Borck Creek Stormwater Corridor

Finding Space in a Changing World

Thriving and resilient Tasman communities

tasman district council | Te Kaunihera o te tai o Aorere

Stantec

Introduction / Overview

Richmond is the largest urban settlement in Tasman District, with a population of 17,000 as of June 2022.

Starting in the late 1990s, TDC determined that infrastructure corridors were required to enable efficient greenfield growth, resulting in the Borck Creek Stormwater Corridor designation in 2010.

This presentation aims to share:

- **information on how the programme has evolved over the years,**
- **the challenges TDC has faced, and**
- **lessons that have been learned along the way.**

Photo Credit: Martin Doyle - TDC

1. Overview of the project
2. The original strategy and assumptions
3. Progress to 2019
4. Key Challenges:
    a) *Challenge 1:* responding to growth
    b) *Challenge 2:* Changing policy and statutory environment
    c) *Challenge 3:* Evolving understanding of the natural environment
5. Our revised strategy
6. Lessons Learned

The Catchment

Richmond is wedged between the steep slopes of the Barnicoat Range, covered mostly in exotic forest, and the low-lying productive floodplains of the Waimea River.

The Richmond catchment is defined by a series of streams that traverse this diverse topography.

The urban stormwater system is largely piped, but discontinuous remnants of the historical streams remain.

The Proposed Channel Network

Designed for a 1% AEP event in 2100 (includes Sea Level Rise, Climate Change & Future Development of the catchment)

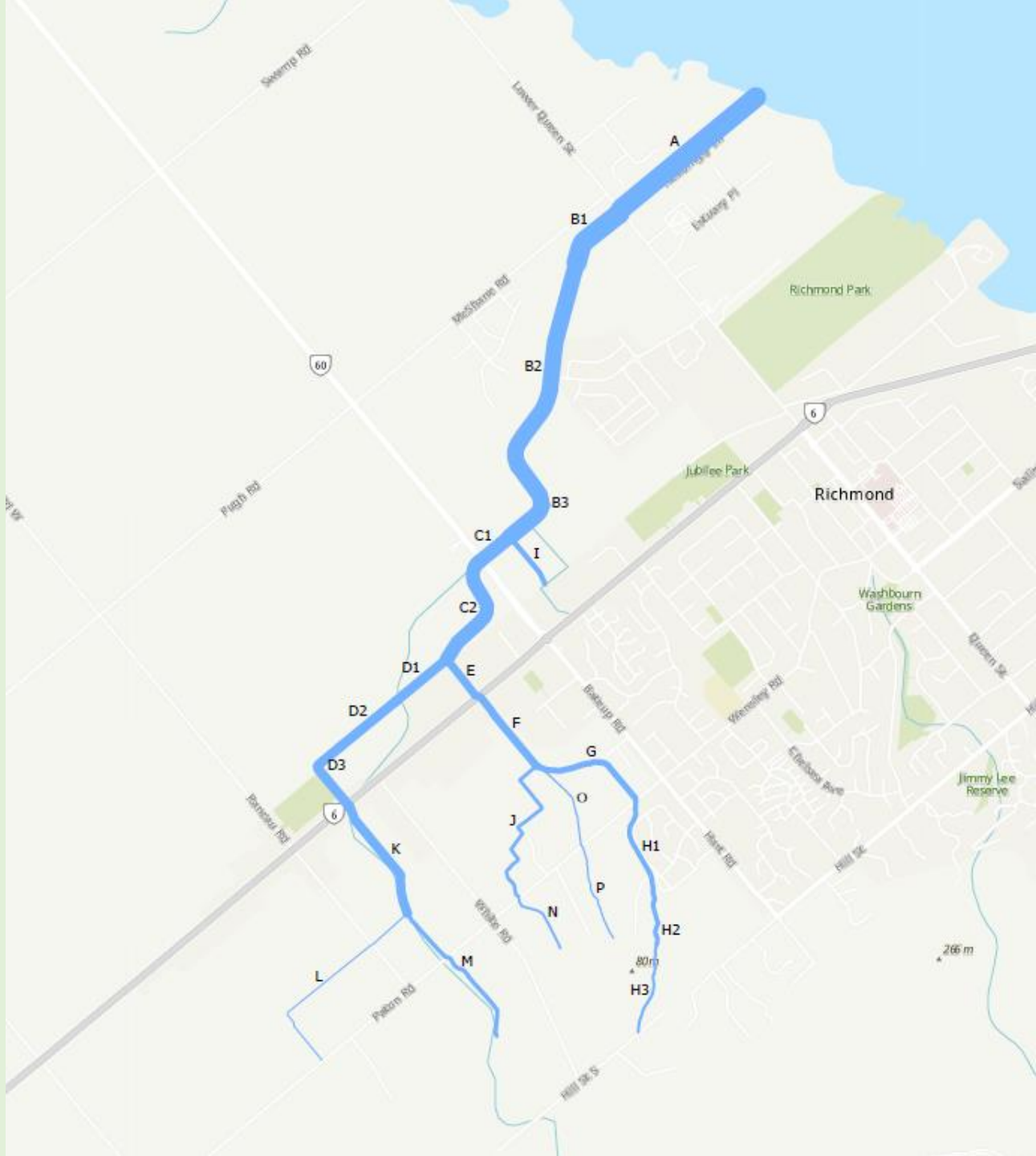
Conveyance requirements:

- 3 m^3/s in sections P & N
- 105 m^3/s in section A

Width requirement:

- 8m wide in section P
- 70m wide in section B

Grades between 1:25 in the upper reaches to 1:330 on the plains



Before and After

Photo Credit: RWDCL

Project Objectives (2010)

a) To provide a stormwater drainage network in the Richmond South Development Area (RSDA) and Richmond West Development Area (RWDA) that is capable of safely containing and efficiently conveying storm flows of Q100 (100-year return periods) to Waimea Inlet;

b) To provide stormwater detention basins as necessary to detain stormwater runoff from urban development in the RSDA until such time as the downstream stormwater drainage network is fully developed;

c) To provide for an open stormwater drainage network using existing waterways where possible, combined with an open space and recreational reserve network aligned with the greenway network of the RSDA and RWDA.

Image Credit: Kumanu Environmental

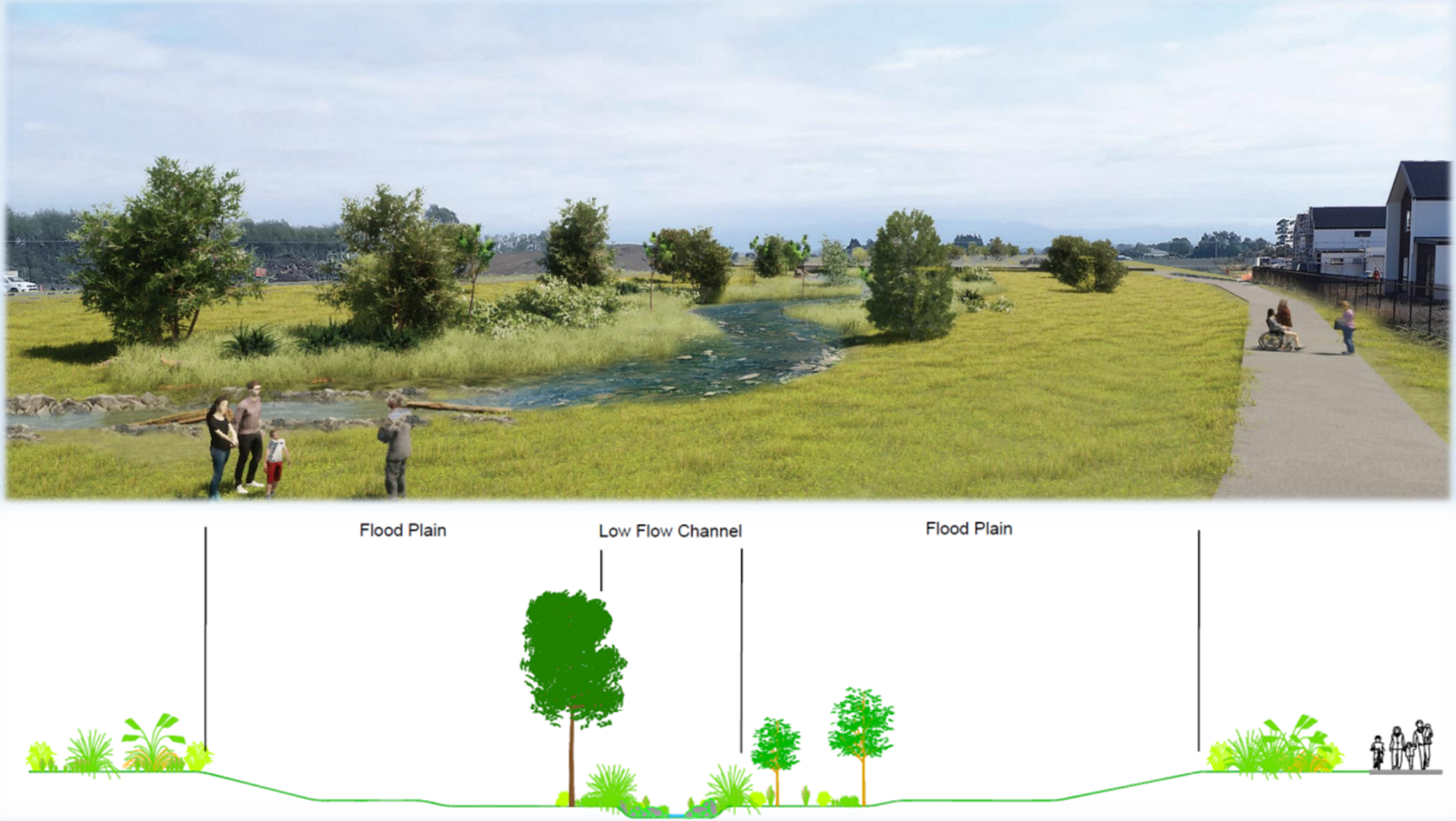


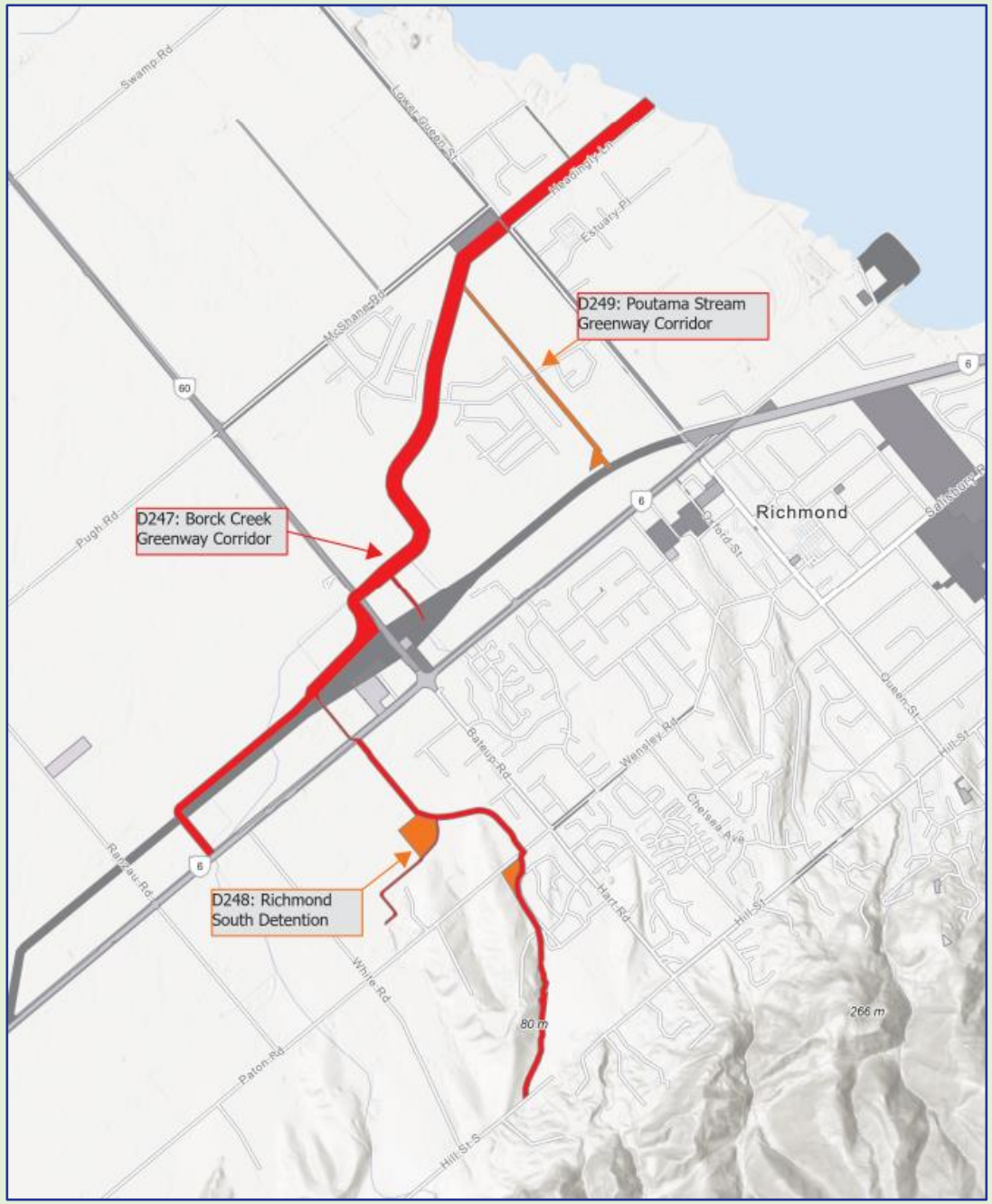
Image Credit: Kumanu Environmental

The Initial Plan

Purchase land when owners either want to sell or want to subdivide.

Construct channels as discrete projects in stages from the estuary upstream

Initially construct the minimum channel required (present day flows) and return to upgrade later



Progress 2000 to 2019

- Secured Designation over channel alignment
- Purchased most of the required land in the Richmond West Development Area (lower sections)
- Constructed environmental channel (present day flows) in section B1
- Construction of partial conveyance channels in Poutama Stream
- Construction of full environmental channel in part of Section A

Photo Credit: Martin Doyle - TDC

Challenge 1: Acceleration of Growth

Responding to Growth: Progress 2019 – 2022

Richmond grew at over twice the rate projected by Stats NZ.

Residential growth was concentrated in the Richmond West Development Area.

Development was progressing much faster than anticipated.

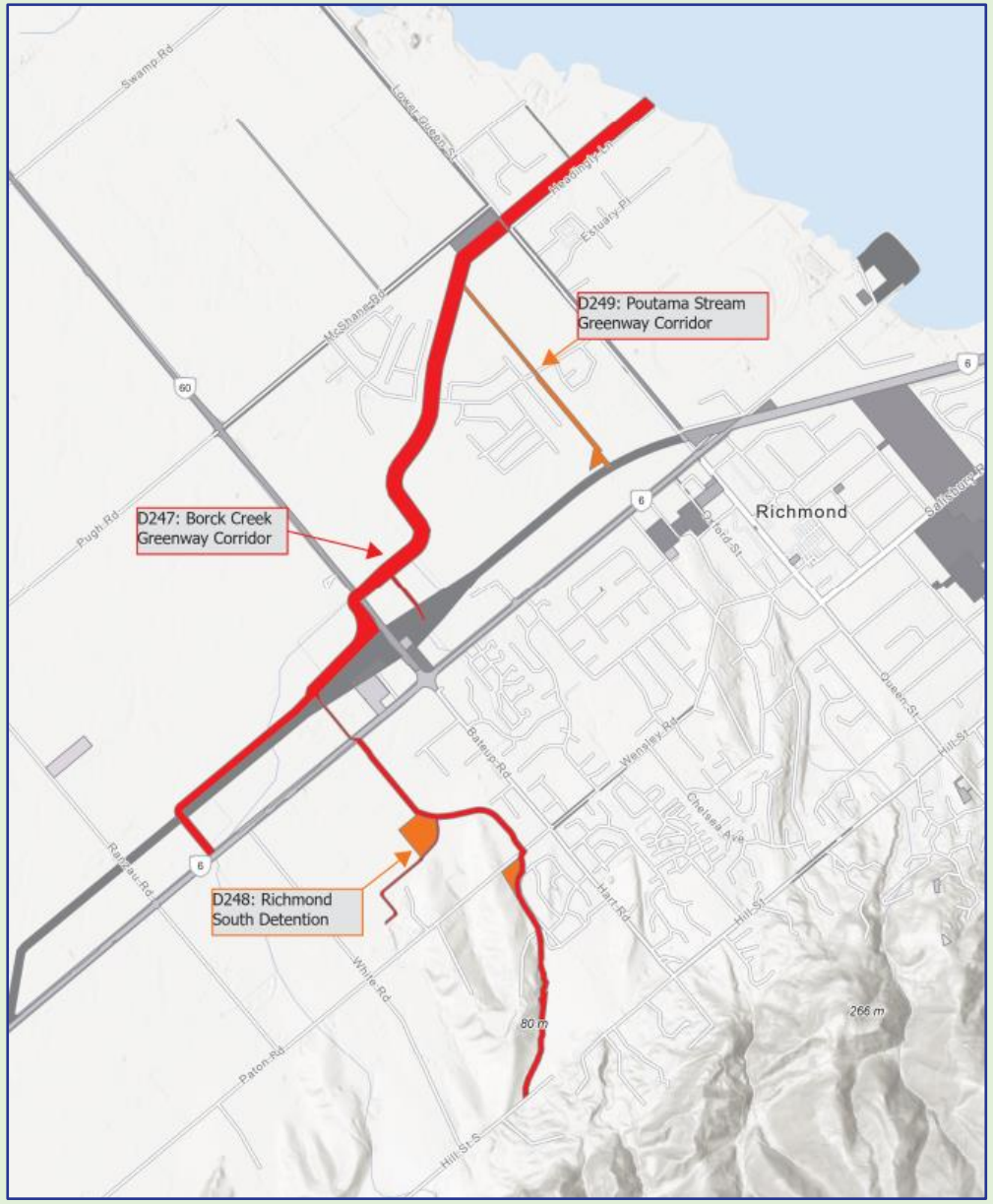
Photo Credit: RWDCL/Martin Doyle

Unexpectedly Rapid Growth

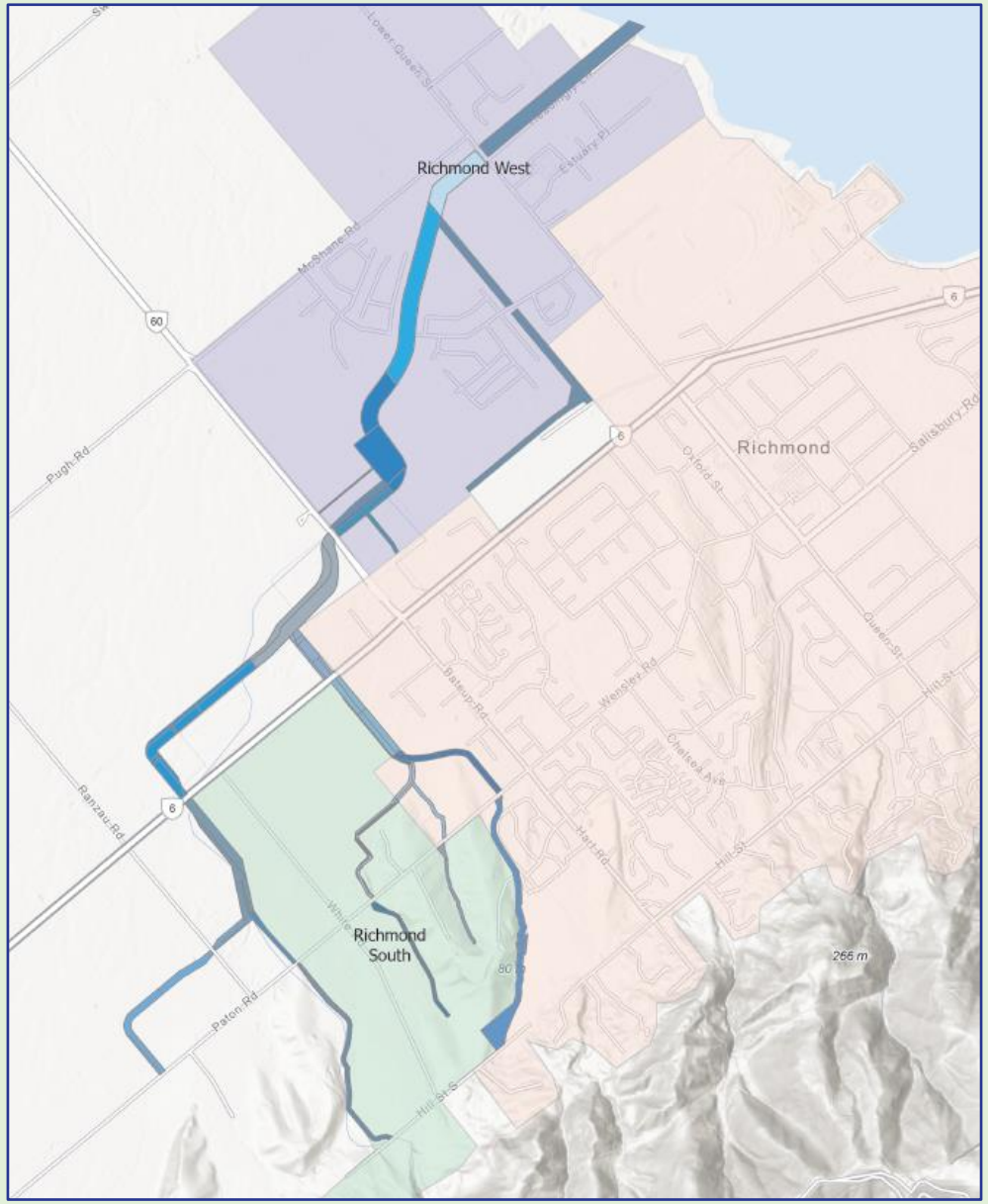
2018

2021

Responding to Growth: Scope Creep



2010 → 2023



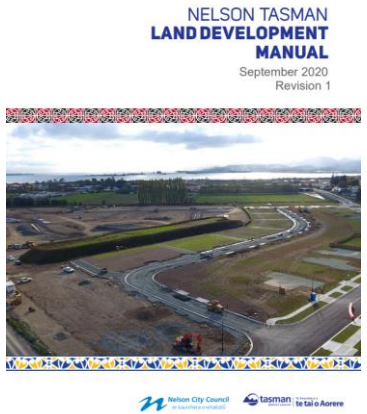
Responding to Growth: Lessons

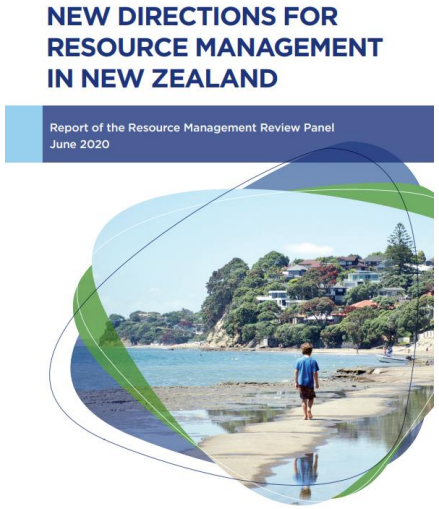
- **It's OK to take an agile approach to design and construction work.**
  Enables realization of some of the benefits before the full design package is ready.

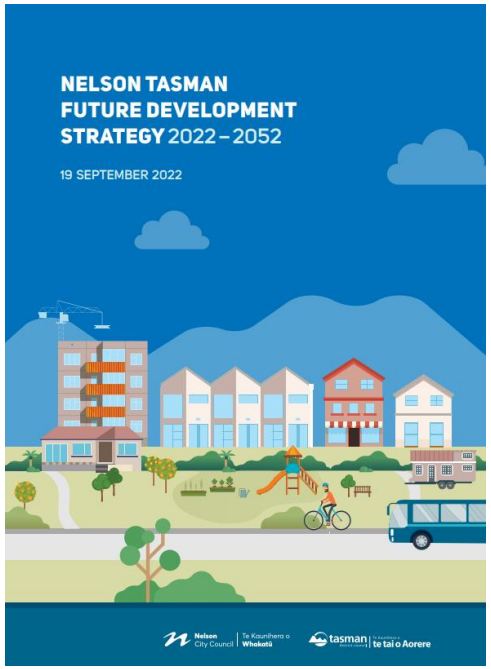
By taking this approach the project team were able to work with developers to construct the full 70m future capacity channel through section B2 within the budget assigned for an interim, present day capacity channel.

Challenge 2: The Rules Change

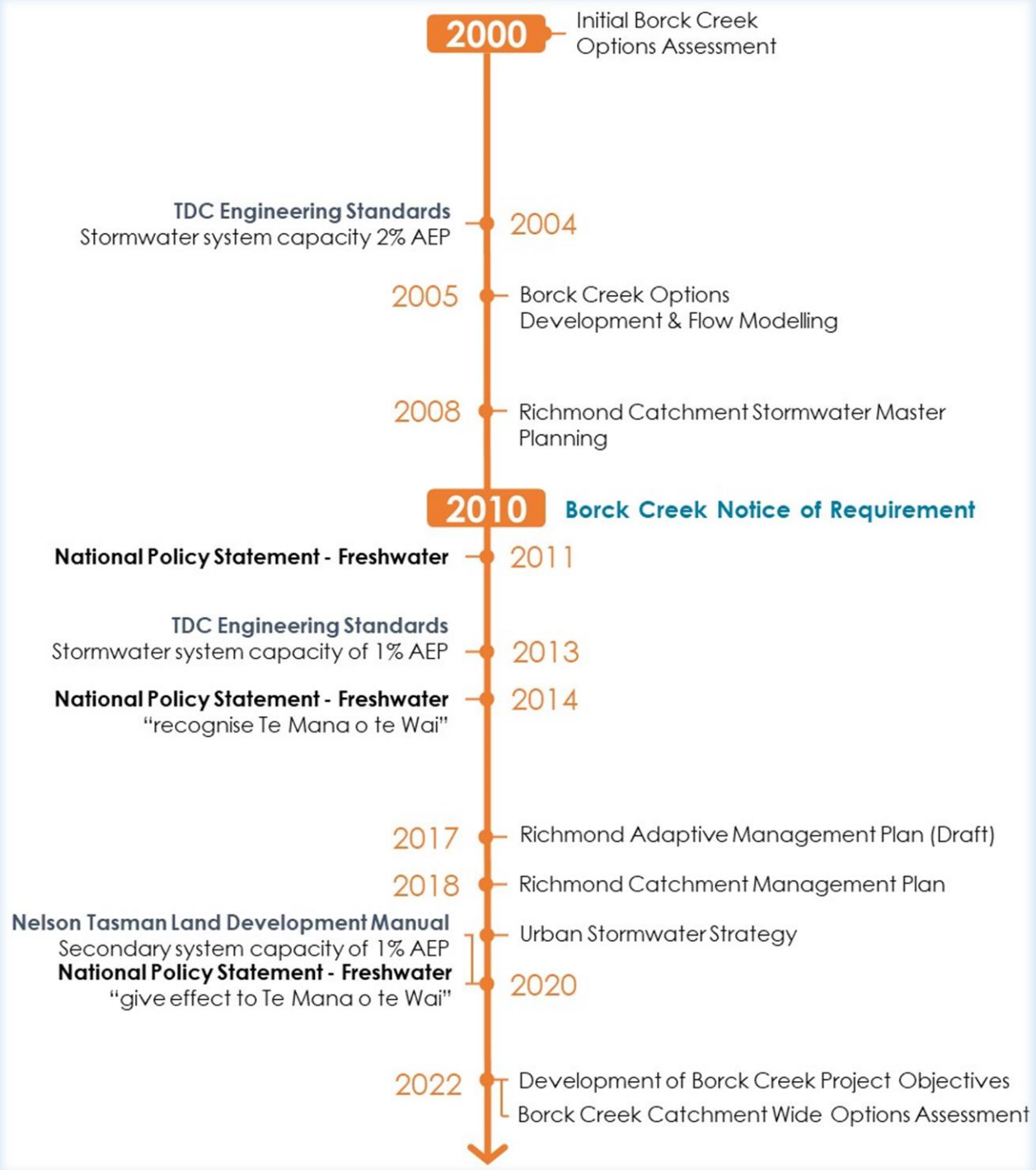
Housing Accords and Special Housing Areas Act 2013







Changing Statutory and Policy Environment



Graphic Credit: Charlotte Holland

Enabled developers to force plan changes through an alternative pathway.

Large parts of the Richmond West development area were re-zoned from deferred mixed business & light industrial to residential.

Council had to accelerate infrastructure projects to keep up with development.

The Borck creek corridor changed from being a buffer zone between residential and mixed business zones to being a residential greenway.

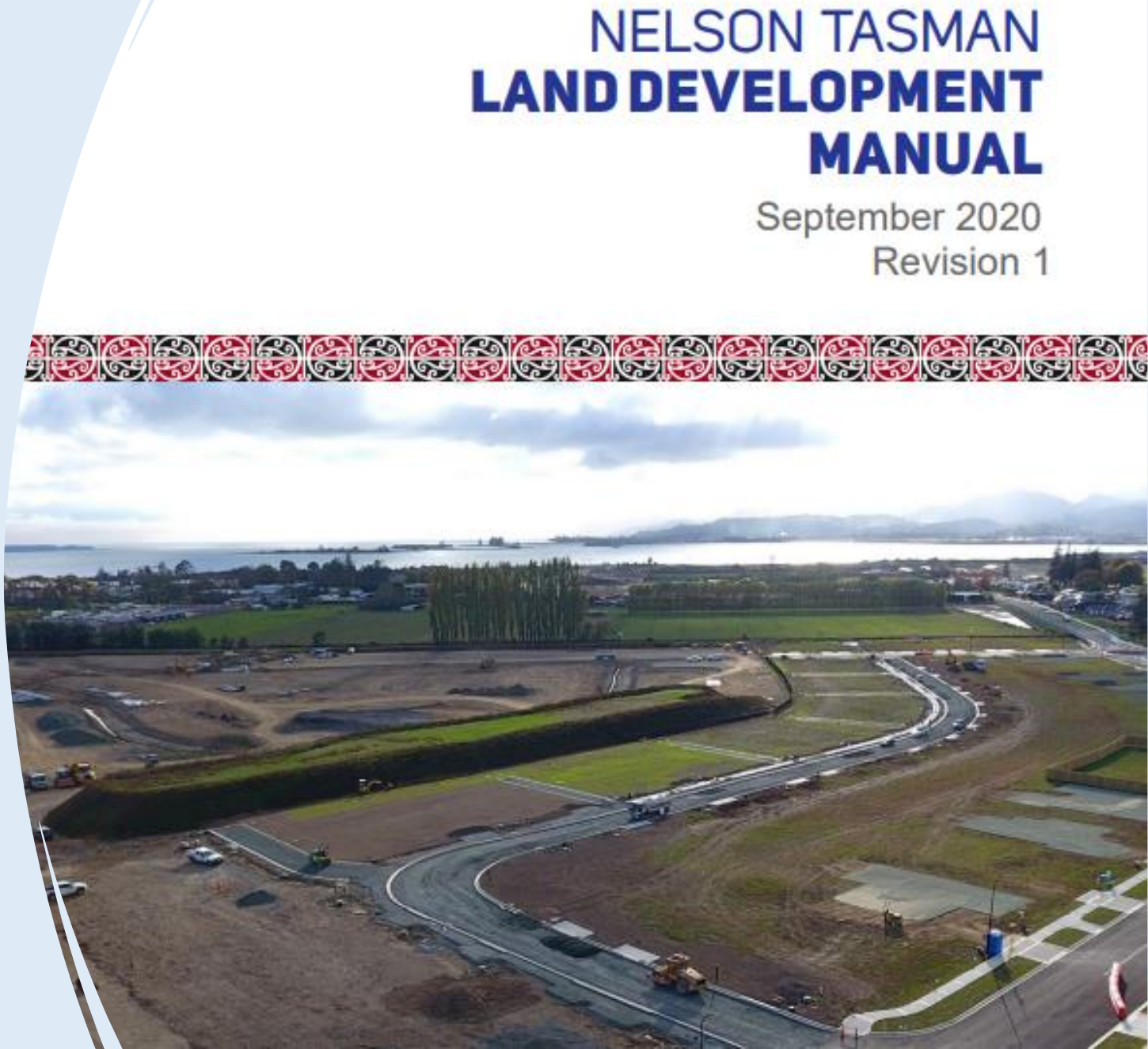
- **NPS–FM 2020 brought the concept of Te Mana o te Wai into a new legislative space**

- **revisit the project objectives**

- **prioritising the health of the water**
  - **more space needed for ecological enhancement**

- **Recognise connection of people to the waterway**
  - **Had to reconsider how public access is incorporated into the corridor**

- **Minimum roughness of 0.055 for stormwater channels, affecting channel sizing calculations**
- **Climate change allowances updated, affecting runoff estimates from future and existing development and assumptions around sea level rise**
- **More focus on environmental outcomes, beyond flood flow capacity**



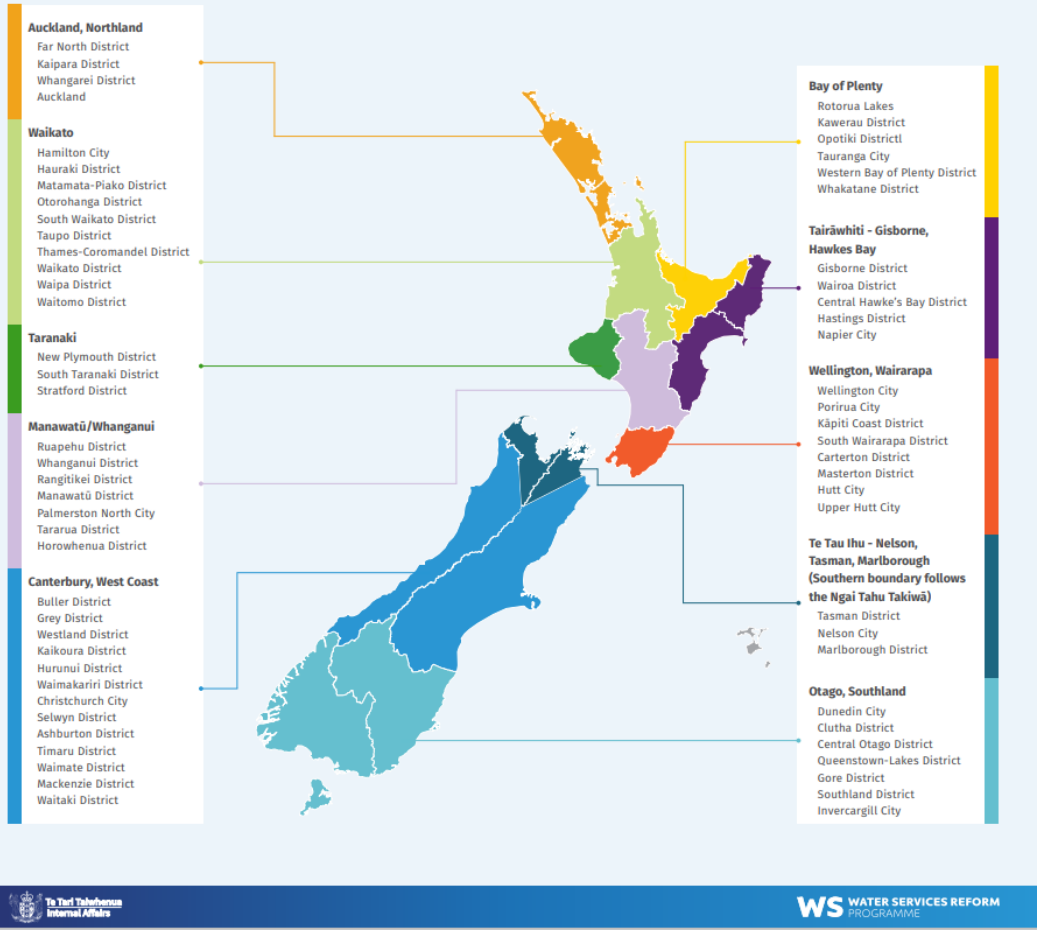
- **Updated strategy to accommodate new requirements of the NPS-UD 2020**
- **Update to development areas – areas of Richmond South brought into the picture much earlier, as Richmond provides more greenfield opportunities for the wider Nelson urban area**
- **Expected rate of development increased in line with recent trends and revised projections**
- **Type of development changed – more higher intensity residential in line with NPS-UD direction**

NEW DIRECTIONS FOR RESOURCE MANAGEMENT IN NEW ZEALAND

Report of the Resource Management Review Panel
June 2020

WS WATER SERVICES REFORM PROGRAMME

Water Service Entities



Challenge 3: Our Understanding of the Environment has Changed

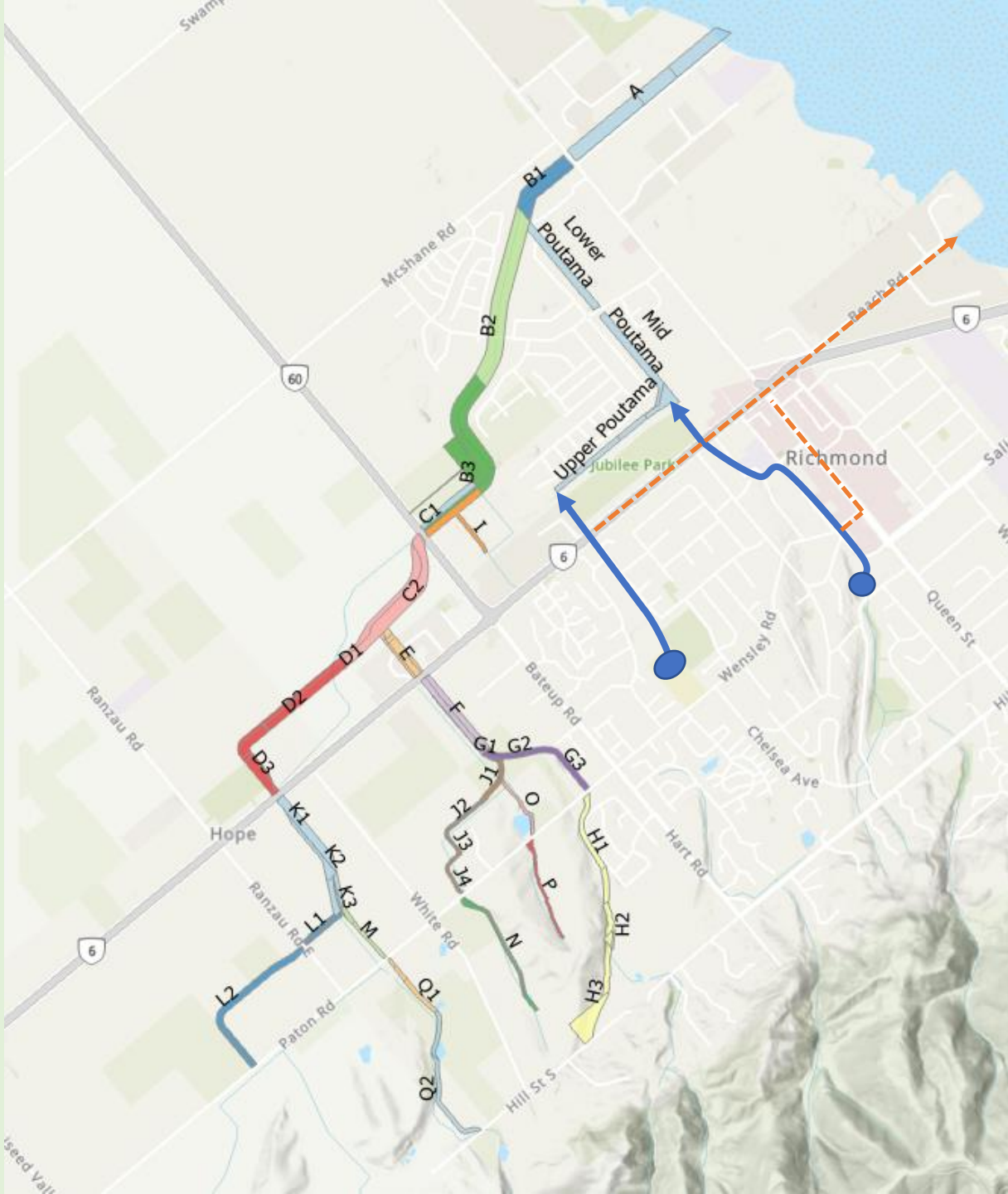
Hydrology - Observed

Significant events in 2012 and 2013 initiated a new plan for central Richmond's stormwater: diverting parts of the CBD's stormwater network into the Borck Creek Catchment.

Image Credit: Waimea Weekly – 24 Apr 2013

Richmond Central Infrastructure Upgrades

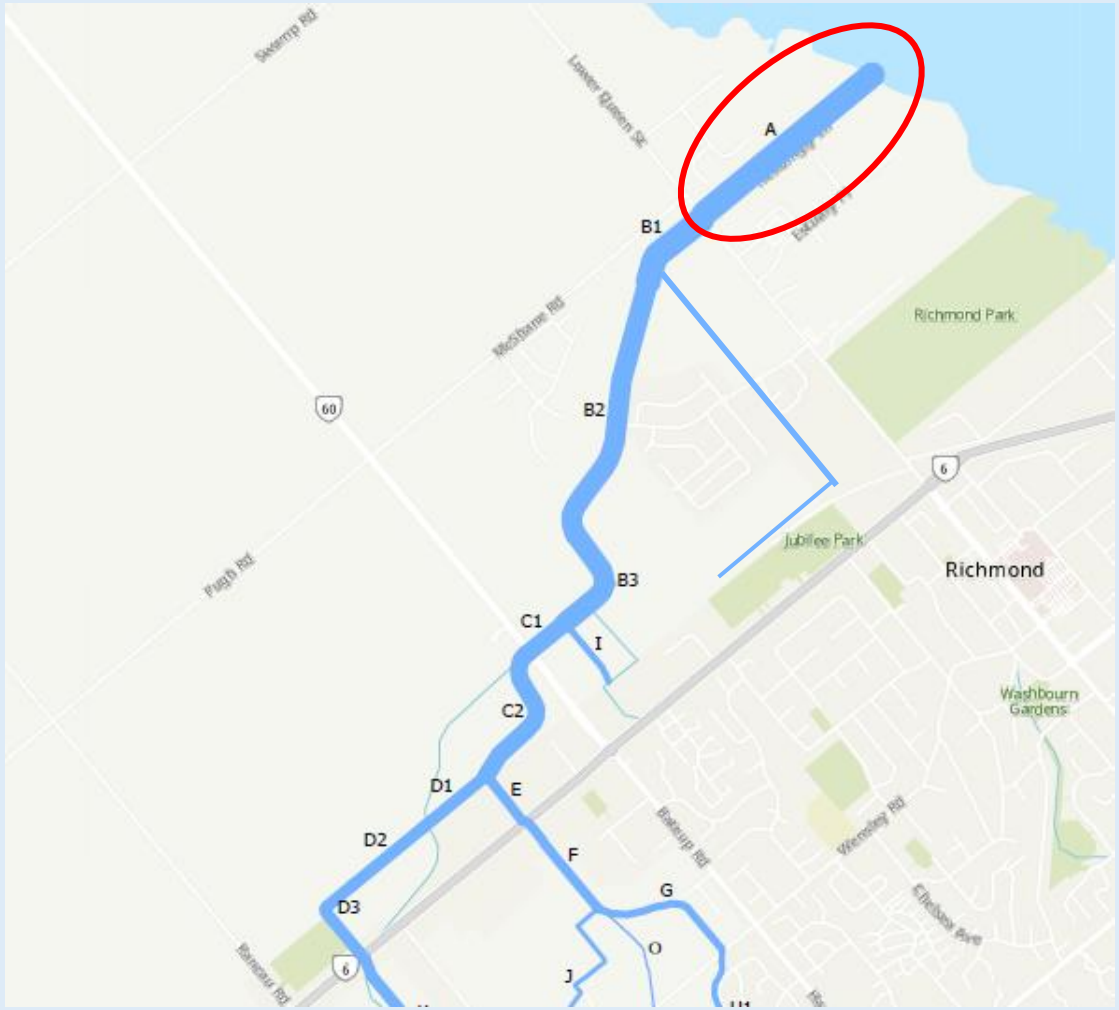
- Flooding in the CBD caused by existing network being overwhelmed:
- Beach road drain and core pipe network are undersized (orange lines)
- Concept is to divert parts of the CBD's stormwater network into the Borck Creek Catchment.
- Comprised two main diversions contributing an additional ~20 cumecs in to the lower Borck network (blue lines).



Hydrology - Projections

- HIRDS v4
- IPCC 5th & 6th Assessment Report
  - RCP Scenario updates
  - Sea Level Rise Projection Updates (and incorporating vertical land movement)

Changing Natural Environment

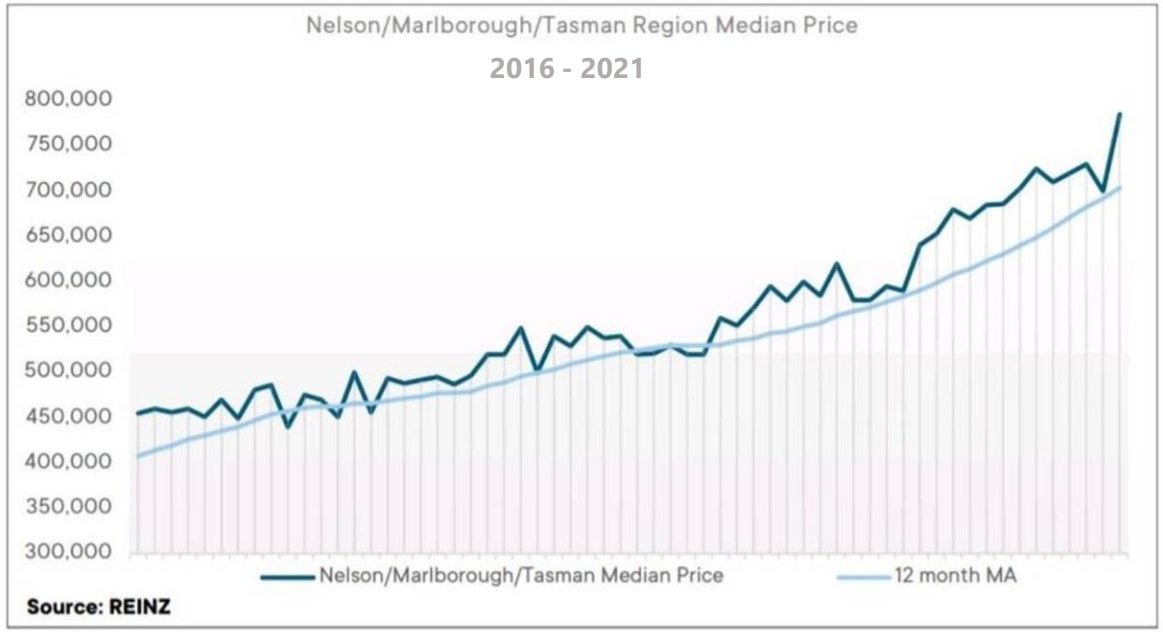


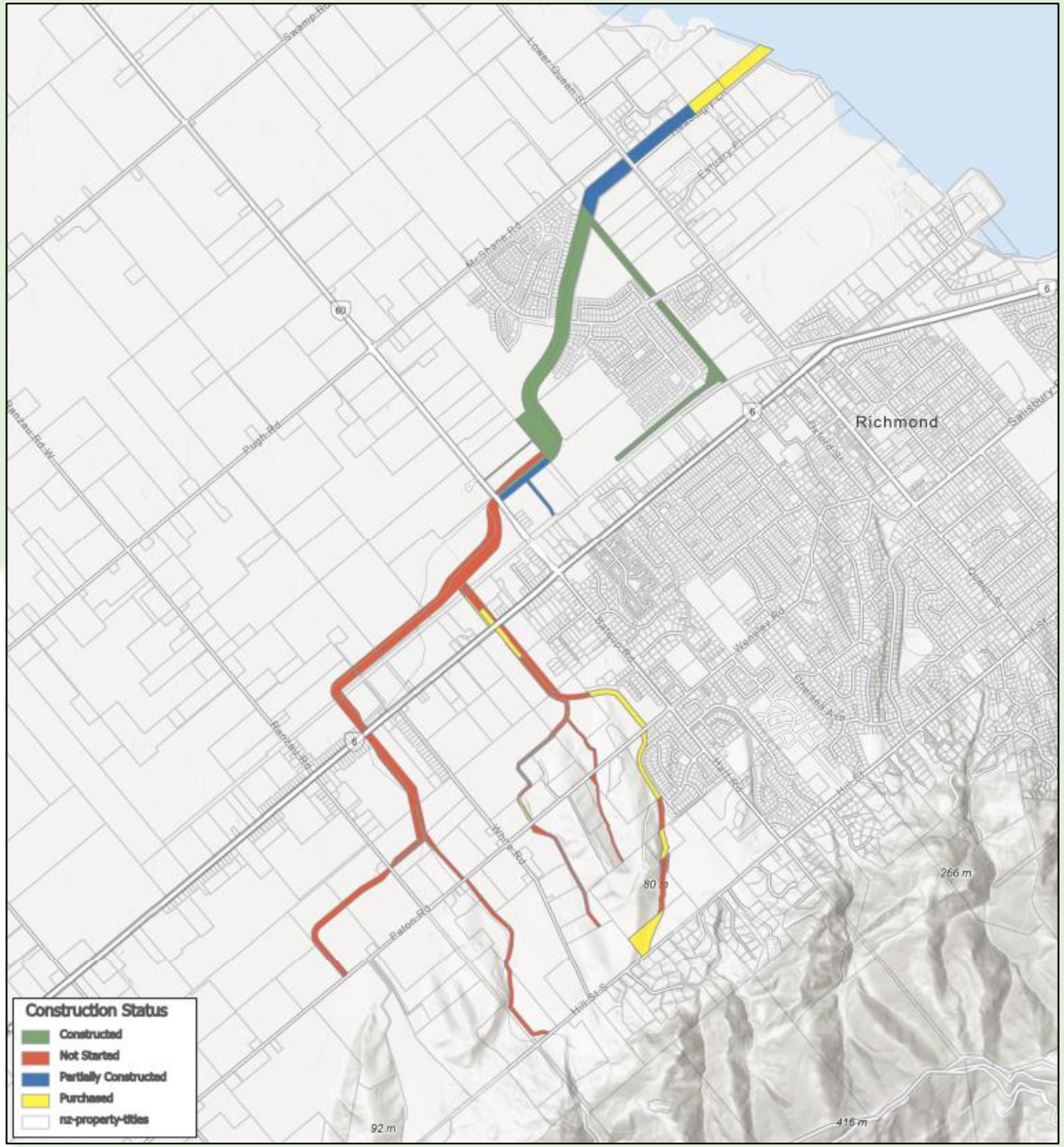
Section	Description	Design Flow (2009) m³/s	Design Flow (2019) m³/s	Design Flow (2021) m³/s	Design Flow (2023) m³/s	Change (2009 - 2023) m³/s
A	Lower Queen Street to Estuary	71	97	105	105	+34
B	Eastern Hills Drain to Lower Queen Street	61	75	85	85	+24
C	Reed Andrews Drain to Eastern Hills Drain	57	60	71	71	+14
D	State Highway 6 to Reed Andrews Drain	46	46	46	46	0
E	Reed Andrews Drain - SH6 to Borck Creek	26	26	36	36	+10
F	Reed Andrews Drain - Whites Drain to SH6	25	25	35	35	+10
G	Reed Andrews Drain - Paton Road to Whites Drain	19	19	22	22	+3
H	Hill Street to Paton Road	17	17	18	18	+1
I	Eastern Hills Drain	10	10	14	14	+4
J	Whites Drain below Paton Road	6	7	10	10	+4

Economic Environment

"Low hanging fruit" land purchases have largely been made, and uncertainty if the 2010 Designation is sufficient basis for PWA compulsory acquisitions.

Strategy reboot has focused on ensuring the network would be acquired in full, a much more expensive prospect compared to years past.





Impact of the Changes

Corridor width requirements have become greater

Programme/Network extent has expanded

Costs have increased

Timeframes have shortened

The Revised Strategy

01

Set up land acquisition programme for compulsory acquisition

02

Manage as a programme & allow flexibility between project budgets

03

Get design work done well ahead of planned construction

Programme Objectives (2022)

New set of Council-adopted programme objectives to align with Urban Stormwater Strategy:

1. **Conveys the 1% AEP event within the stormwater network including effects of future development and climate change.**
2. **Enhances stream health, ecological diversity, and accessibility.**
3. **Enables water sensitive growth for future generations.**
4. **Considers the whole of life costs including future needs, operation and maintenance costs.**
5. **Integrates public access, amenity, and connectivity along the corridor from the Richmond Foothills to the Waimea Estuary and enables the concept of Ki Uta Ki Tai.**

Lessons Learned (so far)

01 **Adopt a programme management approach for the series of planning and design projects related to delivery of the end-use infrastructure.**

02 **Establish a clear suite of programme objectives that enable change and flexibility without compromising the integrity and vision of the programme.**

03 **Plan for worst-case scenario of land acquisition under the Public Works Act.**

Lessons Learned

04 **Accept that general or universal rules for a large-scale infrastructure programme do not always apply, and the specifics of a situation should be considered to get the best outcome.**

05 **Be open to learning from others who have carried out similar work, taking the good and the bad. TDC owes particular thanks to staff from Auckland Council and GHD regarding the Awakeri Wetlands project.**

Thank You!

Thriving and resilient Tasman communities

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