

Preliminary Technical Assessment of the Flood Relief Engineering Measures

Non Viable Measures (not included in Options Development)

The measures found to be unviable as part of the Preliminary Technical Assessment are detailed below.

Conveyance Improvements and Dredging

Conveyance improvements aim to maximise river capacity to reduce the flood risk to neighbouring lands. This is typically done through channel realignment or widening. Dredging maximises river capacity by excavating the riverbed.

Conveyance improvements and dredging is not technically viable in coastal areas as the maximum water level of the tide will still be reached regardless of how much additional storage is provided.

Dredging as an isolated measure in the fluvially dominated reach, e.g. Terryland, is not considered viable for the following reasons:

- Significant negative environmental impact as it is within the Lough Corrib Special Area of Conservation.
- Extensive underpinning of the existing bridges would be required which would be technically very challenging.
- Dredging requires ongoing maintenance as sediments will continue to accumulate over time.



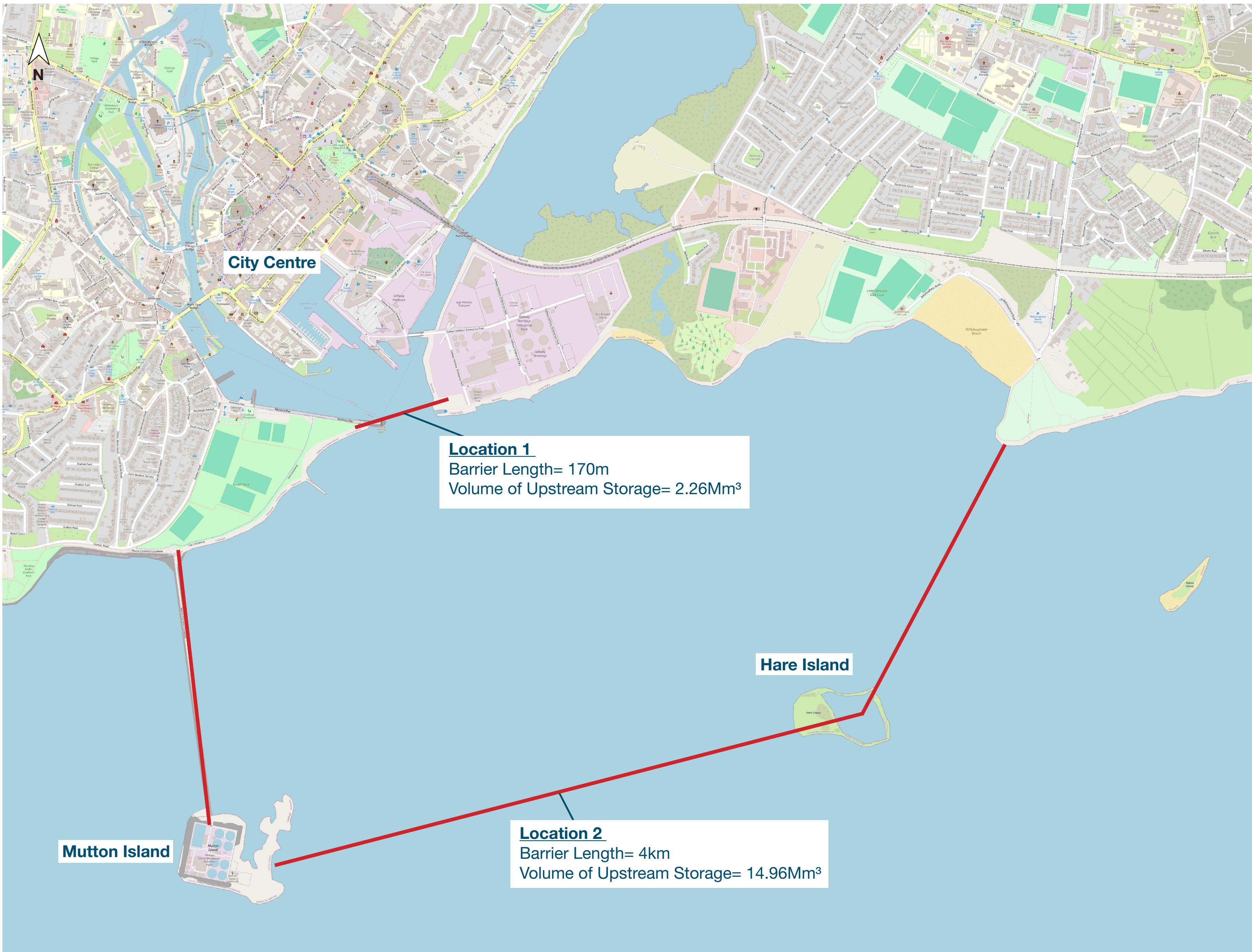
Tidal Barrier

A tidal (or storm surge) barrier is a fully or partly moveable barrier structure which is located across a river or estuary. It can be closed temporarily to prevent the ingress of a tidal surge upstream and therefore reduce or eliminate the risk of tidal flooding. During normal conditions (i.e. when there is no risk of tidal flooding), the barrier is kept open to allow for tidal exchange and navigation.

Any tidal barrier in Galway would operate in tandem with a tidal forecasting system - when a tidal event is forecast the barrier would be closed to prevent tidal ingress. Water from the River Corrib would however be prevented from flowing out to sea while the barrier is closed. The technical viability of a barrier is therefore dependent on there being a sufficient volume in the channel upstream of the structure in order to store water from the river while the barrier is closed. If there is not a sufficient storage volume upstream, Galway City Centre will be at risk of fluvial flooding while the barrier is closed.

Two locations for a tidal barrier were considered as shown in image to the right. It is evident that barriers at these locations would not protect all areas of the scheme from coastal flooding such that additional measures would also be required in parallel.

Barriers located further out to sea were not considered as the scale of the required works would be hugely significant and be grossly uneconomical.

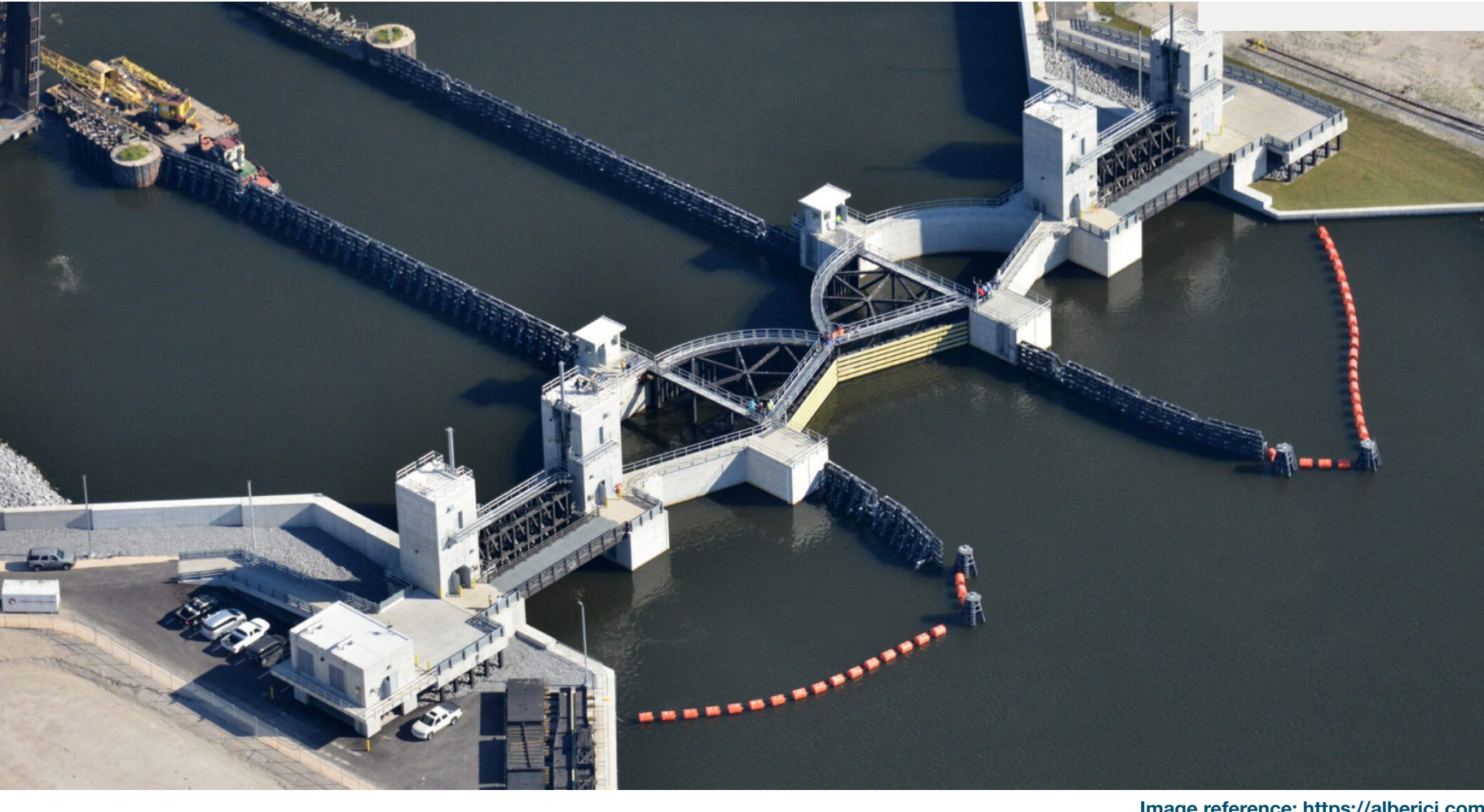


Viability of a Tidal Barrier

Not considered viable for a number of reasons:

- A tidal barrier would only address the risk of coastal flooding in the city centre and not the wider study area.
- Direct defences may still be required to protect the areas of the city that are at risk from fluvial flooding
- A tidal barrier at Location 1 is not technically viable as there is an insufficient volume in the channel upstream to prevent fluvial flooding while the barrier is closed. The option of storing additional fluvial water in Lough Corrib upstream of Galway city is not deemed to be viable as it would require very extensive capital works around a large section of the Lough in order to impound the water.
- To prevent flooding from the River Corrib during the closure of the tidal barrier at Location 1, super pumps could be used. However, this is considered economically unviable, as it would require installing enough pumps to handle up to 460 cumecs, the design fluvial flood event discharge, during the tidal gate closure. The scale of the pumps required makes them very impractical to implement and operate.
- A tidal barrier at Location 2 is technically viable, as there is sufficient upstream channel volume to prevent fluvial flooding while the barrier is closed; however, the cost would be prohibitively high.
- Tidal barrier project cost estimates are significantly greater than the total economic benefit of the scheme such that any such barrier is not economically viable
- Galway Bay is a European designated site - Special Area of Protection (SPA) and Special Area of Conservation (SAC). Construction of a tidal barrier would result in significant environmental impacts making it very difficult to justify.

Example of what a tidal barrier at Location 1 could look like if installed: The Seabrook Floodgate Complex, New Orleans, USA.



Example of what a tidal barrier at Location 2 could look like if installed: Eastern Scheldt storm surge barrier, Netherlands.

