Australian Government

BUILDING OUR FUTURE

mainroads WESTERN AUSTRALIA

Swan River Crossings Forum
25th November 2020

Welcome

Facilitator: Nicole Lockwood

Start	Activity	Responsibility
11:00	Welcome, purpose and process	Nicole Lockwood
11.10	Alignment Forum #1 summary	Gary Manning
11:20	Repurposing the traffic bridge	Julia Summers (ARUP Civil Structures)
12:05	Building between the bridges	Lance Thomas/Richard Thomas/Peter Satie/Sue Hellyer
12:50	Lunch	All
1:10	Building to the west	Lance Thomas/Richard Thomas/Sue Hellyer
1:55	Building to the east	Lance Thomas
2:40	Opportunities and outstanding issues	All
3:25	Next Steps, Closing and Acknowledgments	Nicole Lockwood
3:45	Forum close	

Alignment Forum #1

Alignment Forum #1 summary

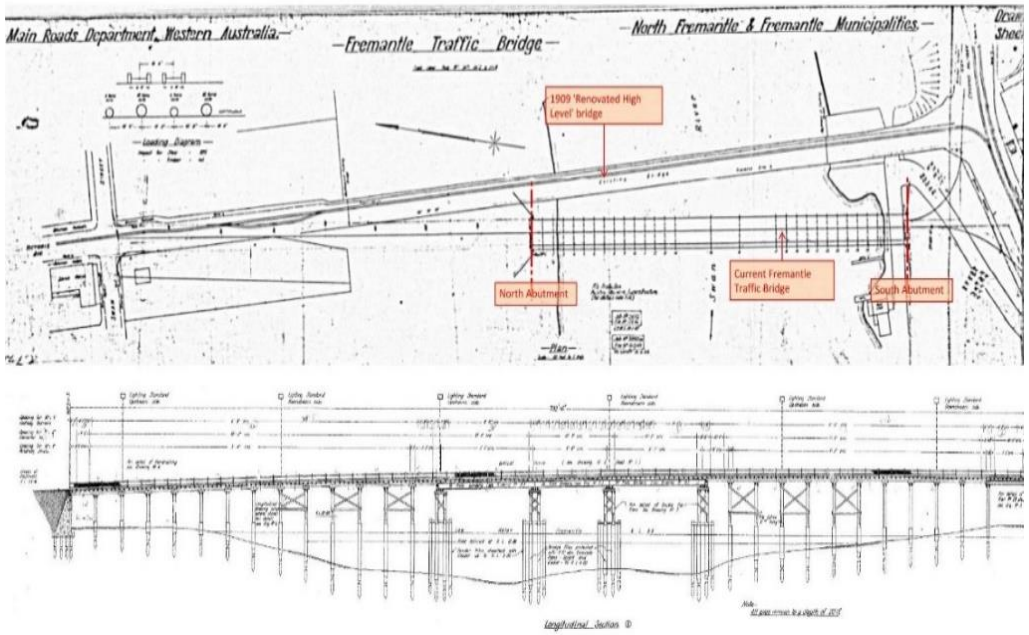
- Held here at the Esplanade in Fremantle on 23rd Oct 2020
- Attended by 25 community representatives as well as stakeholders and technical experts
- Inform the community about project objectives, constraints and background
- Explain the work completed to date, and how we undertook the options assessment process to get to the project team's preferred alignment
- Share other options including City of Fremantle and Andrew Sullivan's
- Identify community drivers and preferred way forward

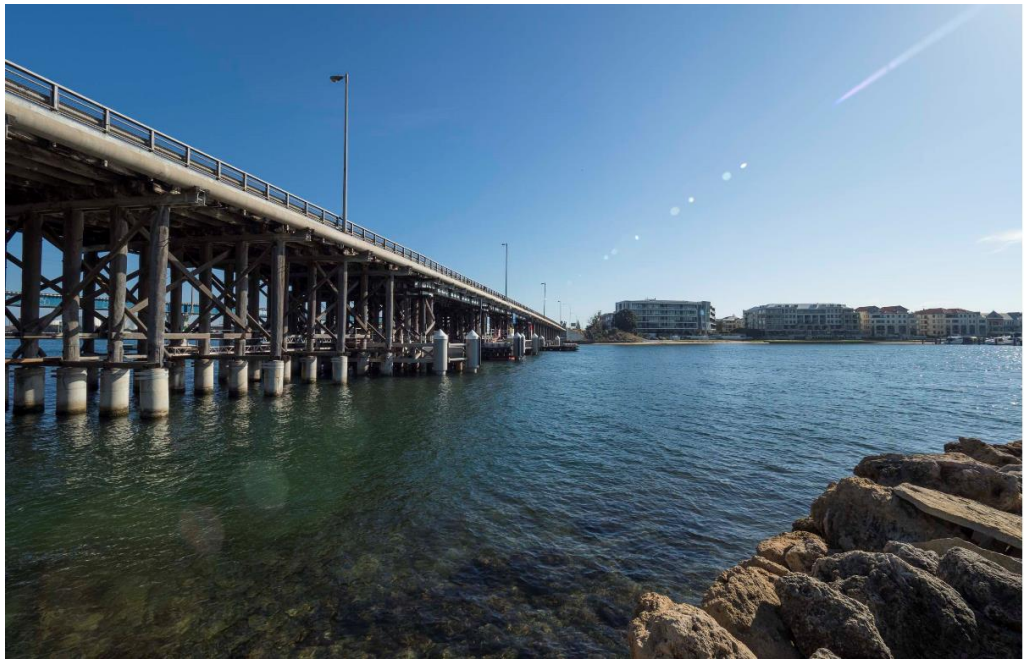
Alignment Forum #1 summary

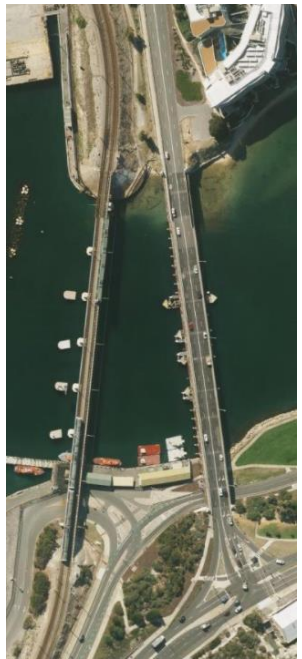
- What we heard
  - Community sentiment not supportive of a bridge to the east of the existing traffic bridge. Keen to maintain as much of the heritage structure as possible
  - Need to further analyse other options:
    - Retaining the existing traffic bridge as a principal shared path
    - No new rail bridge
    - Build between the bridges (one rail line bridge and road bridge)
    - Build to the west (two rail line bridge and road bridge)
- Today
  - Explain/discuss the outcome of the investigations into all 4 options
  - Compare/discuss the findings against the preferred option and project objectives
  - Explain alliance contracting and process

Repurposing the traffic bridge

Fremantle Traffic Bridge – bridge structure







1909

‘Renovated high level bridge’ built

1939

Fremantle Traffic Bridge built immediately west of 1909 bridge

29-span bridge, 223m timber hybrid structure

25 spans with timber girders

3 navigation spans (2 currently in use) and 1 road span over Beach Street with steel girders

1947

Aerial image (above left) showing both high level and Fremantle Traffic Bridge

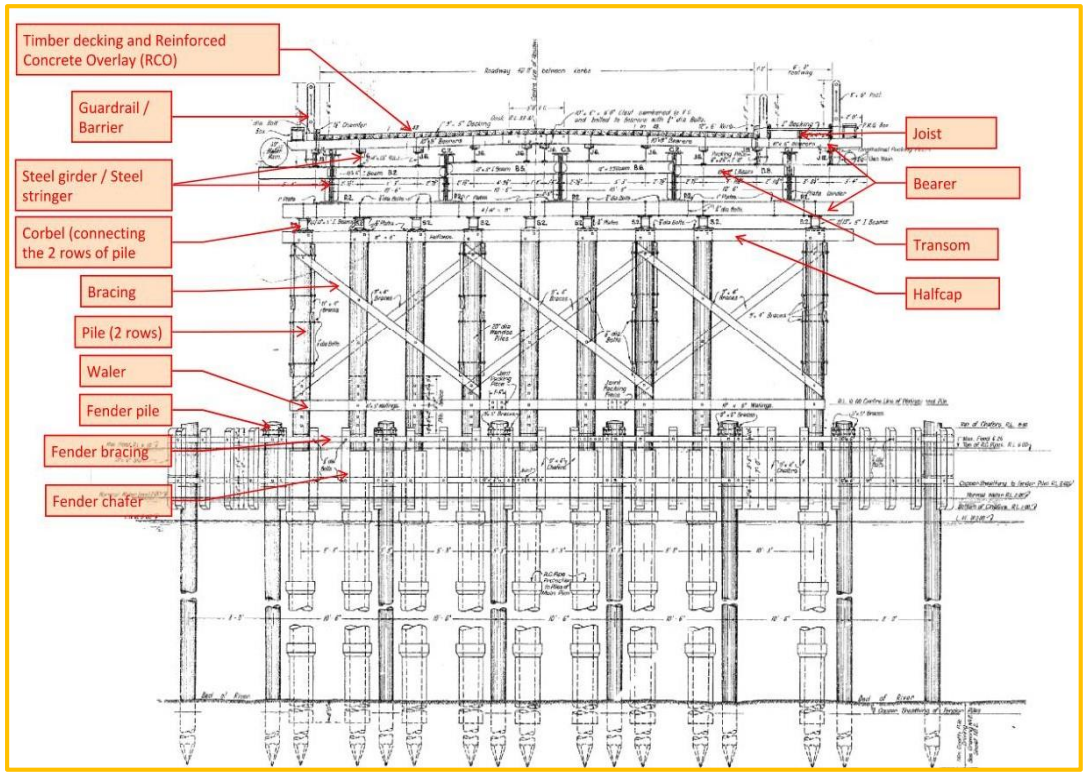
1947-1954

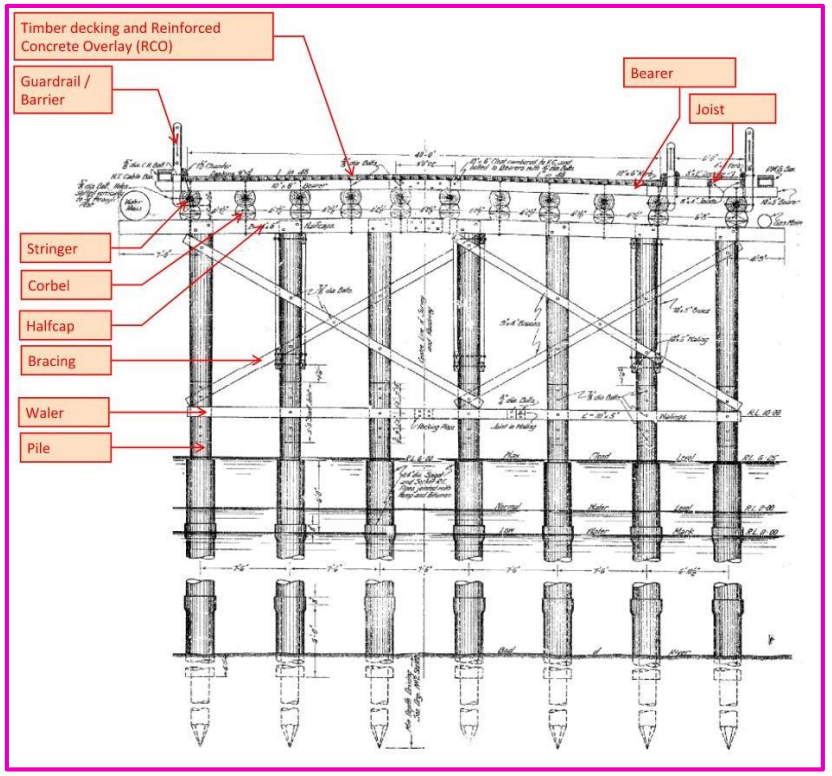
High level bridge demolished 1947-1954

2020

Aerial image (left) showing Fremantle Traffic Bridge and Fremantle Rail Bridge

Fremantle Traffic Bridge – key structural elements - 1939

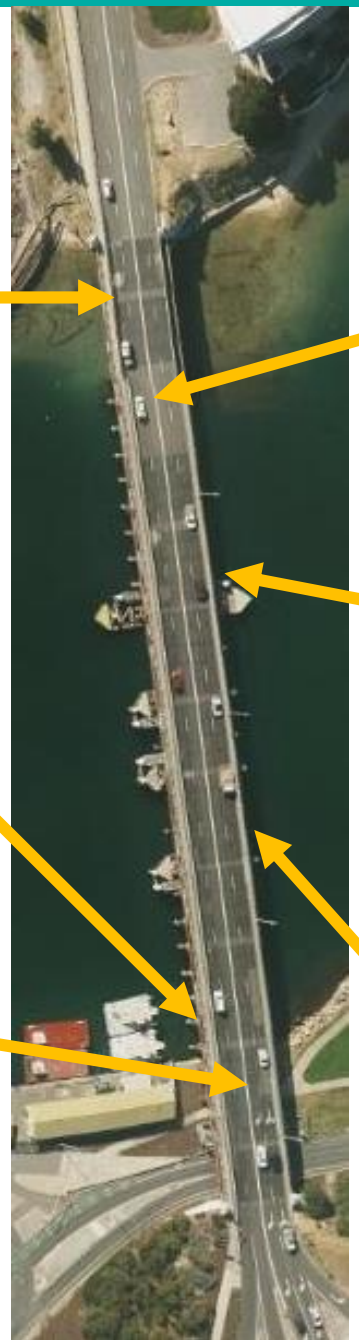




Fremantle Traffic Bridge – key structural elements - 2020

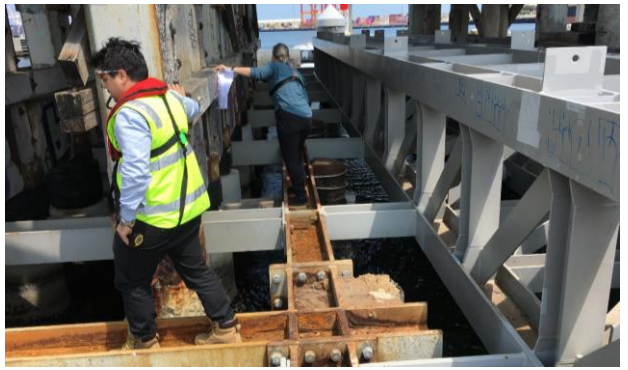
1939	2020
Timber piles – driven 20 ft into the river bed Timber bracing	Rotten piles repaired with steel sections surrounded by concrete and other methods
Pile protection in river via sand-filed concrete pipes	Various repairs – some concrete pots, sand replaced with grout
Non-navigation spans Timber deck beam supports (half-cap and corbel) Timber deck beams (stringers) Timber decking (bearers and deck)	Half-caps replaced with steel Concrete deck overlay
Navigation spans Timber and steel deck beam supports Steel deck beams Timber decking	Additional horizontal bracing added (concrete beam and steel rods) Concrete deck overlay
Piled timber fenders at navigation channels	Steel and timber fender system and navigation channels
Concrete abutments	As constructed with minor repairs / additional retaining walls
Timber guard rails	Steel guard rails

Timber design life – 40 years

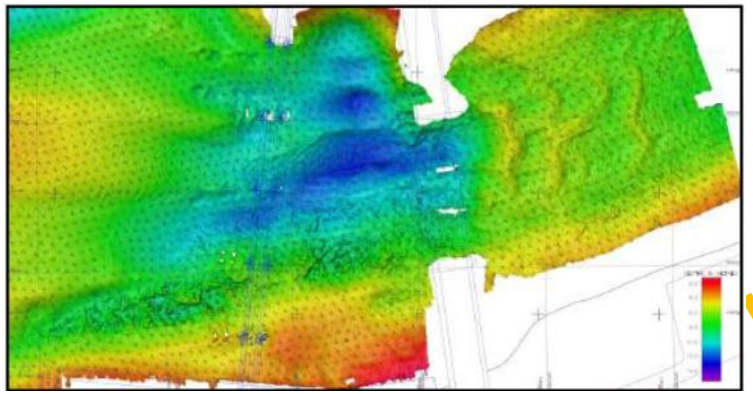


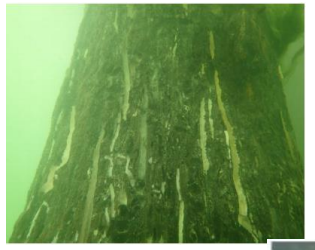
Deck – road and shared path

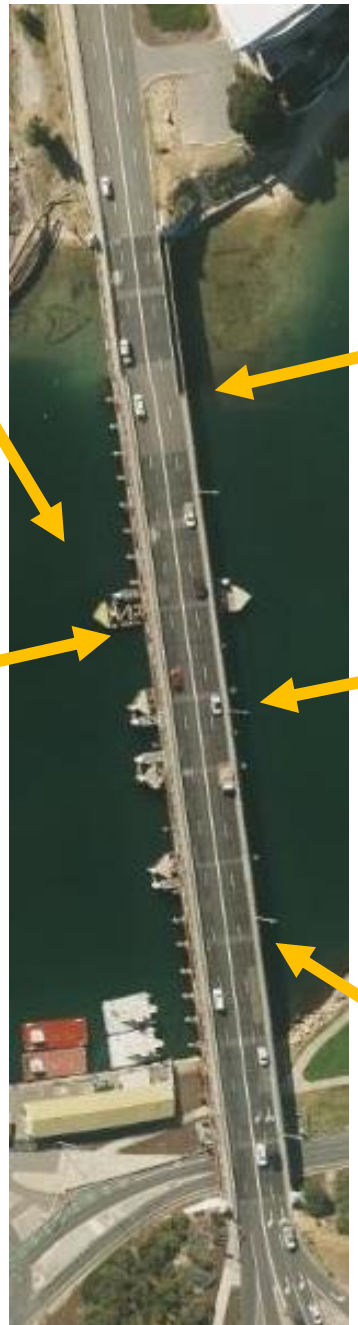
Access for maintenance & inspection

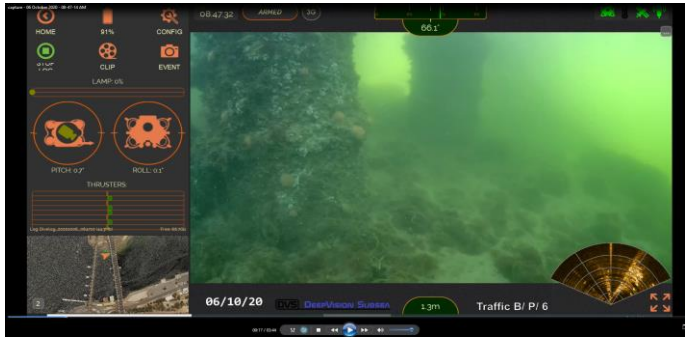


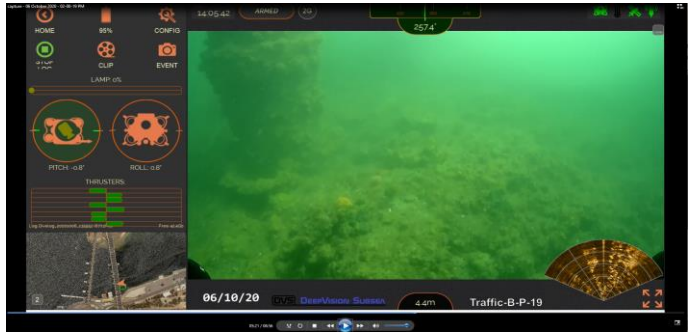
Above and below water durability





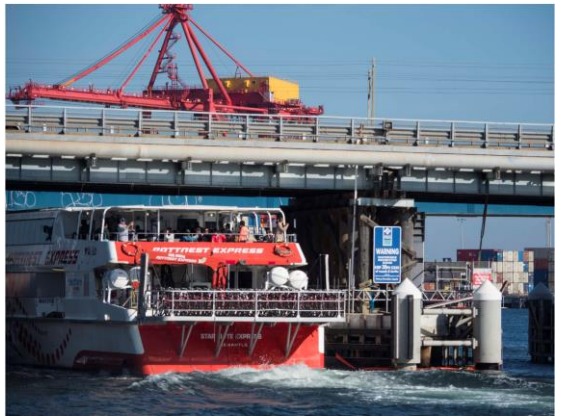






1. Scour
2. Marine borers - teredo
3. River bed condition

Lowest clearance (vertical and horizontal between Barrack Street and the Indian Ocean)

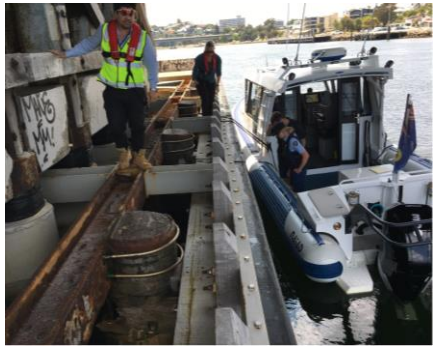


Mis-aligned piers

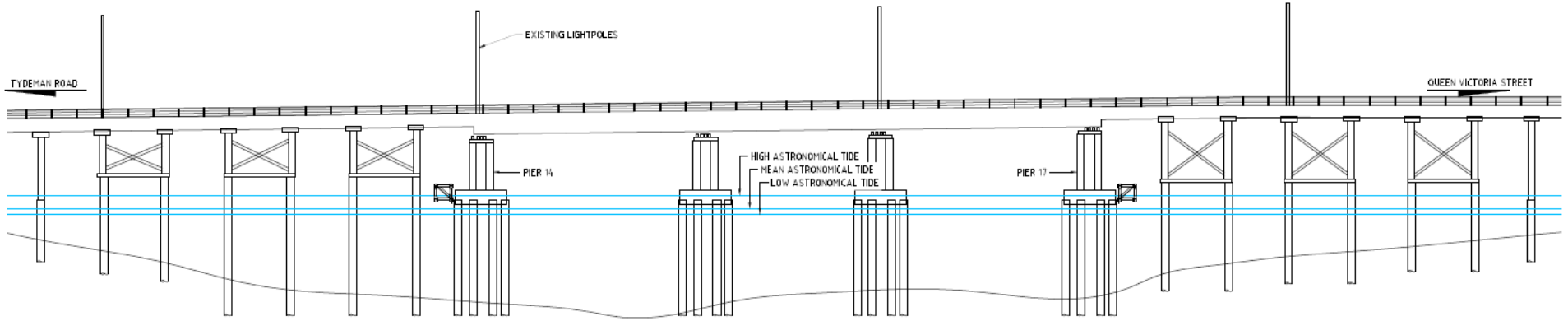
Multiple impacts evident

Piers weak against vessel impact.

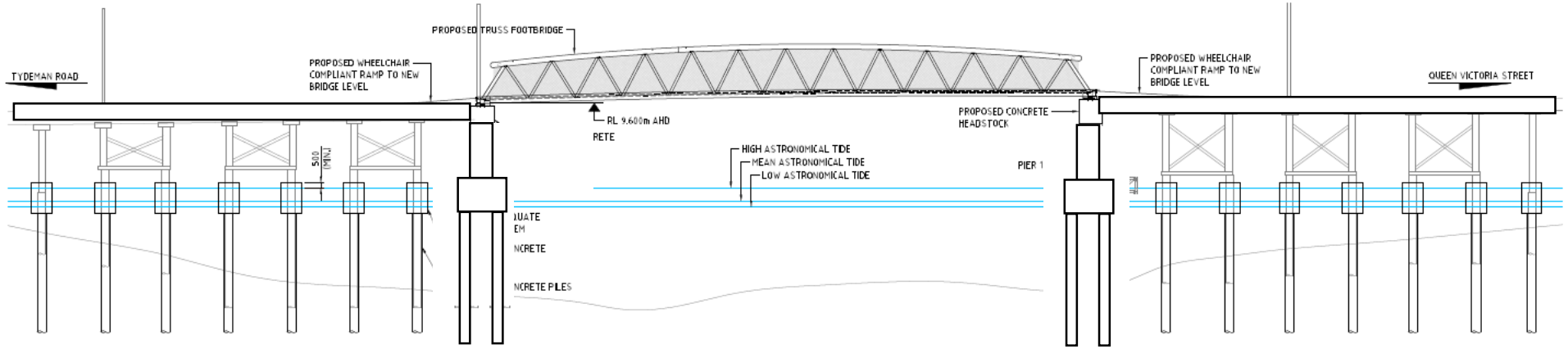
Fender system has limited capacity



1. Replace Navigation spans – increased horizontal and vertical clearance
2. Replace structure below water
3. Replace deck
4. Potential to re-use timber piers noting the ongoing maintenance for asset owner



TRAFFIC BRIDGE – EXISTING PART ELEVATION
1:200



TRAFFIC BRIDGE MODIFICATIONS – PART ELEVATION
1:200

Building between the bridges – No rail bridge

No rail line and road bridge

Key components

1. Road bridge (four lanes)
2. Pedestrian and cyclist path to go under Queen Victoria Street, north of the northern abutment
3. Pedestrian and cyclist path on new bridge

Key considerations

1. Does not meet project objective regarding improved rail capacity
2. Will require new traffic bridge to be higher to provide long term increased navigational clearance and to enable PSP to pass beneath Queen Victoria street, north of the northern abutment.
3. Reduced storage capacity for vehicles at Beach Street / Canning Highway /Queen Victoria street intersection resulting in significant congestion.

- Environmental consideration
- Heritage consideration
- Port consideration
- Rail consideration
- Road consideration
- Navigation consideration
- Residential consideration
- Proposed road alignment
- Proposed PSP alignment
- Proposed road bridge

Between the bridges - no rail bridge

BETWEEN THE BRIDGES – No rail line and road bridge

Strengths

- No impact to port operations
- Able to construct new traffic bridge between existing bridges
- Bridge across the river moves further away from Rivershore Place (south facing) apartments (approximately 10m)

Weaknesses

- No improvements to rail capacity resulting in significant increase in trucks on road
- PSP on the eastern side - New traffic bridge will need to be approx. 4m higher to allow for PSP underpass. This will impact access to local businesses on Queen Victoria Street and have significant visual impact on west facing Rivershore Place apartments
- Brings traffic light intersections at Canning Highway and Beach Street closer together and will increase congestion and traffic queuing during peak once complete
- Removal of heritage Ferry Capstan Base

BETWEEN THE BRIDGES – One rail line bridge and road bridge

Alternatives

- PSP can be constructed on western side of road bridge resulting in minimal need to raise bridge profile, minimised impact on access to local businesses on Queen Victoria Street

Building between the bridges – One rail line bridge and road bridge

One Rail line bridge and new Road bridge between the existing structures

Key component

1. Rai Bridge (one line)
2. Road bridge (four lanes)
3. Pedestrian and cyclist path to go under Queen Victoria Street, north of the northern abutment
4. Pedestrian and cyclist path on new bridge OR option to position on retained Fremantle Traffic Bridge

Key considerations

1. Will require new traffic bridge to be higher to provide long term increased navigational clearance and to enable PSP to pass beneath Queen Victoria street, north of the northern abutment.
2. Reduced storage capacity at Beach Street / Canning Highway /Queen Victoria street intersection resulting in significant congestion.
3. Additional rail bridge required in 40 years (future proofing not considered)

- Environmental consideration
- Heritage consideration
- Port consideration
- Rail consideration
- Road consideration
- Navigation consideration
- Residential consideration
- Proposed road alignment
- Proposed PSP alignment
- Proposed road bridge

Between the bridge - one rail line bridge and new road bridge

BETWEEN THE BRIDGES – One rail line bridge and road bridge

Strengths

- Able to construct new traffic bridge between existing bridges
- Bridge across the river moves further away from Rivershore Place (south facing) apartments (approximately 10m)
- Increase in freight and passenger rail capacity
- All new rail infrastructure retained within existing rail reserve
- No impact to port operations

Weaknesses

- When existing rail bridge needs to be replaced, not enough capacity for passage lines during construction
- No allowance for future proofing. Single track to be replaced with new 2 track bridge in 40 years' time
- PSP on the eastern side - New traffic bridge will need to be approx. 4m higher to allow for PSP underpass. This will impact access to local businesses on Queen Victoria Street and have significant visual impact on west facing Rivershore Place apartments
- Brings traffic light intersections at Canning Highway and Beach Street closer together and will increase congestion and traffic queuing during peak once complete
- Removal of heritage Ferry Capstan Base

BETWEEN THE BRIDGES – One rail line bridge and road bridge

Alternatives

- PSP can be constructed on western side of road bridge resulting in minimal need to raise bridge profile, minimised impact on access to local businesses on Queen Victoria Street

Building to the west

Previously considered – Bridges to the west

Key components

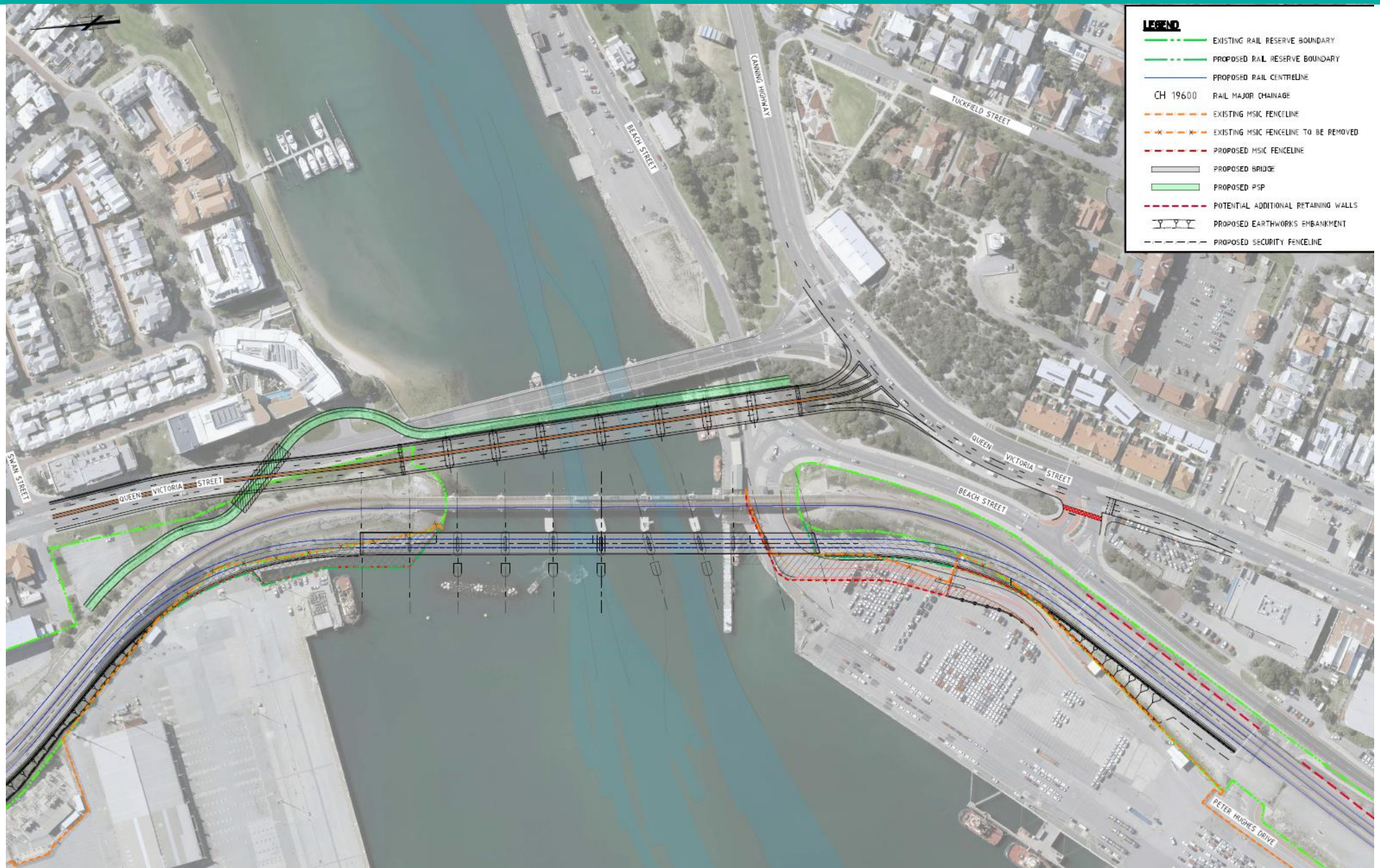
1. Pedestrian and cyclist path to go under road north of the northern abutment
2. Rail bridge (2 lines) to west of existing rail bridge
3. Road bridge (4-lanes + pedestrian and cyclist path) to west of existing road bridge
4. Option to retain Fremantle Traffic bridge for pedestrian and cyclist path
5. Delete existing dolphins and rock mound and add 6 new dolphins on western side of new rail bridge

Key considerations

1. Design standards and grade requirements for new freight rail bridge – significant replacement of rail infrastructure leading to and from rail bridge
2. Outside of rail reserve with impacts on Peter Hughes Drive, Gate 3 and ort operations
3. Reduced storage capacity at Beach Street / Canning Highway /Queen Victoria street intersection resulting in significant congestion.
4. Cost

- Environmental consideration
- Heritage consideration
- Port consideration
- Rail consideration
- Residential consideration
- Proposed road alignment
- Proposed PSP alignment
- Proposed road bridge
- Road consideration
- Navigation consideration

Bridges to the west



BRIDGE TO THE WEST

Strengths

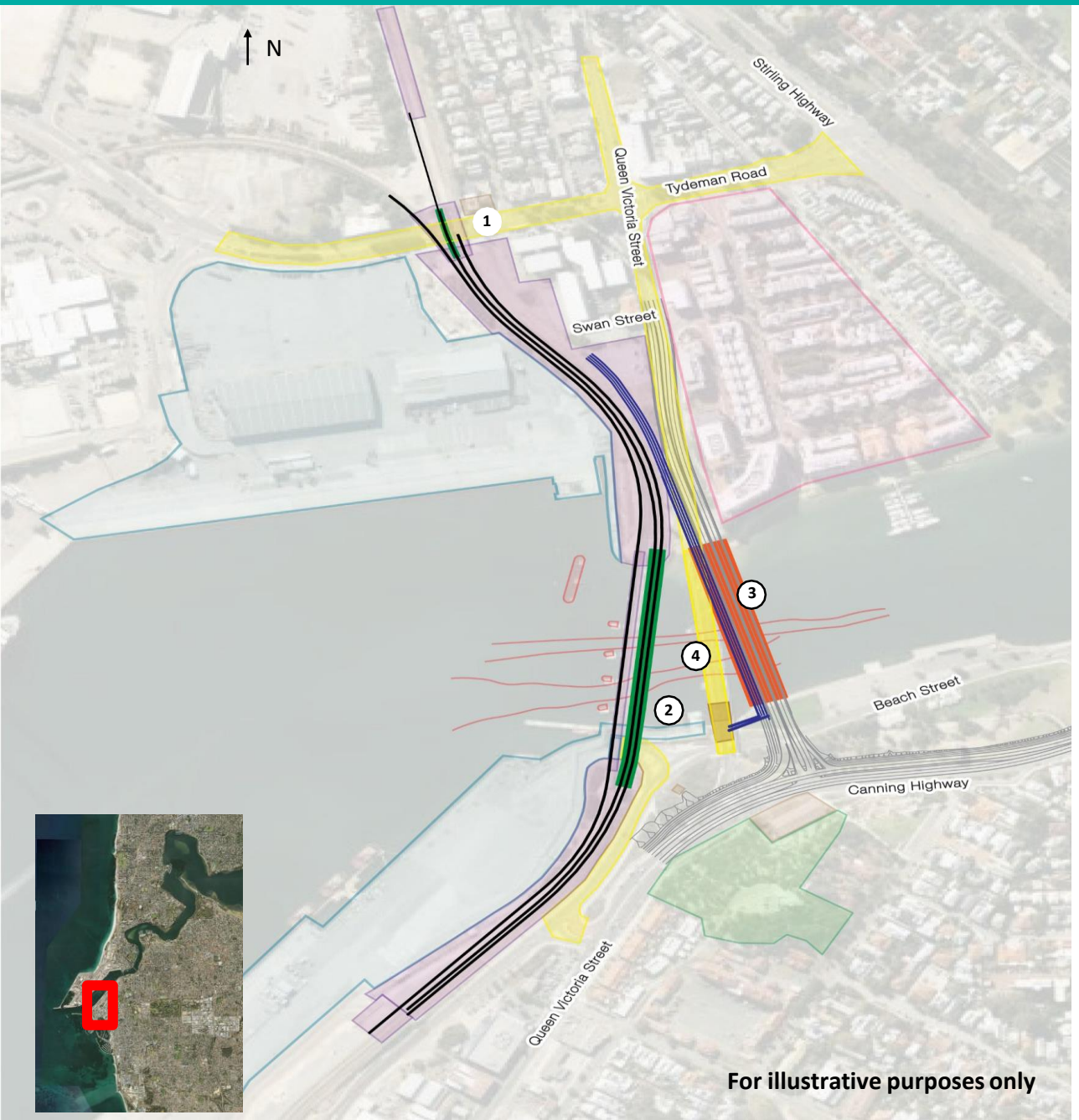
- Able to keep current traffic bridge operating one lane in each direction during construction
- Bridge across the river moves further away from Rivershore Place (south facing) apartments (approximately 10m)
- Increase in freight and passenger rail capacity

Weaknesses

- Significant impact to port operations
- Reclamation of river required
- Significant increase in rail reservation needed
- Excises land from Fremantle Ports' Berth 12a, small craft pens and J-Berth
- Need to realign Gate 3 Accessway and rebuild Gate 3
- Relocation of small craft pen facility
- PSP on the eastern side - New traffic bridge will need to be approx. 4m higher to allow for PSP underpass. This will impact access to local businesses on Queen Victoria Street and have significant visual impact on west facing Rivershore Place apartments
- Reconstruction of bridge impact protection systems (rock mound and dolphins)- $50M
- Brings traffic light intersections at Canning Highway and Beach Street closer together and will increase congestion and traffic queuing during peak once complete
- Removal of heritage Ferry Capstan Base

Building to the east

Bridges to the east



Key component

1. Tydeman Road bridge modification
2. Passenger rail bridge with two lines
3. Road bridge to include four traffic lanes and a six metre wide pedestrian and cycle path
4. Existing Fremantle Traffic Bridge to be demolished (excluding heritage remnant)

Dedicated freight line on retained Fremantle Rail Bridge

Key considerations

1. Proximity to residential apartments on Northern shore

- Environmental consideration
- Heritage consideration
- Port consideration
- Rail consideration
- Road consideration
- Navigation consideration
- Residential consideration
- Proposed rail alignment
- Proposed road alignment
- Proposed PSP alignment
- Proposed road bridge
- Proposed rail bridge

Bridges to the east

BRIDGE TO THE EAST

Strengths

- No impact on access to local businesses on Queen Victoria Street and no visual impact on west facing Rivershore Place apartments
- Increase in freight and passenger rail capacity
- All new rail infrastructure retained within existing rail reserve
- No impact to port operations
- Opportunities for activation in between bridges
- Protects ferry capstan base
- No impact on existing bridge protection systems
- Safer road intersection connection as it is further away from Beach Street
- No additional costs for port impacts as required in building a bridge to the west
- Minimal impact on small craft pens
- No reclamation of Swan River required

Weaknesses

- Bridge across the river moves closer to Rivershore Place (south facing) apartments (approximately 15m)