

# **Barna Greenway - Preliminary Design Options Report (2017)**

The Galway Transport Strategy includes an objective to provide a Greenway between Galway City and Barna.

Atkins Engineering Consultants were engaged to develop and investigate in further detail the feasibility of the project and to examine alternative route options to determine a preferred route.

A copy of that report is attached and has been referred to as “The Atkins Report” in the media. It is important to note that this report was a high level constraints study and route options assessment for the Greenway between Galway City Centre and Barna.

The Report identified a number of constraints to delivering this project and as such it has not progressed beyond route assessment and it has not been considered by the Elected Members of Galway City Council.

By way of summary, the output from the Atkins constraints study highlighted the following key issues:

- There are a number of locations where the proposed Greenway impinges on the Special Area of Conservation. This is a significant constraint to the delivery of this Greenway.
- The report also considered a cost estimate for the scheme, but the scheme was based on permissive access over private lands. Permissive access is no longer considered an appropriate mechanism for Capital Projects. A significant proportion of the 7km Greenway is located on private lands and/or private roadways.
- The proposed Greenway did not provide for full segregation of cyclists on busy city streets and this will give rise to conflict between vulnerable road users and motor vehicles. This type of design, although not ideal, may have been acceptable in 2016 and in earlier years – but it no longer meets the current improved and required design standards for greenways and cycleways, which have now been significantly updated in the interests of safety.

For the reasons outlined above, this project was not brought forward to planning stage as it did not meet the objectives to provide a Greenway to current standards.

*Galway City Council  
March 2022*

**Please note due to file size, this document is available to download in four parts.**

# Bearna Greenway Scheme

Preliminary Design Report  
Galway City Council

7 July 2017

Please note due to file size, this document is available to download in four parts

# Notice

This document and its contents have been prepared and are intended solely for Galway City Council's information and use in relation to Bearna Greenway Scheme.

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This document has 33 pages including the cover.

## Document history

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# 1. Introduction

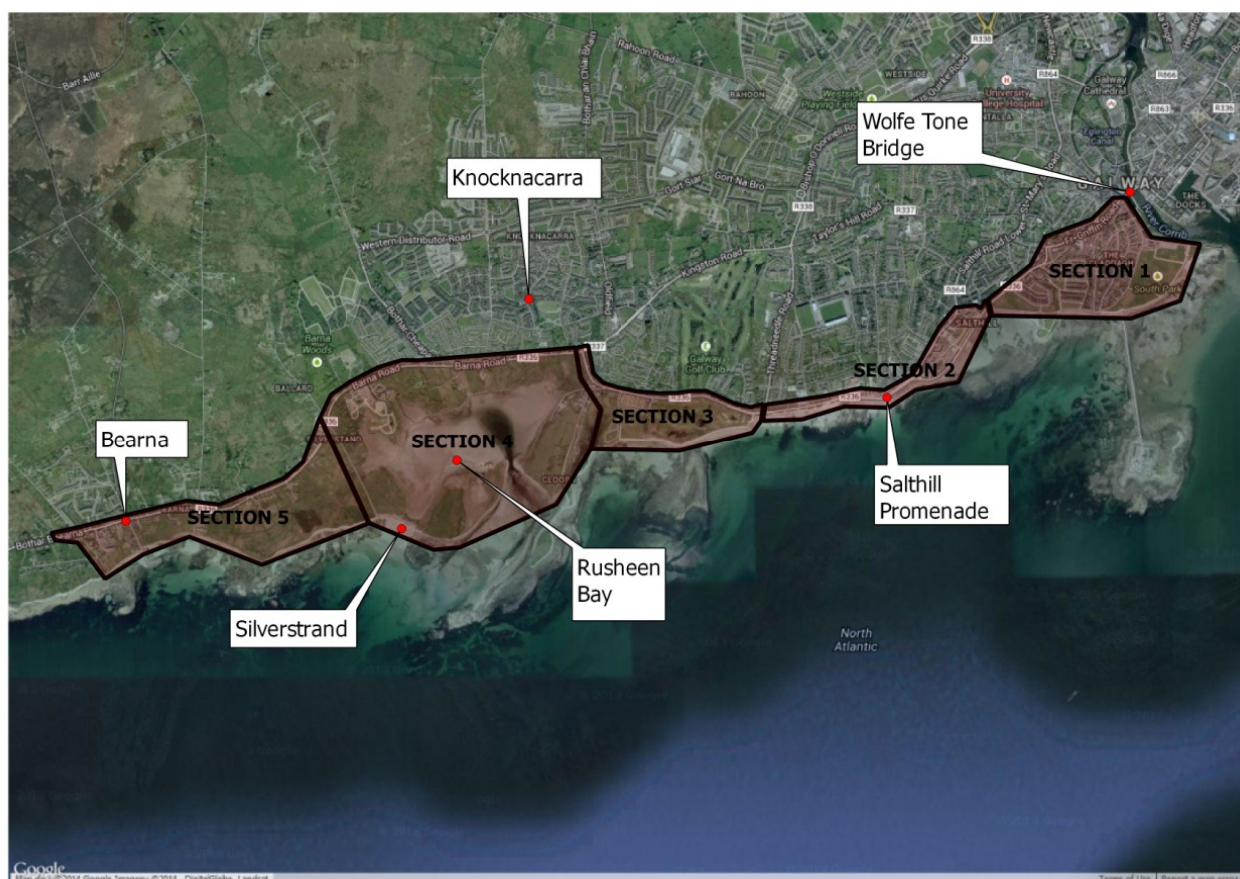
## Background

- 1.1. Galway City Council (GCC), in partnership with the National Transport Authority (NTA) propose to develop a greenway from Galway City Centre to the village of Bearna extending over a distance of approximately 7km.
- 1.2. Atkins have been engaged by GCC to undertake a constraints study, a route options and selection study and the preliminary design and cost estimate of the preferred option.

## Study Area

- 1.3. The Study Area has been defined by GCC who have strategically identified five sections which can be considered both individually within their respective areas and as a whole route throughout the extents of the study area. Figure 1-1 illustrates the identified sections.

Figure 1-1 Study Area



## Scheme Vision

- 1.4. The scheme represents a significant opportunity to create a high quality greenway for pedestrians and cyclists linking Wolfe Tone Bridge in the city centre to Bearna Pier at the western edge of Bearna Village.
- 1.5. The over-arching vision for the Bearna Greenway is that it will ultimately form part of a continuous network of greenways within Galway City and County. It is envisaged that the proposed greenway

will serve as both an amenity route along Galway's Atlantic seaboard for recreational users and as a commuter route from the key residential areas in the southwest of the City such as Knocknacarra.

## Preliminary Design Objectives

- 1.6. The overall objective of the proposed greenway preliminary design is:
- To bring forward and undertake the preliminary design of the preferred route recommended within the Options Report;
  - To develop an estimation of future user demand and a preliminary cost estimate, which will assist in determination of the economic viability of the scheme;
- 1.7. The greenway has been developed as a pedestrian and cyclist corridor. The greenway predominantly consists of a shared use path mixed between pedestrians and cyclists with sections situated adjacent roads/streets and also sections situated off-road set-back from the road carriageway.
- 1.8. Given the high volume of pedestrians along the promenade at Salthill and the place context associated with the promenade, the potential for a segregated cycle facility separate to the promenade but adjacent the road carriageway has been considered.

## Related Projects

### Galway Transport Strategy

- 1.9. In conjunction with the NTA, GCC have developed an Integrated Transport Strategy for Galway City Environs, referred to as the Galway Transport Strategy (GTS).
- 1.10. The GTS sets out a series of actions and measures, covering infrastructural, operational and policy elements to be implemented in Galway over the next 20 years and sets out a framework to deliver the projects in a phased manner.
- 1.11. The proposed greenway directly interacts with measures proposed for Galway City within the GTS and particularly within Section 2 of the proposed greenway along the R336 adjacent Seapoint Promenade and Salthill Promenade. The proposed Galway City bus network as outlined with Appendix C of the GTS 'Public Transport Network Development' and Appendix D 'Public Transport Infrastructure Development' runs directly along this corridor and infrastructure proposals include for the provision of junction upgrades and bus priority interventions including bus lanes at the Threadneedle Road / Coast Road junction and the Salthill Road Upper/Coast Road junction. These measures where possible have been integrated within the proposed greenway preliminary design.

## Methodology

- 1.12. In preparation of this preliminary design report the following methodology has been adopted:
- Review of constraints and route options study;
  - Review of Appropriate Assessment (AA) and Natura Impact Assessment (NIS);
  - Review of all mapping including ordinance survey, ortho-photography and topographical survey;
  - Review of preferred route;
  - Review of design including design principles, design standards and best practice guidance documents;
  - Prepare preliminary design;
  - Prepare preliminary design report.
- 1.13. Ongoing consultation and liaison with GCC and the NTA has been undertaken throughout the above process and the preferred route alignment and preliminary design has been agreed by GCC and the NTA.



## 2. Overview of Related Studies

### Constraints Study

- 2.1. The Constraints Study (3271DG005) assessed the possible problems to be overcome in this commission and how this could be achieved in as simple a manner as possible. The possible constraints to be encountered were considered in three strands, as follows:
- Engineering Constraints
  - Environmental Constraints
  - Landownership Constraints
- 2.2. To compile the Constraints Study the following tasks were undertaken:
- A detailed desktop study which included for a review of national, regional and local planning policy information, a review of engineering constraints and a review of environmental constraints.
  - Stakeholder identification and preparation of a Communication Plan.
  - Additional information was procured. This included a topographical survey for the entire extents of the scheme and traffic count surveys.
  - Site inspections were undertaken to collect up-to-date local information. These were undertaken by foot, bicycle and car which allowed for a thorough consideration of challenges faced by vulnerable road users attempting to negotiate the route.
  - All known significant engineering and environmental constraints were collated and mapped.
  - Consultation formed an important element of the constraints study and this has been undertaken with a number of major stakeholders. These discussions have enabled a clearer understanding of the major concerns and limitations of any route option development.
- 2.3. The above information sources were compiled together to prepare constraints drawings. These drawings identify the primary constraints within the study area and were used to inform the route option and selection process.
- 2.4. The engineering constraints drawings (drawings 3271/HW/001 to 3271/HW/005) are contained within Appendix A, as are the environmental constraints drawings (drawings 3271/HW/011 to 3271/HW/015).

### Route Options Study

- 2.5. The main aims and objectives of the Options Report (3271DG006) were to:
- Set out the route options to be considered and to summarise their feasibility and relative ranking in terms of engineering, environmental and economic constraints;
  - Appraise the findings of the route options study and to make recommendations in relation to the preferred route. In each case an appraisal matrix was used to show the justification for the preference given to each option.
- 2.6. The scheme route options are illustrated on drawings 3271/HW/110 to 3271/HW/115 as contained in Appendix B.
- 2.7. As previously noted the study area has been divided into 5 sections. Therefore routes were both developed and assessed for each individual section and from a holistic standpoint in terms of the overall route. A brief description of each route option identified for each of the 5 sections is presented in the following table, Table 2.1.
- 2.8. To aid a consistent approach, each route option is described in terms of travel from the City Centre to Bearna.



**Table 2.1: Route Options**

Section	Route	Route Description
Section 1	Route 1A	Starts at Wolfe Tone Bridge, proceeds south along Claddagh Quay for 300m before turning west along Nimmo's Pier for 290m before entering Southpark. Proceeds right through Southpark for 780m on existing path before emerging onto Grattan Road. Proceeds for 700m towards Grattan Road/Seapoint Promenade junction. Likely facilities to consist of shared street along Claddagh Quay and Nimmo's pier with shared path facilitated through Southpark and along Grattan Road
	Route 1B	Similar to Route 1A, however at Junction of Claddagh Quay/Nimmo's pier, route continues directly onto Grattan Road and proceeds for 1.3km towards Grattan Road/Seapoint Promenade junction. Likely facilities would consist of shared street along Claddagh Quay with shared path facilitated along Grattan Road
	Route 1C	Starts at Wolfe Tone Bridge, proceeds west along Father Griffin Road for 600m. Veers south onto Whitestrand Road for 540m towards Seapoint Promenade/Grattan road junction Likely facilities to consist of on street cycle lanes.
Section 2	Route 2A	Proceed southwest along Seapoint Promenade towards Salthill Road Upper / Coast road roundabout. Continue west along Coast Road (Salthill Promenade) for 1.2km towards Salthill Diving Board (immediately south west of Threadneedle Road/Coast Road Junction). Likely facilities to consist of either a shared path or two-way cycle track (with adjacent footpath facility) along Salthill Promenade.
Section 3	Route 3A	Starts immediately west of the Threadneedle Road/Coast Road junction, and proceeds south for 100m towards existing coastal path. Proceeds west along existing coastal path for 800m. At this point the route proceeds north along existing access road for 300m which provides access to coast and Salthill Caravan Park. At access road junction with Coast Road, the route deviates northwest for 400m towards Bearna Road/Coast road junction. Likely facilities to consist of shared path along coast, shared space along access road, and shared path along Coast Road.
	Route 3B	Starts immediately west of the Threadneedle Road/Coast Road junction, and proceeds west along Coast Road for 1.2km towards Bearna Road/Coast Road junction. Likely facilities to consist of shared path along Coast Road.
Section 4	Route 4A	Starts at the western end of the existing coastal path at its junction with the coastal access road. At this point the proposed route would proceed west along the coast for 1.9km towards Silverstrand Beach facilitated by the future Sailín to Silverstrand Coastal Protection Scheme. Likely facilities to consist of shared path.
	Route 4B	This route commences at the junction of Gentian Hill / Coast Road. It proceeds west along Gentian Hill for 100m and onto Blakes Hill for another 100m before deviating off road along the northern perimeter of Rusheen Bay for 1.3km. The route then crosses Rusheen Bay by utilising the existing bridge in vicinity of Bearna House Demense and traversing some private lands for 200m before entering into Rusheen Park. The route proceeds through the park and its associated car park for 320m before entering onto the Bearna Road. The route then proceeds towards the Bearna Road/Silverstrand Road junction for 300m. Likely facilities to consist of shared space along Gentian Hill and Blakes Hill and shared path along remainder of route option.
	Route 4C	This route commences at the Bearna Road / Coast Road junction and proceeds west along the Bearna Road for 650m towards its junction with Ballymoneen Road. At this point the route diverts south west along an existing public right of way laneway for

Section	Route	Route Description
		380m. At this point the lane way ends, however there is an existing gravel path that continues for 190m. The path terminates at the existing bridge in vicinity of the Bearna House Demense. At this point the route proceeds similarly to Route 4B towards the Bearna Road/Silverstrand Road junction. Likely facilities to consist of shared path along entire section of route option.
Section 5	Route 5A	This route commences at the Bearna Road/Silverstrand Road junction and proceeds south along the Silverstrand Road for 700m towards Silverstrand beach. At this point the route deviates west along the coast for 1.6km within existing farmland towards Bearna Pier. The route is set to the back of the existing shingle and gravel banks. Along this stretch there is a short section which diverts around three number houses which directly adjoins the foreshore. Likely facilities to consist of shared space along initial section of Silverstrand Road with shared path along remainder of route option.
	Route 5B	This route commences at the Bearna Road/Silverstrand Road junction and proceeds west along the Bearna Road for 2km towards Bearna village and terminates at the Bearna Road/Pier Road junction. Likely facilities to consist of shared path along entire section of route option.

## Route Assessment

2.9. In total 17 No. route options have been assessed allowing for scenarios where different link types were considered along the same route alignment. Route options are assessed with reference to the three key themes of engineering, environmental and land ownership constraints. Within each of the five study area sections various route options were assessed and summarised in a route appraisal matrix coded as follows:

- Green – Positive or neutral Impact
- Blue – Minor Negative Impact
- Red – Significant Negative Impact

2.10. Based on these impacts the options were assessed overall and given a preferred or less preferred status.

2.11. The preferred route option is described in Chapter 3 of this document.

## Appropriate Assessment Screening and Natura Impact Assessment

- 2.12. Initially all Natura 2000 sites within ca. 15km of the proposed greenway were considered. In each case their qualifying interests were assessed against the project. In many instances this allows complete sites and / or specific qualifying interests to be screened out (equivalent to the Stage 1 screening process).
- 2.13. In any instance where the potential for negative impacts on a site or a specific qualifying interest could not be ruled out they were carried forward for more detailed consideration and / or survey.
- 2.14. Full details of the assessment are contained within the document '3271DG11- Stage 1 Screening for Appropriate Assessment & Natura Impact Statement'. A summary of the items which were subject to Full Appropriate Assessment is as follows

### Galway Bay Complex SAC

- 2.15. The majority of the route is not located within Galway Bay Complex SAC. There are, however, four locations where the greenway encroaches upon the SAC.
- 2.16. There are also two habitats which the proposed greenway could potentially interact with two habitats for which Galway Bay Complex SAC has been designated; but in this instance the areas of habitat lie outside the SAC.
- 2.17. With respect to species for which the SAC has been designated Common Seal were screened out as part of the desktop assessment and will not be impacted. As noted a detailed otter survey was undertaken. It was concluded that the proposed scheme will not negatively impact on the conservation status of otter within Galway Bay Complex SAC.
- 2.18. However, due to the ecological sensitivity of the wider Galway area, it is proposed that the successful contractor should be required to prepare a Construction & Ecological Management Plan which includes measures to prevent impacts during construction on waterbirds, otters and bats.
- 2.19. Furthermore, consideration should be given to any areas of sensitive habitat located along the route corridor and specifically measured the protection of perennial vegetation on stony banks and Mediterranean salt meadows must be addressed. This should be prepared by an appropriately qualified ecologist in consultation with NPWS.
- 2.20. Successful implementation of the above would result in a greenway which does not impact on the qualifying interests of Galway Bay Complex SAC.

### Inner Galway Bay SPA

- 2.21. The proposed greenway is not located within Inner Galway Bay SPA. As noted the timing and duration construction are not know at this time; that said the nature of the proposed development is such that the potential for disturbance is low. Also given that works are likely to last for no more than ca. 12 months impacts on wintering waterbirds would if appropriately time be limited to one wintering period.
- 2.22. Furthermore, the appointed contractor should be required to prepare a Construction & Ecological Management Plan which includes measures to prevent impacts on waterbirds. This should be prepared by an appropriately qualified ecologist in consultation with NPWS.
- 2.23. On balance it is concluded that the proposed greenway will not negatively impact upon the conservation status of bird species for which the Inner Galway Bay SPA has been designated.

## 3. Preferred Route Overview

### Overview

- 3.1. The preferred route as identified through an option identification and evaluation process as contained within the Route Options Report (3271DG006) is summarised in the table below.
- 3.2. The preferred route option is illustrated on drawings 3271/HW/110 to 3271/HW/115 as contained in Appendix B.

**Table 3.1: Preferred Route Overview**

Section	Route	Route Description	Proposed Link Provision
1	1A	Starts at Wolfe Tone Bridge, proceeds south along Claddagh Quay for 300m before turning west along Nimmo's Pier for 290m before entering Southpark. Proceeds through Southpark for 780m on existing path before emerging onto Grattan Road. Proceeds for 700m towards Grattan Road/Seapoint Promenade junction.	<ul style="list-style-type: none"> <li>On-treet along Claddagh Quay and Nimmo's Pier;</li> <li>Off road shared path through Southpark facilitated by existing path;</li> <li>Shared path provision adjacent carriageway along Grattan Road.</li> </ul>
2	2A	Proceed southwest along Seapoint Promenade towards Salthill Road Upper / Coast road roundabout. Continue west along Coast Road (Salthill Promenade) for 1.2km towards Salthill Diving Board (immediately south west of Threadneedle Road/Coast Road Junction)	<ul style="list-style-type: none"> <li>Shared path or two-way cycle track provision adjacent carriageway along Seapoint Promenade;</li> <li>Shared path or two-way cycle track adjacent Coast Road carriageway with pedestrians facilitated by the promenade.</li> </ul>
3	3A	Starts immediately west of the Threadneedle Road/Coast Road junction, and proceeds south for 100m towards existing coastal path. Proceeds west along existing coastal path for 800m. At this point the route proceeds north along existing access road for 300m which provides access to coast and Salthill Caravan Park. At access road junction with Coast Road, the route deviates northwest for 400m towards Bearna Road / Coast Road junction.	<ul style="list-style-type: none"> <li>Off road shared path provision facilitated by existing coastal path;</li> <li>Shared space provision provided along access road;</li> <li>Boardwalk Structure facilitating shared path provision adjacent carriageway along short section of Coast Road;</li> <li>Shared path provision adjacent carriageway along Coast Road.</li> </ul>
4	4C	This route commences at the Bearna Road / Coast Road junction and proceeds west along the Bearna Road for 650m towards its junction with Ballymoneen Road. At this point the route diverts south west along an existing public right of way laneway for 380m. At this point the lane way ends, however there is an existing gravel path that continues for 190m. The path terminates at the existing bridge in vicinity of the Bearna House Demense. At this point the route proceeds similarly to Route 4B towards the Bearna Road/Silverstrand Road junction. Likely facilities to consist of shared path along entire section of route option.	<ul style="list-style-type: none"> <li>Shared path provision in the form of a boardwalk structure for circa 400m;</li> <li>Shared path for remainder of route along Coast Road to Ballymoneen junction;</li> <li>Shared space/ shared path provision along Rusheen Bay access lane towards Bearna Demense.</li> <li>Upgrade to bridge structure including reconstructed parapets and deck;</li> <li>Off road shared path provision facilitated by new path within private lands;</li> <li>Off road shared path provision provided through Rusheen Park;</li> </ul>

Section	Route	Route Description	Proposed Link Provision
			<ul style="list-style-type: none"> <li>Shared path provision adjacent carriageway along Bearna Road.</li> </ul>
5	5A	<p>This route commences at the Bearna Road/Silverstrand Road junction and proceeds south along the Silverstrand Road for 700m towards Silverstrand Beach. At this point the route deviates west along the coast for 1.6km within existing farmland towards Bearna Pier. The route is set to the back of the existing shingle and gravel banks. Along this stretch there is a short section which diverts around three number houses which directly adjoins the foreshore.</p>	<ul style="list-style-type: none"> <li>Shared space provision along initial section of Silverstrand Road;</li> <li>Boardwalk Structure facilitating shared path provision adjacent carriageway along remainder of Silverstrand Road;</li> <li>Off road shared path provision provided along coastal section;</li> <li>Shared space provision along short section of route to north of dwellings directly adjoining the foreshore.</li> </ul>

## 4. Design Overview

### Best Practice Guidance and Standards

4.1. The design development of the Bearna Greenway has been implemented in accordance with appropriate design standards and best practice guidance as outlined in the following documents:

- NTA National Cycle Manual (NCM);
- Design Manual for Urban Roads and Streets (DMURS);
- NTA Permeability Best Practice Guide;
- TII Standard DN-GEO-04047 – Rural Cycle Scheme Design (Offline);
- TII Standard DN-GEO-03044 - The Geometric Layout Of Signal Controlled Junctions and Signalised Roundabouts;
- TII Standard DN-GEO-03060 – Geometric Design Junctions

### Design Principle

4.2. As outlined in the NCM, the design of cycle facilities should aim to satisfy the ‘five needs of cyclists’ in order to ensure the development of an appropriate facility. These are:

- Road Safety: Measures should be implemented which increase safety and the perception of safety;
- Coherence: Route and link type should have continuity and layout to be obvious in particular at junctions and connection to existing or other proposed schemes;
- Directness: Route should be direct, minimising delays and bestowing the advantage to cyclists;
- Attractiveness: Route should be well maintained with landscaping and adequate lighting, and;
- Comfort: Routes should provide adequate effective width and surface quality with minimal delays;

4.3. DN-GEO-04047 also identifies the following related principles;

- Convenience: The new facility should offer a clear advantage over previous route (i.e. adjacent the carriageway) in terms of safety and attractiveness. Routes and key destinations should be appropriately sign posted.
- Access: All pedestrian and cycle users and bicycle types should be facilitated, routes should connect all main origins and destinations.

### Link Type and Cross-Section

4.4. In general, there are two primary cycling regimes which should be identified for links from the outset. These are as follows:

- **Integrated Cycling**: This is cycling within general road and street traffic, with or without marked cycle lanes;
- **Segregated Cycling**: This is cycling on dedicated cycle tracks or cycle ways that are separated from general road and street traffic by a physical vertical or horizontal barrier.

4.5. There are a number of factors which influence the identification of an appropriate cycling regime. These are as follows;

- Traffic Speed and Volume;
- Width Requirements;
- Form of Construction.

- 4.6. The overall vision for the route itself and the surrounding area in the context of delivering sustainable travel patterns is also of key importance.
- 4.7. The above factors have been assessed for the relevant sections of the proposed greenway route and are presented following.

### Traffic Speeds and Volumes

- 4.8. The key criteria being considered are:

- **Annual Average daily Traffic (AADT):** The total vehicle volume passing a point or segment of a road for one year, divided by the number of days in the year.
- **85th Percentile Speeds:** The speed only exceeded by 15% of vehicles passing a point on a road.

- 4.9. The below table indicates the appropriate type of facility to be implemented based on the key criteria of AADT and 85th percentile speeds.

**Table 4-1 Type of Cycle Facility (Adapted from DN-GEO-04047)**

85th Percentile Speeds	<30kph	30-50kph	50-60kph	60-80kph
AADT				
<5,500 AADT	Shared Street	Shared Street	Cycle Lane	Cycle Track
5,500-10,000 AADT	Shared Street	Cycle Lane	Cycle Track	Cycle Track
>10,000 AADT	Cycle Lane	Cycle Track	Cycle Track	Cycle Track
<b>Integration</b>				
<b>Segregation</b>				

- 4.10. Traffic surveys as provided by Galway City Council have been reviewed in terms of volumes and speed. Review of vehicle speed and traffic volume in light of the above table indicates that the most appropriate prevailing link type is a Cycle Track. Note that where stated in the above table, cycle track is the basic provision required and therefore accounts for facilities located within the road corridor or segregated from the road corridor, for the sole use of cyclists and if permitted, pedestrians.
- 4.11. Therefore the majority of the proposed greenway has been developed as an off road shared use pedestrian and cyclist path.
- 4.12. However, there are a number of locations where alternative link type options are appropriate. These are as follows:
- Two-way cycle track: A two-way cycle track on the southern side of the road is proposed along Seapoint Promenade and Salthill Promenade;
  - Shared street: Shared street is proposed on a number of sections of the route where the prevailing conditions are conducive to support a mixed cycling regime. This includes Claddagh Quay, Nimmo's Pier, Salthill Caravan Park Access Road, and Access Laneway to Rusheen Bay. Additional measures are recommended where necessary to further cater for a mixed cycling regime along these sections.
- 4.13. It should also be noted that some of these proposed shared street/shared road sections are already conducive to this form of cycling regime.

### Width Requirements

- 4.14. Within TII Standard DN-GEO-04047, low volumes are defined as being below 1500 users per day whilst high volumes are identified as being above 1500 users. Table 4.1 'Required Cross Sectional Widths' of DN-GEO-04047 identifies the corresponding widths required with desirable minimum width of 3.0m for low volume and 5.0m for high volume.



- 4.15. The above advice has been applied in terms of the general widths associated with a shared path provision for pedestrians and cyclist along rural sections. However, it is considered that further guidance is required for width requirements along urban section of the scheme, particularly along Grattan Road, Seapoint Promenade and Salthill Promenade. As such, guidance has been sought from the London Cycle Design Standards (LCDS). This guidance details the flow category and associated widths for peak volume flows as shown in Table 4.2 below.

**Table 4-2 Guideline Flow Categories (Adapted from LCDS)**

Peak Flow Categories	Shared Path		Two-Way Cycle Track
	Pedestrians per Hour	Cyclists per Hour	
Low	0-200	0-150	0-300
Medium	200-450	150-300	300-1000
High	450+	300+	1000+

- 4.16. As part of the project, pedestrian and cyclist surveys have been carried out at key urban locations along the proposed route to determine what level of the existing volumes currently occur. Table 4-3 below identifies these volumes.

**Table 4-3 Recorded Peak Pedestrian and Cyclist Volumes**

Location	Weekday (Tuesday 19/08/2014)		Weekend (Sunday 17/08/2014)	
	Pedestrians	Cycles (off road & on road)	Pedestrians	Cycles (off road & on road)
Grattan Road	211	66	265	43
Seapoint Promenade	333	81	539	64
Salthill Promenade	552	97	934	64

- 4.17. Review of the above table suggests that Grattan Road experiences a medium volume of pedestrians with a peak of 265 recorded on a Sunday. The corresponding cyclist flow is very low at 43.
- 4.18. It can be said that a high volume of pedestrian movements are experienced along Seapoint Promenade, with a peak volume of 539 two-way pedestrian movements recorded on a Sunday afternoon. The corresponding volume of cyclists is low at 34 off-road and 30 on-road during the peak hour. The volume of pedestrians is some 8 times higher than that of cyclists.
- 4.19. The same is true of Salthill Promenade which experiences the maximum volume of pedestrian movement in the entire study extents. This equates to a peak volume of 934 two-way pedestrian movements on a Sunday afternoon. This would be considered to be very high. The corresponding volume of cyclists is low at 35 off-road and 29 on-road during the peak hour. The volume of pedestrians is some 15 times higher than that of cyclists.
- 4.20. A shared path facility is therefore proposed along Grattan Road, whilst given the relative difference between pedestrians and cyclists along both Seapoint and Salthill Promenade, it is considered preferable to separate the modes along this sections through a proposed a two-way cycle track to facilitate cyclists. Pedestrians will continue to use the existing promenades.
- 4.21. The LCDS recommends appropriate effective widths for shared paths and cycle tracks as outlined below.

**Table 4-4 Recommended Effective Widths (Adapted from LCDS)**

Peak Flow Categories	Shared Path	Two-Way Cycle Track
Low	2.2m	2.0m
Medium	3.0m	3.0m
High	4.5m	4.0m
Note: Additional Widths <ul style="list-style-type: none"> <li>• 200mm for low vertical feature of up to 150mm high;</li> <li>• 250mm for vertical feature of between 150mm to 600mm high;</li> <li>• 500mm for vertical feature of above 600mm height.</li> </ul>		

- 4.22. Utilising the pedestrian count survey data and assessing these against the standards required, the following minimum widths are proposed.

#### **Shared Pedestrian and Cycle Path: Located Adjacent Road**

- 4.23. This type of facility is proposed within Section 1 along Grattan Road. Given the medium level of pedestrian and cycle flows it is considered appropriate to provide a 3.0m effective width. Given the paths location adjacent trafficked lanes, it is considered appropriate to provide a 0.5m buffer to either side of this effective width to account for additional features such as kerbs, walls, signage and street furniture. The minimum path width required is therefore 4.0m.

#### **Shared Pedestrian and Cycle Path: Located Off Road**

- 4.24. This type of facility is proposed within Section 1, Section 3, Section 4 and Section 5. Given the medium level of pedestrian and cycle flows it is considered appropriate to provide a 3.0m effective width. The path is located away from trafficked lanes and therefore it is considered appropriate to provide 0.5m to 1.0m verge on both sides of the 3.0m effective path width to account for adjacent features such as fences.
- 4.25. There is one particular link within Section 3 along the coast line which extends from the Diving Board at the western end of Salthill Promenade to the Caravan Park, where an existing path is to be utilised. This path is generally 3.2m wide with a coastal protection wall along its southern perimeter and the Golf Club lands along its northern perimeter. It is not proposed to widen the path given these physical constraints. Notwithstanding, it is considered that the width of the path is sufficient to adequately cater for the current and future pedestrian and cyclist volumes along this stretch.

#### **Two-Way Cycle Track: Located Adjacent Road**

- 4.26. This type of facility is proposed within Section 2 and there are a number of reasons as to why this facility is preferred. The current pedestrian levels within Section 2 are high whilst the cyclist volumes are noteworthy but relatively low in comparison. Additionally there are significant conflict issues due to cross movements and pedestrian congregation occurring along Seapoint Promenade and in particular Salthill Promenade. As such the optimum solution is considered to be segregation of the modes.
- 4.27. The raised two-way cycle track is proposed to run adjacent the southern side of the R336 Coast Road. It is proposed to provide a 2.5m wide effective width with an additional 500mm afforded to each edge to account for adjacent vertical features. In comparison with the NTA Width Calculator, for a basic two-way cycle track adjacent a 50kph road, a width of 2.75m is required. Therefore a two-way cycle track of 3.0m total width is proposed.
- 4.28. The with-flow cyclists will be positioned closest to traffic whilst the contra-flow cyclist will be positioned on the inside and as such furthest from traffic.

## Shared Street

- 4.29. This type of facility is proposed within Section 1 along Claddagh Quay and Nimmo's Pier. It is also proposed within Section 3 along the access road to Salthill Caravan Park and within Section 4 along the access laneway to Rusheen Bay.

## Form of Construction

- 4.30. As the route of the greenway scheme predominantly runs adjacent the local road network, the retrofitting of the existing road corridor and the construction of the Greenway as an adjacent pathway has been the adopted as the general design solution in order to provide an appropriate pedestrian and cycle facility. In this context there are generally four options available:
- Reduction of motorised vehicle speeds on low trafficked roads;
  - Redistribution of the existing space within the road corridor;
  - Use of available public land adjacent the roadway;
  - Purchase of additional land to accommodate the proposed cycling facility.
- 4.31. Within Section 1 it is proposed to manage traffic speeds on Claddagh Quay and Nimmo's Pier, utilise available public land through Southpark on existing path and redistribute existing road space on Grattan Road.
- 4.32. Within Section 2, it is proposed to redistribute existing road space which will incur losses to parking on the southern side of the carriageway.
- 4.33. Within Section 3, it is proposed to utilise public lands along the coast on existing path, utilise public right of way along existing access road to caravan park, acquire additional land adjacent Coast Road to construct a short section of boardwalk structure and redistribute existing road space along Coast Road up to junction with Bearna Road.
- 4.34. Within Section 4, it is proposed to acquire additional land adjacent Bearna Road to construct a boardwalk structure, utilise available public land adjacent Bearna Road, utilise existing public right of way along existing laneway, acquire additional lands through Bearna Demesne, utilise public lands through Rusheen Park and associated car park, utilise available public land adjacent Bearna Road, manage traffic speeds on initial section along Silverstrand Road, acquire additional lands adjacent Silverstrand Road to construct boardwalk/bound path.
- 4.35. In section 5, it is proposed to acquire additional land adjacent the coast from Silverstrand to Bearna Pier.

## Parking

- 4.36. The proposed scheme along both Seapoint Promenade and Salthill Promenade will require a noteworthy reduction in on street parking in order to accommodate the preferred two-way cycle track adjacent road.
- 4.37. An assessment of on-street parking indicates that the current approximate number of spaces along Seapoint Promenade and Salthill Promenade is approximately 155 and 140 No. spaces respectively (Note: Individual parking bays are not defined on the ground, thus it is assumed that parked vehicles will take up 6m lengths).
- 4.38. The potential loss of spaces resulting from the two-way cycle track adjacent the road along the full length of both promenades, excluding locations where there are currently double yellow lines, is in the order of 90 spaces along Seapoint Promenade and of the order of 40 spaces along Salthill promenade.
- 4.39. Notwithstanding the above, as part of the plan to manage traffic in the central area of Galway City, the Galway Transport Strategy (GTS) envisages that the availability of on street parking will be

reduced. As such, there will be a greater emphasis on rationalising and managing access routes to off street parking facilities.

4.40. As such the reduction of parking along both promenades aligns with the vision of the GTS and is therefore acceptable. However, the implementation of Bearna Greenway and traffic management proposals of the GTS will need to be co-ordinated to ensure that off street parking facilities are in place, appropriately managed and accessible with the necessary way finding signage implemented.

4.41. The latest revision of drawings 5138824 / HW / 300 – 315 are contained in Appendix C.

## 5. Design Details

### Pavement and Kerb Construction

#### Pavement

- 5.1. Bicycles are more sensitive to ride quality than motor vehicles and as such it is imperative that the quality of all finished surfaces meet the minimum requirements of Series 700 Road Pavements General (CC-SPW-00700) and Series 900 Road Pavements Bituminous Materials (CC-SPW-00900) of the Transport Infrastructure Ireland's Specification for Road Works. A cycle facility with good surface quality will increase the attractiveness and comfort to potential users.
- 5.2. With this in mind, it is envisaged that pavement construction for the proposed shared path and cycle-tracks will consist of;
- Capping layer (where necessary) at a minimum of 300mm, exact depth to be determined by insitu CBR testing.
  - Geotextile membrane (where necessary);
  - Sub-base of minimum 150mm clause 804 material;
  - Base course of 70mm Asphalt Concrete (bitmac) with 32mm nominal stone;
  - Surface course of 25mm Stone Mastic Asphalt (SMA) with 10mm nominal stone.
- 5.3. Note that exact pavement construction to be determined at detailed design stage.

#### Kerbing

- 5.4. Road side kerbing provided adjacent new footpath, shared path and cycle-track construction is to consist of 255mm x 125mm half batter precast concrete kerbs. Upstand adjacent footpath and shared path to be 100mm. Corresponding upstand for new cycle –track is to be 70mm. The edge of the shared path and track will be demarked with a continuous white line at a 300mm set back from the kerb edge.
- 5.5. Precast concrete bull nose kerb 150mm x 50mm wide to be installed to provide pavement edge restraint where necessary.

#### Gradients

- 5.6. The overall gradient along a cycle facility is an important design consideration and directly impacts on cyclists needs in terms of comfort and attractiveness.
- 5.7. The following are the maximum gradients permissible for cycle facilities as per Table 4.3 of DN-GEO-03040 and Table 6.2 of DN-GEO-03031 of the TII Standards. These requirements are equally applicable to on road, off road and off line cycle facilities in both urban and rural situations.

**Table 5-1 Vertical Gradient Requirements (Reproduced from TII Publications Standard)**

	Gradient	Notes
Desirable Maximum	3%	n/a
One step below Desirable Maximum	5%	n/a
Two steps below Desirable Maximum	10%	Provision of gradients greater than 5% should be confined to short sections, preferably less than 100m in length.

## Boardwalk

### General

- 5.8. There are three locations on the proposed greenway scheme where the provision of a raised boardwalk structure is necessary due to environmental and engineering constraints.
- 5.9. The first boardwalk, is located within Section 3, along the R336 Coast Road immediately west of the access road to the Caravan Park and extends for 80m.
- 5.10. The second boardwalk is located within Section 4, along the R336 Bearna Road immediately west of the R336 Bearna Road / R336 Coast Road junction and extends for approximately 400m.
- 5.11. The third boardwalk is also located within Section 4, along Silverstrand Road and extends for approximately 140m.
- 5.12. All boardwalks are required due to a lack of width within the adjacent road cross-section and the requirement to traverse either poor ground conditions or sloping gradients. It is envisaged that the greenway boardwalks will be constructed at a level commensurate to the existing road level.
- 5.13. Along with the upfront capital investment required for a boardwalk, the ongoing maintenance and repair costs will play a significant role in the selection of an appropriate boardwalk and in particular the constituent material of the boardwalk.
- 5.14. Items which would be of particular interest in terms of maintenance are listed following:
- Slip resistance of surface;
  - Painting or treatment requirements;
  - Susceptibility to rotting or splintering;
  - Loosening of screws and or bolts;
  - Graffiti removal;
  - Susceptibility to fire.

### Boardwalk Details

- 5.15. It is envisaged that the boardwalk will be constructed of either timber or recycled plastic material. The width of the boardwalk will provide a total clear distance of 4.0m to allow for 0.5m edge clearances and thus an effective width of 3.0m to be achieved. Handrails at 1.40m height will be provided to include intermediate rails. Where the raised boardwalk extends beyond a clear height above ground level of 1.80m a bespoke steel support structure is likely to be required.
- 5.16. It would be envisaged that piling of the support posts would be required if suitable ground conditions exist. Suitable plant would be required to undertake this. Should rock be encountered the support posts could be socketed into the rock.

### Slopes or Ramps

- 5.17. The boardwalk will generally be constructed to a relatively flat gradient. The desirable maximum gradients will be 3% with an absolute maximum not exceeding 5%. The maximum cross fall shall not exceed 1:45.

### Slip Resistance

- 5.18. A critical factor in the success of a boardwalk and its attractiveness to the end user is ensuring that adequate slip resistance is achieved.
- 5.19. Section 16 of the Safety, Health and Welfare at Work Act, 2005 places legal obligations on those who design, supply and install flooring, to ensure that it:
- Is designed and constructed so that it can be used safely and without risk;
  - Complies with any relevant legislation, and;

- Is properly tested and examined so as to meet such requirements.

5.20. Pendulum results are referred to as Pendulum Test Values (PTV) or Slip Resistance Values (SRV). PTV's are generated for both wet and dry conditions. When the test is operated properly, the PTV should be interpreted as shown in Table 5.2 as follows:

**Table 5-2 Slip Potential Classification**

Slip Potential	PTV
High slip potential	0-24
Moderate slip potential	25-34
Low slip potential	35-65
Extremely low slip potential	66+

- 5.21. The PTV tests are normally undertaken in three directions, along the board, across the board and diagonal. Slip resistance measured across the grain is likely to be higher than in the along grain direction and the best results are normally obtained in the across grain direction. Decking should therefore be laid with the profile or grain running perpendicular to the direction of travel.
- 5.22. Annexe E of BS 8300 – 2009 outlines that for level external surfaces a wet PTV of 36 is considered suitable. However, where a user is likely to be turning (i.e. a wheelchair user, or indeed a cyclist) a wet PTV of 40 is more appropriate. On a sloping surface, the PTV needs to be higher again to compensate for the increase in the lateral component force. Desirable gradients of 1:20 require a PTV of 45 whilst a maximum gradient of 1:12 requires a PTV of 49.
- 5.23. It is therefore recommended that upon installation of the structure surface a minimum cross profile PTV of 50 should be achieved. A warranty should be agreed with the manufactures to ensure that the required minimum PTV is maintained for a minimum period of 5 years.
- 5.24. Notwithstanding the above, given that the greenway the current and future usage of the greenway, it is recommended that decking is coated in a polyurethane bound aggregate. Polyurethane bound aggregate surfacing has a quoted life span of 7-10 years. Repair can be undertaken in-situ by reapplying the resin and aggregate without the need for replacing the decking boards.

## Junction and Crossings

### Side Roads, Accesses and Crossing Facilities

- 5.25. Within areas where the greenway is located adjacent to an urban road or street carriageway, it is aligned along the southern side (i.e. coast side). As such the greenway does not encounter many side road junctions or side access points. Where the greenway does encounter these features, the proposed design requires greenway users to yield priority to side roads junctions and utilise the provided side road raised uncontrolled crossing, when it is safe to do so. Where greenway users encounter side access points, mainly associated with private dwellings, the proposed design allows them to maintain priority across the access, thereby requiring vehicles crossing the facility to yield priority.
- 5.26. Within Sections 1, 2 and 3, there are a number of junction upgrades being proposed. The majority of these are priority controlled side road junctions. In general terms kerb radii have been tightened



where possible to 4.5m in urban areas and 6.0m in rural areas. This ensures that approaching vehicles have to slow down to make the turn and crossing distances are reduced for pedestrians.

- 5.27. Stop lines at priority side road junctions have been set back along the minor road arm so that they are in line with the back edge of footpath or in some cases in line with the building line. This increases driver expectation of main road priority and reduces conflicts with pedestrians. As such vehicles make a two stage approach to the junction where they stop at the setback stop/yield line, allowing any pedestrians or cyclists to take priority and cross with a greater degree of comfort and security. Drivers will then slowly proceed forward to the road edge line to make their intended turning movement when appropriate.
- 5.28. There are also 3 no. proposed signalised junctions; These are as follows:
- **Salthill Road Upper/Coast Road junction (D'Arcy Roundabout):** This existing roundabout junction is to be developed as a Signalised 'T' junction in line with recommendations proposed within the Galway Transportation Strategy. As such the junction incorporates bus priority measures such as 50m bus lanes on the western and eastern approaches. The traffic signals will provide high quality crossing facilities on all arms and should also incorporate technology to prioritise bus progression through the junction.
  - **Threadneedle Road / Coast Road junction:** This existing mini roundabout junction is proposed to be developed as a Signalised 'T' junction in line with recommendations proposed within the Galway Transportation Strategy. The traffic signals will provide high quality crossing facilities on all arms and should also incorporate technology to prioritise bus progression through the junction.
  - **Bearna Road / Coast Road junction:** This existing Priority 'T' junction is to be developed as a Signalised 'T' junction. The southern approach along the Coast Road is to be reduced from double lane entries to a signal lane entry to accommodate the proposed greenway along the western side. The ghost island right turn lane on the western approach of the Bearna Road is to be retained. The traffic signals will provide high quality crossing facilities on all arms.
- 5.29. At mid-block controlled crossings located along the two-way cycle track, traffic signals will require pedestrians to cross both the cycle track and street carriageway in one go. Therefore, traffic signals specific to cyclists will operate in sequence with the adjacent vehicle traffic signals. These crossings will be facilitated with raised platforms and tactile paving.

## Bus Stop Provisions

- 5.30. All existing bus stops have been retained. These are predominantly located along the Coast Road within Section 2 adjacent to Salthill promenade. Where amendments are required bus stops have been locally relocated and/or repositioned as necessary. The bus stops in vicinity of the off street car park at Salthill Promenade are designed as inset bus bays. All other bus stops are designed as inline bus bays.
- 5.31. In vicinity of bus stops, the two-way cycle track is designed to transition into an unsegregated shared use bus boarder area for pedestrians and cycle users at footway level. This enables cyclists to continue across the bus boarder without impacting their progression when it is clear to do so or to slowly cycle past passengers alighting a waiting bus. The design of the bus border and positioning of the associated tactile paving will be such that it encourages bus passengers to wait for buses behind the back edge of the bus boarder.

## Accessibility

- 5.32. The Greenway Scheme has been designed with the requirements of the mobility and visually impaired in mind. Reference in this regard has been made to the National Disability Authorities guidance document "Building for Everyone" 2013.

## Year Round Access

- 5.33. The location of the greenway in proximity of Galway Bay presents the risk of flooding. Notwithstanding, it should be noted that flooding in itself is not an insurmountable problem provided that the length of time over which the route is flooded is limited. A rule of thumb, as outlined by

Sustrans guidance documents, suggests that if the path is impassable for 2% of the year (i.e. impassable for 5 - 10 days), this would be considered to be acceptable. It is also suggested that situations where the path is available for 95% of the time (i.e. impassable for 15 – 20 days) rather than not at all would still represent a significant bonus for the amenity value of the adjacent area.

- 5.34. As part of the planning and detailed design stages, a Flood Risk Assessment should be undertaken to ascertain the potential for flooding.

## Surfacing

- 5.35. The Greenway pavement will be of bound material to provide a consist flat smooth surface universally accessible by all users including people with reduced mobility, wheelchair users, the visual impaired, families with small children or buggies and older people. Surface finishes should be smooth, non-slip, hard, all weather surfaces free from all potential trip hazards.
- 5.36. The alignment and cross fall of the path will be designed such that it easily sheds water efficiently and ensure that the path can be easily cleaned of any silt or debris retained after a flood event.

## Access Controls

- 5.37. It is likely that access controls to the greenway route, particularly from the Diving Board at Salthill to Bearna Pier, will be required to deter passage of livestock, vehicles and motorcycles whilst enabling access by maintenance vehicles. The exact form of control measures will be subject to further consideration at detailed design stage, however it should prevent unauthorised motorised vehicles accessing whilst still allowing comfortable access by cyclists, pedestrians and wheelchairs. Locked removable bollards could be used to allow access by maintenance vehicles.

## Tactile Paving

- 5.38. Tactile paving is used to guide visually impaired pedestrians at crossings. A “Buff” coloured tactile paving slab is to be used at uncontrolled crossings and should be laid across the full width of the flat dropped kerb and be 800mm deep. “Red” tactile paving slabs are used at controlled crossings. The layout at controlled crossings should form an “L” shape, which includes a stem of 1200mm width that extends to the back of the footpath.

## Drainage

- 5.39. Adequate drainage has a significant impact on the quality and safety of cycling facilities. Where possible the existing drainage infrastructure is to be maintained. Where necessary this will be upgraded to the desired standard.
- 5.40. Cycle friendly drainage, such as side entry gullies, will be incorporated where appropriate. If gullies or manhole covers cannot be relocated off-line, they will be finished flush and recessed covers provided to avoid slippery surfaces.
- 5.41. Cycle facilities surfaces shall drain to one side. On bends this shall be to the shorter radius to avoid negative camber and increased skidding risk. Cross falls shall be between 1:100 (1%) and 1:33 (3%). Long falls to be between 1:33 (3%) and 1:20 (5%) to avoid ponding. Gradients greater than 1:20 and up to a maximum of 1:10 (10%) are to be confined to shorts section of the route.

## Public Lighting

- 5.42. Public lighting is an essential part of any urban greenway scheme. It increases the attractiveness and sense of security of the scheme. Existing public lighting along the Claddagh Quay, Nimmo's Pier, Grattan Road, Seapoint Promenade and Salthill Promenade are of a sufficient standard to illuminate all road surfaces and the greenway.
- 5.43. However, with the removal of the central refuge that lies between the D'Arcy Roundabout and Dalysfort Road, there will be a requirement to relocate the existing public lighting columns within this verge appropriately.

- 5.44. Within Southpark it is proposed to install new lighting for the purpose of lighting the greenway. It is also proposed to install new public lighting along the existing path extending from the Diving Board to the Caravan Park and along the existing access road to the Caravan Park. Public lighting will be then be upgraded where necessary from the Caravan access road junction along Coast Road, up to the Ballymoneen Road junction along Bearna Road.
- 5.45. Beyond this point, the greenway takes on a more rural context and thus the requirement for Public Lighting is not as necessary or desirable. Thus, from the Ballymoneed Road junction onwards to Bearna Pier, there are no proposals to provide public lighting.
- 5.46. All new and upgraded public lighting along the greenway will be subject to further bespoke design at the detailed design stage. The provision of standard lighting similar to existing is assumed and the design will be such as to limit light spillage onto adjacent lands.

## Traffic Signs and Road Markings

### Traffic Signs

- 5.47. The greenway will require a high quality signposting system. The signing system should be designed as a single entity and the signs should be of a uniform standard in accordance with the Department of the Environment Traffic Signs Manual.
- 5.48. Signs should also be carefully sited to avoid any interference with the sight lines or visibility distances incorporated into the geometric design.
- 5.49. Additional pedestrian and cycle signage associated with the proposed greenway will also be provided.

### Road Markings

- 5.50. Painted road marks will be used to delineate the carriageway centre line and associated junction markings to complement regulatory signs in accordance with the Traffic Sign Regulations and the DOE Traffic Signs Manual.
- 5.51. Additional pedestrian and cycle markings associated with the proposed greenway will also be provided.

## Parking

- 5.52. The proposed two-way cycle track located within Section 2 along Coast Road will result in removal of all parking to the southern side of the carriageway adjacent Seapoint Promenade and Salthill Promenade. This approximately accounts for the loss of 90 spaces along Seapoint Promenade and 40 spaces along Salthill Promenade. Parking to the northern side of the carriageway will be retained and formalised through provision of buildouts at junctions and at mid-block crossing locations. On street parking bays have been designed as 2.4m wide by 6.0m long bays.

## Structures and Fencing

- 5.53. At the eastern end of the Rusheen Bay lane way which links Bearna Road at the Bearna Road / Ballymoneen Road junction to Bearna Demense, there is an existing bridge structure. This bridge structure traverses Bearna Stream at the point at which it enters Inner Galway Bay North.
- 5.54. Alterations to this existing disused bridge will be required. An initial visual assessment has indicated that the existing bridge abutments and deck are of sound construction. Therefore the upgrade will mainly consist of installing bridge guardrails and resurfacing the existing deck. However a thorough bridge inspection by qualified personnel will be required at detailed design stage to definitively ascertain suitability of the existing abutments and deck. Whilst it is not proposed to alter the primary structure of the existing bridge, the provision of new railings and the resurfacing of the existing deck may result in an impact on the hydraulic characteristics of the

adjacent watercourses during a flood event and as such it is likely that a Section 50 application to the Office of Public Works (OPW) will be required to obtain consent.

- 5.55. All new fencing proposed, which is predominantly located within Section 5 from Siverstrand Beach to Bearna Pier, will be installed at a setback of 1.0m from the path edge to facility the 3.0m effective width of the shared path and at a minimum height of 1.4m.

## 6. Cost Estimate

### Preliminary Cost Estimate

6.1. A preliminary cost estimate for the Proposed Scheme has been undertaken based on the allowances and assumptions outlined in Table 6.1. These assumptions should be read in conjunction with the latest revision of drawings 5138824 / HW / 300 – 315 as contained in Appendix C.

**Table 6-1 Assumptions**

SERIES	WORKS DESCRIPTION	ASSUMPTIONS
000	General	<ul style="list-style-type: none"> <li>The cost estimates have been developed based on historical rates from other similar projects and TII Schedule of Rates;</li> <li>A contingency of 20% has been applied to the subtotal of measured works and preliminaries;</li> <li>The cost estimates do not allow for the cost of land-take or accommodation works;</li> <li>The costs estimates do not allow for furniture and landscape features;</li> <li>The cost estimates do not allow for the cost associated with maintenance;</li> <li>The costs estimates do not allow for design costs and professional fees;</li> <li>All figures are rounded to the nearest hundred.</li> </ul>
100	Preliminaries	<ul style="list-style-type: none"> <li>Preliminaries have been estimated at 10% of the measured works;</li> <li>Traffic management has been estimated at 5% of the measured works;</li> </ul>
200	Site Clearance	<ul style="list-style-type: none"> <li>A general site clearance rate has been applied to the whole site area of the proposed scheme;</li> </ul>
500	Drainage & Utilities	<ul style="list-style-type: none"> <li>Utilities works have been estimated based on available topographical survey information;</li> <li>Widening of footpaths and promenades, reduction of road carriageways and introduction of cycle tracks and associated features will require manholes, gullies and other drainage features and associated connections to be raised, lowered, repositioned, relocated or removed;</li> </ul>
600	Earthworks	<ul style="list-style-type: none"> <li>Earthworks include for excavation and disposal of unacceptable material and hard material and preparation of formation and sub-formation;</li> <li>A significant proportion of earthworks is due to the excavation and disposal of all footpaths (100mm concrete) and assumed unacceptable material below footpath (150mm base);</li> </ul>
700	Road Pavement Construction	<ul style="list-style-type: none"> <li>Road pavement works assumed to consist of cold milling and disposal of existing carriageway at specified locations to a depth of 100mm;</li> <li>Overlay of carriageway includes for 60mm binder course and 40mm surface course;</li> <li>Requirement for capping layer assumed for new shared path construction in open field;</li> <li>New pavement works includes for full pavement construction, subbase and capping layer;</li> </ul>
1100	Kerbs, Footpaths & Paved Areas	<ul style="list-style-type: none"> <li>Works include for new construction of shared cycle paths and cyclist only two-way cycle tracks including full pavement construction, subbase and associated kerbs.</li> <li>Allowance is also made for buildouts narrowing of corner radii at side roads and new junctions;</li> </ul>

SERIES	WORKS DESCRIPTION	ASSUMPTIONS
1200	Signing & Lining	<ul style="list-style-type: none"> <li>New lining assumed for entire extents of scheme.</li> <li>New signage associated with pedestrian and cycle facilities assumed;</li> <li>Signage requiring take down assumed to be replaced;</li> </ul>
1300	Public Lighting	<ul style="list-style-type: none"> <li>Where existing public lighting is present, this is assumed to be of adequate standard;</li> <li>New lighting installed assumed to be standard road lighting columns and lanterns;</li> </ul>
1400	Electrical Work	<ul style="list-style-type: none"> <li>Electrical work and equipment associated with traffic signals, signalised crossings and zebra crossings included;</li> <li>Impacts on services have not been included within this preliminary cost estimate. It is envisaged that this work be undertaken at detailed design through consultation with the relevant service providers.</li> </ul>
2400	Structures	<ul style="list-style-type: none"> <li>Accommodation works over and above that which forms part of the design proposals or which may be negotiated during the land acquisition process have not been included within this preliminary costs estimate.</li> <li>Estimate for Boardwalk sections are based on manufacturer's standard design and specification and includes for standard delivery and installation costs.</li> </ul>

6.2. Table 6.2 on the following page summarises the preliminary cost estimate items:

**Table 6-2 Preliminary Cost Estimate**

SERIES	WORKS DESCRIPTION	Section 1 Cost (€)	Section 2 Cost (€)	Section 3 Cost (€)	Section 4 Cost (€)	Section 5 Cost (€)	Total Cost (€)
200	Site Clearance	€135,500.00	€86,100.00	€27,200.00	€43,100.00	€5,900.00	€297,800.00
500	Drainage & Utilities	€24,000.00	€112,900.00	€10,900.00	€11,300.00	€1,000.00	€160,100.00
600	Earthworks	€11,400.00	€193,400.00	€25,200.00	€23,200.00	€19,800.00	€272,900.00
700	Road Pavement Construction	€29,200.00	€109,000.00	€34,200.00	€25,400.00	€0.00	€197,700.00
1100	Kerbs, Footpaths & Paved Areas	€96,600.00	€416,300.00	€112,700.00	€219,400.00	€332,400.00	€1,177,400.00
1200	Signing & Lining	€8,000.00	€19,100.00	€256,400.00	€8,000.00	€2,800.00	€374,300.00
1300	Public Lighting	€54,800.00	€9,100.00	€92,800.00	€6,100.00	€0.00	€162,800.00
1400	Electrical Work (Incl Traffic Signal Equipment)	€41,500.00	€718,600.00	€250,200.00	€82,300.00	€0.00	€1,092,600.00
2400	Structures (Boardwalk)	€0.00	€0.00	€86,100.00	€602,400.00	€0.00	€688,500.00
<b>Sub -Total Measured Works</b>		<b>€401,000.00</b>	<b>€1,664,500.00</b>	<b>€674,600.00</b>	<b>€1,021,300.00</b>	<b>€361,800.00</b>	<b>€4,089,000.00</b>
100	Preliminaries (10%)	€40,100.00	€67,500.00	€102,100.00	€97,400.00	€36,200.00	€408,900.00
100	Traffic Management (5%)	€20,100.00	€33,700.00	€51,100.00	€48,700.00	€18,100.00	€204,500.00
<b>Sub -Total Series 100</b>		<b>€461,200.00</b>	<b>€1,914,100.00</b>	<b>€775,700.00</b>	<b>€1,174,500.00</b>	€416,100.00	€4,702,400.00
Contingencies (20%)		€92,200.00	€382,800.00	€155,100.00	€234,900.00	€83,200.00	€940,500.00
<b>TOTAL CONSTRUCTION WORKS (Exc. VAT)</b>		<b>€553,400.00</b>	<b>€2,297,000.00</b>	<b>€930,900.00</b>	<b>€1,409,400.00</b>	<b>€499,300.00</b>	<b>€5,642,900.00</b>
VAT @ 13.5 %		€74,700.00	€310,100.00	€125,700.00	€190,300.00	€67,400.00	€761,800.00
<b>TOTAL COST (INC. VAT)</b>		<b>€628,100.00</b>	<b>€2,607,000.00</b>	<b>€1,056,600.00</b>	<b>€1,599,600.00</b>	<b>€566,700.00</b>	<b>€6,404,600.00</b>

6.3. The preliminary estimated cost of the Proposed Scheme is in the order of €6.5 million.