

# Preliminary Technical Assessment of the Flood Relief Engineering Measures

## Non Viable Measures (not included in Options Development)

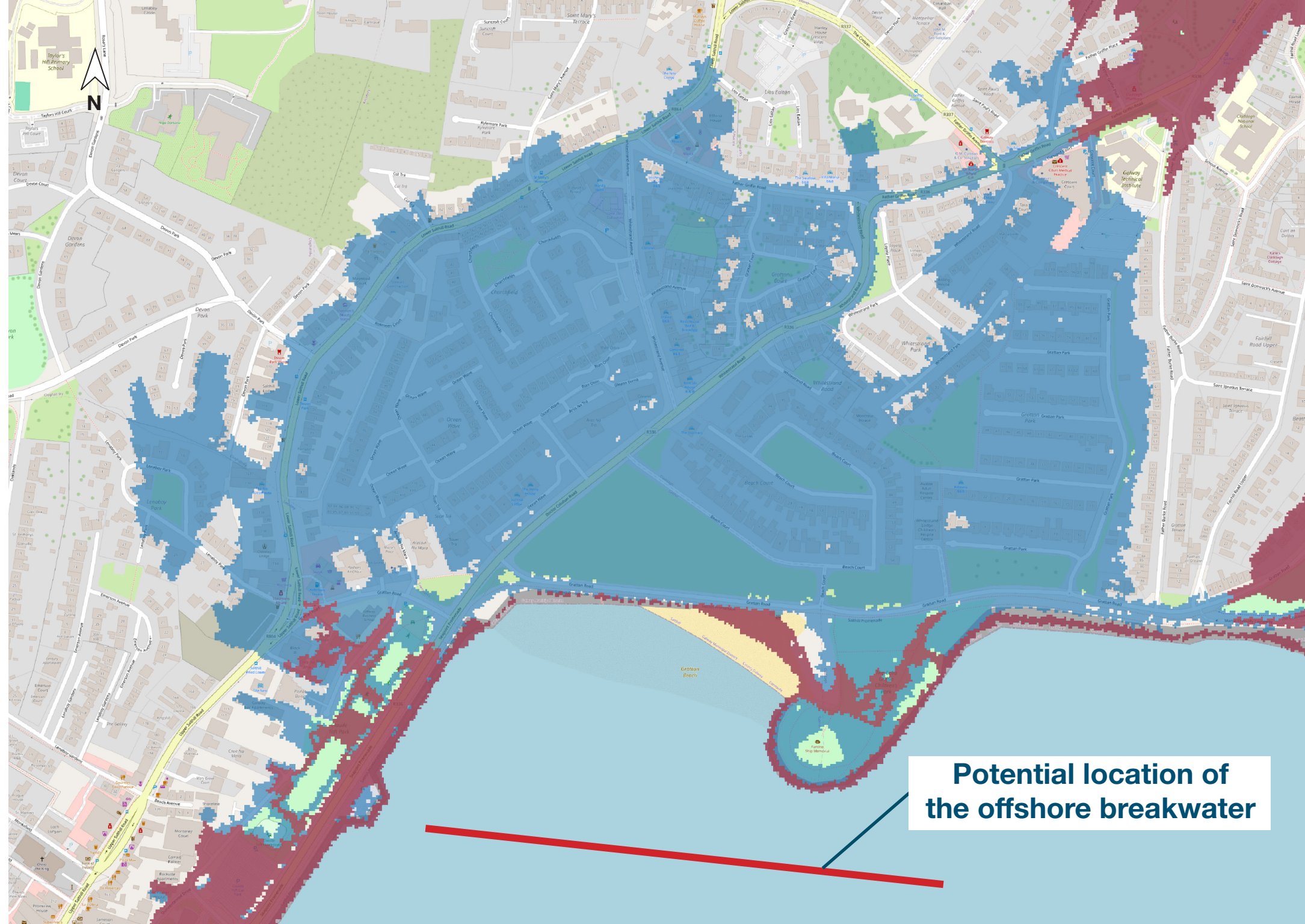
The measures found to be unviable as part of the Preliminary Technical Assessment are detailed below.

### Offshore Breakwater

An offshore breakwater is designed to break waves offshore, thereby reducing the wave energy reaching the coastline and can therefore reduce the risk of wave overtopping in certain areas.

An offshore breakwater does not however prevent tidal flooding as the tide still flows around and across the structure.

One area where an offshore breakwater may be technically viable as a standalone localised solution to defend against wave overtopping is along Grattan Road as shown in the image to the right.



#### Legend

Wave overtopping flood extent Tidal flood extent

### Viability of an Offshore Breakwater

#### Not considered viable for a number of reasons:

- Galway Bay is a European designated site - Special Area of Protection (SPA) and Special Area of Conservation (SAC). Construction of an offshore breakwater would result in significant environmental impacts.
- While this solution may reduce flood risk by limiting wave action on the coastline, it does not protect against tidal flooding. Areas at risk of tidal flooding would still require alternative flood defence measures to achieve the standard of protection of the scheme.
- Climate change will increase the risk of tidal and wave overtopping flooding, making offshore breakwaters less effective and therefore less adaptable.
- Offshore breakwaters can cause strong currents which may be hazardous to the public.

### Salmon Weir Barrage gate operation modification

The Salmon Weir Sluice Barrage regulates the flow of the River Corrib between Lough Corrib and Galway Bay. The gate operation of the barrage is regularly adjusted to control flow and therefore water levels both upstream and downstream of the barrage.

The majority of gates are kept open during the winter months as the operator aims to create storage within Lough Corrib to prepare for potential winter floods. The gates are typically closed during summer months in order to direct more flow towards the canal system and maintain higher water levels upstream for navigation.

Modification of the operation of the barrage could potentially reduce flood risk in areas on the River Corrib, however it would not achieve the standard of the protection of the scheme on its own and additional measures would be required. Furthermore modification of water levels and flows could result in significant environmental impacts within the Lough Corrib Special Area of Conservation and the Lough Corrib Special Area of Protection.

Downstream of the weir, the area is also at risk of tidal flooding which can not be mitigated by the change in operation of the barrage.



### Natural Flood Management (NFM)

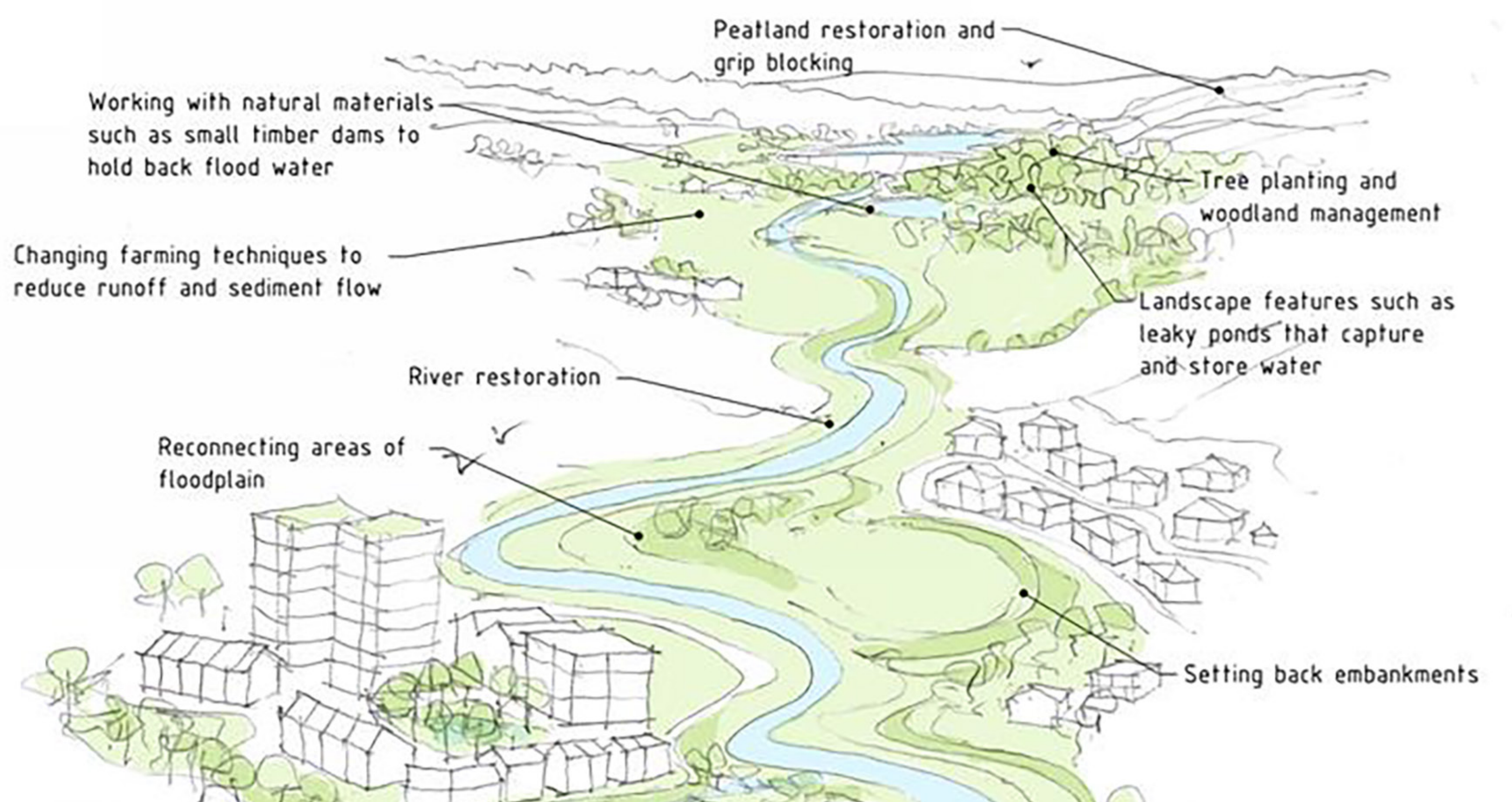
NFM is the alteration, restoration or use of small scale localised landscape features to reduce flood risk.

NFM will be considered as part of the climate change adaptation strategy rather than included within the main flood defence scheme.

#### NFM for areas at risk of coastal flooding

In coastal areas, NFM can be used to increase the natural resilience of the shoreline and improve flood and erosion protection.

NFM measures can improve the volume, height and health of natural buffers, thus helping absorb wave energy. Projects like the dune restoration pilot project at Grattan Beach is a form of NFM. Sand fences help prevent sand loss and promote dune growth, providing protection to the land behind the coastline against wave action. However due to the magnitude of the wave action in areas along Salthill, including the Grattan Road area, an NFM measure, such as dune restoration, is not considered viable as a stand alone flood defence measure. It does not provide the required standard of protection. Maintenance of these types of measures is also logistically challenging.



#### NFM for areas at risk of fluvial flooding

In these areas, NFM measures can be used to alter specific hydrological processes to store precipitation throughout the catchment, reducing the speed and intensity at which runoff and sediment can enter the receiving watercourse. It is not considered viable for the following reasons:

- Not effective for large flows and therefore can not offer the required standard of protection of the scheme
- In combination with other measures, it would require extensive change of use of large tracts of private land, thus requiring significant landowner agreements.
- Difficult to achieve logistically both for construction and maintenance in the long term.