

# A Fresh Look at Waitematā Harbour Connections

## Aims

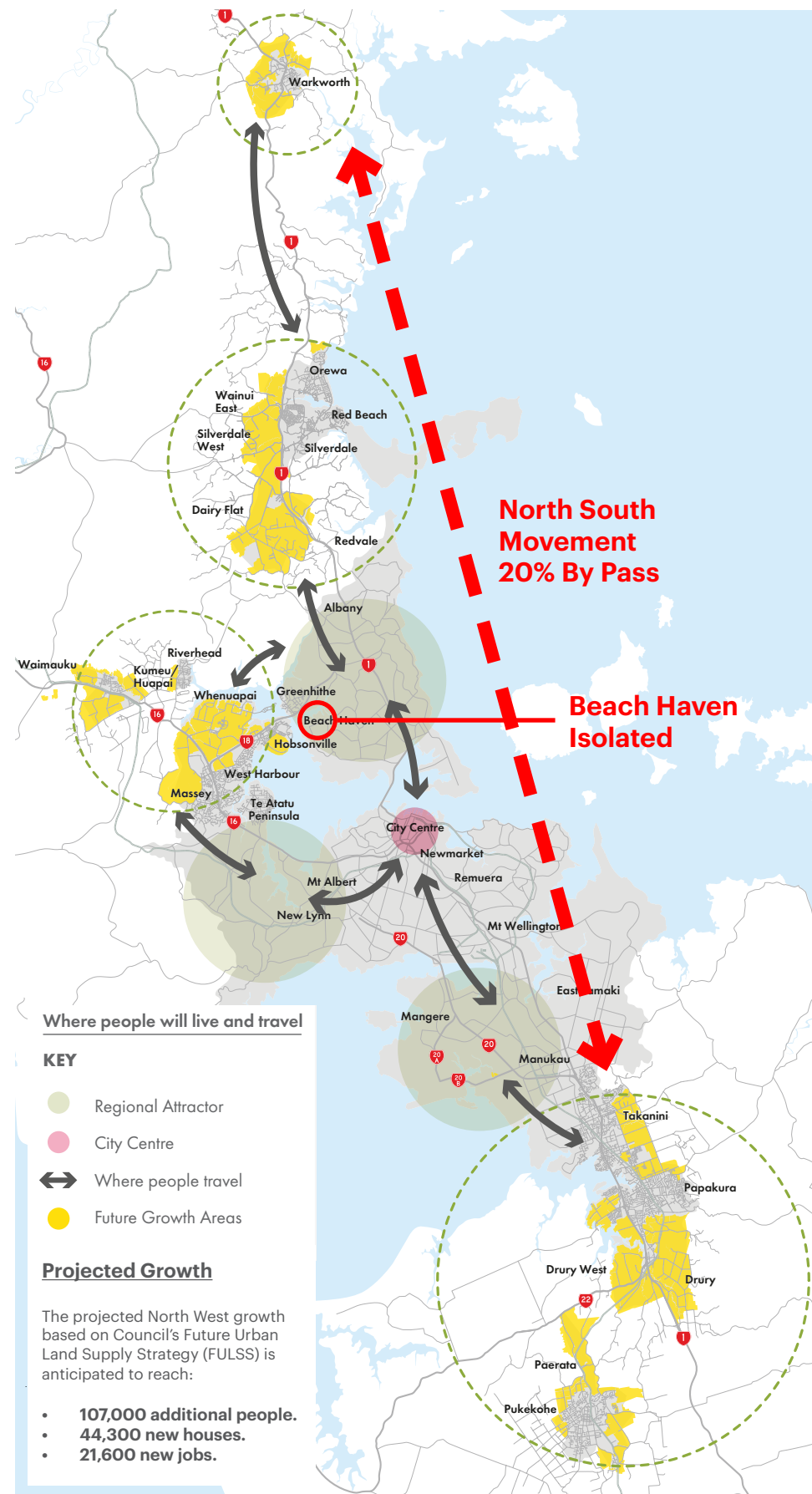
1. Connecting Communities
2. Decongesting Movement
3. Resilience
4. Economic Benefits

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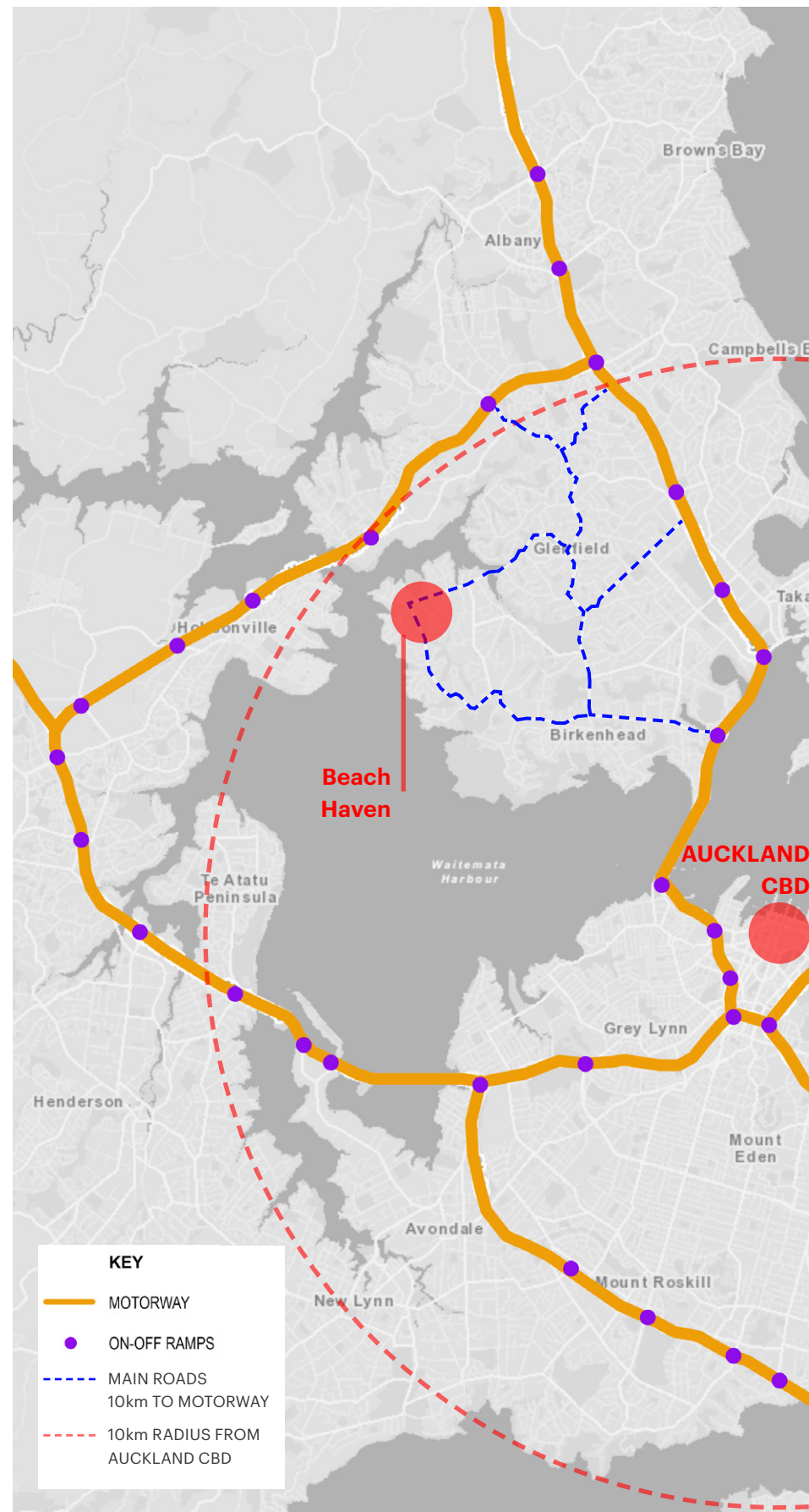




# Waitematā Connections The Big Picture



Auckland Growth Areas & North South Movements

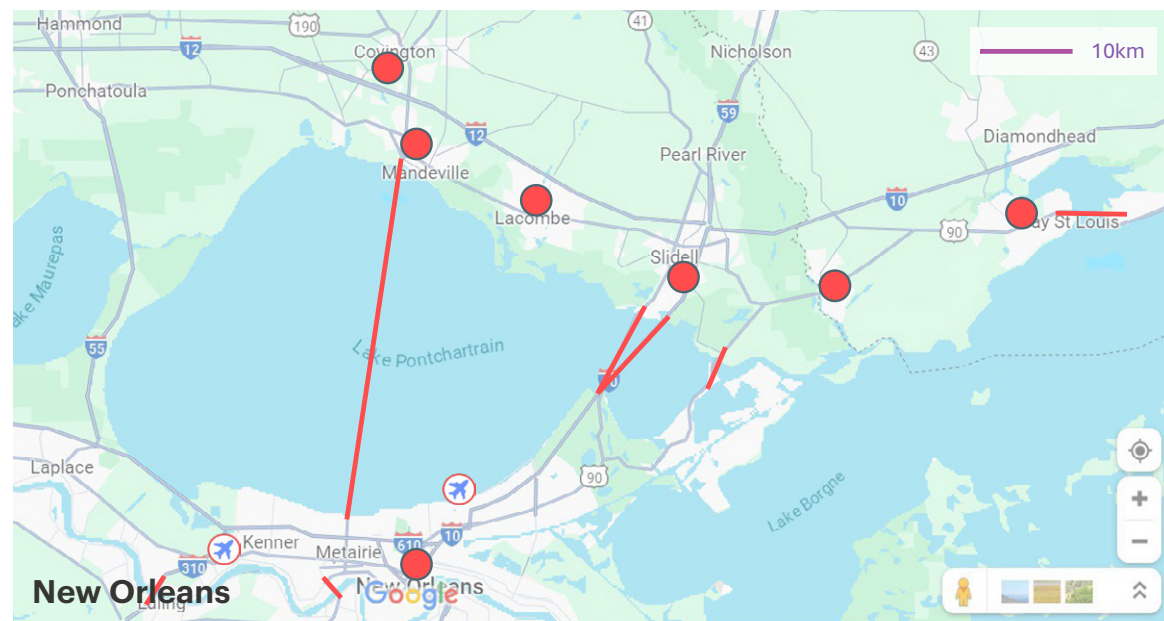
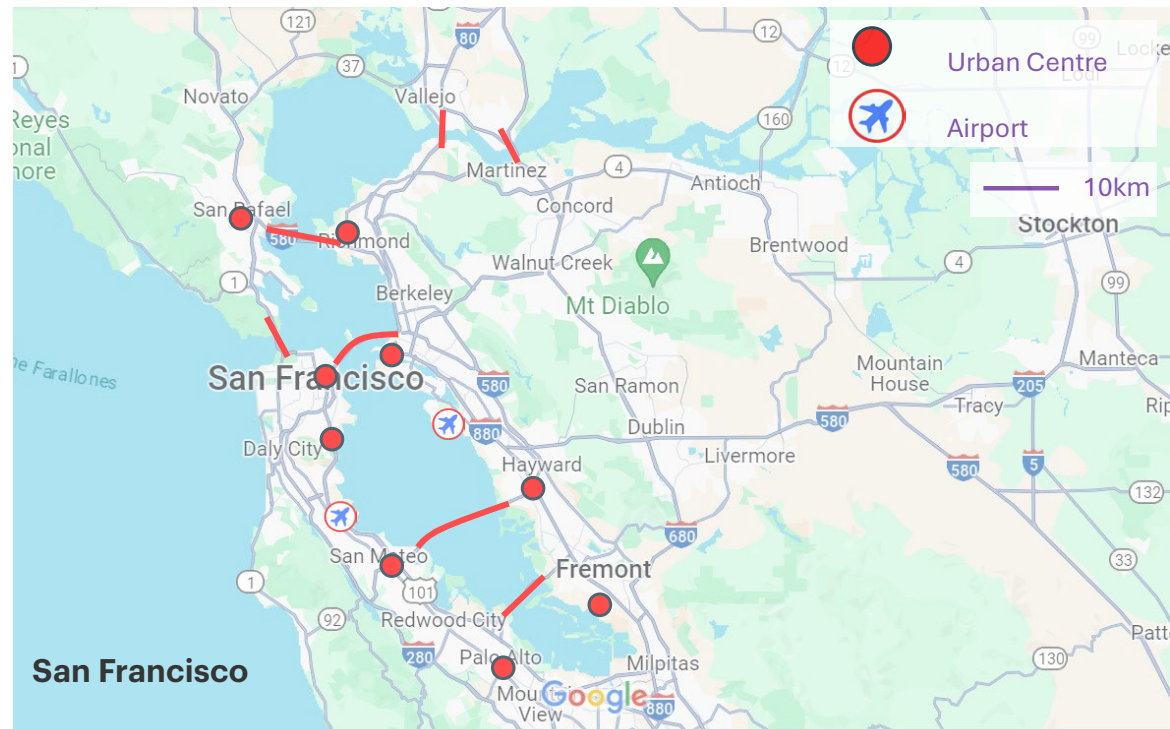


Ring Road Motorway & Central City Choke Point



Heavy Contour Setting





## Case Study of Growing Cities Separated by Large Water Bodies

### Lessons Learnt

- Successive bridges with city growth
- Links key facilities (Airports, Hospitals, Town Centres)
- Unlocks growth areas - Development opportunities
- Distributes movement / traffic
- Bridges become iconic
- Avoids sensitive areas

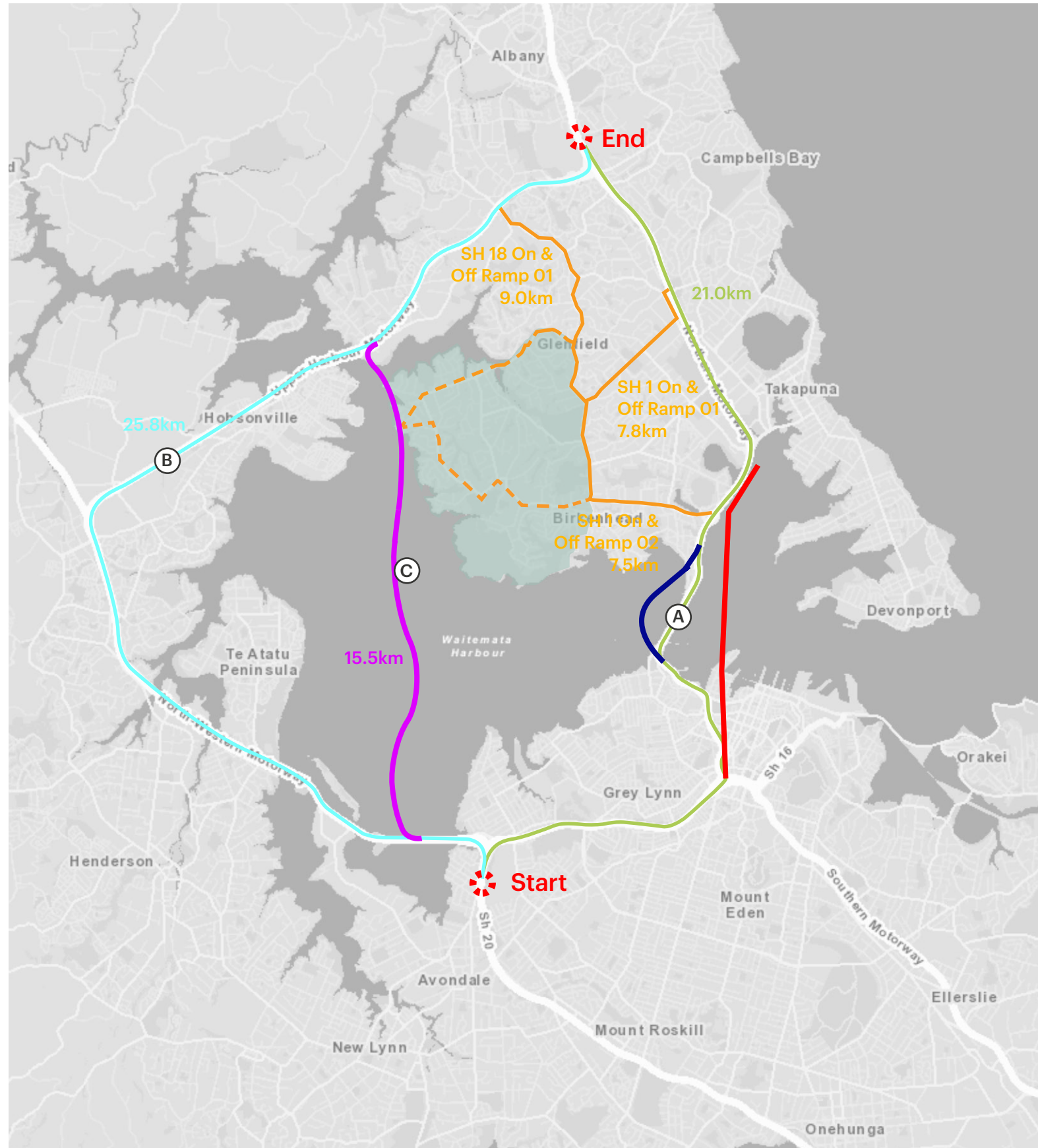
## A History of Waitematā Harbour Crossing Options - Auckland 1997

### Lessons Learnt


- Previous options focused on city centre
- Environmental concerns squashed
- 1972 Meola Reef to Birkenhead proposal
- Local roads prone to congestion
- Needs to link up with motorway
- Community disruption a big issue






# Waitematā Connections Options Considered




## Legend

-  Start / End Point
-  Unlocked Catchment Population ( 25k )
-  Arterial Road
-  Local Road to become Arterial Road

## Routes Length Comparison - SH20 Waterview Tunnel to Constellation Drive

 (A) Northern Motorway (SH1)	21km
 (B) Northern-Western Motorway (SH18)	25.8km
 (C) New Causeway Bridge	15.5km

## Bridge Length Options

	Cost
 Option 1: <b>CAUSEWAY BRIDGE</b> - SH16 to Upper Harbour Highway (11.0km) - Motorway connection that bypasses central city - On/Off Ramp Connections to communities - Minimal disruption	3.0 B
 Option 2: <b>WAITEMATĀ BRIDGE</b> - SH1 to SH1 (2.5km) - Provides for active modes - Takes traffic load off Auckland Harbour Bridge - Unlocks additional functions for the Auckland Harbour Bridge - Expands existing SH1 Highway and infrastructure resilience	2.5 B
 Option 3: <b>NZTA TUNNEL</b> - SH16 to SH1 (5.0km) - Bypasses the Auckland Harbour Bridge - Infrastructure has low visual impact - Direct connection to North Shore	17.0 B





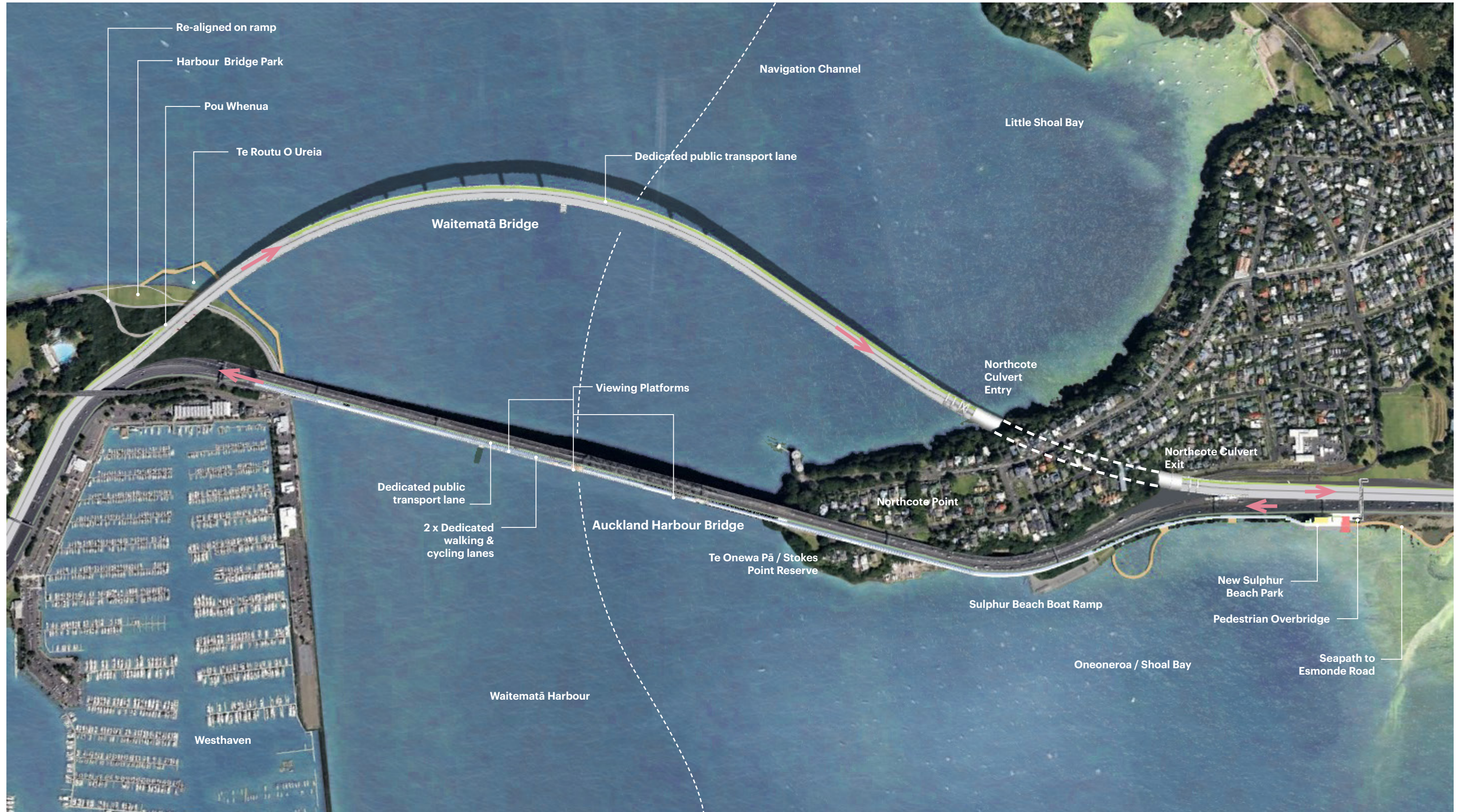
# Waitematā Bridge Study



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# Waitematā Bridge Study Plan View



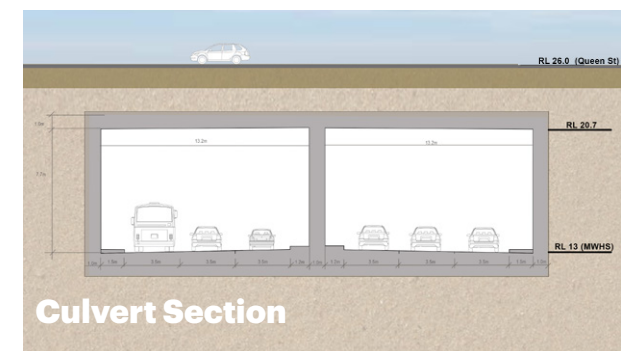
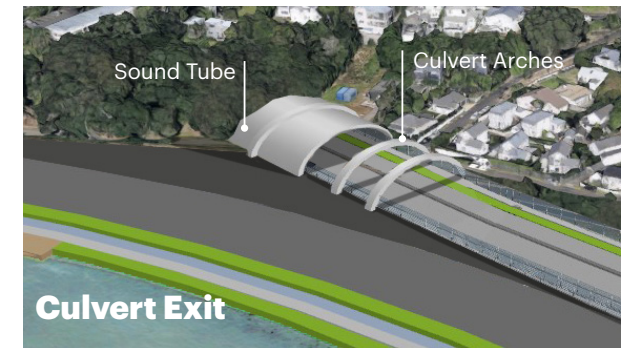
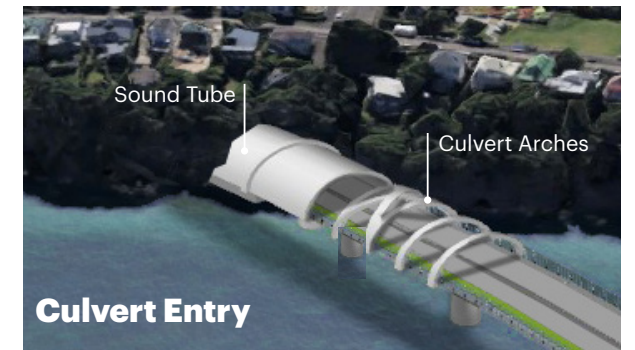
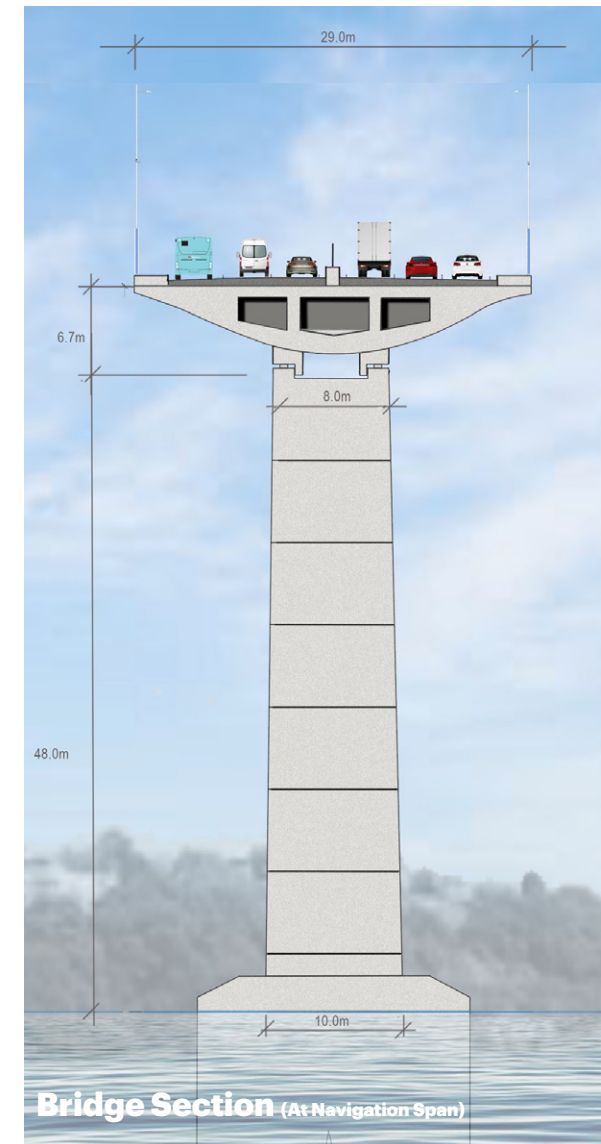


# Waitematā Bridge Study Design Proposal

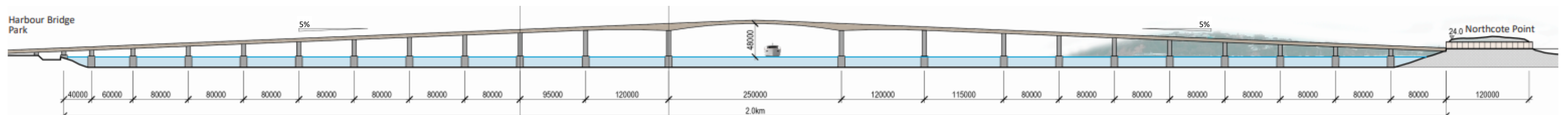
- 2.0km long
- 48m max high
- 29m wide
- 6 lanes
- 1 public transport lane
- Prestressed concrete construction - maintenance free with a design life of 300yrs (similar to Brisbane Gateway Bridge)
- Designed to HN-HO-72 traffic loads.
- Navigation span of bridge is 250m (similar to AHB)
- 3.5m high strengthened acrylic louvers to cut wind speed (50% reduction)
- Central median barrier allows for providing southbound traffic lanes in emergency
- 250m section of culvert at Northcote with a 7.7m high ceiling.

## Design Key

- A. Central Median
- B. 5 x Northbound Vehicle lanes
- C. 1 x Northbound PT Lane
- D. 3.5m High Wind Louvers
- E. Prestressed Concrete Structure



## Waitematā Bridge Elevation



## Precedents



Prestressed Concrete Structure



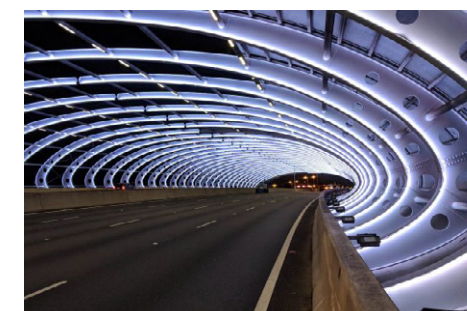
Wind Louvers



Wind Louvers Gap



Gateway Arches



Culvert / Tunnel Lighting



Night Lighting



# Waitematā Bridge Study Re-purposed Auckland Harbour Bridge

## Proposed Lane Reconfiguration:

- 8 existing lanes (north & south)
- 1 dedicated public transport lane (south)
- 5 vehicle lanes (south)
- 2 eastern lanes (9m total width) converted to walking/cycling
- Seating/viewing platforms

## Waitematā Harbour Viewing Deck:

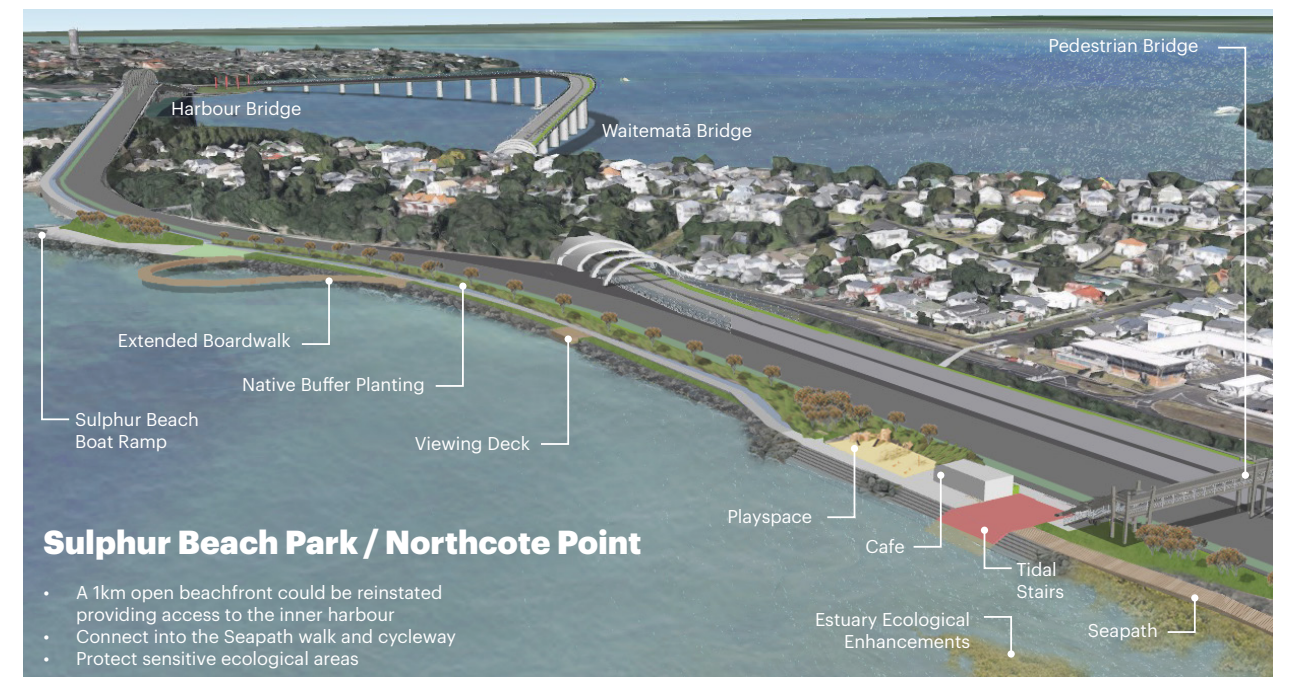
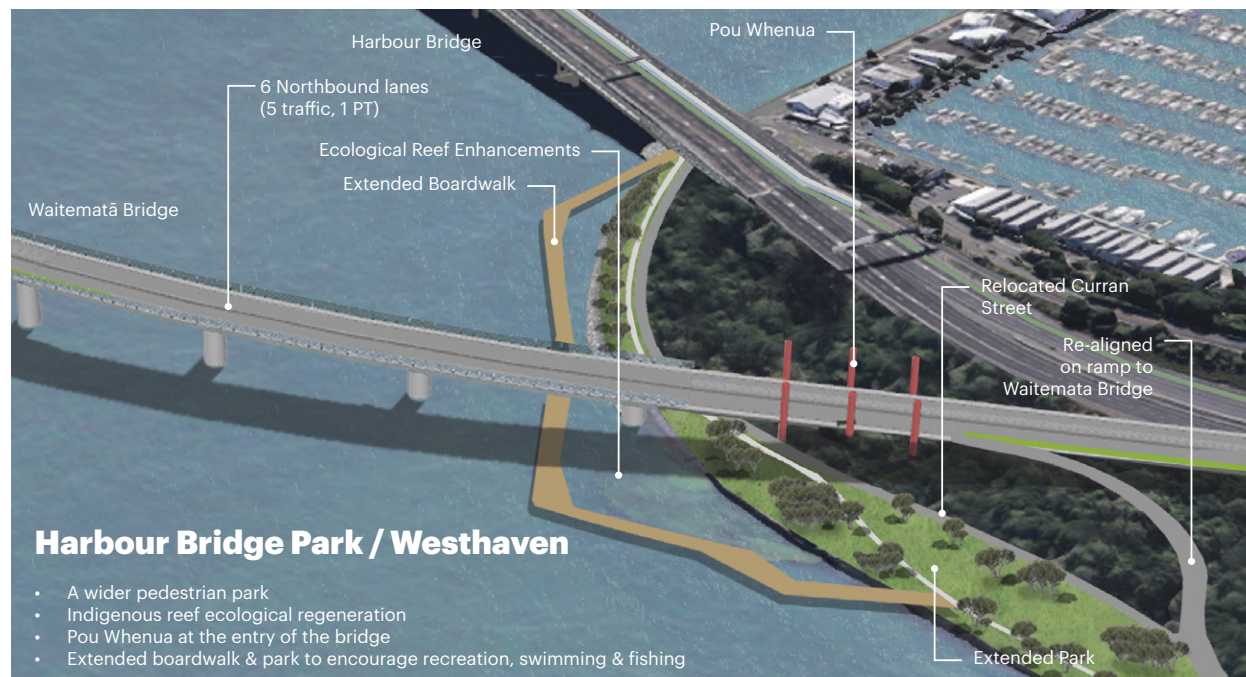
- Expansive city and harbour views
- Potentially Auckland's No.1 tourist destination
- Operating hours: 5am-10pm with CCTV and security guards (similar to Sydney Harbour Bridge)
- Estimated 5000 x Walking & Cycling Movements Per Day

## Design Key

- A. Auckland Harbour Bridge
- B. 5 x Southbound Vehicle Lanes
- C. 1 x Southbound PT Lane
- D. 1 x Northbound & 1 x Southbound Cycle Lane
- E. 5.0m Wide Walking Lane
- F. 3.5m High Wind Louvres
- G. Seating / Viewing Platform



## Historical Precedents





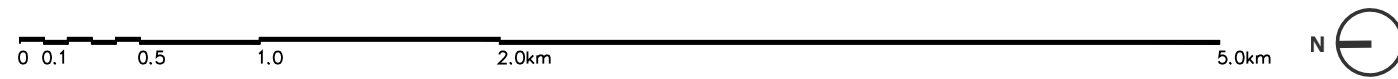
# Causeway Bridge Crossing Study



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# Causeway Bridge Crossing Study Plan View





# Causeway Bridge Crossing Study Design Proposal

## Features:

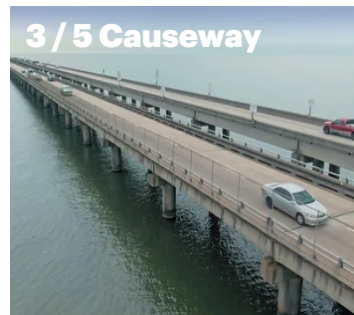
- 11.0km long
- 34m wide
- 6 lanes

## Opportunities:

- Acts as bypass to avoid Auckland City centre and congestion on either side of existing Harbour Bridge resulting in reduced carbon emissions and travel time
- Reduces travel distance and time between SH1 (north of Constellation Dr) and SH20
- Provides for community recreation with proposed walking /cycling lanes and viewing/fishing deck

## Structure:

- Prestressed concrete construction - maintenance free with a design life of 300yrs (similar to Brisbane Gateway Bridge)
- Designed to HN-HO-72 traffic loads.
- Navigation span of bridge is 250m (similar to AHB)
- 3.5m high strengthened acrylic louvers to cut wind speed (50% reduction)





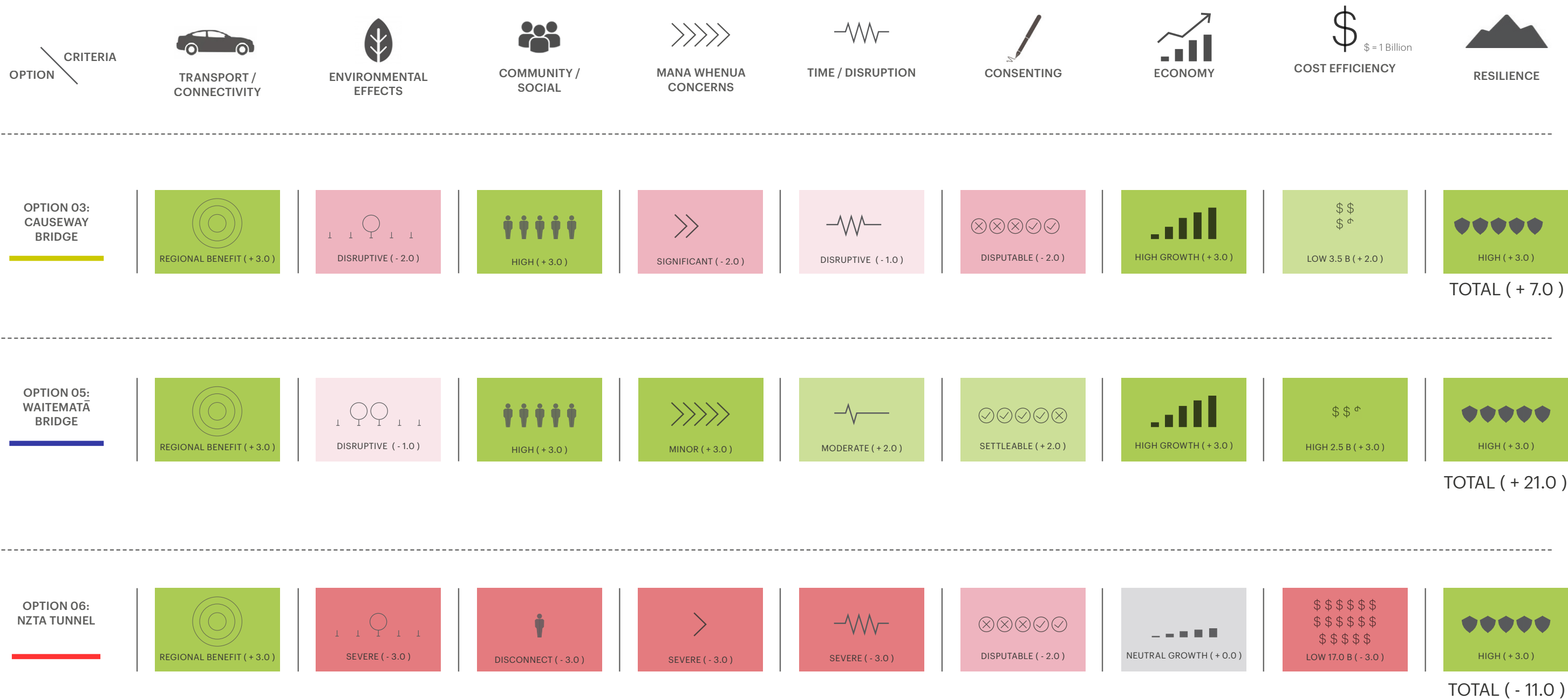
# Analysis



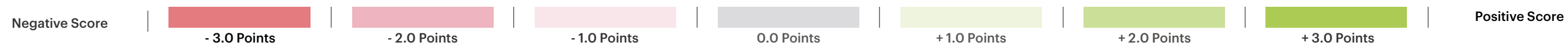
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# Waitematā Harbour Crossing Analysis Bar Graph



## SCORING SYSTEM





# Waitematā Harbour Crossing Study Conclusions



## Study Aims

- Connecting Communities
- Resilience
- Provide a By - Pass
- Economical Benefits

## Main Purpose of Connection

- Unlock Beach Haven/Birkdale for future growth
- Alternative harbour crossing – for resilience & by pass movement
- Support planned growth of public transport & active travel

## Options Review

	Score
<p> <b>Option 1: CAUSEWAY BRIDGE (MEDIUM TERM)</b></p> <p>A long-term consideration could be a causeway bridge across the upper harbour.</p>	+ 7.0
<p> <b>Option 2: WAITEMATATA BRIDGE (HIGHEST PRIORITY)</b></p> <p>The Waitemata Bridge scores the highest across all assessment criteria.</p>	+ 21.0
<p> <b>Option 3: NZTA TUNNEL</b></p> <p>The tunnel scores poorly due to high costs, long time to deliver and associated risks.</p>	- 11.0



# Waitematā Harbour Crossing Aerial View 01

Short to Medium Term





# Waitematā Harbour Crossing Aerial View 02

Short to Medium Term





# Waitematā Harbour Crossing Aerial View 03

Short to Medium Term





# Waitematā Harbour Crossing Aerial View 04

Short to Medium Term





# Waitematā Harbour Connections Appendices



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# Waitematā Harbour Crossing Appendix 01

## Celebrating The Harbour In The City

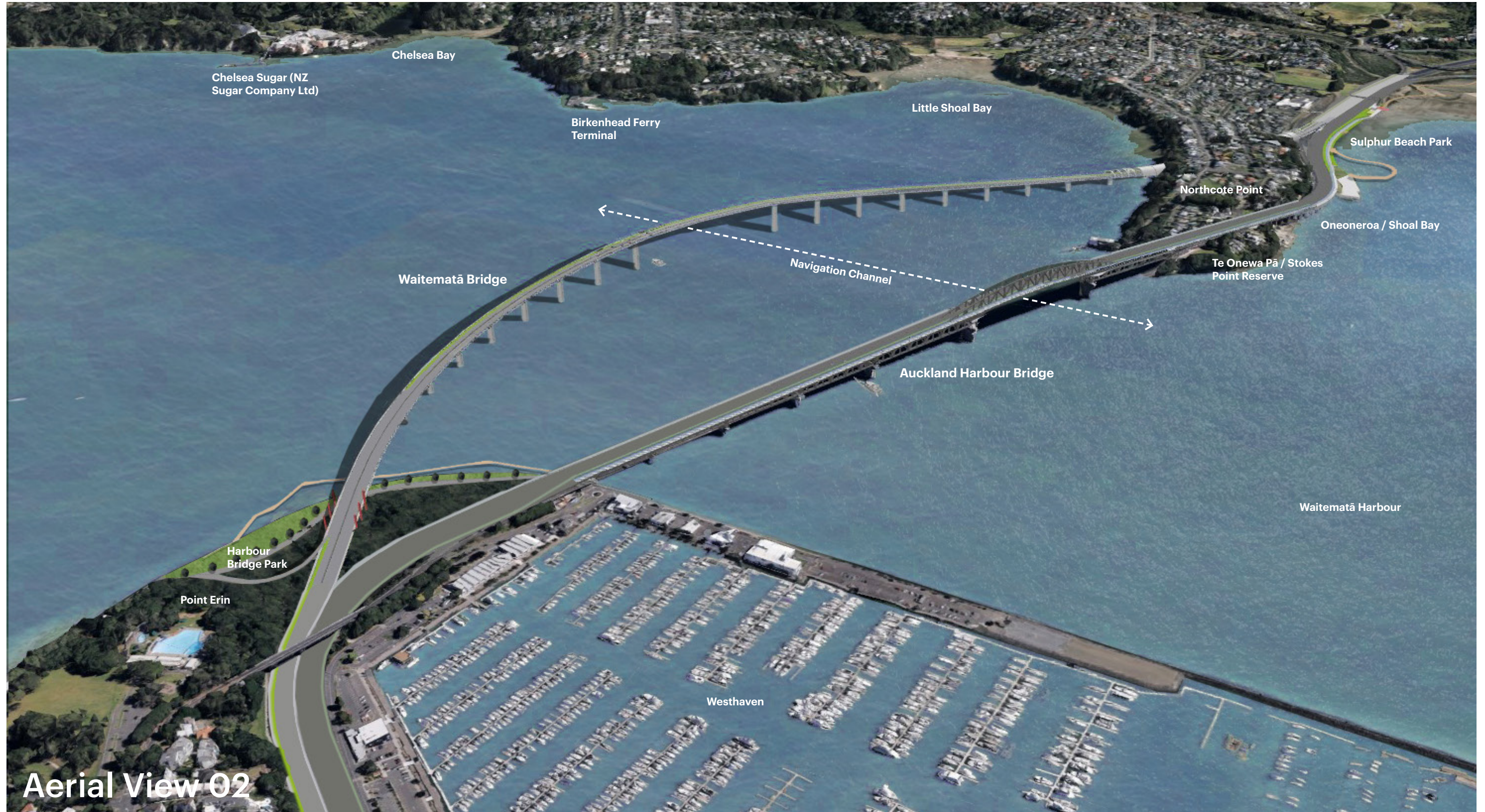


Aerial View 01



# Waitematā Harbour Crossing Appendix 02

## Celebrating The Harbour In The City



Aerial View 02



# Waitematā Harbour Crossing Appendix 03

## Celebrating The Harbour In The City



Aerial View 03



# Waitematā Harbour Crossing Appendix 04

## Celebrating The Harbour In The City



Aerial View 04



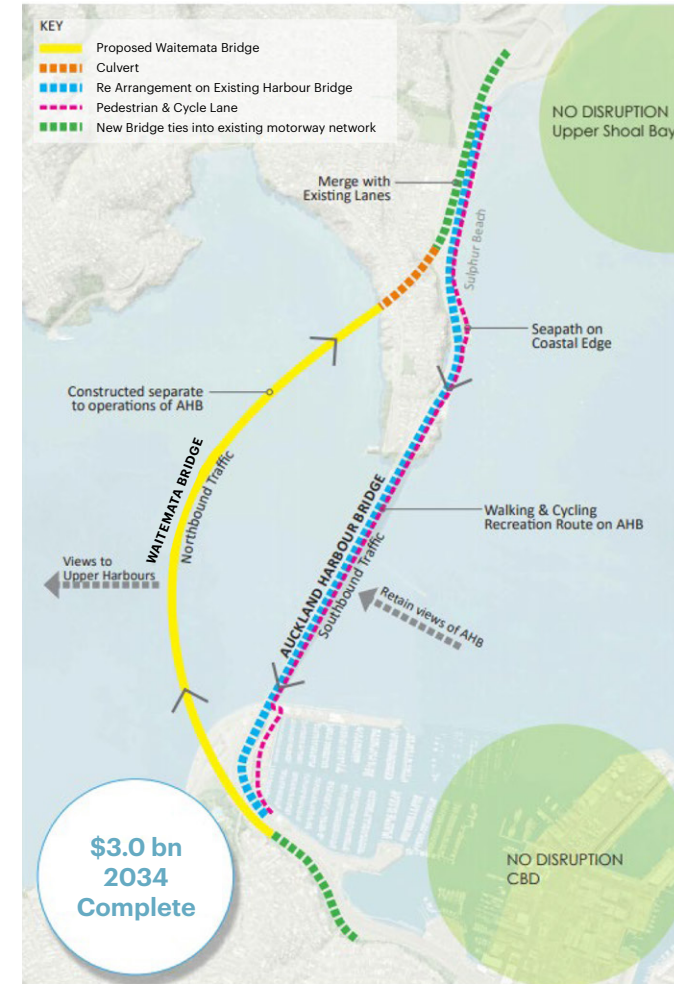
## Better:

### Challenges with a Tunnel:

- High cost: \$45 billion
- Major construction disruption to the CBD and Shoal Bay
- Extended construction timeline
- High operational and maintenance costs
- Does not address walking and cycling infrastructure needs
- Significant environmental impacts
- Requires extensive supplementary structures (flyovers, bridges, tunnel portals, buildings, vent stacks)
- Intensive ground engineering needed in the Waitematā
- High potential for environmental damage to Shoal Bay
- Risk of cost overruns (e.g., CRL project)

### Benefits of a Bridge:

- Estimated cost: \$3 billion
- Built offline, minimising disruption
- 10-year construction timeline
- Lower long-term maintenance requirements
- Addresses the division of Auckland city by the Waitematā Harbour
- Supports future population growth
- Facilitates active transport modes and public transit
- Enhances tourism opportunities
- Contributes to city development
- Constructed by local NZ companies
- Lower long-term maintenance requirements
- Potential for fast-track consenting
- Includes a compensation package



This proposal for an additional crossing of the Waitematā is more:

## Respectful...

- ... of the surrounding environment
- ... of the Auckland Harbour Bridge
- ... of the existing infrastructure

## Resourceful...

- ... optimises the existing assets
- ... build offline with minimal disruptions
- ... lower maintenance
- ... local skills and knowledge

## Resilient...

- ... strengthens and supplements
- ... extend the lifespan of the AHB
- ... all weather resistant
- ... additional capacity
- ... unlock access - public transport & walking/cycling

## Responsible...

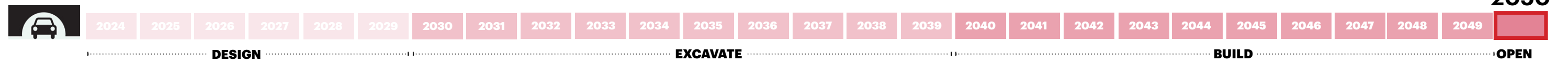
- ... reasonable cost
- ... quicker delivery
- ... better city shaping outcomes

## Faster

### Bridge Timeline



### Tunnel Timeline



## Cheaper:

### Bridge Budget

1. Planning & Design	\$50m
2. Waitematā Harbour Bridge Construction (2km) Including merging lanes & on ramps	\$1500m
3. Northcote Culvert (250m)	\$575m
4. Northcote Compensation	\$160m
Tier 1 - Removal x69	
Tier 2 - Mitigation x 20	
5. Sulphur Beach Overbridge & Upgrade	\$20m
6. AHB Repurposing (Highline + wind barriers)	\$50m
7. Bridge Park Upgrade	\$20m
8. Seapath to Esmonde Rd	\$25m
9. Contingency (20%)	\$600m
<b>TOTAL:</b>	<b>\$3.0b</b>

**\$3.0b**

### Tunnel Budget

1. Indicative cost of road tunnels:	\$12-15b
2. Indicative cost of SH1 improvements:	\$1-1.5b
3. Indicative cost of Northern Busway upgrades	\$0.5b
4. Indicative cost of walking and cycling improvements	\$0.5b
5. Indicative cost of light rail tunnel (CBD to North Shore)	\$8.5-11b
6. Indicative cost of light rail tunnel (North Shore to Albany)	\$12.5-16b
<b>(From 2023 NZTA Estimates) TOTAL:</b>	<b>\$35-45b</b>

**\$35 - 45b**

### Case Studies



Where: Pelješac Bridge, Croatia  
 What: 2.4km long, 55m high, 4-lane  
 When: Built in 4 years (2018-22)  
 Cost: \$800m NZ



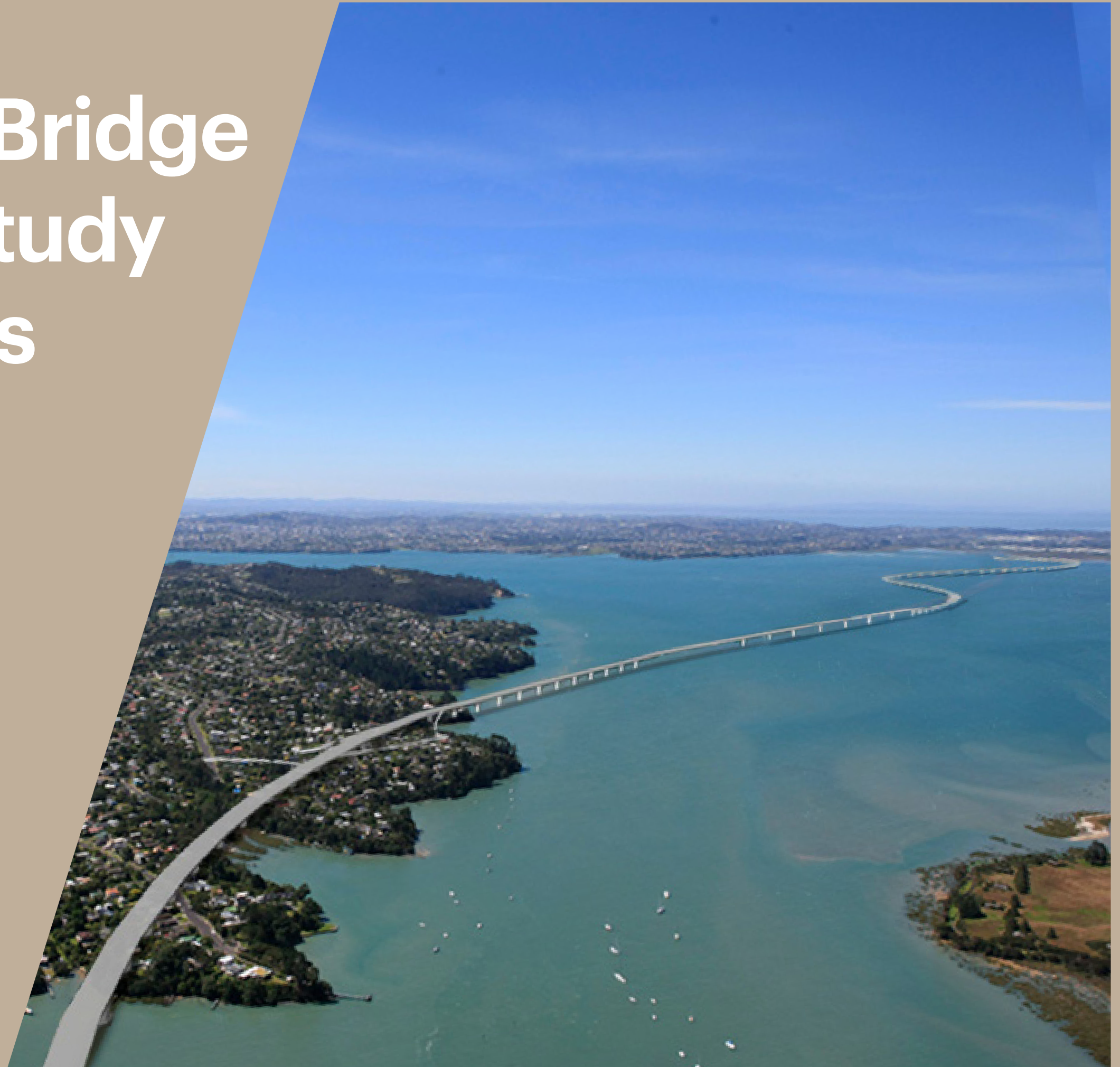
Where: Coronado Bridge, San Diego  
 What: 3.4km long, 61m high, 5-lane  
 When: Built in 2 years (1967-69)  
 Cost: equivalent to \$650m NZ 2023



Where: Genoa San Giorgio Bridge, Italy  
 What: 1.1km long, 45m high, 6-lane  
 When: Built in 15 months (2018-20)  
 Cost: \$385m NZ



# Causeway Bridge Crossing Study Appendices

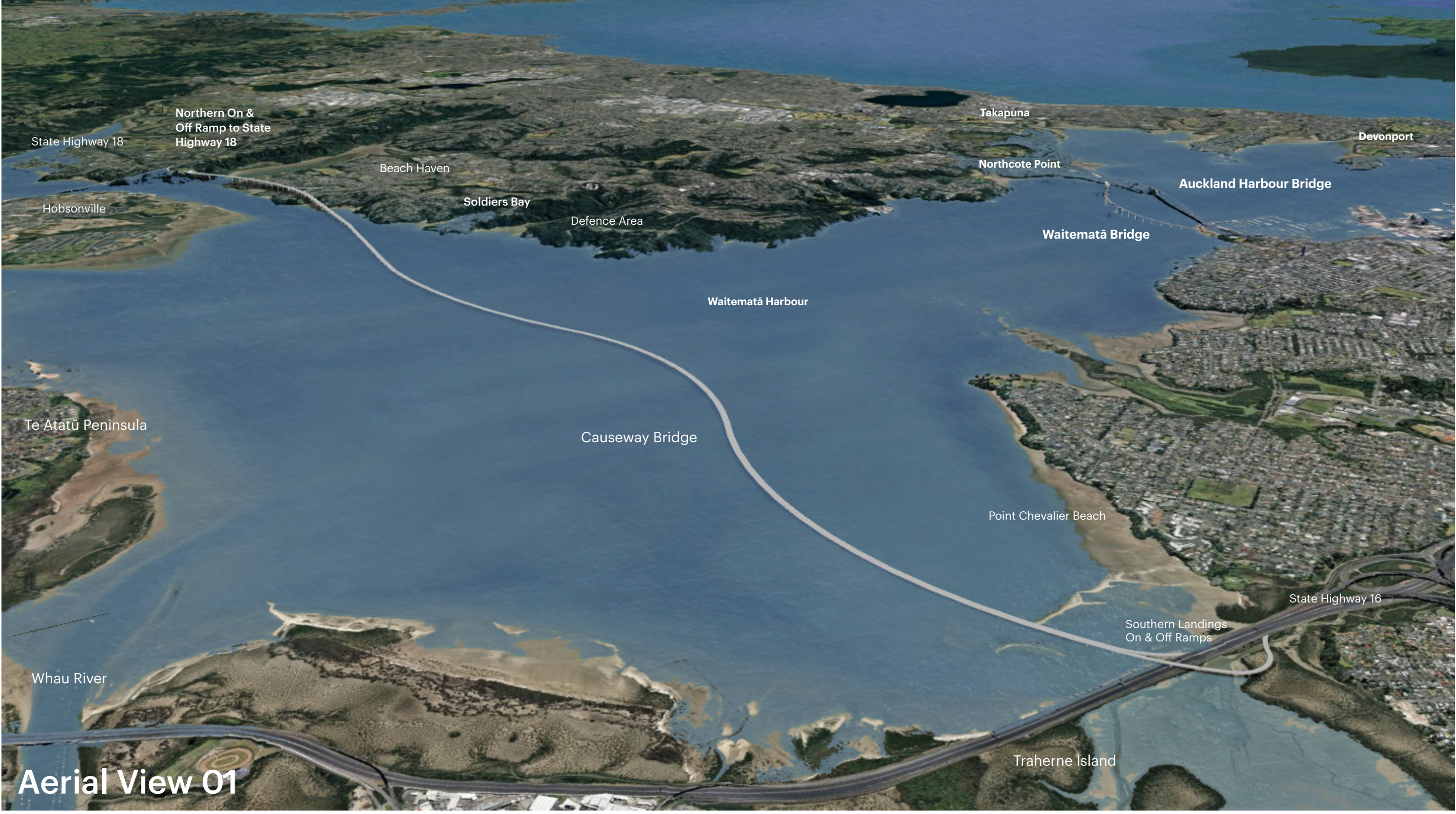


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# Causeway Bridge Appendix 01

## Celebrating The Harbour In The City



Aerial View 01



# Causeway Bridge Appendix 02

## Celebrating The Harbour In The City



Aerial View 02



# Causeway Bridge Appendix 03

## Celebrating The Harbour In The City



Aerial View 03