

MEMO

TO



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DATE

21st eptember 2022**DRAFT FOR COMMENT AND DISCUSSION**

Let's Get Wellington Moving –Thorndon Quay & Hutt Road Three Waters Pipe Renewals Priority

Background

Detailed design is currently underway for the Thorndon Quay & Hutt Road corridor (Figure 1) as part of the Let's Get Wellington Moving programme. There is opportunity for potable water, wastewater, and stormwater pipe renewals in the Thorndon Quay & Hutt Road corridor to be aligned with the construction programme.

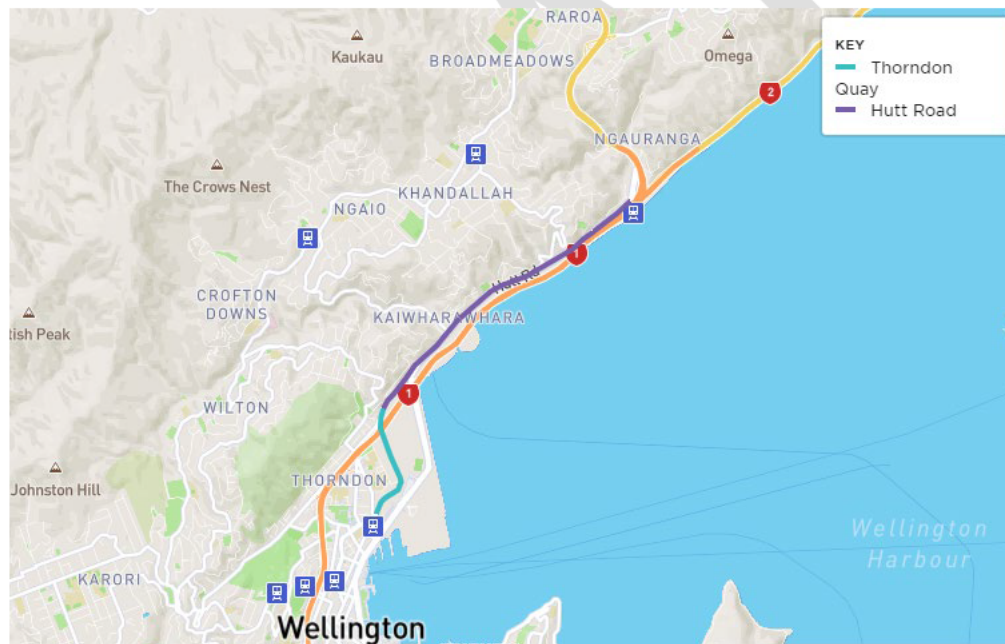


Figure 1: Thorndon Quay & Hutt Road corridor

As part of this investigation for aligning renewals, a desktop study has been undertaken to understand the existing assets. A prioritisation for the assets has been created and split into three categories:

1. "Must Do"
2. "Should Do"

3. "Could Do"

It is noted that the programme of works should firstly be assessed against the prioritisation method outlined in the September 2021 Wellington Water board paper 058-10.

The prioritisation method for the three waters is outlined below.

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Stormwater

The process for defining the stormwater prioritisation criteria included:

- Consultation with stormwater and network engineers at Wellington Water.
- Accessing the Very High Criticality Assets (VHCA) GIS dashboard.
- Calculating total criticality score.
- Calculating asset remaining life.
- Accessing Wellington Water Stormwater GIS data.
- Analysing pipe material.
- Calculating risk score (likelihood score × consequence score = risk score).
- Potential asset repairs (pending engineering investigation).

The pipe renewal process has been prioritised into the following criteria:

Priority	Criteria
1 – “Must Do”	<ul style="list-style-type: none">- All pipes with condition grade 5- All pipes with condition grade 4 + high criticality score- VHCA Dashboard identified pipes with very high criticality and poor condition- Brick Pipes- Risk score over 30 + cross main road
2 – “Should Do”	<ul style="list-style-type: none">- Condition 4 pipes- Likelihood score over 4
3 – “Could Do”	<ul style="list-style-type: none">- Pipes with less than 20 years remaining life + risk score over 10

Wastewater

The process for defining the wastewater prioritisation criteria included:

- Consultation with wastewater and network engineers at Wellington Water.
- Accessing the VHCA GIS dashboard.
- Calculating asset remaining life.
- Accessing Wellington Water Wastewater GIS data.
- Identifying NET engineering risk threshold & asset grouping.
- Analysing pipe material.

The pipe renewal process has been processed into the following criteria:

Priority	Criteria
1 – “Must Do”	<ul style="list-style-type: none"> - All pipes with condition grade 5 - All pipes with VHCA dashboard condition grade 5 - VHCA condition grade 4 and very high criticality - CI Pressure pipes - Asset grouping 'PS10 rising mains and gravity pipes'
2 – “Should Do”	<ul style="list-style-type: none"> - Condition 4 pipes - EW pipes with less than 20 years remaining life - Asset grouping 'Commercial Thorndon Quay renewal'
3 – “Could Do”	<ul style="list-style-type: none"> - Pipes with less than 10 years remaining life - Asset grouping 'Hutt Road – Kaiwhawhara Road renewals' - Very High VHCA criticality

Blockage data was also analysed using the COG heat map. This was taken into consideration but did not affect the overall priority criteria due to the limited number of assets with reported blockages.

Potable Water

The process for defining the potable water prioritisation criteria was centred differently to wastewater and stormwater due to the existing work which has already been undertaken to calculate asset risk. The process included:

- Consultation with potable water and network engineers at Wellington Water
- Accessing the VHCA GIS dashboard
- Using the WCC Water Pipes Risk Assessment Database
- Calculating a combined criticality which takes into account network and commercial criticality
- Calculating remaining life
- Analysing pipe material

The pipe renewal process has been processed into the following criteria:

Priority	Criteria
1 – “Must Do”	<ul style="list-style-type: none"> - 150 FIB installed in 1966 - 150 Cast Iron (CI) - Asbestos Cement (AC) and Copper (Cu)
2 – “Should Do”	<ul style="list-style-type: none"> - WCC Water Pipes Risk Assessment Database risk ratings greater than 10 - High criticality* (above 150mm diameter) asbestos cement, copper, cast iron, and galvanised steel pipes with less than 10 years remaining life - 525 Cast Iron (CI)
3 – “Could Do”	<ul style="list-style-type: none"> - Pipes with less than 10 years remaining life

*The 'Critical PW Pipes' layer was analysed and considered. However, given the small number of assets in the Thorndon Quay & Hutt Road corridor located in this layer, criticality was assessed using a combination of the WS Pipe Risk Assessment method and conversations with the Network Engineering Team (high criticality assigned to pipes with diameters greater than 150mm).

Clashes with the Thorndon Quay & Hutt Road structures and gardens

The Thorndon Quay & Hutt Road designers identified key proposed structures, rigid pavement, and rain garden locations. It is noted that the design is currently undergoing public consultation and is subject to change.

The priority 1,2, and 3 assets which are located underneath or near these structures have been identified. A level 1 cost estimate was completed for these clashing priority 1,2 and 3 assets (Table 1).

These costs are indicative only. The base unit rates are from June 2020 and it is noted that considerable changes (significant increase in costs) to the construction market have occurred since this date.

Table 1: Level 1 Cost Estimate

Priority	Stormwater	Wastewater	Potable Water	Total
1 – “Must Do”	\$2.5 M	\$0.3 M	\$2.4 M	\$5.2 M
2 – “Should Do”	\$2.3 M	\$1.0 M	\$0.7 M	\$4.0 M
3 – “Could Do”	\$0.8 M	\$0.4 M	\$0.2 M	\$1.4 M
Total	\$5.6 M	\$1.7 M	\$3.3 M	\$10.6 M

Assumptions made during the cost estimate calculations included:

- Pipe lengths rounded to the nearest 5m in the cost estimate spreadsheet per type/diameter of pipe.
- Removal of abandoned assets not included in the cost estimate.

Risks to asset owners

Major risks to public disruption and renewal costs may affect the asset owner. These include:

1. Potential failure of 3W assets in the Thorndon Quay & Hutt Road corridor within 10 years of completion.
 - a. There are many assets which have been identified as priority 1,2 and 3 based on the criteria outlined above which do not clash with the identified structures along the corridor. Many of these are likely to need replacement within the next 10 years.
 - b. Pipes of high risk materials, including asbestos cement, cast iron, brick, copper and earthenware, are less predictable in terms of expected lives. Cast Iron pipes are at risk of rust and corrosion, reducing pipe flow and causing erosion inside the pipe. Earthenware pipes can be fragile and porous, leading to leaks and susceptibility to tree root intrusion. Risks of asbestos cement pipes include ground contamination, which can be costly and disruptive. It is noted that there is a significant number of earthenware, asbestos cement and cast iron pipes which were installed in the 1960s, 1970s and 1980s. As a result, these will likely require

renewals over the next decade. There are many pipes of high risk materials with less than 10 years remaining life in the Thorndon Quay & Hutt Road corridor.

Recommendations and next steps

To confirm the three waters renewal programme in the Thorndon Quay & Hutt Road corridor, it is recommended that:

- Existing CCTV data is analysed for all assets categorised as priority 1 (where available).
- A CCTV programme to be devised to capture CCTV footage of pipes where existing CCTV data does not exist or is more than 5 years old.
- The project team reviews and considers assigning non-priority assets which clash with the identified structures/gardens priority ratings.
- The project team reviews and considers priority assets located in the Thorndon Quay & Hutt Road corridor which do not clash with the identified structures/gardens.

Supporting links:

Cost Estimate: <https://woogle.wellingtonwater.co.nz/site/gadf/activity/7.%20Major%20Third-Party%20Projects/Let's%20Get%20Welly%20Moving/TQHR/TQHR%20Clash%20cost%20estimate>

Prioritisation spreadsheet: <https://woogle.wellingtonwater.co.nz/site/gadf/activity/7.%20Major%20Third-Party%20Projects/Let's%20Get%20Welly%20Moving/TQHR/LGWM%20Thorndon%20Quay%20Hutt%20Road%20Assets%20Prioritisation%20Draft%20B.xlsx?Web=1>

VHCA Dashboard:

<https://gis.wellingtonwater.co.nz/portal/apps/dashboards/2d3841bedc1d424a9b60d57a408ff549>

Three Waters GIS:

<https://wellingtonwater.maps.arcgis.com/home/item.html?id=d70eead642bf49e393a3b199f0c63e8c>

Critical PW pipes layer:

<https://wellingtonwater.maps.arcgis.com/home/item.html?id=25e8aee610164875ae8139627f70e20f>