NTA
Údarás Náisiúnta Iompair
National Transport Authority

# Rapid Build Active Travel Facilities

February 2023

# Active Travel Advice Note:

# Rapid Build Active Travel Facilities

## Document Control Sheet

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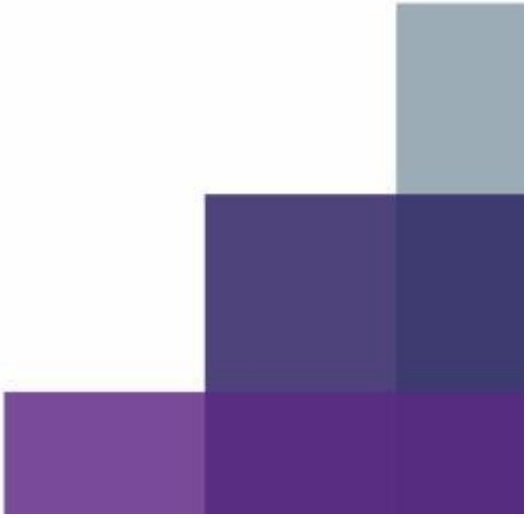

## Key Points

1. The Climate Action Plan requires 1000km of new active travel infrastructure to be built by 2025;
2. The cost of traditional construction has increased significantly in recent years;
3. Cost Effective Rapid Build construction approaches, including road space reallocation, are now required to be the initial options to be considered in new active travel infrastructure; and
4. Such approaches have been shown to produce high quality results as outlined in the many Irish Case Studies in this document.

## Table of Contents

# 1. Introduction

The purpose of this advice note is to give guidance on the options available to deliver high quality walking and cycling infrastructure using rapid build, cost-effective methods in order to reduce car-dependency and to favour sustainable modes over the private car, and as a means of achieving reductions in carbon emissions.

# 2. What is meant by Rapid Build Active Travel Facilities?

Rapid Build active travel facilities are schemes that utilise cost-effective measures to deliver walking and cycling infrastructure quicker than traditional (full build) construction methods. They do not typically involve major construction works such as full road reconstruction or significant changes to drainage systems or relocation of utilities etc. however they may involve changes to kerb lines and minor drainage works. The works will also be typically within the boundaries of the existing roadway which can simplify the planning process, which positively effects project programme and delivery.

Rapid Build Schemes does not have to mean bollards, although using bollards to reserve road space for walking and cycling can be useful interim measure. As the examples in this advice note will show there are design options available for rapid build projects which use robust materials, with a quality finish, that produces schemes that can remain in place for many years.

Rapid Build Infrastructure is infrastructure that can generally be accommodated within the existing carriageway or verge and has limited drainage impacts. This may include:

- Road markings/traffic restrictions;
- Narrowing/converting general traffic lanes to active travel facilities;
- Converting on-street parking to active travel facilities;
- Creating Traffic Free streets; and
- Redesigning junctions to provide greater capacity for walking, cycling and public transport.

# 3. Why are Rapid Build Active Travel Facilities needed?

The need for a rapid rollout of active travel infrastructure nationally, in a cost-effective manner, is urgently needed for several reasons, including:

1. The Climate Action Plan 2023 reaffirms the Climate Action Plan 2021 action requiring the construction of an additional 1,000km of cycling and walking infrastructure by 2025 to help achieve emissions reductions targets. This was supported by a corresponding budget of €1.8bn in the Programme for Government 2020-2025, equating to an annual budget of €365m. However due to rising costs in the construction sector, traditional build schemes involving "building line to building line" construction e.g., new footpaths, new linear drainage, lighting, and road resurfacing are now ranging from **€4-7m per km**, compared to rapid build construction which cost in the range of €**0.25-€1m per km.** The cost, combined with the length of time it typically takes to deliver traditional build schemes (3-5 years), signify a need to change the delivery approach to achieve our Climate Action Plan targets.

2. The Climate Action Plan 2023 endorses the recommendations of the report from the Climate Change Advisory Council and OECD (Organisation for Economic Cooperation and Development) on Redesigning Ireland's Transport for Net Zero. This report recommended widespread, large-scale road space reallocation needs to be a priority in Ireland to reduce over reliance on the private car and transform our transport system.

3. The National Investment Framework for Transport in Ireland (NIFTI) sets out hierarchies for where investments in transport should be prioritised and stipulates that investments in active travel and public transport should be prioritised ahead of investments in infrastructure for private cars. Importantly, NIFTI also specifies that investments in interventions which maintain, optimise, or improve existing assets are to be prioritised over investments in new infrastructure. Providing improved facilities for active travel modes by reallocating existing road space, thus optimising, or improving existing road assets, aligns closely with these NIFTI priorities.


4. Rapid build schemes are also helpful to Local Authorities as they:
    - Cost less and allow for an expanded programme of works within the overall Local Authority funding envelope;
    - Provide infrastructure faster, which has been shown can result in a virtuous circle – numbers of people walking, and cycling can be accelerated at a quicker pace, providing increased support for Local Authorities' active travel programme;
    - Involve less construction time disruption; and
    - Involve less use of materials and minimise the environmental impact of new construction.

## 4. Key Design Principles for Rapid Build infrastructure

Rapid build schemes should be guided by the following key principles.

- **Network Approach** – focus on developing walking cycle networks i.e., a series of interconnected routes that allow those walking and cycling to cross easily and safely at junctions rather than unconnected, singular schemes along links;

- **Segregation** – pedestrian and cycle facilities on streets, other than quiet streets (e.g., street with low speeds and low traffic volumes), should be segregated from traffic and from each other – this is the type of infrastructure which attracts people to switch to walking or cycling.[1]

[1] The Walking and Cycling Index asked 1,100 Dublin Metropolitan Area residents what facilities would help them to cycle more. 65% said more traffic-free cycle routes away from roads, 63% said more cycle tracks along roads that are physically separated from traffic and pedestrians, 64% said more signposted local cycle routes along quieter streets

- **Everyday Mobility** – focus on supplying infrastructure that provides both for commuting **and** everyday trips to schools, shops, and services;
- **Inclusive Mobility** – facilities should be designed to be useable by people of all ages and abilities using a variety of different types of bicycles; and
- **Place making and biodiversity** – Schemes should aim to enhance the surrounding public realm and prioritise the protection and/or enhancement of biodiversity using quick and cost-effective measures.

## 5. Typical Costs of Walking and Cycling Infrastructure

| **Type of Infrastructure** | **As of Dec 2022** |
|---|---|
| Full Build Segregated Cycle Tracks | *Range €4 - 7m/km*<br><br>(Median cost €5.5m/km) |
| Rapid Build Cycle track with extruded or bolt down kerb. The higher range costs include epoxy surfacing/ tarmac backfill. | *Range €0.3 - 1m/km,*<br><br>(Median cost €0.6m/km) |
| Rapid Build bollard protected cycle lane. The higher range costs include epoxy surfacing.<br>(Maintenance costs associated with bollards, can be significant.) | *Range €0.1 - €0.75m/km* |

## 6. NTA Funding Prioritisation of Rapid Build Infrastructure

To maximise the amount of Active Travel infrastructure delivered within available resources over the coming years and to increase the speed of delivery, the following approach will be applied to all NTA Active Travel schemes.

- Utilising road space reallocation of the existing carriageway should be the first options considered in developing active travel schemes. Full build "building line to building line" construction will be the exception rather than the default design;
- Resurfacing of the existing carriageway, other than the cycle lanes, shall not be the default position and will need to be justified. Full depth rebuild of carriageway will be by exception only;
- Schemes should seek to minimise changes to the drainage systems, through modifications to existing gullies and connections if needed. Major changes to drainage systems shall be avoided, although opportunities to provide rain gardens or other Sustainable Urban Drainage (SUDs) feature should be considered;
- Schemes should design around existing utilities where possible, only moving/ reorientating manholes where they conflict with kerbs.

https://www.nationaltransport.ie/wp-content/uploads/2022/05/220504-WACI22_DublinMetropolitanArea_v35_DIGITAL_v2.pdf

- Grounding of overhead wires on Active Travel schemes will be by exception only, although facilitation of ducting as part of footpath upgrades should be considered;

- Reduction in Street Clutter and minimisation of street signage shall be considered as part of all schemes; and

- While removal of trees should be avoided where possible, working within the constraints of the existing carriageway may result, subject to necessary environmental reviews, in the removal of trees. Where a tree is removed this should be replaced locally by replacement trees.

## 6.1.Rapid Build Options Report

### New Deliverable

A Rapid Build Options Report will be required as an initial step on all Active Travel Schemes going forward. This is a new requirement for Phase 2 (Concept Development & Options Selection) of the NTA Project Approval Guidelines.

An options report focusing on rapid build options will be required for all NTA active travel scheme option development from the publication date of this report, unless otherwise agreed with the NTA. This rapid build options report should be considered the first step in Phase 2 - Concept Development & Options Selection.

Rapid Build Options to be examined should include as a minimum:

- Traffic Calming e.g., Implement new traffic calming measures such as build-outs, chicanes, ramps raised tables etc. to reduce traffic speeds and volumes to accommodate pedestrians and mixed cycling and traffic environments;

- Reducing the vehicle carriageway to a suitable minimum width and utilising remaining space for paired unidirectional, or bidirectional, protected cycle lanes; this may involve new kerbs, revisions to drainage or using some verge space;

- Road Space Rebalancing e.g., removal/ reorientation of parking, making roads one-way, filtered permeability etc…

If rapid build is not feasible, for at least part of the scheme, NTA agreement shall be sought before the project proceeds to consider traditional build options.

Some schemes may require a combination of rapid and traditional build, e.g. links upgraded using rapid build techniques and junctions, the point where pedestrians and cyclists are most vulnerable, fully upgraded.

**It is important to note that projects may be deprioritised should a rapid build option not be possible as resources, both financial and skills, need to be focused on delivering projects more quickly in response to Climate Action Plan Targets.**

## 6.2.Length of Options Report

The principal of proportionality in CAF (Common Appraisal Framework) states that *"the resources to be spent on appraisal or evaluation should be commensurate with the likely range of cost, the nature of the project or programme and with the degree of complexity of the issues involved",* Therefore:

1. If rapid build options are less than €500k a very concise options appraisal report is needed, guidance on this is outlined in the "Options Selection report Band 1", available on the NTA Local Authority SharePoint..
2. For rapid build projects between €500k and €5m, guidance on the structure and content of the Option Selection Report is outlined in the "NTA Simplified Project Approval Process for Minor Works", available on the NTA Local Authority SharePoint.
3. For more expensive rapid build projects >€5m, or on primary cycle route, the options report template should follow the structure and content of this "NTA Option Selection" template, available on the NTA Local Authority SharePoint.

If no rapid build option is possible, much of the content and information gathered for the rapid build options report will be available for use on any agreed traditional build options assessment study.

## 6.3.Options Assessment

Options should be assessed as outlined within the Common Appraisal Framework (CAF), namely: Economy; Safety; Environment; Accessibility & Social Inclusion; Integration; and Physical Activity. It may also be useful to use sub-criteria.

Often space is constrained for rapid build solutions, and bidirectional facilities can support more comfortable widths for those cycling, allowing overtaking and side by side cycling, and reducing impacts on parking and greenery. Bidirectional facilities can be as direct a solution for cyclist as unidirectional cycle tracks on typical distributor roads where access points are limited to a few crossing points, or when key origins or destinations are located on one side of a street.

There can sometimes be increased hazard at junctions because drivers may not expect contraflow cyclists. However, this can be mitigated by ensuring low speeds for turning cars e.g., through traffic calming on the main route, raised crossings and setbacks at side road junctions and careful design at larger junctions. Bidirectional tracks can also be used by emergency vehicles, as shown in the image below, so consideration should be given to how they can gain access and leave the track at critical points.

***Figure 1*** *Ambulance using a bidirectional cycle track in Blackrock, Co. Dublin (Photo Courtesy of DLRCC)*

### 6.4.Rapid Build Materials

More details on rapid build materials and cycle track segregation options can be found in the **NTA Protected Cycle Lanes Draft Design Guide** available on the NTA Local Authority SharePoint.

## 7. Irish Case Study Examples

There are several ways in which space on existing roads can be rebalanced towards active travel modes, some with little, or no, impact on traffic capacity, and most will result in reduced traffic speeds due to the reduced road widths and tighter corner radii which will give road safety benefits. The measures below can be used in combination to gain the necessary road space to provide for active travel modes, e.g., narrowing carriageways and removing ghost islands, or turning lanes, usually provides sufficient space to provide cycle lanes on many distributor roads.

**Some of the case studies include notes on refinements that would be recommended for any similar scheme being developed, reflecting lessons learned and current best practice.**

### 7.1.Narrowing Wide Carriageways

Many carriageways are wider than necessary i.e., wider than standard carriageway widths of Arterial and Link Streets - 5.5 to 6.5m outlined in Section 4.4 DMURS. A typical 9m wide distributor road offers potential to provide protected cycle facilities, with negligible impact on traffic capacity, and positive impacts on traffic safety. As stated in DMURS "Research from the UK has found that narrow carriageways are one of the most effective design measures that calm traffic." Figure 2 below illustrates the impact lane narrowing can have on speed. A 6m carriageway is sufficient for most urban roads, even those with bus services, though local widening on bends e.g., should be provided to aid bus movements.

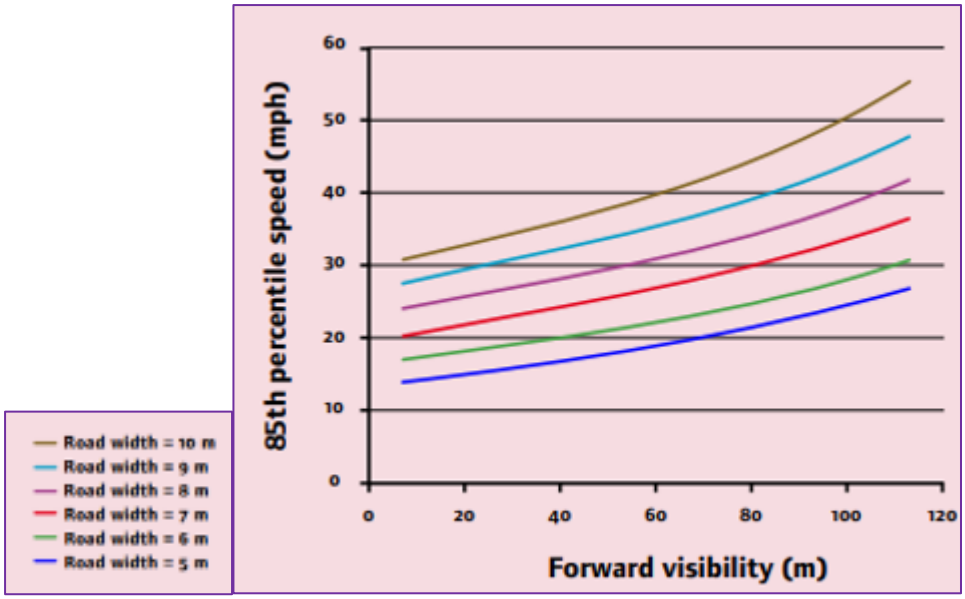


*Figure 2 Correlation between visibility and carriageway width and vehicle speeds (Source: Manual for Streets[2], UK)*

2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1072722/Essex_Manual_for_Streets_Redacted.pdf

| CASE STUDIES | BEFORE | AFTER |
|---|---|---|

**Please note the google street view captions are hyperlinks to the location**

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|---|---|---|
| **Blacklion Road, Wicklow County Council**<br><br>The existing carriageway was narrowed, and protected cycle tracks provided via extruded kerbs, backfilled with asphalt. New gullies feed into the existing drainage system. Further work is planned to reallocate road space from the ghost island median into a planted median, and to upgrade junctions.<br><br>**Refinement Note**: Where preferred design is to raise the cycle track to the same level of the adjoining footpath a delineator kerb should be used. Examples include a concrete block option and a bolt down option.<br><br>**Cost €0.5m/km** |  <br>*©Google Street View 2009* |  <br>*©Google Street View 2022* |

**Templeville Road Dublin, South Dublin County Council**

The existing carriageway was narrowed, and protected cycle tracks provided via extruded kerbs, backfilled with asphalt to the level of the adjoining verge. As with Blacklion Road above, new gully pots feed into the existing drainage system.

**Refinement Note:** For cycle facilities in or adjacent to the carriageway, the NTA recommend the use of red SMA for cycle track asphalt. The specification can be supplied by the NTA. This will allow for consistent, recognisable cycle facilities with the added benefit of visually reducing the width of the vehicular carriageway and therefore further reducing vehicle speeds.

**Cost €0.6m/km**


*©Google Street View 2021*

*Oct 2022*

***Step 1** Gully excavation*

***Step 2*** *Temporary tarmac to new gully pot, notice the road narrowing intentions*

***Step 3*** *New extruded kerb, asphalt cycleway and gully mastic surround*

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| **Childers Road, Limerick City and County Council**<br><br>The existing carriageway was narrowed from 10m to 6.5m and a two-way 3m wide cycle track was created using bolt down kerbs. Gaps in the kerbs were left for drainage so the existing drainage did not need to be altered.<br><br>**Cost €0.3m/km** |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2022* |
| **Wellington Lane, South Dublin County Council**<br><br>The existing carriageway was narrowed from 10m to 6m traffic lanes (2x3.0m lanes) and 2m wide protected cycle lanes on both sides of the road. Two large roundabouts were upgraded with rapid build interventions as part of this quick build scheme.<br><br>The bus service frequency on this road is approximately 15mins (each direction) at peak times, and the reduced road width has not impacted their operation.<br><br>**Cost: €0.2m/km** |  <br>*©Google Street View 2021* |  <br>*©Google Street View 1022* |

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| **Avonbeg Road, South Dublin County Council**<br><br>The carriageway was narrowed on a 1.3km distributor road and road space reallocated to a 4m wide urban greenway connection to the Dodder Greenway. In addition junctions were tightening on all side roads, with upgraded uncontrolled pedestrian crossings and lighting also provided.<br><br>**Cost: €1.8m/km** |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2022* |

*Table 1 Examples of Narrowing Wide Carriageways*

## 7.2.Removal of Ghost Islands/ Hatching/ Central Islands

Many roads in urban areas, have ghost islands, or medians, which can take up a considerable amount of underutilised road space while making roads wider and therefore faster, and harder to cross on foot or bike. In many circumstances these ghost islands, or medians, with right/left turn pockets were designed according to older standards and are no longer required, or appropriate. In many cases, the loss of right turn lane into a specific estates, or businesses, does not reduce the capacity of the road as this is dictated by the capacity of the proximate junctions. TII (Transport Infrastructure Ireland) guidance states that in the design of inter-urban rural roads no ghost island is required if the minor road has an AADT of less than 300 vehicles; this threshold is conservative in urban settings where traffic speeds are lower and needs of active travel users should be prioritised.

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| **R407 Sallins, Kildare County Council**<br><br>The hatched median and turning lane were removed on this busy road next to Sallins and Naas Train Station. The carriageway was narrowed to 6m, existing narrow advisory cycle lanes were removed and replaced with 2m wide protected cycle lanes. |  <br>©Google Street View 2021 |  <br>©Google Street View 2022 |
| **Newtownpark Avenue, Dún Laoghaire Rathdown County Council**<br><br>This carriageway was narrowed from 9m to 6m, including removal of 3m wide ghost island and right turn lanes, and protected cycle lanes installed on both sides of the road using bolt down kerbs, which helps pedestrians and cyclists access schools along the route.<br><br>**Cost €0.2m/km** |  <br>©Google Street View 2019 |  <br>©Google Street View 2022 |

*Table 2 Removal of Ghost Islands/Hatching*

## 7.3.Reducing the Number of Traffic Lanes including Turning Lanes

On urban roads with more than one lane for general traffic, it may be possible to reduce the number of traffic lanes and quickly create facilities for active travel modes in the space gained. This is particularly useful in towns which have now been bypassed and no longer need the extra capacity for strategic traffic, removing this excessive capacity will help promote a modal shift to active travel modes. Also, in urban areas the capacity of the network is typically limited by the capacity of junctions rather than the link.

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| **Ushers Quay, Dublin City Council**<br><br>One lane for general traffic was removed, with the bus lane relocated to the middle of the carriageway and a one-way protected cycle lane installed next to the kerb, with low level bollards providing segregation. |  <br>©Google Street View 2019 |  <br>©Google Street View 2022 |
| **Shannonbridge, Limerick City and County Council**<br><br>One of the inbound traffic lanes on the Shannonbridge/Condell Road was removed and a two-way protected cycle lane installed in the newly available space. |  <br>©Google Street View 2019 |  <br>©Google Street View 2022 |

*Table 3 Reducing the Number of Traffic Lanes including Turning Lanes*

## 7.4.Re-orientating/Removing Parking spaces

The re-orientation/removal of car parking spaces can quickly create space for active travel facilities on important routes. A one-way or a two-way cycle facility could be installed depending on the amount of space gained by the removal of parking (and other potential measures e.g., carriageway narrowing).

Converting perpendicular parking to parallel parking improves road safety as there is better visibility for drivers exiting parking spaces. Where parking demand is high it might be necessary to look at means of increasing turnover of spaces through a car parking management plan or providing additional parking elsewhere. If there is only enough space to implement a cycle facility in one direction meaning cycling in the other direction is mixed with traffic, consideration should be given to changing traffic circulation arrangements (creating a one way to provide space for the cycle lane in the other direction) and/or implementing traffic calming measures to reduce the volume and/or speed of traffic respectively to levels suitable for cyclist to share streets with traffic.

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| **Fitzwilliam Street, Dublin City Council**<br><br>Perpendicular parking on both sides of the street was reoriented to parallel parking bays and parking protected cycle lanes installed on both sides of the road. A hatched buffer was provided between the parking and the cycle lane.<br><br>**Cost €0.7m/km** |  <br>*©Google Street View 2019* |  <br>©Google Street View 2022 |

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| **South Mall, Cork City Council**<br><br>Echelon parking on one side of the street was changed to parallel parking, the carriageway narrowed, and a two-way 3m wide cycle lane was installed on one side. A buffer was created using hatching, bollards and planters along the length of the scheme. |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2022* |
| **Donovan Rd, Cork City Council**<br><br>On-street parking was removed, and a bollard protected cycle lane installed on the uphill side of the street. The road remains two-way for traffic with a road width of 5-5.5m. Cyclists share with traffic in the downhill direction. |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2022* |

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| **Inns Quay, Dublin City Council**<br><br>On-street parking and one lane of traffic were removed in front of the Four Courts in the centre of Dublin. A protected cycle lane and additional space for pedestrians was created in the reallocated space. A buffer using robust, and attractive, steel planters was used to segregate the active travel modes from the busy traffic lanes. |  <br>©Google Street View 2019 |  <br>©Google Street View 2022 |

*Table 4 Re-orientating/Removing Parking spaces*

## 7.5. Widening Footpaths and Narrow Footpaths

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| **St Anne Street South, Dublin City Council**<br><br>Car parking removed and wider footpaths created using bolt down kerbs, backfilled with asphalt and a surface resin. |  <br>©Google Street View 2019 |  <br>*St Anne St 2021 Photo courtesy of Dublin City Council* |

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| | |  <br>*Excavation of existing carriageway and introduction of bolt down kerb* |
| | |  <br>*Placing of linear drains* |

*Table 5 Widening Footpaths and Narrow Footpaths*

## 7.6.One-Way streets/ Restricted Entry/ Shuttle Systems

One-way streets or shuttle systems can be a very effective and cost-effective measure to provide space for active travel facilities.

**Coastal Mobility Route, Dún Laoghaire Rathdown County Council**

This scheme provided 3.6km of a two-way segregated cycle track via a mix of bolt down kerb and wave delineators, along with several junction improvements. This involved reallocation of road space through the introduction of a one-way system for vehicles along the route – the N31 from Blackrock to Dun Laoghaire.

**Cost €0.7m/km**


©Google Street View 2019

*Photo courtesy of Dun Laoghiare Rathdown County Council*

**Dundrum Main St, Dún Laoghaire Rathdown County Council**

Dundrum Main Street was re-arranged into a one-way system for vehicular traffic, with a contra-flow cycle lane and wider footpaths and buildouts for seating. Some parking was also removed/reoriented.

The scheme involved local re-routing of public transport, including the development of new bus stops, alternative bus routing, and junction signalling.


©Google Street View 2018


©Google Street View 2022

**Blackrock Village, Dún Laoghaire Rathdown County Council**

Blackrock Main Street was re-arranged into a one-way system for vehicular traffic, with a contra-flow cycle lane segregated by bolt down kerbs. Additional pedestrian space and congregation/seating areas were demarcated using bolt down kerbs, planters and a change in carriageway surfacing.

The majority of parking was also removed along Main Street.


*©Google Street View 2018*

*©Google Street View 2021*

**Belmont Avenue, Dublin City Council**

On Belmount Avenue one end of the street was closed to all vehicles except cycles, to remove "rat-running" traffic through this residential street.


*©Google Street View Jun 2022*


*©Google Street View Nov 2022*

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| **Clane, Kildare County Council**<br><br>A give-way (unsignalised) shuttle system was provided to enable the provision of wider footpaths on both sides of an existing bridge and a safer crossing from a busy playground to the nearby village. |  <br><br>*©Google Street View 2019* |  <br><br>*©Google Street View 2021* |

*Table 6 One-way streets/ Restricted Entry/ Shuttle Systems*

## 7.7.Traffic Calming

Traffic calming uses physical design and other measures to improve safety for pedestrians, cyclists and motorists. It is an important tool for reducing vehicle speeds and encouraging safer, more responsible driving and can reduce traffic flow and speeds to levels where cyclists can comfortably share roadway with motorised vehicles.

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| **Kimberly Road Greystones, Wicklow County Council**<br><br>Wider footpaths and buildouts were added to reduce carriageway width, manage parking and provide space for planting and SUDs features. |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2021* |

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|---|---|---|
| | |  <br>*Tree Pit with drainage channel (Photo credit Wicklow CC)* |
| **Lower Dodder Road Quiet Street, South Dublin County Council**<br><br>Rapid build chicanes and ramps were installed to reduce "rat running" and speeds, in order to provide an appropriate environment for cyclists to share the carriageway as an interim/ trial measure. Should this be made permanent planting and seating can be provided as part of the permanent works.<br><br>**Cost €40,000** |  <br>*©Google Street View 2014* |  <br>*©Google Street View 2022* |

*Table 7 Traffic Calming*

## 7.8.Shuttle Systems on Bridges

Shuttle systems are cost effective ways of managing traffic on existing bridges to provide for space for active travel, as an alternative to expensive and long term projects like new bridges. They have been shown to be effective even in relatively high traffic locations for many years in many parts of the country.

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| **Kildangan Bridge, Kildare County Council**<br><br>Footpath provided on a narrow bridge via space made by a signal-controlled 200m shuttle system. Three private entrances within the shuttle area were each signalised.<br><br>**Cost €0.5m** |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2022* |
| **R415 Rathbride Rd, Kildare Town, Kildare County Council**<br><br>250m long shuttle system on the R415 bridge over the rail line on one of the main traffic spines in Kildare Town. This shuttle has been in place for some time, as are many other similar shuttles over various rail or canals in Co. Kildare. |  <br>*©Google Street View 2021 southbound* |  <br>*©Google Street View Northbound* |

*Table 8 Shuttle Systems on Bridges*

## 7.9.Converting Hard Shoulders

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| **R510, Limerick City and County Council**<br><br>Hard shoulders may not always be required on urban roads and therefore there may be potential to provide protected cycle tracks by adding bolt down kerbs or similar interventions, such as this scheme on the R510 in Limerick. |  <br>*©Google Street View 2018* |  <br>*©Google Street View 2022* |

*Table 9 Converting Hard Shoulders*

## 7.10. Rapid Build Pedestrian/ Cycle Only links

**Traffic Free Streets, Dublin City Council**

During the summer of 2021 Dublin City Council made parts of South Anne St, Dame Court, South William St, and Drury Street traffic free. The decision to carry out these works was made following the successful "weekend traffic free trials". 34 on-street car parking spaces were removed on these streets.


*©Google Street View 2018*

*©Google Street View 2022*

**Traffic Free Street, Plunket Street, Killarney, Kerry County Council**

Kerry County Council undertook the temporary removal of traffic from several streets in Killarney to generate space in a busy pedestrian location. Originally part of the town's COVID response these measures are to remain in place until the end of 2023, by which time a plan for permanent solution for these streets will have been made.


*©Google Street View 2019*


*Photo courtesy of Kerry Co. Co.*

**Filtered Permeability Grangegorman, Dublin City Council**

The filtered permeability measures were installed firstly as interim measures at Grangegorman Lower, linking both sides of the TUD Campus. Following the trial period, councillors voted to make the permanent in 2021 and the layout was upgraded with permanent kerbing and planting installed, as is seen in the 2022 image.

*©Google Street View 2017*

*©Google Street View 2022*

**Interim Layout**

*©Google Street View 2021*

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| **Convent Rd, Navan, Meath County Council**<br><br>In 2021 Meath trialled a filtered permeability scheme allowing motorised traffic to access the properties and businesses located along the route but limiting through traffic. The scheme has been in place over 12 months and has been positively received by local schools in particular. Following a Part 8 process in 2022 the trial was made permanent in January 2023.<br><br>**Cost: €450k** |  <br>*©Google Street View 2019* |  <br>Photo courtesy of Meath County Council |

*Table 10 Rapid Build Pedestrian/ Cycle Only links*

## 7.11. Rapid Build Junction Improvements

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|---|---|---|
| **Wellington Lane, South Dublin County Council**<br><br>Two large roundabouts were treated as part of this quick build scheme, with raised Zebra Crossings provided on all 4 arms, using solar powered belisha beacons.<br><br>**Note, subject to the results of the ongoing Zebra Crossing Pilot Project it may be possible to install zebra crossings without belisha beacons from the second half of 2023.**<br><br>**Cost: €200k** |  <br>*©Google Street View 2018* |  <br>*©Google Street View 2022* |
| **Railway St Roundabout, Navan, Meath County Council**<br><br>Not a rapid build project but an example of a Cycle Friendly Roundabout on this key strategic route in Navan (Average Annual Daily Traffic of 15,000), re-balanced priority in favour of pedestrian and cyclists.<br><br>**Cost: €1.4m** |  <br>*©Google Street View 2014* |  <br>*©Google Street View 2018* |

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|---|---|---|
| **College Green, Dublin City Council**<br><br>Interim cycle signal crossing to support a rapid build two-way cycle track and bus gate at one of the busiest pedestrian crossing locations in Ireland. |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2022* |
| **O'Connell Street, Dublin City Council**<br><br>A section of the nearside bus lane on O'Connell St on the approach to the junction with Parnell Street was removed. A new protected cycle lane, with turning lanes marked, was created in the reallocated space using robust and attractive planters.<br><br>A separate cycle signal was introduced to facilitate access to northbound contra-flow cycle facility on Parnell Square East. |  <br>*©Google Street View 2019* |  <br>*©Google Street View 2021* |

*Table 11 Rapid Build Junction Improvements*

## 7.12. Side Road Junction Tightening

**Side road junction Hartstown, Fingal County Council**

In Hartstown as part of a rapid build protected cycle track scheme, junction tightening and raised tables were provided. These kerb realignments slow traffic down and reduce crossing distances for pedestrians.

Interim measures involved hatching and bollards, and were followed by permanent buildouts and raised crossings.

**Cost: €40,000 each**

*©Google Street View 2019*

*Phase 1 Hatching and Bollards ©Google Street View Jun 2021*

*Phase 2 Concrete Build Out and Ramps ©Google Street View Mar 2022*

| | | |
|---|---|---|
| **UK examples of rapid build Islands and crossings using bolt down kerbs and infill surface.**<br><br>There are many suppliers of bolt down kerbing products which can be used to quickly tighten corners or reduce radii.<br><br>Please note these images are from the UK and the blue surfacing is not recommend. |  <br>*Image (rediweldtraffic.co.uk)* |  <br>*Image (rediweldtraffic.co.uk)* |

*Table 12 Side Road Junction Tightening*

## 7.13. Rapid Build Safe Routes to School Elements

<table>
<tr>
<td>Rapid Build School Zones, Dublin City Council<br><br>Pencil bollards were placed on the carriageway to create additional pedestrian space and narrow the road width. This prevented parking and vehicle idling directly at the school gate.<br><br>Cost: €20-40,000 each</td>
<td>  <br>©Google Street View 2019</td>
<td>  <br>©Google Street View 2022</td>
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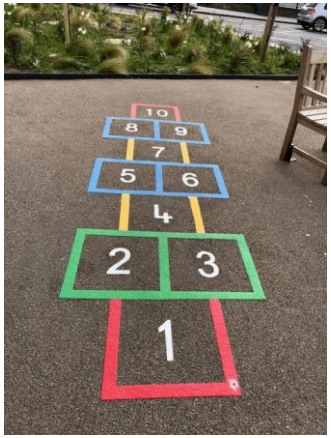
<tr>
<td></td>
<td>  <br>©Google Street View 2018</td>
<td>  <br>©Google Street View 2022</td>
</tr>
</table>

*Table 13 Rapid Build Safe Routes to School Elements*

## 7.14. Placemaking and Greening

**Dundrum, Dún Laoghaire County Council**

Dundrum main street was altered to be one-way for vehicular traffic as part of the county's COVID response. The council used bolt down kerbs to separate contra-flow cyclists from general traffic and added many placemaking and greening elements.




*Dundrum Main Street*


*Dundrum ©Google Street View 2022*


*©Google Street View 2022*


*©Google Street View 2022*

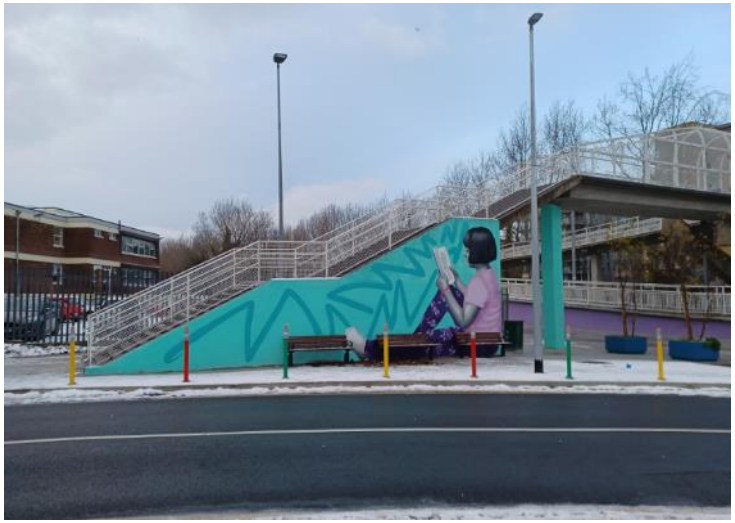
| | | |
|---|---|---|
| **Avonbeg Rd, South Dublin County Council**<br><br>As part of a rapid build scheme referenced in Table 1 a mural was commissioned for the bridge ramp outside a school and colourful pencil bollards were used to restrict parking.<br><br>**Approximate Cost: €30,000** |  <br>*©Google Street View 2019* |  <br>*Photo courtesy of South Dublin CC* |
| **Other Street Furniture**<br><br>Examples show seating areas provided in Capel St, Dublin and Blackrock, Dublin |  <br>*Seating and Planting on Capel Street, Dublin* |  <br>*©Google Street View 2021* |

*Table 14 Placemaking and Greening*

Údarás Náisiúnta Iompair
Dún Scéine, Lána Fhearchair
Baile Átha Cliath 2, D02 WT20

National Transport Authority
Dún Scéine, Harcourt Lane
Dublin 2, D02 WT20

NTA
Údarás Náisiúnta Iompair
National Transport Authority