Santry River Greenway Feasibility Appraisal

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Santry River Greenway

Feasibility Study Report 2016

A DIT Students Learning With Communities Initiative in Association with the Northside Partnership.
This project is a partnership between the Northside Partnership and DIT Environmental Management and Spatial Planning.

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Preface

The Northside Partnership Healthy Communities Pilot Area.
The North East Dublin area has been identified for the development of a plan addressing health inequality and promoting a Healthy Community (WTO 2011) by the Northside Partnership (NSP), a local development company established in 1991 to address social exclusion, and the Dublin North Health Promotion Department.

Poor health has been identified as an issue for people who live in areas affected by structural disadvantage and social exclusion in North East Dublin. A community survey in 2008 and a health needs assessment in 2003 both highlighted risk factors for high levels of chronic disease risks in the surveyed neighbourhoods and raised problems relating to mental health, income levels and environmental issues which all impact on health. Sustainable transport was identified as one of the key areas which could bring social, economic, environmental and health gains to the Pilot Area.

Promoting the Development of the Santry River Greenway
As part of the area-wide cycling audit carried out in 2014, the Santry River Greenway Corridor was identified as a key potential resource for increasing mobility, health and long-term social inclusion within the Pilot Area. The greenway is identified as part of the Strategic Green Network in the National Transport Authority (NTA) Cycle Strategy for the Greater Dublin Area (GDA). Yet, of all the greenways, it alone has not commenced through the planning stages. In the Dublin City Development Plan 2016-2022, Dublin City Council (DCC) states that it is its objective to ‘develop, within the lifetime of this plan, the Strategic Cycle Network for Dublin city – connecting key city centre destinations to the wider city and the national cycle network, and the implement the NTA’s Greater Dublin Area Cycle Network Plan; to bring forward planning and design of the Santry River Greenway, incorporating strongly integrative social and community development initiatives’ (DCC, 2016, p. 108). Initial appraisal, as part of the Northside Partnership Healthy Communities Pilot, suggest that it can potentially be among the most viable, in terms of health, community regeneration and local economic development.

DIT Environment & Planning Community Links Active Research Project.
Since 2013 DIT Environment & Planning have engaged with the NSP through the auspices of DIT Students Learning with Communities to support the Healthy Communities Pilot Project. DIT’s area of input is to study specifically transport and mobility within the pilot area.
The planned Santry River Greenway is mostly segregated from traffic, which, in their study on infrastructure preferences for cycling, Caulfield et al (2011, p. 2) found to be the ‘most preferred form of cycling infrastructure, regardless of cycling confidence’, meaning that investment in the greenway has the potential to encourage non-cyclists to use the route.

This Santry River Greenway Feasibility Study, which is a collaborative project between the DIT Environmental and Spatial Planning Class and the NSP, aims to contribute to the development of the greenway by outlining the key interventions required to make it happen.
1. Introduction

Greenways are corridors of land that connect people and places together. By improving bicycle and pedestrian facilities, this type of route promotes the mobility of the community, which can greatly help improve the health profile of an area. Improvements in health are not only an achievement in their own right, but they also bring about economic benefits. For instance, using the World Organisation’s (WHO) Health Economic Assessment Tool (HEAT) Deenihan and Caulfield (2014) estimate that an initial investment of €12 million would yield between €26,695,000 and €141,222,000 in health benefits over a ten year period. Moreover, greenways can improve water quality, reduce the impacts of flooding and also enhance cultural awareness and community identity.

This study covers the entire length of Santry River Greenway, which is an objective of the National Transport Authority (NTA) Cycle Strategy for the Greater Dublin Area (GDA). The greenway runs across the outer northern suburbs from the coast at Bull Island, through Raheny and Coolock, to Santry. This report aims to carry out an initial feasibility assessment of the corridor; to record its current condition; and to suggest possible actions to improve sections of the new greenway.

The Feasibility Study Report addresses the route in three sections. Each section has been analysed with regard to its geography and land use character. Furthermore, the study proposes measures to achieve environmental, health, community and economic benefits.

1.1 Background/Context

This Feasibility Study is informed by the following documents and schemes:

- The NTA GDA Cycle Strategy
- National Cycle Policy Framework
- National Cycle Manual
- Design Manual for Urban Roads and Streets
- Smarter Travel - A sustainable Transport Future 2009 -2022
- Dublin City Council Development Plan 2016 - 2022
- Dublin Bikes
- Dodder Greenway Feasibility Report
- The Great Western Greenway
1. Introduction

1.1.1 The NTA GDA Cycle Strategy

The Irish Government, the NTA and various state agencies are committed to ensuring that cycling as a transport mode is supported and enhanced. Current policy measures for achieving local and national goals are set out in various documents produced by the Department of Transport, Tourism & Sport and its agencies.

In order to maximise the efficiency of investments in cycling infrastructure, a cycle network map of the GDA, and an evaluation of the availability and condition of current bicycle facilities are needed.

This Santry River Greenway Feasibility Study aims to provide the necessary information which would allow cycle infrastructure projects to be prioritised in terms of their importance to the strategic network and the likely cycle demand for such a scheme.

1.1.2 National Cycle Policy Framework

The Government is committed to developing cycling as one of the most desirable modes of travel, due to its environmental, health, and economic benefits (ref). This National Cycle Policy Framework (NCPF) sets out objectives for 2020 in order to achieve this aim. The NCPF envisages that all cities, towns, villages and rural areas will be bicycle friendly. Cycling will be one of the main modes of transport for all ages. Next to walking, cycling will be the most popular means of getting to school, university and work, with 10% of all trips being made by bike.

Not only will Ireland have a healthier and happier population – an incentive in its own right – but there will also be economic gains, as increases in cycling help reduce congestion and result in a fitter and more alert work force.

According to the framework, to encourage more cycling, there needs to be cycle-friendly urban design and road networks, which make use of traffic calming measures to ensure the safety and comfort of cyclists. Integration with public transport and the provision of adequate cycle parking are also very important for encouraging more cycling. The framework sets out interventions for the built environment that are required for promoting cycling. These interventions range from large-scale regional and urban planning to more detailed actions, such as the provision of cycle parking.

The framework also identifies the importance of cycling for recreational use and tourism, in both urban and rural areas. Greenways, in particular, provide important links between towns and are especially useful for encouraging younger, or less experienced cyclists to travel by bicycle.

While an overall framework for a tourism network has been identified, there is more work to be carried out to identify further routes, particularly in the Midlands, and also the use of existing traffic free routes such as the canal and river tow paths. There is also further work to be carried out in identifying which sections of the extensive network of disused rail-lines that could be converted into high quality, traffic-free routes.
1. Introduction

1.1.3 National Cycle Manual
This manual covers the basic building blocks required for any cycling scheme from inception and planning through to route choice and appropriate type of facility. The principles of Sustainable Safety underpin this entire manual and it provides a useful starting point in terms of design.

1.1.4 Design Manual for Urban Roads & Streets
The Design Manual for Urban Roads and Streets (DMURS) and the National Cycle Manual (2011) (NCM) promote cycling as a sustainable form of transport and seek to rebalance design priorities to promote a safer and more comfortable environment for cyclists. To achieve these goals, the NCM recognises the importance of slowing vehicular traffic within cities, towns and villages, and advocates many of the measures contained within DMURS, such as narrower vehicular carriageways and tighter corner radii.

1.1.5 Smarter Travel - A sustainable Transport Future 2009 - 2022
This policy document sets its key targets as:
• Improve quality of life and accessibility to transport for all and, in particular, for people with reduced mobility and those who may experience isolation due to lack of transport
• Improve economic competitiveness through maximising the efficiency of the transport system and alleviating congestion and infrastructural bottlenecks
• Minimise the negative impacts of transport on the local and global environment through reducing localised air pollutants and greenhouse gas emissions
• Reduce overall travel demand and commuting distances travelled by the private car
• Improve security of energy supply by reducing dependency on imported fossil fuels
1. Introduction

1.1.6 Dublin City Council Development Plan 2016 – 2022

The new Dublin City Development Plan (2016 – 2022) provides an integrated, coherent spatial framework to ensure the city is developed in an inclusive way which improves the quality of life for its citizens, whilst also being a more attractive place to visit and work. It also creates a platform to facilitate and promote sustainable, long-term recovery for the benefit of the city, the region and the country.

In order to create a more sustainable city, the Development Plan, in accordance with national policy, places emphasis on the need for a modal shift from motorized private modes of transport towards public transport, cycling and walking. This requires improvements to both the current public transport network and to facilities for pedestrians and cyclists. Dublin City Council has committed to working with the emerging strategy of the National Transport Authority and supplement it with supporting local improvements, particularly to the city centre environment through the implementation of the Public Realm Strategy and locally-focused objectives. A pro-active approach is taken to influencing travel behavior, and additional through-traffic restrictions will be implemented within the city centre in order to give greater priority to more sustainable modes. Throughout the city, an integrated approach will be taken towards land use and transport planning, with more intensive uses promoted at locations with higher public accessibility.

As stated in the Development Plan, it is DCC’s objective ‘to bring forward planning and design of the Santry River Greenway, incorporating strongly integrative social and community development initiatives’ (DCC, 2016, p. 108).

1.1.7 Dublin Bikes

Dublin Bikes is a public bicycle rental scheme which has operated in Dublin since 2009. It is a self-service bike rental system open to everyone from 14 years of age. It has increased the accessibility of cycling as a mode of transport for those living in, or visiting Dublin. An expansion of the scheme into other parts of Dublin, such as Grangegorman, has been planned, adding to its viability as principal mode of transport.
1. Introduction

1.1.8 Dodder Greenway Feasibility Report

The Dodder Greenway Feasibility Report (see figures on the right) prepared by AECOM consulting on behalf Dublin City Council (DCC) and the National Transport Authority (NTA) is a comprehensive study of the entire length of the River Dodder, which aims to identify one or more feasible routes for a high quality cycleway between the city centre and the Dublin mountains.

This is a good comparison study for the Santry River Greenway as there are some similarities between both schemes. Both schemes connect suburban and inner parts of Dublin city with Dublin Bay. Both schemes access neighbourhoods of similar density and character. It has to be noted that the Santry River Greenway is approximately half the length of the Dodder Greenway and is entirely off-line, requiring no major infrastructural change.
1. Introduction

1.1.9 The Great Western Greenway

The success of the Great Western Greenway (GWG), a cycling route which runs between Westport and Achill in County Mayo, provides a strong argument in favour of investing in cycling infrastructure. While in some ways the GWG and the Santry River Greenway are not comparable - the GWG is in a rural area which has traditionally been a tourist destination – it demonstrates the local economic gains that can be achieved by developing cycling infrastructure.

The GWG brings approximately €737,000 from domestic tourists and €405,000 from non-domestic tourists to the area a year due to increased tourist expenditure (Deenihan et al, 2013). Moreover, a Fáilte Ireland commissioned report by Fitzpatricks consultants (2011, cited in Deenihan et al, 2013, p. 7) estimated that ‘after a 6 year period, the facility [the GWG] will have returned the initial investment from solely tourism revenue’.
2. Overall Corridor Profile

Unlike existing greenways of Dublin, which lead to the city centre, the Santry River Greenway is an orbital route, which runs through Dublin’s northern suburbs toward Dublin Bay, near Bull Island. The greenway starts just south of Dublin Airport and follows the Santry River, passing through three main neighbourhoods of the north side of Dublin: Santry, Beaumont and Raheny. Its route links these disparate communities, which are fragmented by industrial estates and major roads.

The proposed route connects the communities not only to areas of employment; industries, retail centres, etc., but also to major parks and leisure spaces, such as Santry Park, Coolock Lane Park, the Stardust Memorial Park and St. Malachy’s Football Club.

Although a green corridor does currently exist along much of the Santry River, the conditions are quite poor. In many areas visibility and lighting is reduced due to tree cover. Problems related to the surface of the path, such as unevenness, mud, and water puddles have also been identified. Moreover, the route is interrupted by factories, large roads and fencing.

While in the current plan the route does extend beyond Santry, this study believes that the greenway should extend as far as Finglas. This would not only provide links to major neighbourhoods such as Ballymun and Finglas, but would also include green spaces such as Poppintree Park and the Tolka Valley Park, enhancing it’s viability as a green corridor. This could also be linked to the Phoenix Park cycleway, creating a full loop and connecting many neighbourhoods in north Dublin.

To validate the viability of the implementation of the Santry River Greenway, an outline cost benefit appraisal is included in this study. The benefit to the local and city economy in addition to wider societal gains are likely to significantly outweigh any costs.
2. Overall Corridor Profile

2.1 Section 1 Profile: Ballymun Road – M1

The first section of the Santry Greenway starts at the R108 Ballymun Road with a large green area, where there is currently a path. This path, however, is very narrow (approx. 2.5m wide) and enclosed by trees and vegetation, with a few open areas and little access.

This section has few residential areas, except for some large housing blocks. There are also large industrial areas and green areas, including Santry Park, which is an important amenity for the wider area.
2. Overall Corridor Profile

2.2 Section 2 Profile: M1 – Malahide Road

This section of the greenway is located between two large roads: the M1 and the Malahide Road. It is surrounded mainly by residential areas, which do not have good access to the path. It also runs through industrial areas, such as the Malahide Industrial Park, which acts as a barrier at the end of this section of greenway.

Other physical barriers, such as the bridge access to Coolock Lane Park, which has also been vandalised, were also identified. Moreover, the M1 underpass attracts anti-social behaviour and has a very threatening character. How this section is treated will be key to the success of the entire route.
2. Overall Corridor Profile

2.3 Section 3 Profile: Malahide Road – Raheny Village

This section of the Santry Greenway runs between the Malahide Road and Raheny Village. Unlike the previous section, the path is not longer interrupted by industrial areas, as it is largely a residential area. The Santry River also becomes more visible and easily accessible.

There is, however, some evidence of rubbish tipping and littering in the Santry River and on its banks. There are also traces of fires and broken fences. There is a notable absence of bins along the path.
3. General Requirements

The following general requirements have been identified for the greenway in order to achieve the objectives set out above:

3.1 Coherence and Directness
The route should be legible and coherent, making use of signage in areas of road crossings that may not be legible, for instance in areas where the path moves away from the Santry River.

3.2 Width
The National Cycle Manual suggests a minimum width of 4 meters for greenways, to facilitate two cyclists cycling abreast with room for overtaking. This width is proposed for the greenway, given the need to also accommodate pedestrians along the route.

3.3 Priority
Greenways should be prioritised at road crossings to minimise delay and disruption for cyclists. This can be done using advanced sensors, such as those using radar or detection loops. For instance, intelligent sensors can be used which give priority based on the number of cyclists approaching, or which favour the greenway in poor weather conditions.

All road crossings should be Toucan crossings (as can be seen in the image above, taken from US NACTO Manual) a minimum of 4m wide, and with push button units on each side of the greenway. An example of this can be seen at the Northwood/Swords Road crossing. Raised bars for cyclists to rest their foot on when stopped should also be provided on each side. Where the route is shared with traffic and crosses a busy road, the junction should be adjusted to provide more space for pedestrians and cyclists.
3. General Requirements

3.4 Lighting
High quality public lighting, where not already present, should be installed along the entire length of the route. In areas with mature trees, uplighters can be used to highlight the trees and enhance the public realm. In areas further away from passive surveillance, lighting will reduce the risk of anti-social behaviour. The M1 underpass should be fully lit with a very enhanced design treatment to reduce anti-social behaviour.

3.5 Paving
The route should be paved to a high quality, free from service chamber covers, bumps around tree roots, etc. Newer sections should be surfaced with fine cold asphalt or an equivalent.

3.6 CCTV
Certain sections of the route, which do not have sufficient passive surveillance, should have CCTV coverage installed. The M1 underpass is one example where CCTV could be used to deter any anti-social behaviour. It will likely be impractical to monitor the entire length of the route. The preliminary design should consider locations where CCTV is most necessary. CCTV could be linked to either the Dublin City Council traffic control centre or the Dublin Port Tunnel control centre.

3.7 Environment
The Santry River provides an important ecological corridor through the length of the scheme from Harristown to Raheny. The site links a number of parks from Silloge Park Golf Course and Santry Park, to Saint Malachy’s Football Club, allowing for the connection of existing natural areas and maintaining a healthy ecosystem. The linking of natural areas allows for species to move, migrate, disperse and exchange populations, which helps ensure their long term survival. The habitats along the greenway include wet grassland riparian woodlands. The river supports river plants and animals in and along the river, such as otters, trout’s, kingfishers, wagtails and green figwort.

The greenway offers the opportunity for a parallel scheme which aims to enhance the existing ecological corridor. This could include features such as: artificial otter holts; vortex weirs for outfalls to improve water quality; and landscaping for the enhancement of the aquatic environment.
3. General Requirements

3.8 Access and Permeability

Barriers such as gates and low walls at junctions along the route should be addressed. These pose barriers to cycling and other means of controlling anti-social behaviour should be identified, such as CCTV. Bollards at the entry to a 4m wide track would prevent vehicular access while allowing cyclists to pass. Occasional abuse of the greenway by motorbikes is a potential problem, however, the solution to this should not be to render the proposed cycleway unusable by the vast majority of responsible pedal cyclists. Links to the surrounding areas should be provided along the entire route to maximise the usage of the greenway.

3.9 Tourism and Leisure

The greenway should emphasise features of interest to tourists along the route, for example, St. Anne’s Park, which has been earmarked for the inclusion of a proposed city farm. Signage boards and sheltered stops should be included in the design. Local businesses should be encouraged to engage with the scheme, which could deliver additional custom to their premises.
3. General Requirements

3.10 Signage
In addition to the signboards proposed for tourists, a comprehensive and coherent route signage strategy should be developed for the greenway. This should include complementary signage towards the route from its hinterland and from the greenway towards village centres e.g. Coolock, Raheny and other features of interest.

3.11 Planting
Where trees are required to be removed to facilitate the development of the greenway route, compensatory planting should be provided nearby. Where possible, existing greenery along the river corridor should be maintained.

3.12 Synergy with utility proposals
The opportunities for synergies between the proposed greenway route along the Santry River and proposals for new or upgraded services / utilities should be investigated. While it might provide an additional funding avenue, any appreciable volume of excavation would increase the environmental impact of the scheme and the implications would require detailed consideration.

3.13 Green Energy
The public lighting along the route will require power supply. Consideration should be given to renewable energy, such as solar powered lighting.

3.14 Diversions during construction
Where possible, the design of the route should maintain access to parks and the river corridor during the construction period.
3. General Requirements

3.15 Social & Community

To successfully deliver the Santry River Greenway, investment in community collaborative planning is required.

Ideally meaningful participatory projects to promote cycling and develop community cohesion around the greenway would form part of its investment package, as doing so would yield wider social and economic returns.

As a poor attitude towards cycling is one of the greatest barriers to cycling in the area, projects that aim to promote and encourage a cycling culture should be explored. These initiatives should be done in collaboration with local schools and clubs.

It is also important that the community are involved in the overall project design and delivery of the Santry River Greenway. Interventionist projects should be collaborative in nature and could include physical interventions (e.g. a community garden) as well as programmatic solutions (e.g. an event or participatory process). Two such potential projects were identified by the students of the 2015/2016 MSc in Sustainable Development and Local Development and Innovation programmes: a Community Health and Fitness Trail; and a Community Farm Network.

The greenway should offer opportunities for community activities, such as guided walks and cycles, sports days, nature walks, clean-ups, etc. It should also reflect the character of the area, for example though the use of art.

This could also offer the opportunity to work in collaboration with local schools and clubs.

The potential for the greenway to connect communities to wider amenities in their own city needs to be explored. Barriers such as the M1 and Malahide Road and DART corridor act as major severances to communities to rich amenities such as St. Anne’s Park (proposed site for the new city farm) and the Dublin Bay biosphere.
4. Section 1 - Santry to Gateway Site

Santry to Gateway Site

A DIT Students Learning With Communities project in Association with the Northside Partnership
Key interventions
• Install a signalled toucan crossing near the rear entrance to Gulliver’s Retail Park
• Widen path to the west of the road by extending it into the field
• Cut into the side of the park to allow room for cycling
• Add overhead lighting, bins and associated furniture
• Widen existing path to appropriate greenway standards.

Current Description
This section begins at a busy road which is used by heavy goods vehicles (HGV) moving to and from Tesco and Keelings warehouses. The paths are very narrow and in poor condition, with overgrown vegetation and large amounts of litter. The park entrance is substandard for pedestrian and cycle access and landscaping through the parkland section is in poor condition.

Additional interventions
• Create a new cycle lane through a new entrance into the park to link up with the existing path;
• Re-landscaping of the park in environs of greenway path.
Key interventions
- Widen existing path to appropriate greenway standards;
- Add overhead lighting, bins and associated furniture;
- Open up barriers which restrict entry to employment and housing to make the area more permeable and accessible for all;
- Thin trees and shrubs towards the river to increase its visibility and to allow more light into the route.

Additional Interventions
- Bridge crossing to access light industrial employment to north of path.

Current Description
This area is in good condition in terms of its surfaces and vegetation, which is well maintained, if overly dense. The paths, however, are narrow (approximately 2m wide) and there is poor lighting throughout stage 2. Walls and gates also block access to housing and employment in this part.
Current Description
This stage has paths which are in good condition but is narrow in parts, including the section under the Northwood Avenue bridge which measures at just 2.9 meters. There a lot of graffiti and litter under the bridge and areas near the bridge experience flooding which waterlogs the cycle track. This stage has poor lighting in general.

Key Interventions
- Widen existing path to appropriate greenway standards
- Add overhead lighting, bins and associated furniture
- Add CCTV and high quality lighting under and around the bridge
- Widen under the bridge with a new overhanging board walk over the river, similar to the Grand Canal Greenway at Leeson Street bridge (see top left picture below)
- Improve cycle lane surface
- Conduct a full engineering drainage assessment to address flooding
- Apply anti-graffiti paint to ease the removal of graffiti
Two route options are recommended in this section. Route A, mostly on-street, is more direct and will cater especially for commissions and those under pressure. Route B is more scenic route for those who wish to take advisable of the park and its amenity.

**Key Interventions**
- Route A: provided a two-way path to appropriate Greenway standards;
- Route B: Widen path to appropriate greenway standard;
- Add overhead lighting, bins and associated furniture
- Improve cycle lane surface;
- Thin woodland along route B to allow more visibility, light and to widen the cycle route;
- Widen entrance/exit to the park.

**Current Description**
Santry Park is a large, well maintained park with excellent landscaping. Its paths are in good condition. It is a well used park, providing it with good passive surveillance. The park has poor lighting in place but there is CCTV. The existing cycle lane in Route A requires a new surface due to the presence of potholes.
Current Description
At the start of this stage there is a signalled toucan crossing which traverses the Old Swords Road. After this crossing there is a wall with a narrow entrance, making it difficult to navigate on a bike. All the paths are in good condition but are narrow. The area has reasonable lighting but could be improved. There are poor links to housing along the greenway.

Key Interventions
• Remove walls at entrance to have a straight route to the toucan crossing;
• Widen existing path to appropriate Greenway standards;
• Add improved overhead lighting, bins and associated furniture;
• Improve cycle lane surface;
• Increase access to the greenway from housing along the route.
4. Section 1 (Stage 6) - Santry to Gateway Site

Key Interventions
- Widen existing path to appropriate Greenway standards;
- Add overhead lighting, bins and associated furniture;
- Improve cycle lane surface;
- Improve landscaping by thinning the trees and shrubs;
- Add new bins along this part of the route.

Additional Interventions
- Consider switchback layout to minimise gradient in approach to underpass;
- Wider park and landscaping interventions to open up the river side on both sides.

Current Description
The path through stage 6 is wide, yet the drainage is quite poor, as can be seen in the figures above. There is no lighting along this part of the route. There is also a lot of litter and overgrown vegetation and a possible gradient issue on approach to underpass.
Current Description
This stage shows evidence of antisocial behaviour broken glass and large amounts of rubbish. The underpass under the M1, which does not have CCTV, is especially unpleasant due to the presence of graffiti and broken glass. The path surface is in poor condition with potholes throughout. A major cluster of bollards block the route for cyclists. There is also overgrown vegetation and has poor visibility.

Key interventions
- Add high quality lighting and CCTV in underpass which is linked up with the Port Tunnel Traffic Control Centre;
- Widen existing path to appropriate Greenway standards;
- Add overhead lighting, bins and associated furniture;
- Improve cycle lane surface;
- Remove bollards;
- Improve landscaping by thinning trees and shrubs to open up the river;
- Open up a new link with the Gateway site for access to future employment.

Additional interventions
- Add possible cantilevered bridging structure to provide route with increased visibility (marked in yellow on map);
- Consider “psychological design” measures, e.g. pastel or pink colour to discourage anti-social behaviour.
4. Section 2 - Gateway Site to Malahide Road
4. Section 2 (Stage 1) - Gateway Site to Malahide Road

Description
The first stage (560m) of section 2 starts after the M50 Motorway and continues until a bridge that crosses the Santry River to the south, connecting with Coolock Lane Park. It borders Woodlawn and Larch Hill on the south side and the Clonshaugh Business & Technology Park on the north side. The main problems identified in the site visit are the barrier at the beginning and the poor quality of the path and the bridge towards the end. The barriers aim to block bicycles and vehicles from entering as the following path is only intended for pedestrians. Not only do these barriers restrict entry for cyclists, but they are also visually unpleasant and unwelcoming. This is worsened by the poor condition of the environment around the river. The lack of park furniture and lighting also increase the perception of danger. The bridge at the end has been quite degraded: it has lost one of its handrails and the other is in very poor condition. It is also quite narrow, measuring at 2.70 m wide.

Key Interventions
• Widen existing path to appropriate Greenway standards;
• Remove the barrier at the beginning to allow for cyclists;
• Use alternative obstacles to prohibit vehicle access, such as planters or bollards;
• Improve planting and landscaping;
• Add overhead lighting, bins and associated furniture;
• Improve cycle lane surface.

Additional Interventions
• Consider replacements of bridge, extending it to at least 3m, ensuring it can accommodate both cyclists and pedestrians and making it more visually and physically safe.
4. Section 2 (Stage 2) - Gateway Site to Malahide Road

Description
The second stage (730m) starts after the bridge, where it then traverses Coolock Lane Park, the entrance for the Clonshaugh Business & Technology Park and the entrance to the Northside Shopping Centre (NSC). It borders Coolock Lane on the south side and the Clonshaugh Business & Technology Park on the north side. The site also includes public football fields and much empty green space (point 1).

The main problems identified in the site visit are the discontinuity of the path after the bridge and the waterlogged ground. In addition, the north side of the river is quite isolated and the entrance for the Clonshaugh Business & Technology Park sees a lot of HGV traffic. Moreover there are inadequate pedestrian and cycle crossings. The main Greenway route can optimally run north of the pitches adjacent to the river.

Key interventions
• Provide a path-link to connect the path to the Oscar Traynor road;
• Widen existing path to appropriate Greenway standards;
• Add overhead lighting, bins and associated furniture;
• Improve cycle lane surface;
• Install active recreational amenities, such as outdoor gyms or playgrounds;
• Create a raised signalized crossing with low gradient at the entrance to Clonshaugh Business & Technology Park to reinforce the transition to a lower speed, making it safer to cross.

Additional Interventions
• Consider ancillary community and recreational infrastructure, such as changing facilities, bike parks, seating, etc.
Description

This section (103 meters) traverses one of the NSC overflow car parks, at the Clonshaugh Road. Given the importance of the NSC, this provides an opportunity to link residential areas to one of the major key trip demand centres. It should help link residential areas to the greenway and encourage people to cycle or walk to the industrial area on West, indicated in the previous stage, and also go to recreational areas, which are the shopping centre and the Stardust Memorial Park on East, indicated in the next stages.

Key Interventions

- Reduce the area of the overflow car park (as indicated in figures). It should give more space to the greenway and would also keep the greenway designed as an opened space;
- Move the entrance of the overflow car park north of its current position. This new entrance could make use of the existing mini-roundabout;
- Construct a Toucan Crossing at point 3, as proposed in the National Cycling Manual;
- Construct the greenway along the southern river bank to the west of the Clonshaugh Road;
- Widen existing path to appropriate Greenway standards;
- Add overhead lighting, bins and associated furniture;
- Improve cycle lane surface.
4. Section 2 (Stage 4) - Gateway Site to Malahide Road

The opportunity exists to provide a strong link between residential area and the Northside Shopping Centre. The main commercial and community centre for the area.

Key Interventions

- Construct the greenway south of the river;
- Construct a Toucan crossing at point 4 towards the Stardust Memorial Park to replace existing mini-roundabout.

Additional Interventions

- Construct a link at point 1. It will be located at the Riverside road to include a new bridge, which would link the residential area to the south part of the greenway;
- At point 2, a small elevated bridge would be constructed to provide access across the river. It should be designed to pass over the riparian zone of the river;
- Construct a link to the shopping centre on the north, displayed at point 3;

Description

Stage 4 (394 meters) is a green area, which is located between a residential area and the Northside Shopping Centre. It is a green area where the river is clearly identified with a strong riparian character.
Description
Located in Coolock, the Stardust Memorial Park is a well maintained memorial park with an important significance for the history of the region, as it was built to commemorate the lives of those who died in the fire that happened in 1981 in the Stardust nightclub. The park presents a well established structure, which would facilitate the implementation of the green cycle lane (650 meters of length), due its wide space. Moreover, as the park is near a residential area, the construction of the Greenway would have a positive impact on those living in adjacent neighbourhoods, as it provides a safe and pleasant cycling route. While there is an existing cycle path in the park, improvements will be needed to match the future demand and the instructions outlined in the National Cycle Manual of Ireland. Several route options are potentially available. This study recommends that it would be most beneficial to the park and general public for the greenway to be accommodated within and through the park.

Key Interventions
- Optioneering exercise to determine optimal greenway route through Stardust Memorial Park.
- Add appropriate signage for cyclists and pedestrians.
- Add overhead lighting, bins and associated furniture
- Include two routes that will provide access to the local community to the bike path, for example as indicated at point 2 and 3.
- Landscaping measures to integrate the greenway and park environments.
- Remove the mini-roundabout that is located at the park entrance (point 1) and replace it with a toucan crossing and signalised junction.

Additional Interventions
- Consider the removal the railings surrounding the Stardust Memorial Park to increase permeability, only in consultation with and with the consent of adjacent communities.
Description

The section (560 meters) passes primarily through private property, which means its inclusion in the greenway would require an agreement with the owner. Due to the uncertainty of the outcome, and the length of the process, it may be necessary to devise an interim on-street alternative route. The best provisional alternative route identified is to construct the greenway along the Greencastle Road, which runs alongside the optimal path.

Key Interventions

- Providing appropriate signage for cyclists, drivers and pedestrians;
- Construct a bike path parallel to the sidewalk, with a small barrier between the bike path and the road;
- Add overhead lighting, bins and associated furniture
- Adapt the cycle and pedestrian crossings through the construction of a Toucan crossing at point I.

Additional Interventions

- Ideally the Greenway will continue Riverside through the industrial lands. This can be part achieved by planning condition, as a planning gain, as the site comes forward for development. Alternatively, agreements could be reached with existing landowners.
- This study strongly recommends the provision of a link through the existing Malahide Industrial Estate to connect with Darndale Park, and Malahide Cross and future development lands at Belcamp.
4. Section 3 - Malahide Road to Raheny Village

Malahide Road to Raheny Village

A DIT Students Learning With Communities project in Association with the Northside Partnership
Description
This stage of the greenway (200m) runs from the Greencastle Road / Malahide Road junction to the Tonlegee Road. The stage is currently in relatively good condition, with open space and grass banks leading down to the river. This is a pleasant feature which allows for good natural light. However some additional landscaping could be beneficial as the area could seem bleak in the winter months. The houses overlooking this section provide passive surveillance. This combined with the openness of the stage gives this part of the route a safe feeling. Along this section, the river is contained within a concrete channel, giving it a sterile appearance, which is not particularly attractive. Measures to increase bio diversity could be taken to enhance the ecosystem and increase the attractiveness of this stage. The footpath running along this stage is narrow, around 1.5 – 2m. The path should be widened to comfortably accommodate both cyclist and pedestrians.

Key Interventions
• Widen path to appropriate Greenway standards
• Maintain grass banks and introduce some light planting of trees and shrubs

Additional Interventions
• Potential to add foot bridge across river to link houses with the green way (see point (iii))
• Increase bio diversity of river by removing concrete banks
There are two possible routes for this stage. The first one is to go along the Springdale Road sidewalk, and the second one is to construct a path on a high bank along the north side of the Santry river. This study proposes the latter option, as there is currently much more available space than the former option. It must be noted that the path is not wide enough to comfortably accommodate cyclists and pedestrians. Litter can be found in and around the Santry river, giving the area an unpleasant appearance and impacting on the local environment. The attractiveness of this stage could be enhanced with the addition of furniture, bins and more planting, including a small garden.

Key Interventions
- Greenway alignment on high bank on northern side of the river
- Improve planting and landscaping
- Widen existing oath to appropriate Greenway standards
- Add overhead lighting, bins and associated furniture
- Clean the area and decontaminate the river
- Install a small garden
- Install a small playground and/or outdoor gym facility

Additional Interventions
- Removal of concrete channel to improve riparian environment.

Description
Stage 2, which is 280 metres long, goes from the Tonlegee Road and along Springdale Road before reaching Glenwood Road.
4. Section 3 (Stage 3) - Malahide Road to Raheny Village

Description
Stage 3 is approximately 650 meters. This Stage contains notable degraded areas. Problems such as trash, traces of fires, broken fences, pollution of the river, and a lack of well located bins have been observed. Furthermore, there is a lack of paved trails proper lighting and benches. It is important to allow access to communities both sides of the river; a bridge and link to the Harmonstown side might be considered. This would also provide more mobility for wildlife. In stage 3 there are two football fields, which appear to be abandoned. A good initiative would be to improve this area by using the space for recreational activities for both children and adults, such as, chess tables, tennis courts, outside gyms, playground, etc. Additionally, the removal of the long pallisade fences should be considered. Lastly, a lack of diversity in terms of vegetation has also been observed, with grass accounting for the majority of the plant life. More planting would be a positive step towards increasing the biodiversity of the greenway.

Key Interventions
• Add overhead lighting, bins and associated furniture;
• Install a small playground and/or an outdoor gym facility;
• Improve planting and landscaping.

Additional Interventions
• Improve infrastructure of the football field;
• Remove or improve fences;
• Construct bridge to link both sides.
Description
The fourth Stage crosses to the south bank of the river along Harmonstown Road. West of Harmonstown Road lies continued open space with housing to the south. The lighting is very poor and would require improvements. There is potential to construct additional recreational facilities. The river would also require measures to improve its appearance, such as cleaning, as it is currently poorly maintained throughout this area.

Key Interventions
- Greenway alignment on southern river bank;
- Short protected on-street section along Harmonstown Road;
- Add overhead lighting, bins and associated furniture;
- Widen existing path to appropriate Greenway standards;
- Clean and decontaminate the river along this section.

Additional Interventions
- Flood risk and drainage assessment with possible mitigation measures.
Stage 5 starts at an existing bridge which is in good condition. The existing path needs improvement and widening. Part of stage 5 presents some challenges, as it passes through a private residential area. Any intervention would require consultation with residents of this estate. This study suggests that a “Homezone” environment with sharing of space within a well designed, speed-reduced environment could both facilitate the greenway and significantly enhance the amenity of the residential area. A narrow passage takes the greenway out onto Raheny Road, close to Raheny DART station. A protocol for access through the passage would need to be established.

Key Interventions
- Add overhead lighting, bins and associated furniture;
- Install active recreational amenities, such as outdoor gyms or playgrounds;
- Consultation with residential community;
- Consider well-designed “Homezone”, speed-reduced environment;
- Establish protocol for access to passageway onto Raheny Road.

Additional Interventions
- Appraise bridge structure for suitability and structural integrity in use for greenway.
7. Cost

The following parameters have been used, in assessing the costs in the Dodder River Feasibility Study. The different scheme costs include:

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planting / Resurfacing Works (per m width)</td>
<td>€45,000 per km per m width</td>
</tr>
<tr>
<td>Landscaping Works (per m width)</td>
<td>€25,000 per km per m width</td>
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<tr>
<td>Public Lighting</td>
<td>€130,000 per km</td>
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<tr>
<td>CCTV</td>
<td>€135,000 per km</td>
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<tr>
<td>Ducts</td>
<td>€55,000 per km</td>
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<tr>
<td>Boardwalk</td>
<td>€1,200 per m²</td>
</tr>
<tr>
<td>Bridges</td>
<td>€1,200 - €3,500 per m²</td>
</tr>
<tr>
<td>Underpasses</td>
<td>€3,500 - €6,000 per sqm</td>
</tr>
</tbody>
</table>

The costs set out in the Dodder River Greenway Feasibility study include 15% preliminaries and 10% contingency but exclude VAT and client costs (e.g. design and supervision). Land acquisition costs have also been excluded. On the basis of the foregoing, the following costs have been estimated:

The Dodder River is a 16km scheme. The route starts at Grand Canal Square and follows the course of the River Dodder in a south-westerly direction to the Dublin Mountains at the Glenasmole Reservoirs in Bohernabreena.

The Santry River Greenway is 8km in length. Based on the cost per km of the Dodder River Feasibility Study, the cost of the Santry River scheme (calculated on a pro-rata basis) is an estimated at between €4.165m and €11.6m.

Given the low incidence of structural requirements and the absence of significant on-street sections it is likely that the costings should come in at the lower end of this estimate. It will be critically important to include an adequate allowance for community integration and social development around the Santry River Greenway.
