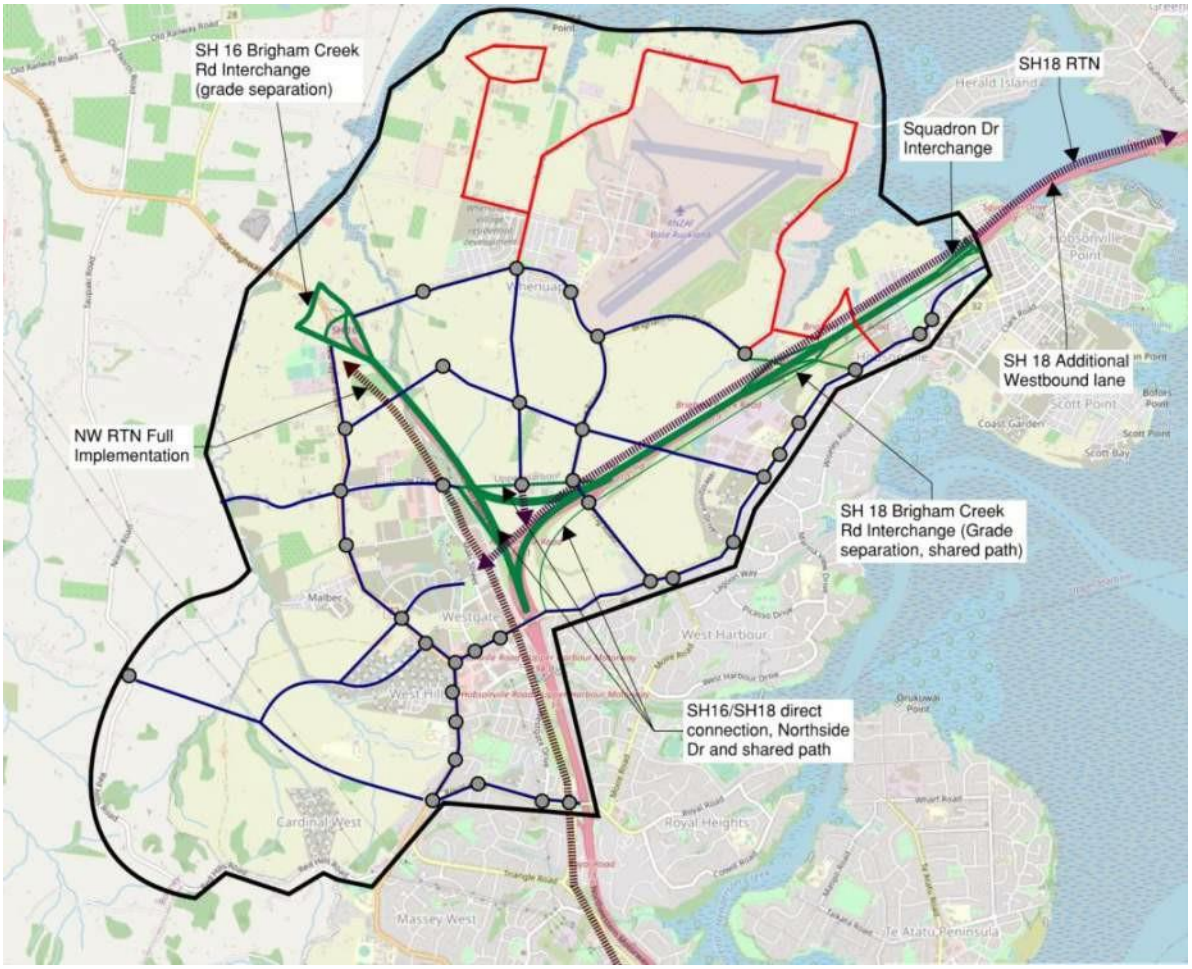
Table I610.6.2.1 Trigger for Development – Transport

Trigger	Infrastructure upgrade
In advance of development accessing the Northside Drive intersection	Fourth arm at Fred Taylor Drive/Northside Drive signalised intersection
When fourth arm to Dunlop Road is provided	Signalise Fred Taylor Drive/Dunlop Road intersection
In advance of development accessing Baker Lane	Upgrade to Fred Taylor Drive/Baker Lane intersection
In advance of development in the area adjacent to Henwood Road extension / Fred Taylor Drive intersection.	Upgrade Fred Taylor Drive/Kakano Road/Henwood Road signalised intersection to incorporate fourth arm into signals

Geographic Scope

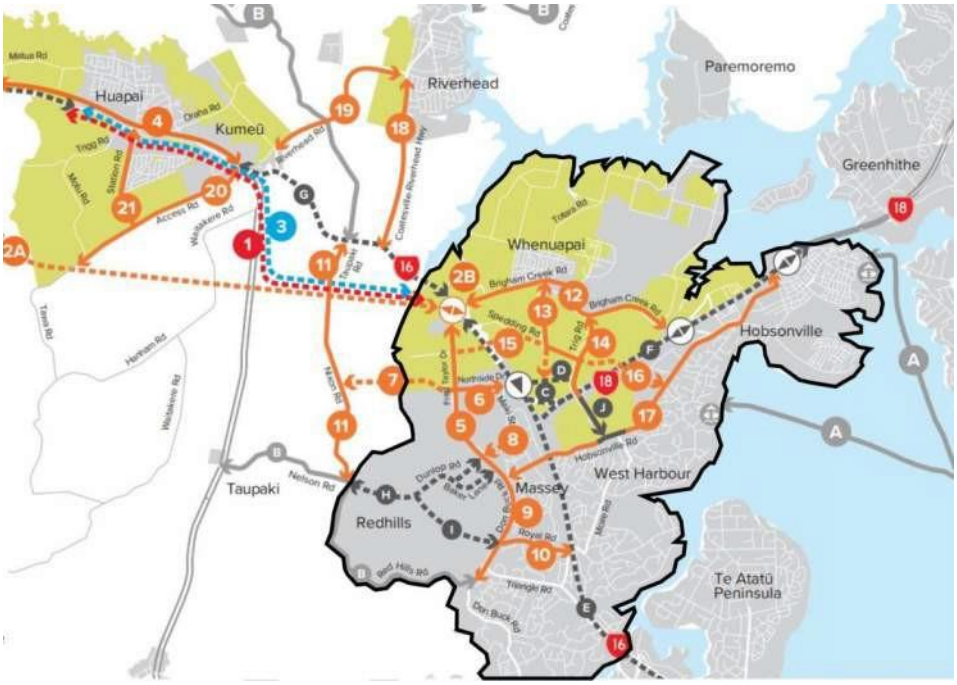
The geographic extent of corridors shown in Figure 6, shows the extent of the area associated with the projects which are included in this NWIFF study. The area extent includes Whenuapai, Redhills, Westgate and an area of West Harbour located directly south of SH18.

Figure 6: Geographic extent of corridors



The scope boundary refers to the areas included in Figure 7. The areas within this boundary area are included to cover the development areas that inform the beneficiary and causation assessment. This boundary area includes Massey, Scotts Point and all of West Harbour in addition to the geographic extent shown above.

Figure 7: Scope boundary



Timing & Design Principles

The Alliance have been working with Auckland Council to determine the impact upon the transportation network of accelerated urban development of the North West. A key component of this work has been to determine the staging and sequencing of transport infrastructure projects and the associated funding requirements.

The 'Timing and Design Principles' inform development of the staging transport infrastructure, based on similar principles used for the Drury Infrastructure Funding and Finance (DIFF), with changes to recognise any NW-specific context.

Timing and Design Principles Overview

Due to the uncertainty regarding the timing and form of specific land-use activities staged over two decades in the North West, a principle-based approach is regarded as the best way to manage and deliver the desired transport and land use outcomes consistently.

The 'Timing and Design Principles' is intended to provide guidance to stage transport infrastructure to achieve balanced growth, that aligns with the long-term outcomes and achieved optimum land use and transport integration over time. These principles have previously been agreed with by AT and Waka Kotahi for the DIFF workstream.

Changes from DIFF for NWIFF Principles

There are no significant differences between the DIFF and NWIFF timing and design principles.

Timing principle 1 was slightly modified for conciseness by joining two of the three DIFF sub-principles within this principle. However, the fundamental principle definition and the application of the principle in considering timing of the projects remains the same as the DIFF workstream.

Timing and Design Principles

Summary of Timing and Design Principles

Timing Principles:

5. On sites where urban development is occurring:
    c) Urbanise existing corridors within and adjacent to development concurrently with that development
    d) Provide interim facilities as part of the development and where transport improvements are provided in an interim form, ensure alignment with the full build-out network
6. Beyond sites where development is occurring, stage the form and capacity of the transport network progressively to match both development stages and system needs, including cumulative effects of urban development on transport demands on the network.
7. Provide safe and efficient public transport and active mode facilities from the outset of urban development to support a shift to more sustainable travel.
8. Sequence the provision of rapid transit systems/ stations and facilities for gaining access to rapid transit to coincide with and support:
    e) A commitment to adjacent land use of significant scale within walking distance
    f) The need to serve as a strategic PT hub to service a wider catchment with poor PT options
    g) Support significant mode shift to PT from early in the development cycle
    h) Noting a need to find a balance between criteria (4a and 4c)

Design Principles:

9. Include elements to support place function, not solely movement function (i.e. design standards change based on place value)
10. Provide safe travel by all modes
11. Provide walk and cycle connections from the start of residential development to the following key destinations/attractors within walk/cycle catchments:
    a) Closest rapid transit station
    b) Nearby education facilities
    c) Closest major centre
    d) Existing centre
    e) Major employment area
12. Provide walk and cycle connections from the start of non-residential development to the following key locations within walk/cycle catchments:
    a) Closest rapid transit station
    b) Existing centre
    c) Adjacent residential areas

13. FTN services & infrastructure provisions when needed to provide reliable, efficient & attractive frequent public transport
14. Provide local bus services and associated facilities to respond to timing, scale and location of urban development
15. General traffic improvement when needed for:
    a) Safety
    b) Wider network resilience
    c) Accessibility to key destinations
    d) Inter-peak reliability & LoS for all modes
    e) Alleviation of severe peak-period congestion
    f) Alleviation of impact on public transport services
16. Coordination of adjacent projects for the purpose of practical construction staging

It is considered that there is strong alignment between these timing and design principles and the current AT and Waka Kotahi strategic and policy documents. These strategic and policy documents include; GPS (Government Policy Statement) on land transport 2021-24, ATAP (Auckland Transport Alignment Project), TDM (Transport Design Manual), Better Travel Choices, Toitū te taiao (Sustainability action plan), Emissions Reduction Plan, and Te Taruke a Tawhiri: Auckland's Climate Plan.

Collector Road Principles

As part of this workstream, projects were categorised into strategic, (corridors serving more regional or inter-regional/ national level of function), arterials (corridors serving local and sub-regional functions) and collectors.

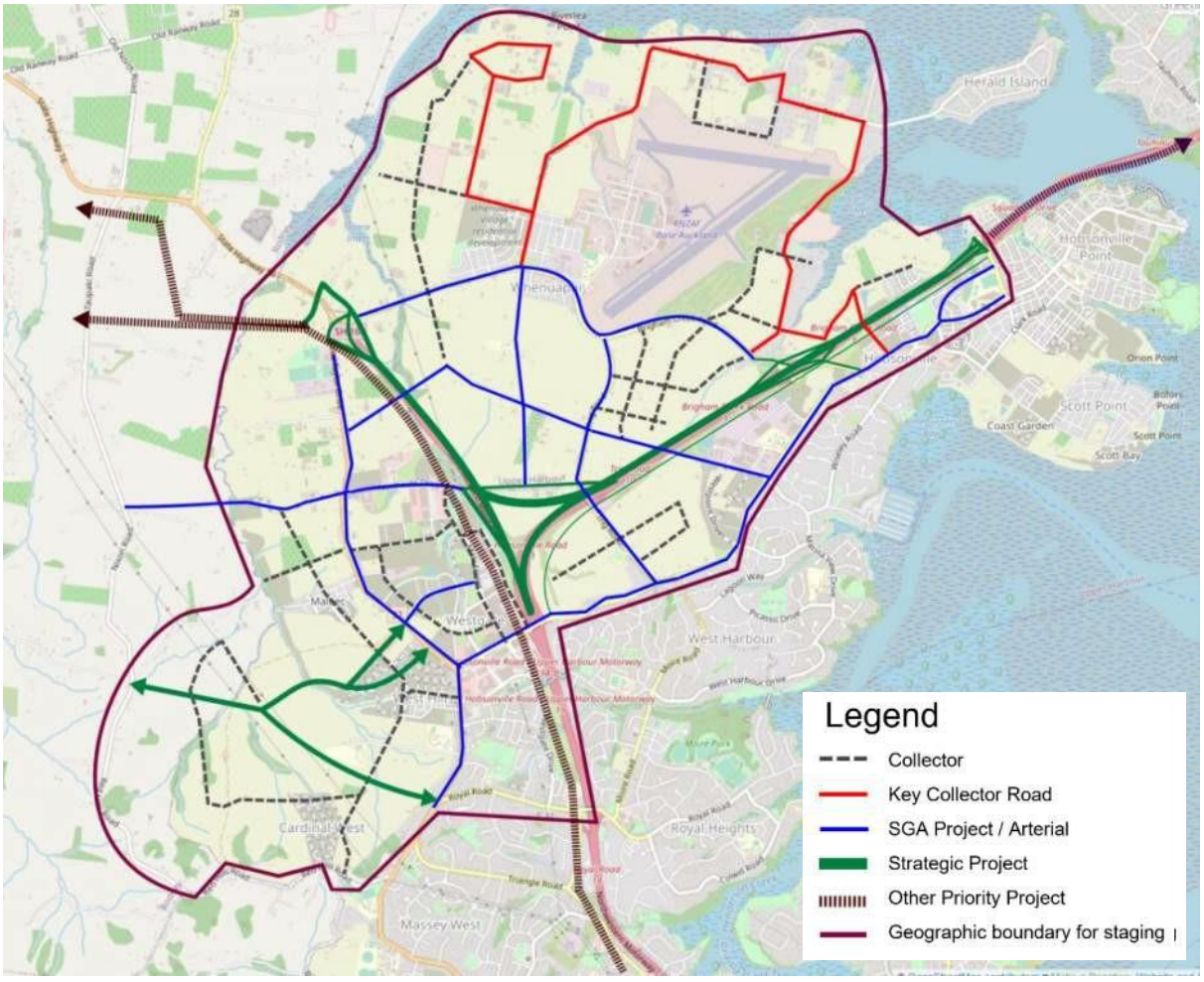
Key collector roads will be important in the overall network operation and can have a critical role in supporting the planned land use. As such, the following 'Collector Road Principles' are intended to provide guidance to identify key collector roads, which are to be considered in the NWIFF workstream.

Collector Road Principles:

1. Provides a key walk and cycle connection, which will improve walk and cycle accessibility between residential development and any of the following key destinations/attractors:
    a) Closest rapid transit station
    b) Closest major centre
    c) Existing centre
    d) Major employment area
2. Provides a key route for FTN services to provide reliable, efficient & attractive frequent public transport.

Figure 8 shows the key collector roads (in red), which have been identified for consideration in the NWIFF workstream, based on these collector road principles. Other collector roads currently identified on Structure or Precinct Plans have also been shown for broader network context.

Figure 8: Key collector roads selected based on collector road principles



- Collectors are generally assumed to be formed by developers at the time of subdivision and vested in AT as public assets
- However, there are some cases where there are parts of collectors that are not the clear responsibility of a single developer. For these parts of collectors, Council are likely to need to lead the delivery of the road and share the cost proportionally between developers through Development Contributions, i.e for example a collector road crossing a stream with different developers on either side
- At this stage, it cannot be clearly determined which collector roads, or parts of collector roads, Council may need to lead. However, it is appropriate to understand that some will need to be led by Council and AT.
- For this reason, as part of the analysis of the projects, the key collectors have been identified, where they form key parts of the network and there may be uncertainty around the delivery of these by developers. As the area evolves, the specific parts of the collectors that will need to be led by Council will become clearer and further detail can be included.

2 Appendix B – Modelling/ Land Use Inputs

This appendix provides an indication of growth assumptions based on I11.5 land use scenario. This data will provide information on the build-out rates, expected growth in traffic and areas of deficiency from the existing traffic models for consideration in determining the potential timing of the supporting transport infrastructure.

The I11.6 land use scenario data has also been reviewed at a high-level to understand the sensitivity between the two land use scenarios in relation to build-out rates, so this can also be considered. The I11.6 land use scenario is based on a post-Covid 19 review of future land use forecasts. It is noted that the 2048+ forecast year for I11.5 represents full build-out of the future growth areas, so is actually considered to be a longer-term scenario than the I11.6 2051 scenario.

I11.5 Land Use Summary

Figure 2-1: I11.5 2048+ data

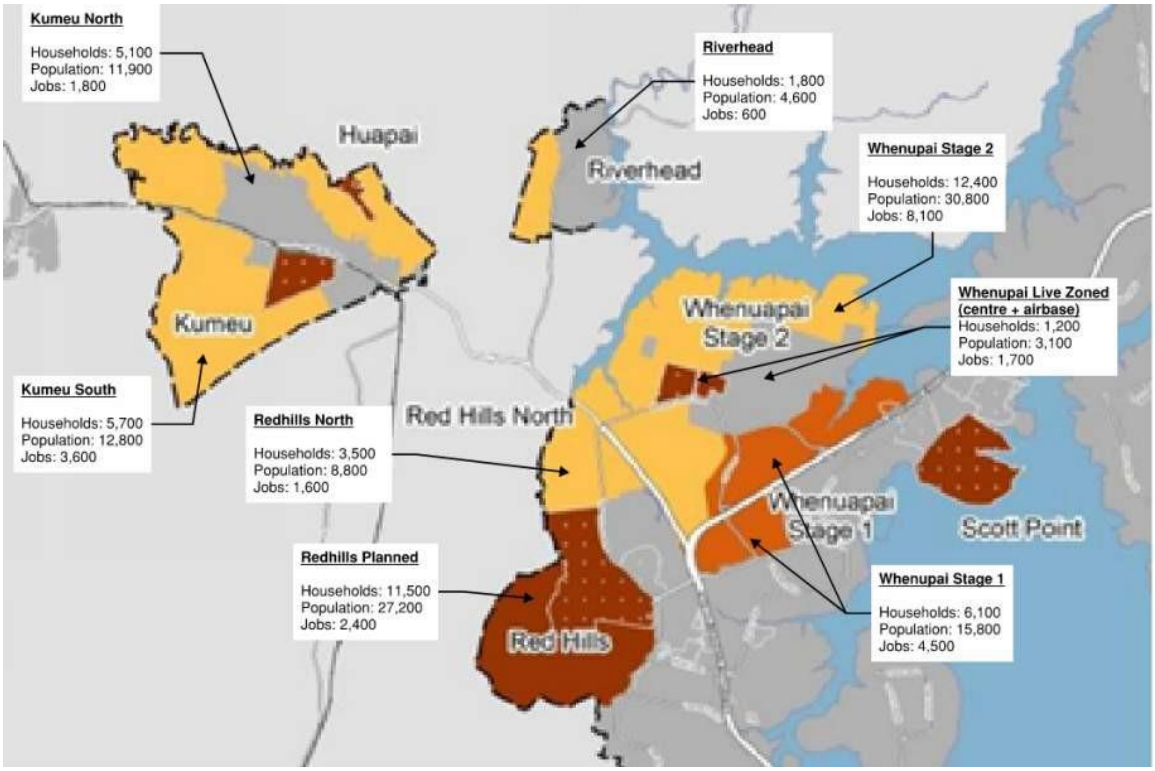


Table 2-1: I11.5 2048+ data – Households

North West area		2028	2048	2048+
Whenuapai	Whenuapai Stage 1	2,300	4,400	6,100
	Whenuapai Live zoned (centre & airbase)	600	1,000	1,200
	Whenuapai Stage 2	2,600	10,500	12,400
Redhills	Redhills North	200	300	3,500
	Redhills Planned	2,900	7,700	11,500

Table 2-2: I11.5 2048+ data – Population

North West area		2028	2048	2048+
Whenuapai	Whenuapai Stage 1	6,600	11,500	15,800
	Whenuapai Live zoned (centre & airbase)	1,700	2,600	3,100
	Whenuapai Stage 2	7,100	26,100	30,800
Redhills	Redhills North	500	800	8,800
	Redhills Planned	7,300	18,300	27,200

Table 2-3: I11.5 2048+ data – Employment

North West area		2028	2048	2048+
Whenuapai	Whenuapai Stage 1	2,600	3,900	4,500
	Whenuapai Live zoned (centre & airbase)	1,100	1,200	1,700
	Whenuapai Stage 2	800	5,700	8,100
Redhills	Redhills North	400	1,600	1,600
	Redhills Planned	700	1,600	2,400

I11.6 Land Use Summary

This section presents an area level comparison of the overall growth expected based on the I11.6 land use assumptions. Currently, no 2048+ data is present in the I11.6 land use assumptions. Hence, I11.6 2051 data was used for the purposes of this comparison analysis.

Figure 2-2: I11.6 Summary 2051 data

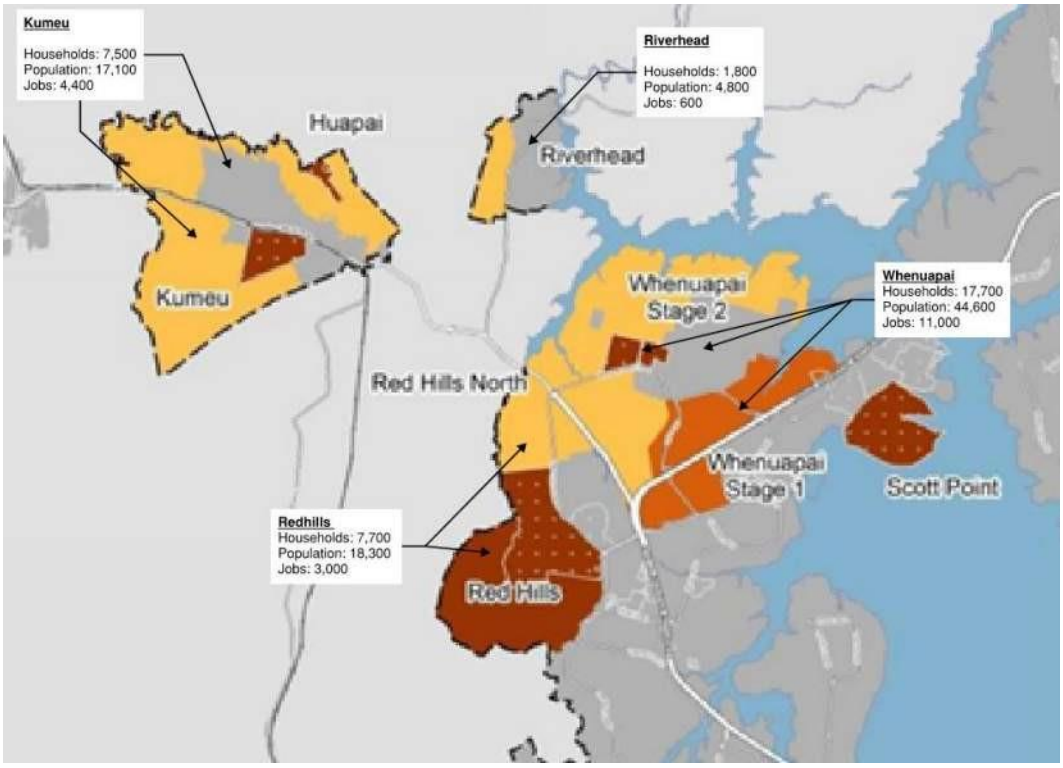


Figure 2-3: I11.5 Summary 2051 data (for comparison)

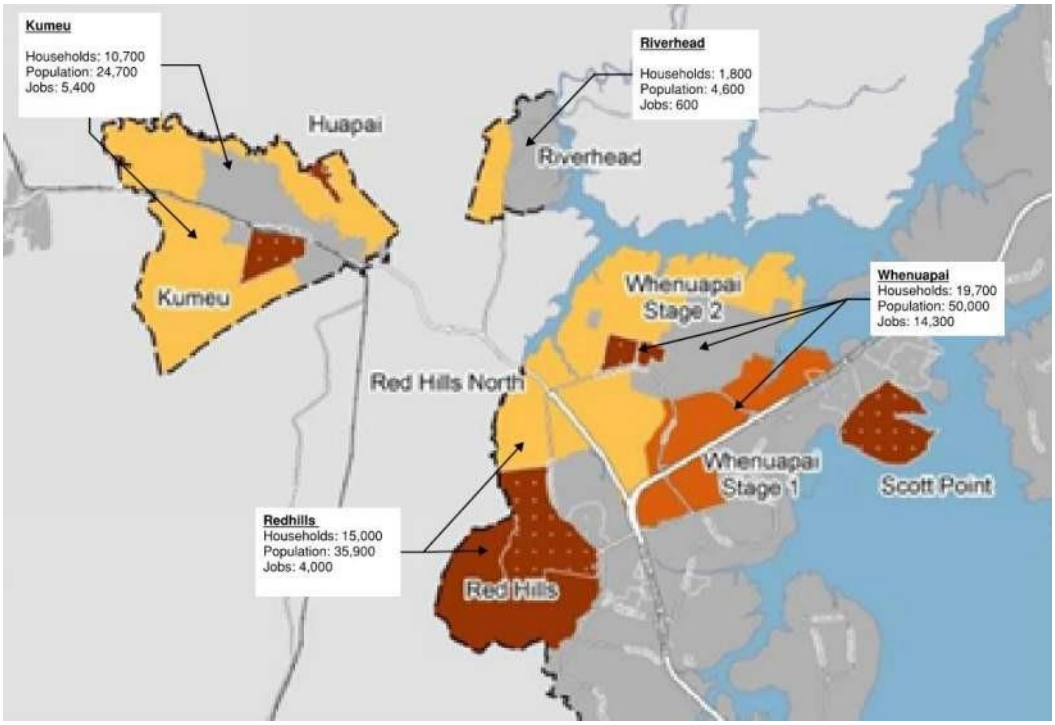


Table 2-4: I11.6 Land use scenario summary (2051)

North West Area	Households (2051)	Population (2051)	Employment (2051)
Whenuapai	17,700	44,600	10,800
Redhills	7,700	18,300	3,000

Table 2-5: I11.5 Land use scenario summary (2048+)

North West Area	Households (2048+)	Population (2048+)	Employment (2048+)
Whenuapai	19,680	49,700	14,300
Redhills	15,000	35,900	4,000

Table 2-6: Difference between I11.6 (2051) and I11.5 (2048+)

North West Area	Households (2048+)	Population (2048+)	Employment (2048+)
Whenuapai	-2,000	-5,100	-3,500
Redhills	-7,300	-17,600	-1,000