

A Fresh Look at Waitematā Harbour Connections

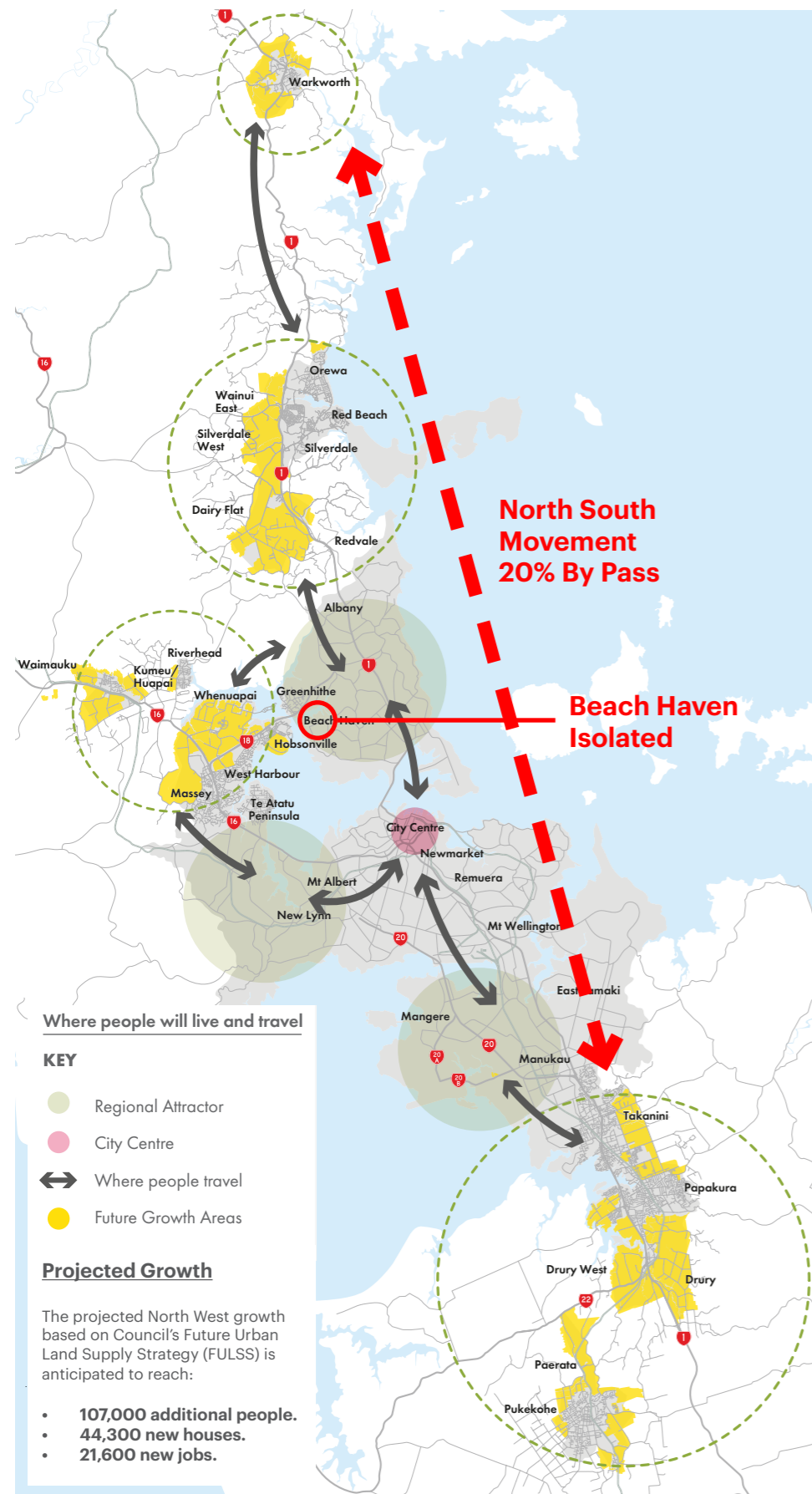
Aims

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

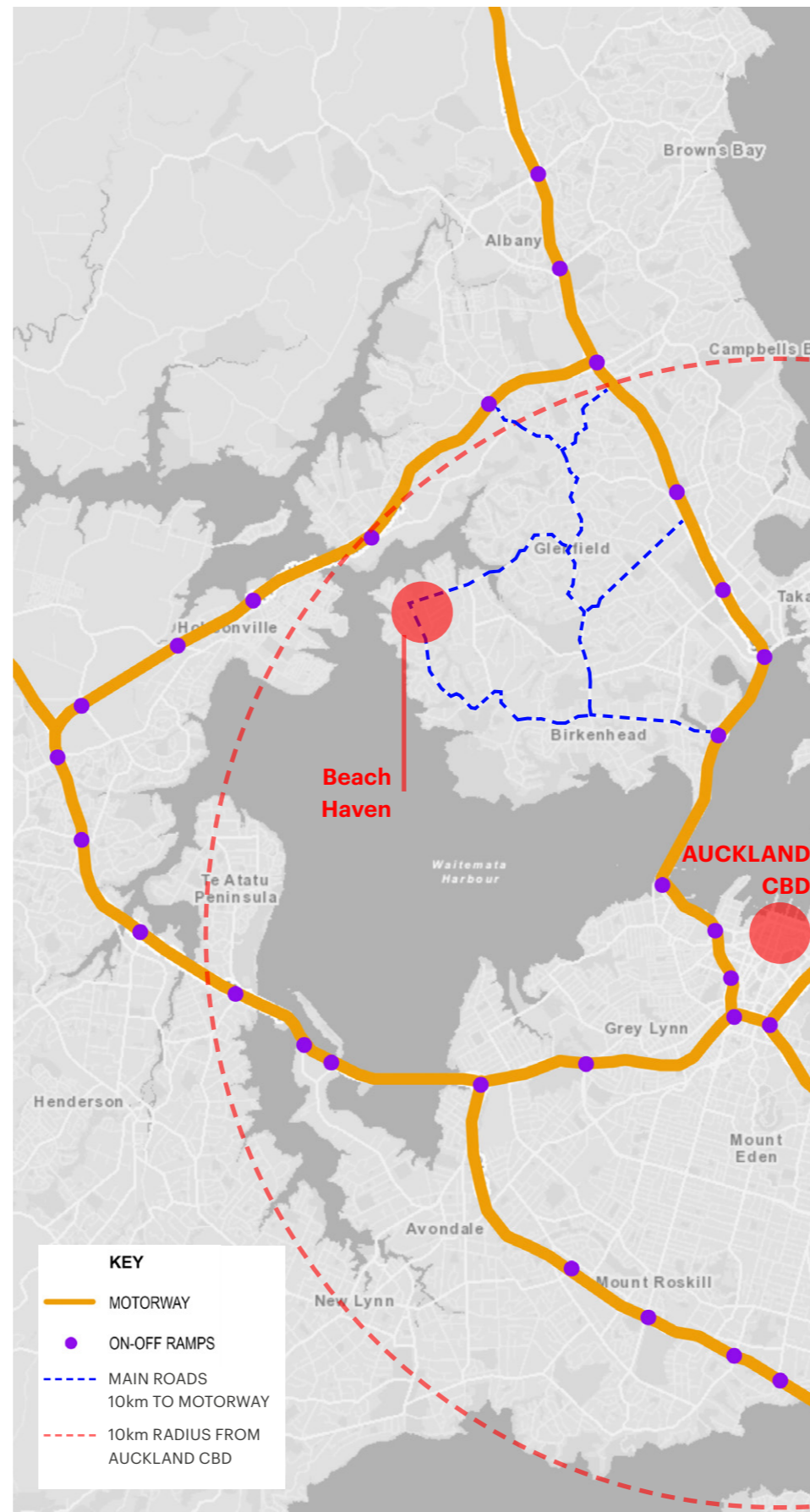
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Waitematā Connections The Big Picture



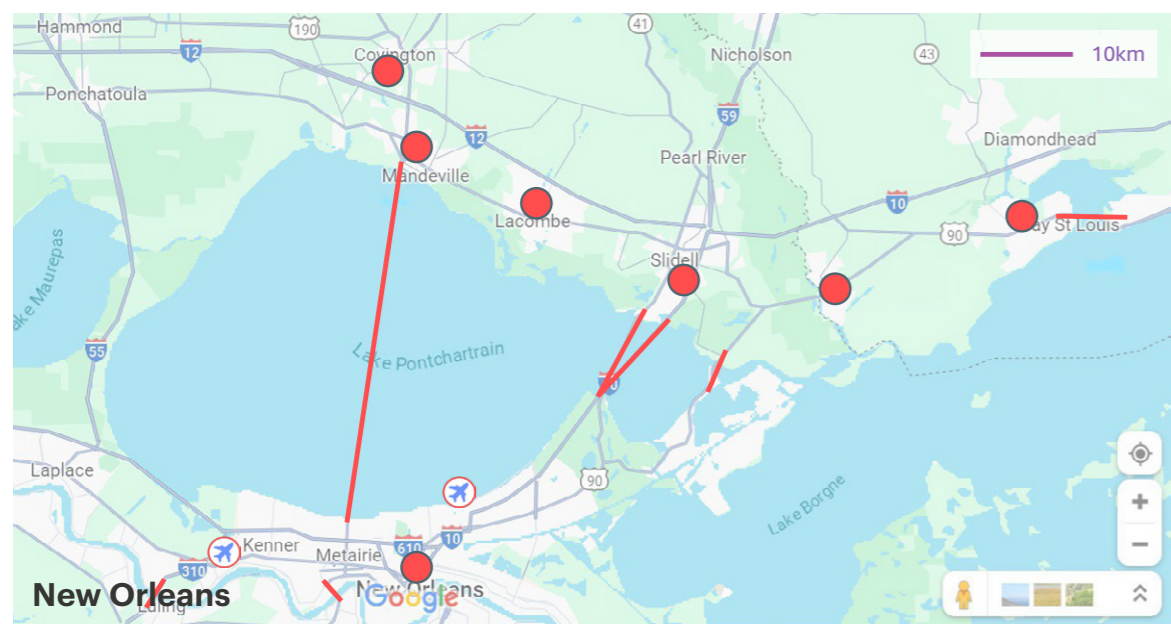
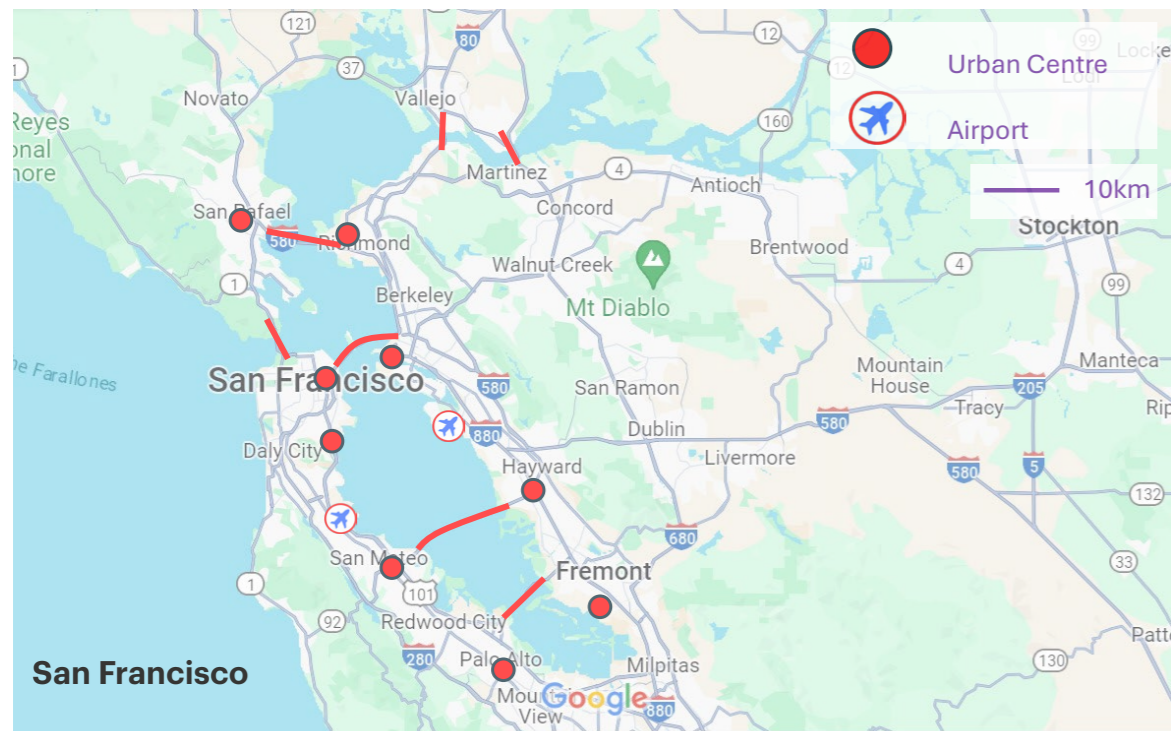
Auckland Growth Areas & North South Movements



Ring Road Motorway & Central City Choke Point



Heavy Contour Setting



Case Study of Growing Cities Separated by Large Water Bodies

Lessons Learnt

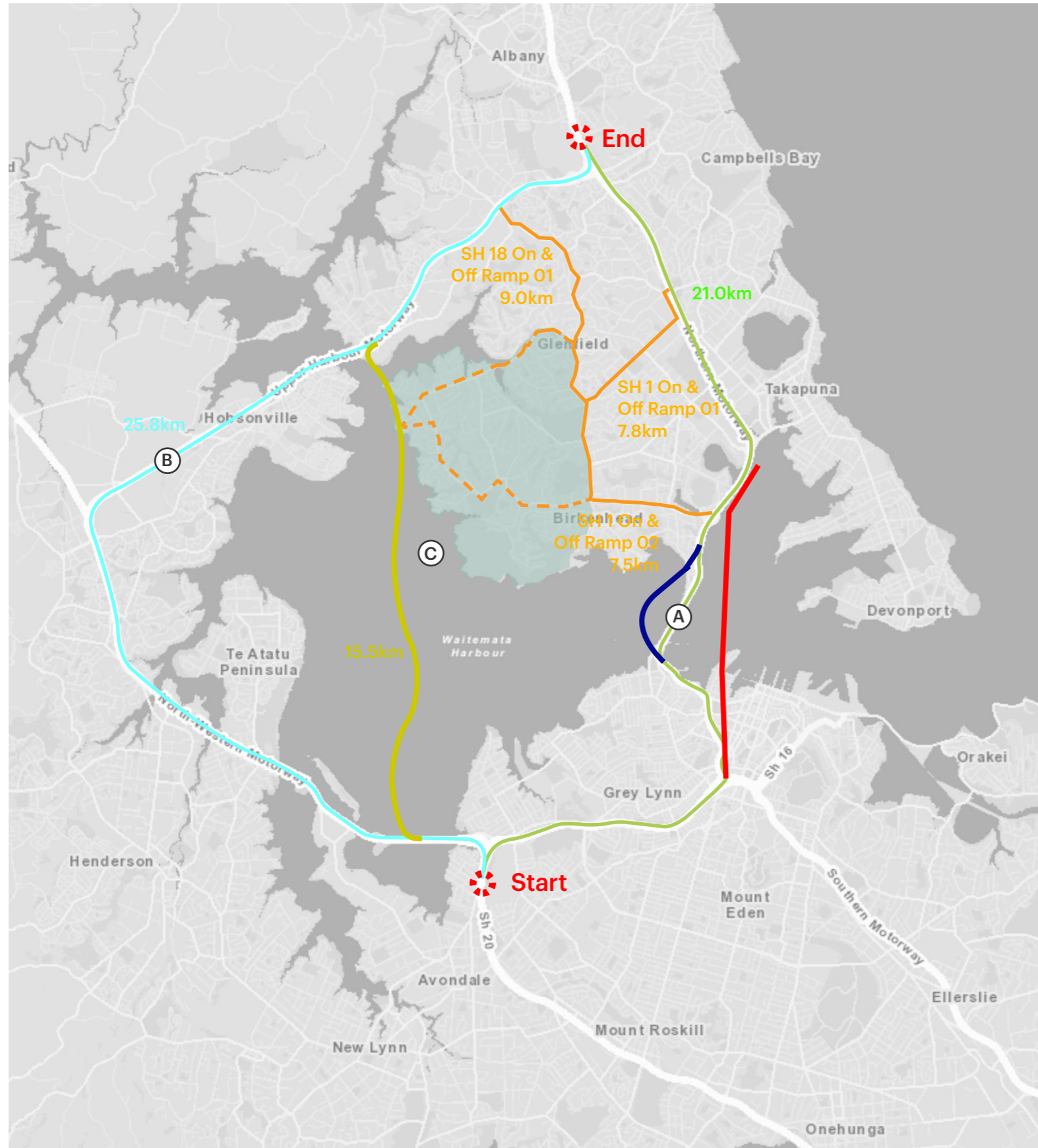
- Successive bridges with city growth
- Links key facilities (Airports, Hospitals, Town Centres)
- Unlocks growth areas - Development opportunities
- Distributes movement / traffic
- Bridges become iconic
- Avoids sensitive areas

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
-  Arterial Road
-  Unlocked Catchment Population (25k)
-  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: CAUSEWAY BRIDGE - 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: WAITEMATĀ BRIDGE - 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: NZTA TUNNEL - SH16 to SH1 (5.0km) - Bypasses the Auckland Harbour Bridge - Infrastructure has low visual impact - Direct connection to North Shore	17.0 B

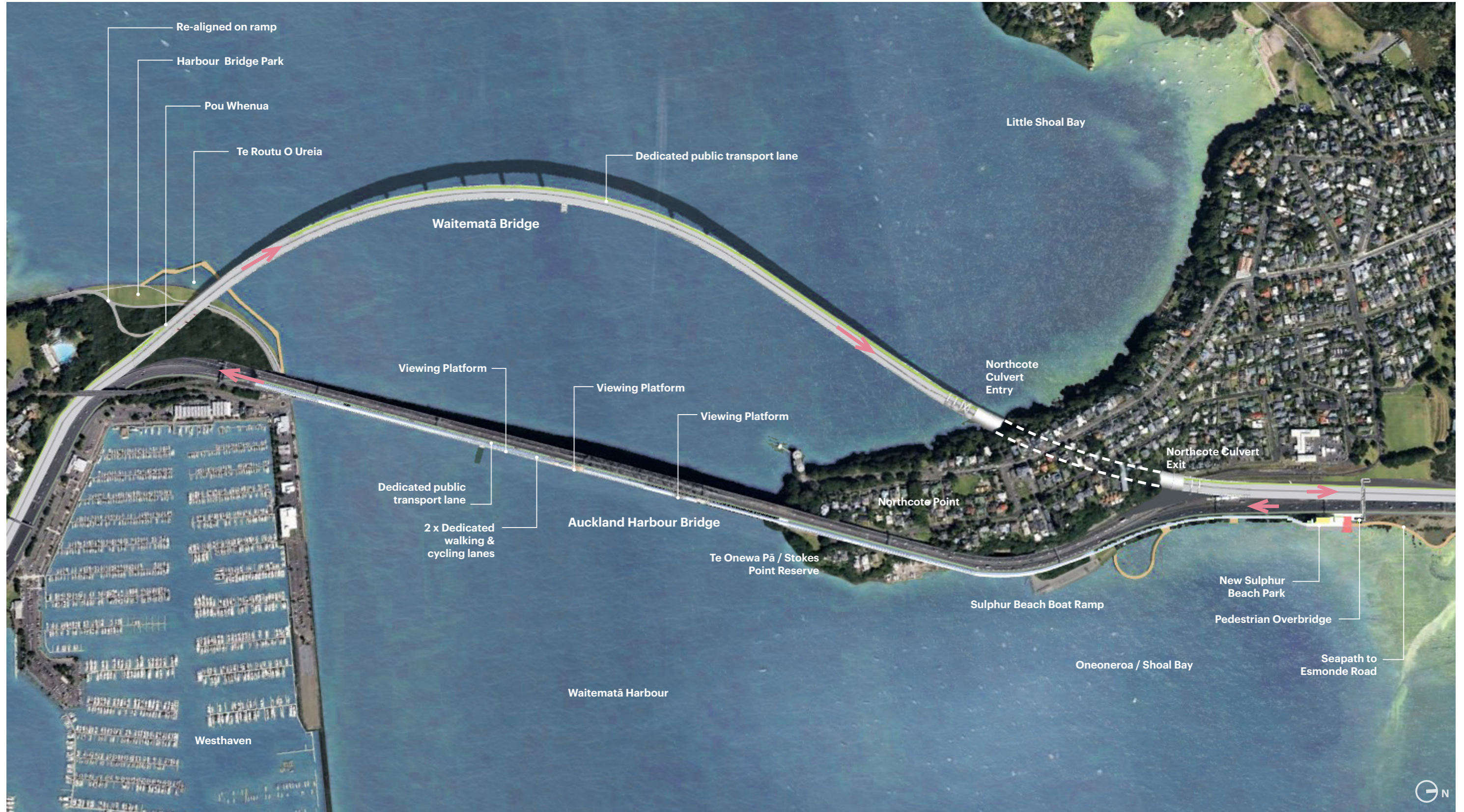


Waitematā Bridge Study



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Waitematā Bridge Study Plan View

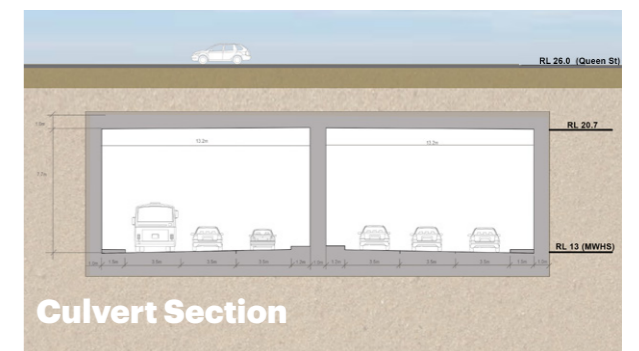
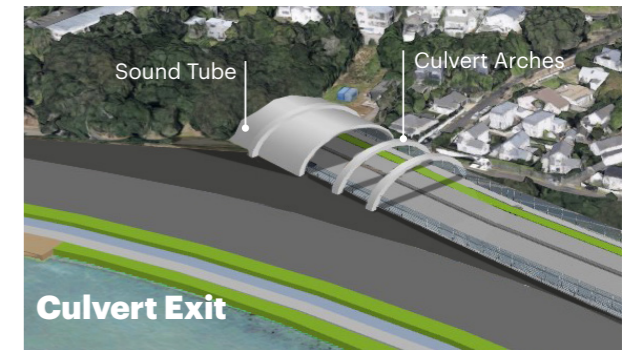
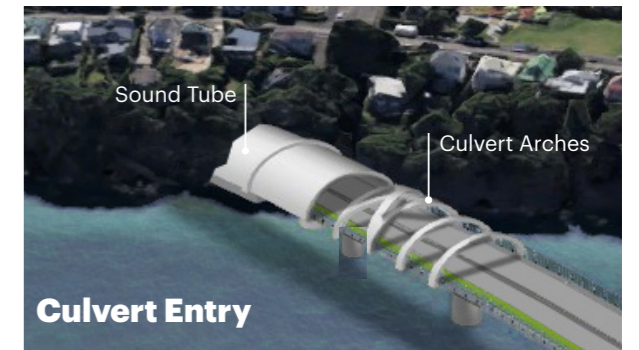
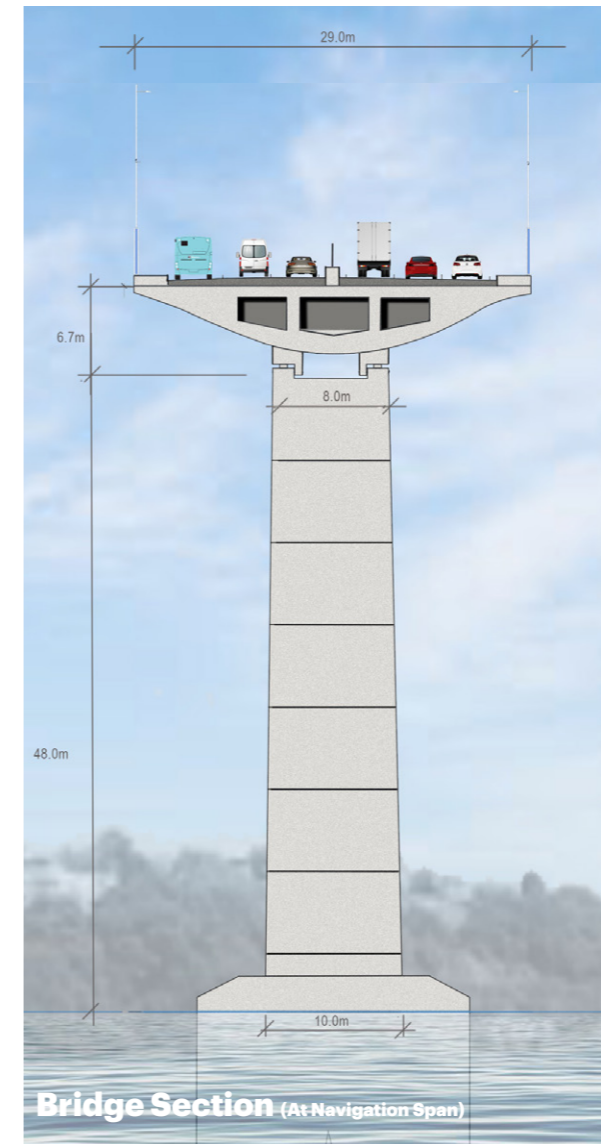
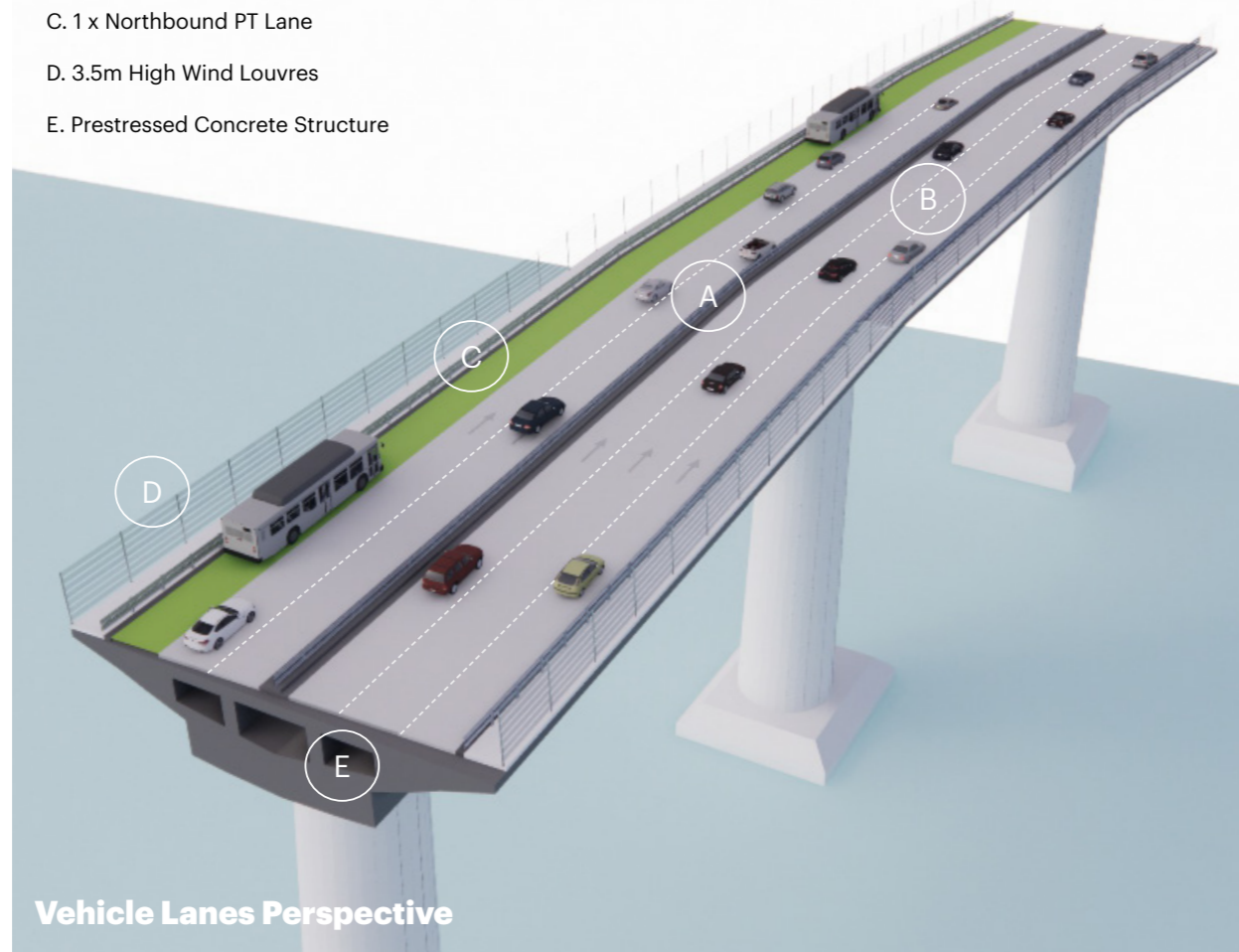


Waitematā Bridge Study Design Proposal

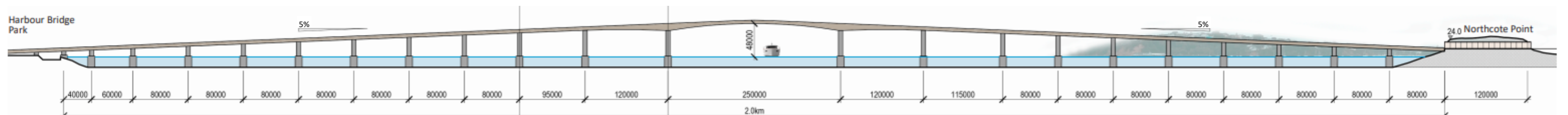
- 2.0km long
- 48m max high
- 29m wide
- 6 lanes
- 1 public transport lane
- Prestressed concrete construction - maintenance free with a design life of 300yrs (similar to Brisbane Gateway Bridge)
- Designed to HN-HO-72 traffic loads.
- Navigation span of bridge is 250m (similar to AHB)
- 3.5m high strengthened 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



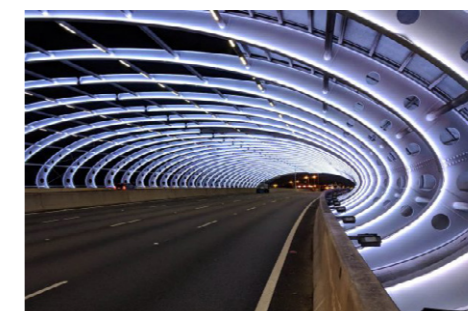
Wind Louvers



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:

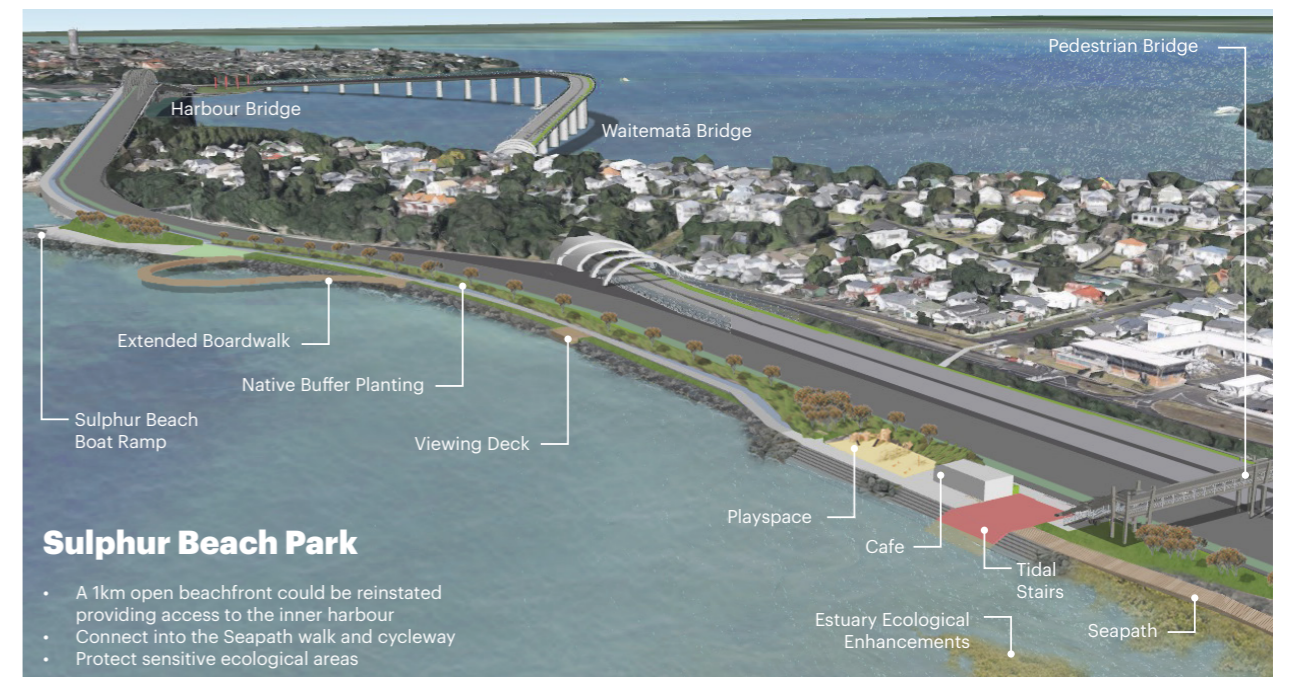
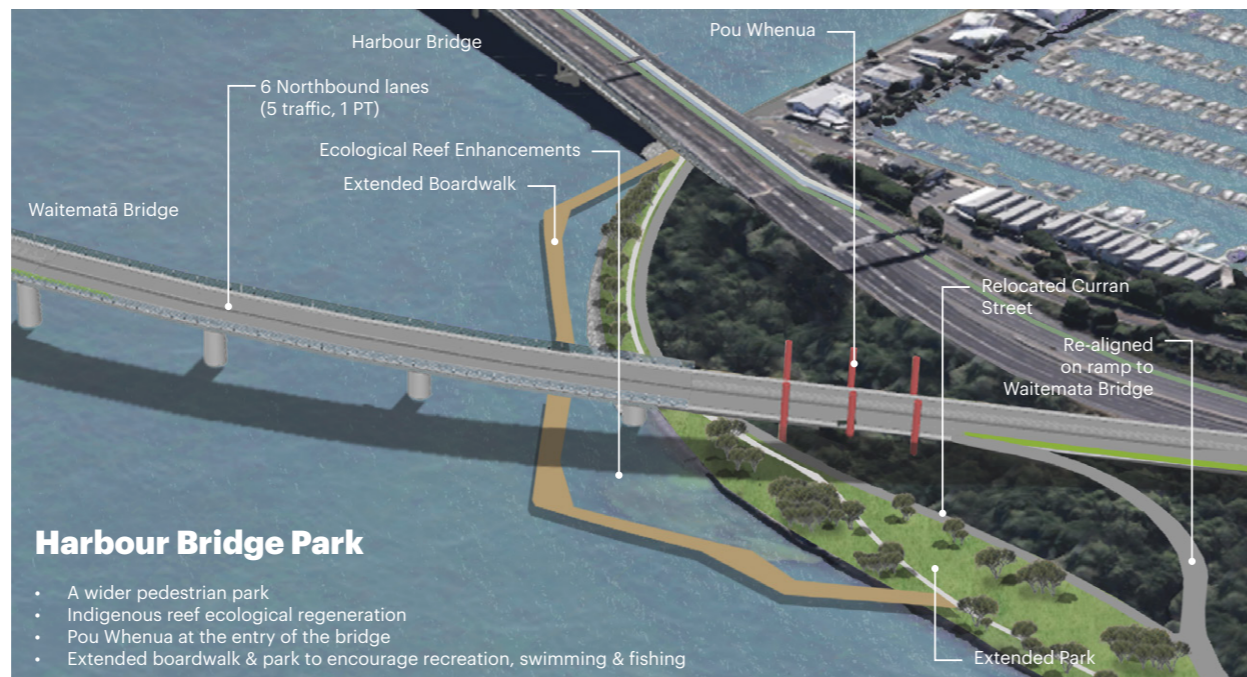
- Expansive city and harbour views
- Potentially Auckland's No.1 tourist destination
- Operating hours: 5am-10pm with CCTV and security guards (similar to Sydney Harbour Bridge)
- Estimated 5000 x Walking & Cycling Movements Per Day

Design Key

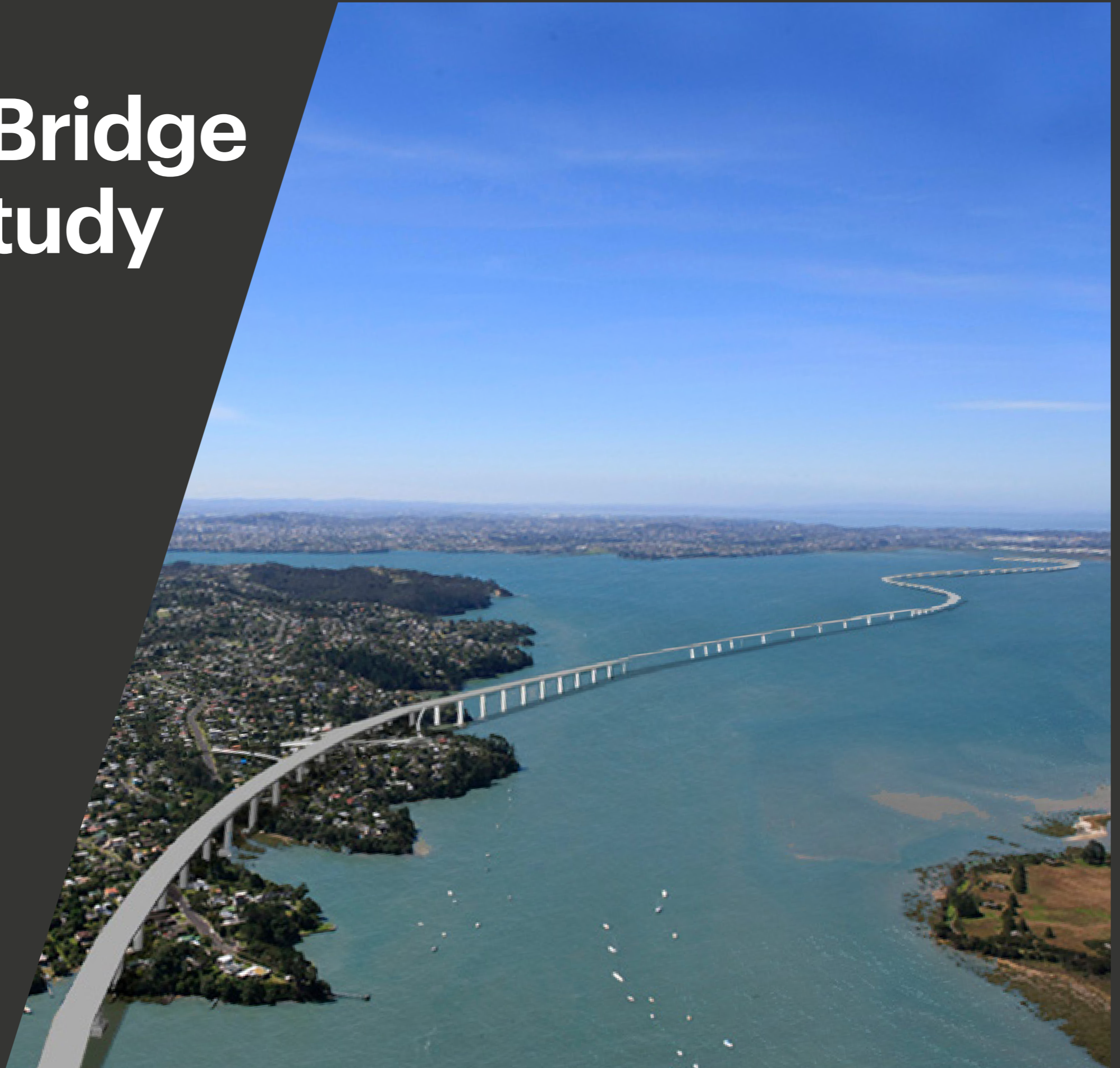
- A. Auckland Harbour Bridge
- B. 5 x Southbound Vehicle Lanes
- C. 1 x Southbound PT Lane
- D. 1 x Northbound & 1 x Southbound Cycle Lane
- E. 5.0m Wide Walking Lane
- F. 3.5m High Wind Louvres
- G. Seating / Viewing Platform



Historical Precedents



Causeway Bridge Crossing Study



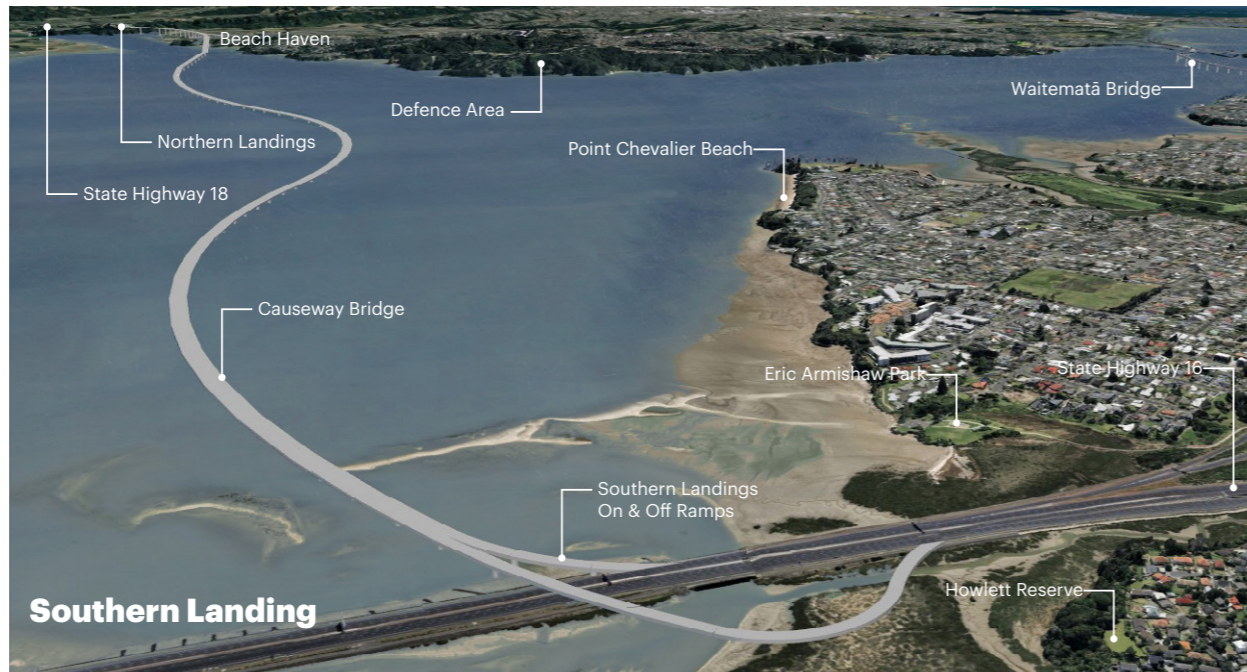
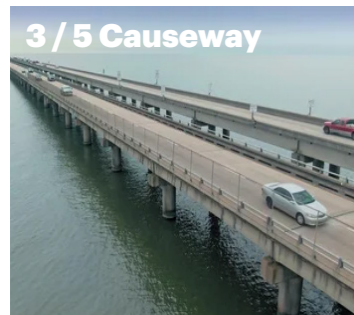
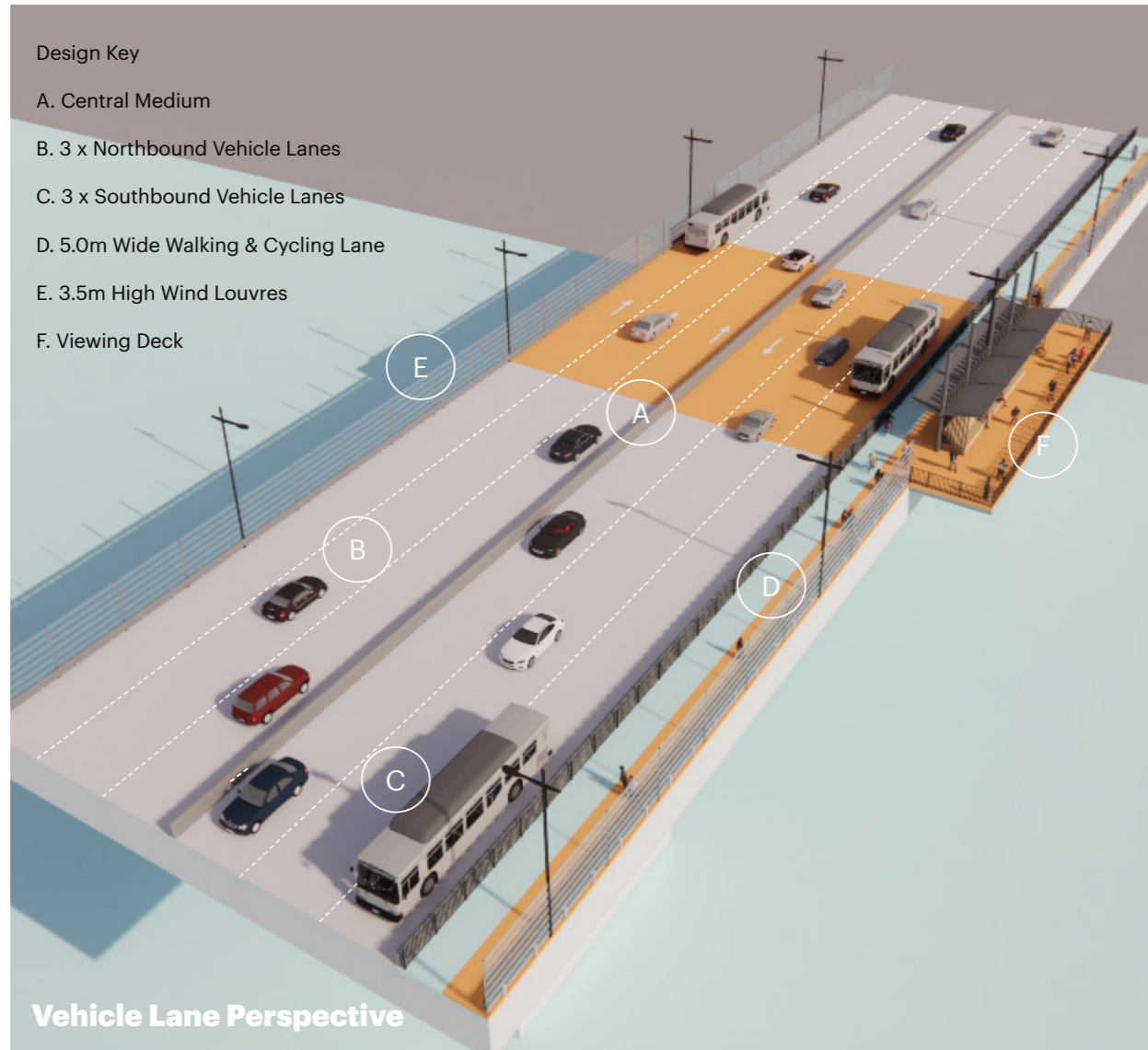
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Causeway Bridge Crossing Study Plan View

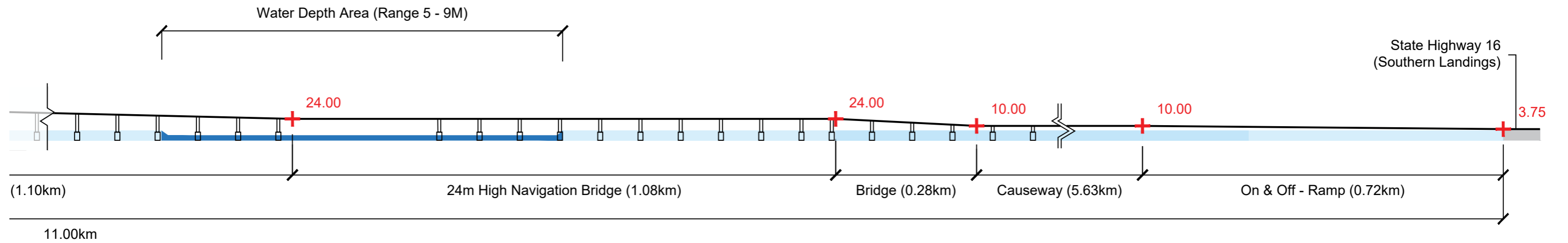


Causeway Bridge Crossing Study Design Proposal

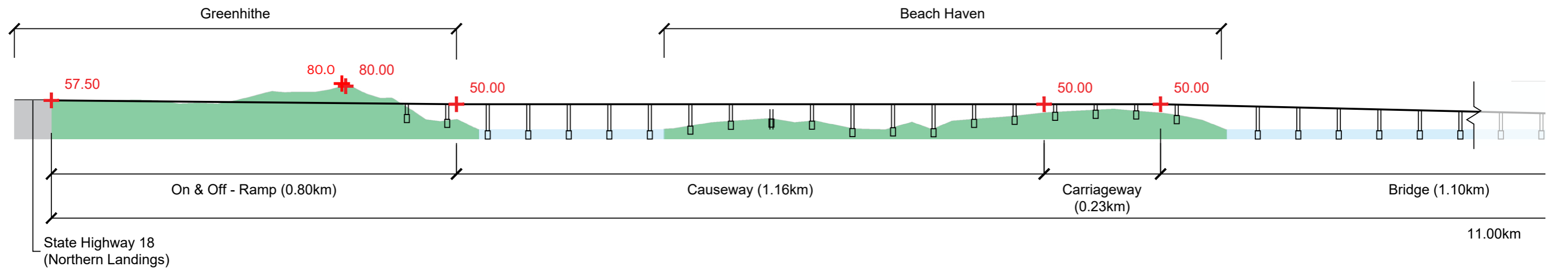
- 11.0km long
- 34m wide
- 6 lanes
- Prestressed concrete construction - maintenance free with a design life of 300yrs (similar to Brisbane Gateway Bridge)
- Designed to HN-HO-72 traffic loads.
- Navigation span of bridge is 250m (similar to AHB)
- 3.5m high strengthened acrylic louvers to cut wind speed (50% reduction)



Causeway Bridge Crossing Study Landing Elevation



Southern Landing Elevation



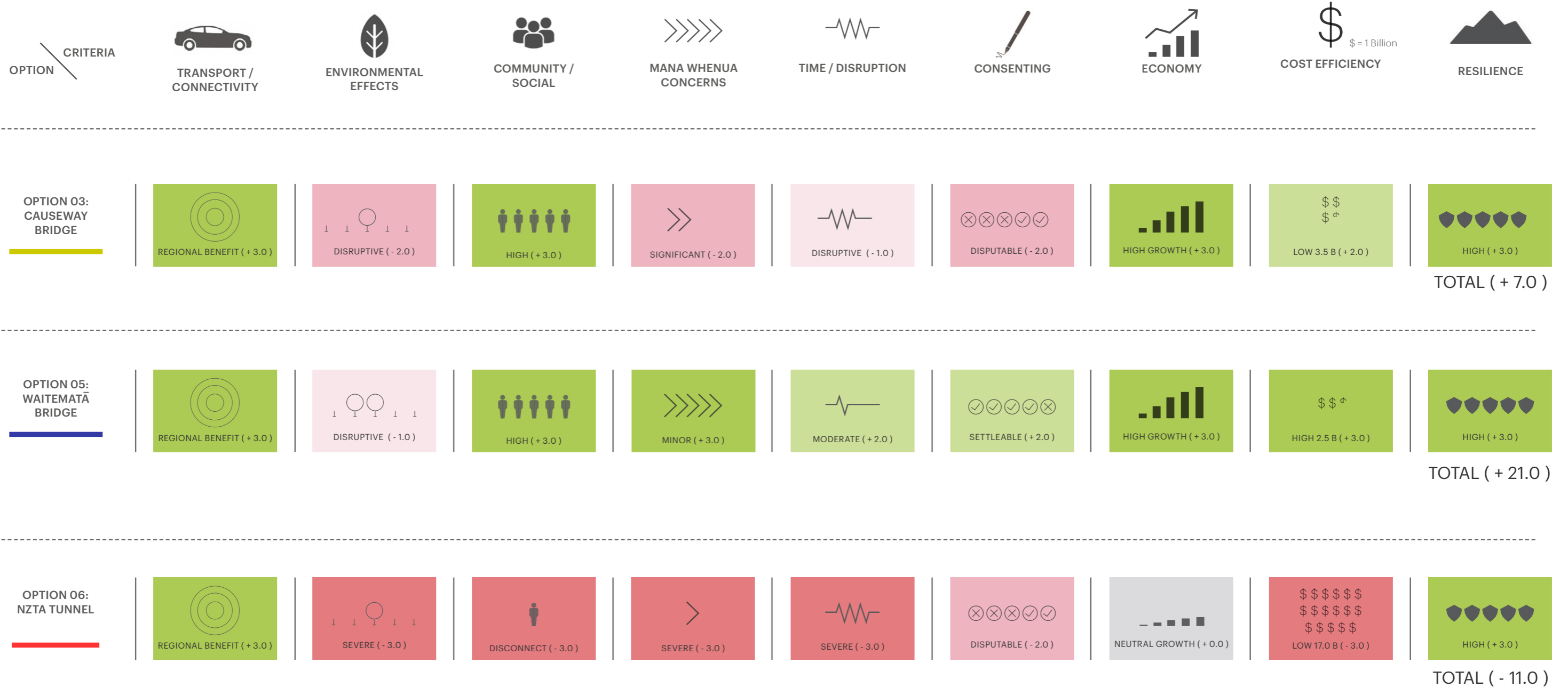
Northern Landing Elevation

Analysis

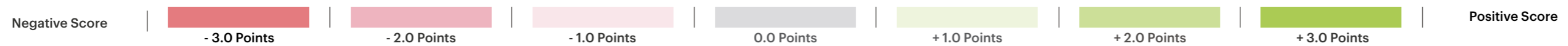


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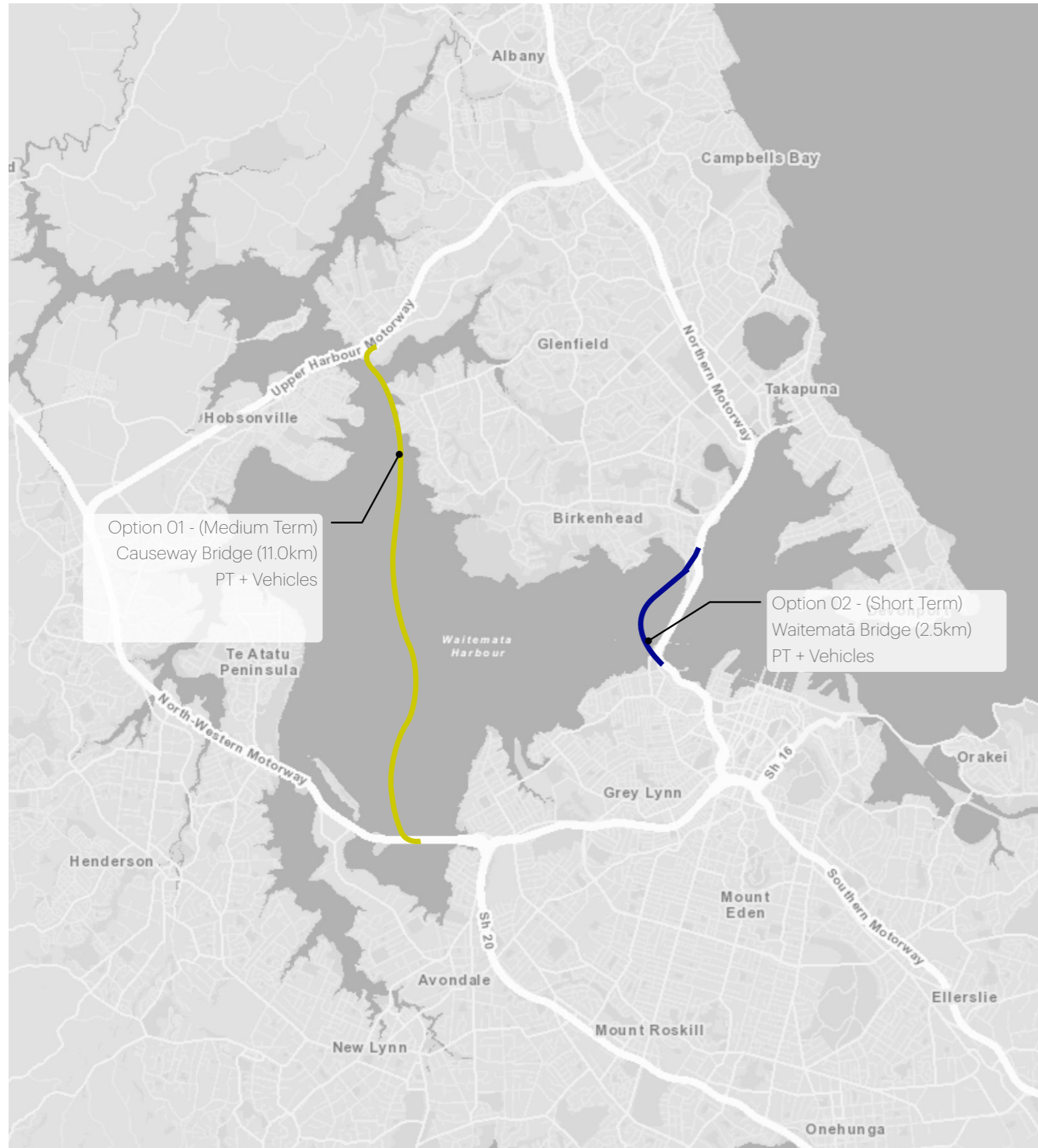
Waitematā Harbour Crossing Analysis Bar Graph



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> Option 1: CAUSEWAY BRIDGE (MEDIUM TERM)</p> <p>A long-term consideration could be a causeway bridge across the upper harbour.</p>	+ 7.0
<p> Option 2: WAITEMATATA BRIDGE (HIGHEST PRIORITY)</p> <p>The Waitemata Bridge scores the highest across all assessment criteria.</p>	+ 21.0
<p> Option 3: NZTA TUNNEL</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

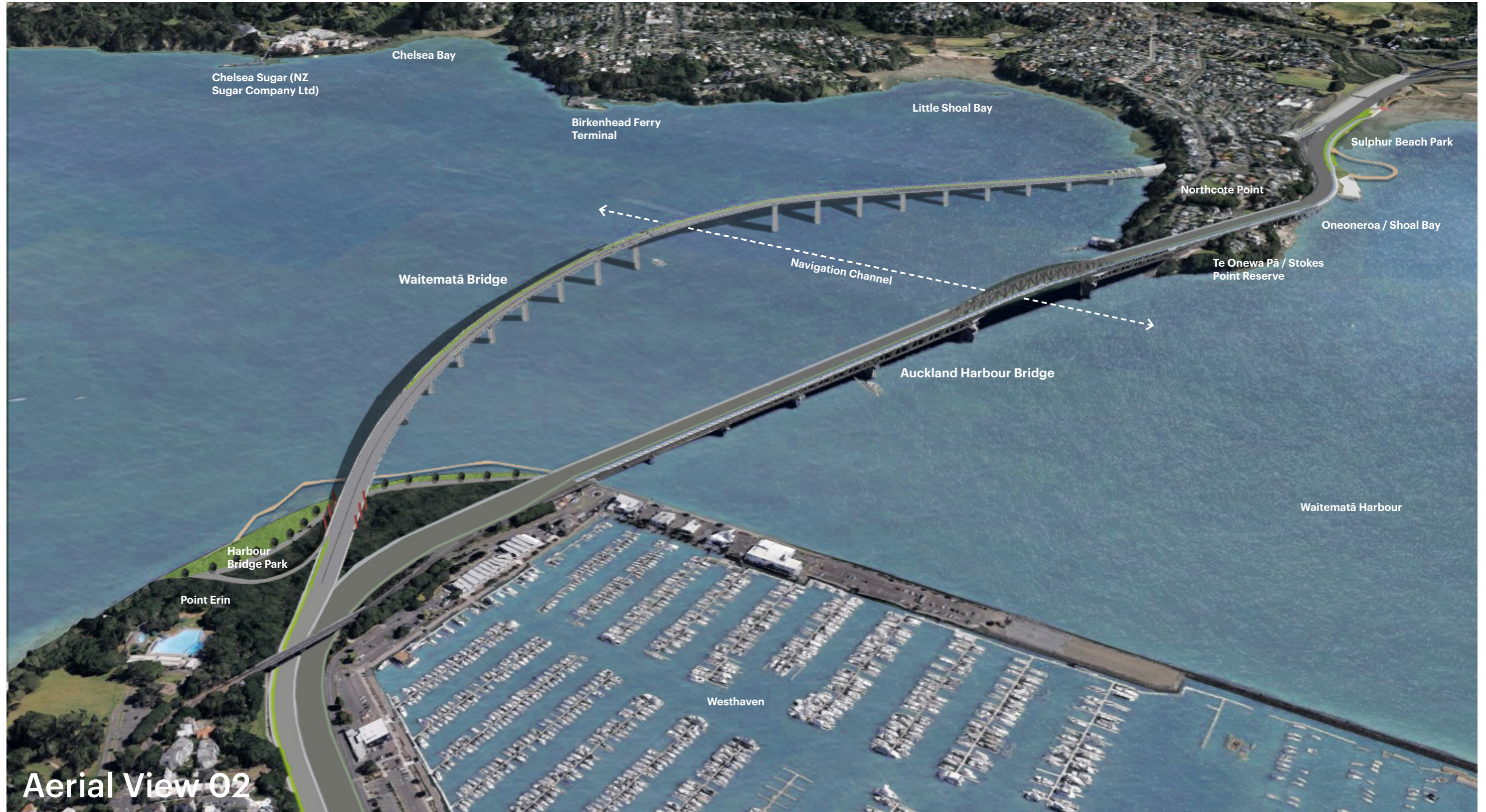
Celebrating The Harbour In The City



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

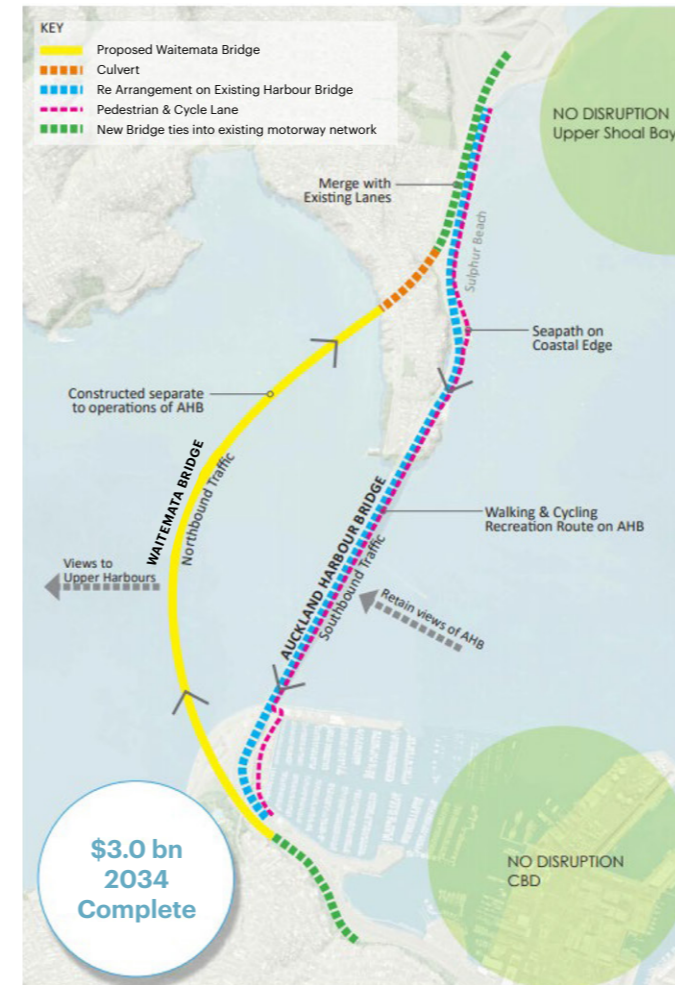
Better:

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	
Tire 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
TOTAL:	\$3.0b

\$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
(From 2023 NZTA Estimates) TOTAL:	\$35-45b

\$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

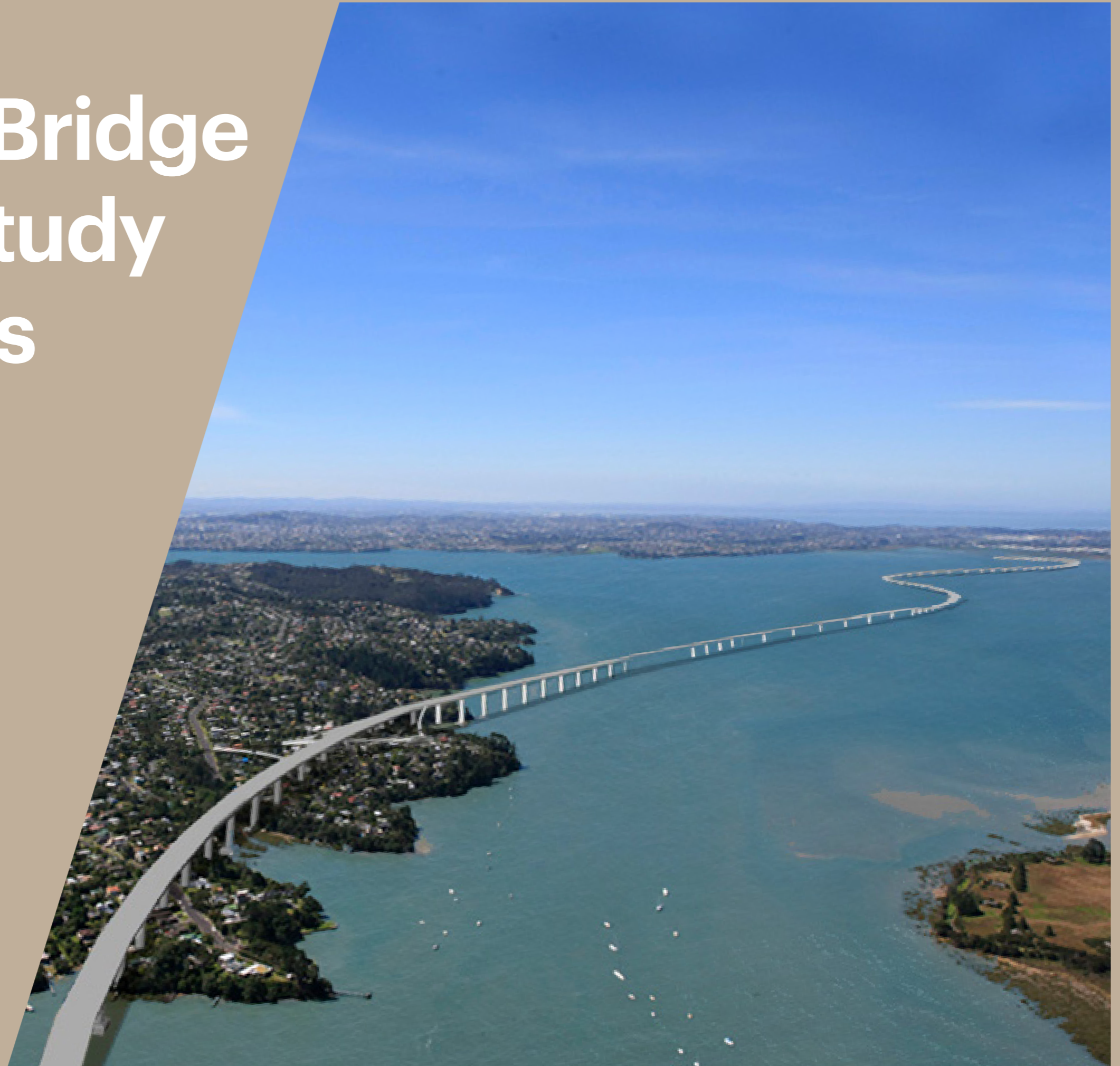


Where: Coronado Bridge, San Diego
 What: 3.4km long, 61m high, 5-lane
 When: Built in 2 years (1967-69)
 Cost: equivalent to \$650m NZ 2023



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

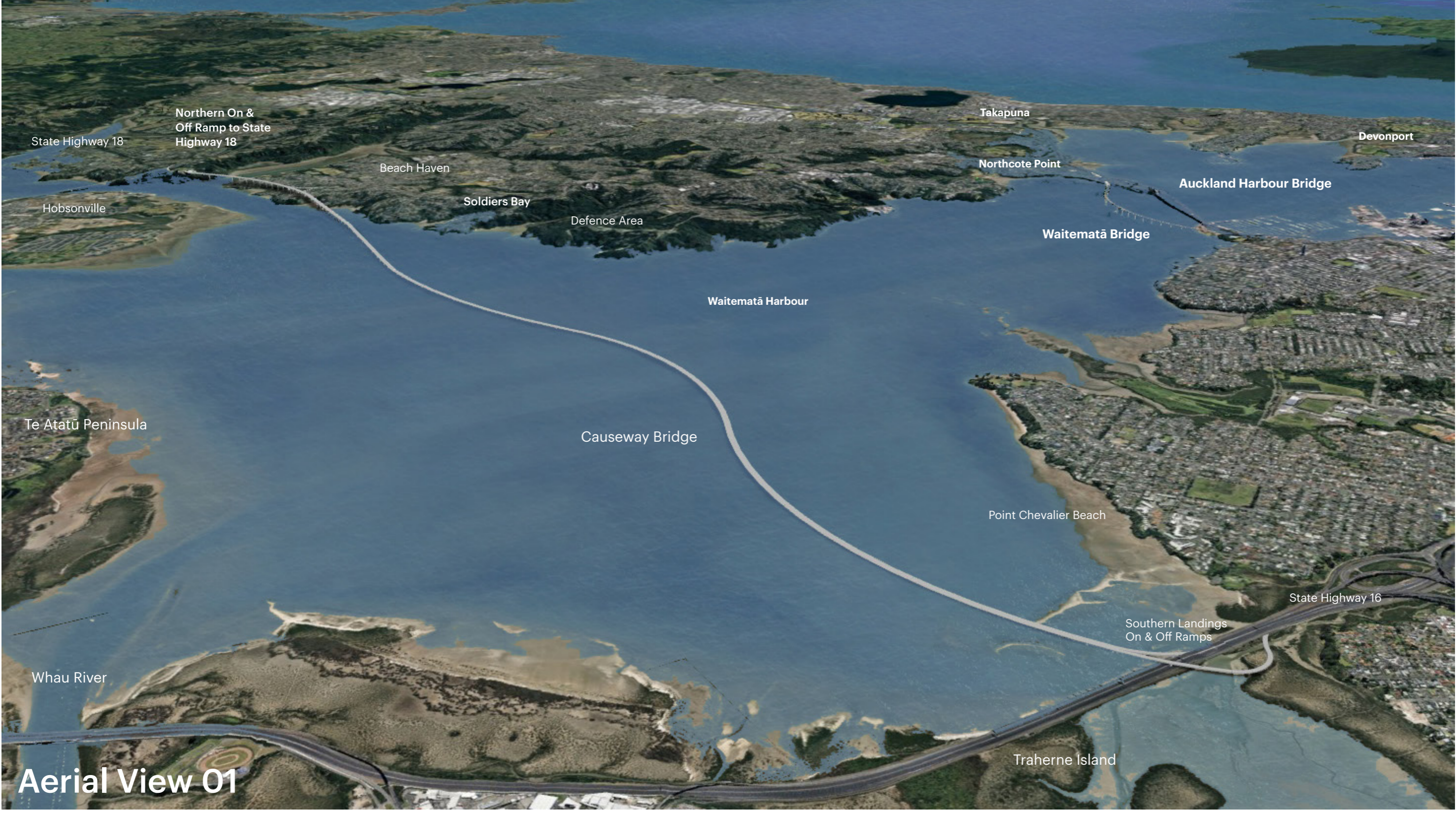
Causeway Bridge Crossing Study Appendices



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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