



**SMART
DÚN LAOGHAIRE**
A Smart Dublin District

Smart Dún Laoghaire Review

2022



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Introduction

Welcome to the review of what has been a brilliant year for the Smart Dún Laoghaire programme! This review details some of our highlights, keeping you up to date with the latest activities, events and outputs of our projects. Significant highlights from the last year include: the impact of our EU Horizon 2020 research projects SCORE, PROBONO and PRECINCT (pg 6); the award of NTA funding for our active travel project (pg 9); and the launch of our IoT accessibility project the largest of its kind in the country (pg 5)!



The collaboration between climate and smart city research continues to grow in Dublin: Along with the four other Smart Dublin districts, our emphasis on using tech to address climate change has never been more important. We are also excited to be working with the new Climate Development Zone in Dún Laoghaire, which launched this year.

We would like to thank all of our partners, ENABLE and CONNECT, in Trinity College Dublin, Dún Laoghaire-Rathdown County Council (DLR), and Smart Dublin, for their continued support. We are looking forward to an even busier second year, progressing our research projects and developing smart solutions and ultimately increasing our impact for citizens.



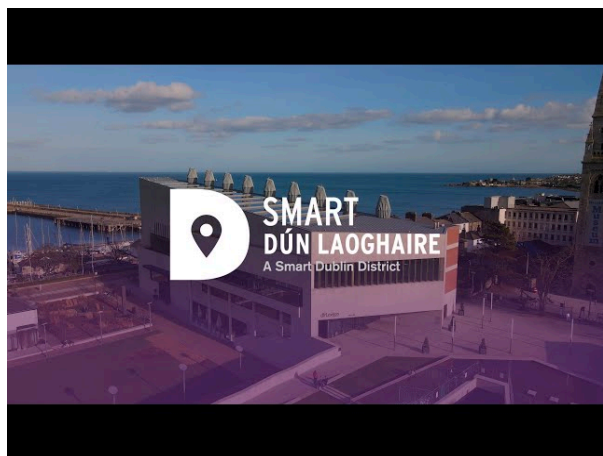
Overview

The Smart Dún Laoghaire programme brings research and technology together to make them real for Dublin. The Smart Dún Laoghaire programme aims to develop Dublin as a smart city using an applied research approach. This involves data-driven decision making, on-the-ground technological innovation, and living lab collaborations. Working alongside European counterparts, we maintain strong regional, national and international collaborative partnerships, so that local interventions reflect global best practice.



The programme focuses on two key challenge areas: The first is environmental resilience, coastal towns are becoming increasingly vulnerable to the impacts of climate change. The second is sustainable mobility, we need a shift in many sectors but transport has one of the highest carbon footprints in Ireland. The DART runs on reclaimed land and is regularly flooded from overtopping, demonstrating how these two challenges are inextricably linked. Through the programme we use innovation and technology to address these challenges.

Smart Dún Laoghaire brings technology to life for the benefit of the community. The Smart Dún Laoghaire programme is a partnership between DLR and Enable Research with CONNECT. It was established to strengthen the town's response to climate challenges and answer the question 'How can emerging technologies future-proof Dublin?'



Check out the district video on the website:

<https://smartdublin.ie/smart-districts/smardunlaoghaire/>

IoT in Action



IoT (Internet of Things) is a network technology that allows devices to communicate small packages of data across almost any use case. This technology enables us to monitor elements of cities like never before, greatly enhancing informed decision making.

Over the last 6 years CONNECT have developed 'Pervasive Nation', the IoT research testbed. Smart Dún Laoghaire builds on this work by facilitating the development, trialling and scaling of IoT technology through real world projects. These projects range across departments and sensor types including:

- Electric parking monitoring;
- Energy usage;
- Environmental air quality;
- Accessible parking;
- Manhole access;
- Network coverage development;
- Water quality: and,
- Storage room temperature and humidity.



Cellnex IoT Partnership



Cellnex is the largest telecom infrastructure provider in Europe and the IoT team have been working with us to trial and test IoT devices to enhance communication efficiency. With their Irish HQ in Sandyford, Cellnex have deployed the first commercial 'LoRa' based IoT network across Ireland. They have given access for research and the trialling of new technologies with Smart Dún Laoghaire. This has included collaboration on IoT development and deployment of sensors across DLR and base stations (network providing units) on council buildings.



Connectivity issues are common throughout the urban environment where buildings often block network connectivity. In advance of our trials a Cellnex LoRa gateway was installed on County Hall and Dún Laoghaire shopping centre to ensure coverage for the town. Another element of this collaboration is to

demonstrate the use of IoT sensors at scale. This network also allows for companies already trialling their products in the Pervasive Nation testbed to expand their trials to industrial levels. This relationship has led to further collaboration with Cellnex funding an engagement role in Smart Docklands among other CONNECT projects coming soon.

Accessible Parking IoT

Over the summer we launched an accessible parking trial covering all of Dún Laoghaire town. IoT sensors are being deployed on all of the town's accessible parking spaces in the largest trial of this kind in Ireland.

The sensors connect to the Cellnex LoRa network and then display their data to the end user via the 'Park Magic' parking app. This provides real-time information on the location and availability of accessible parking spaces to the public. This app and service is free for users.



The sensor data will also be made available via the Access Earth platform to maximise user engagement. Access Earth are working with us to enhance the offering and develop additional services using a personalised experience with additional features.

The project was covered in the Independent:

<https://www.independent.ie/regionals/dublin/dublin-news/new-app-to-help-drivers-find-accessible-parking-in-dun-laoghaire-41692889.html>

Research Driven

This year Smart Dún Laoghaire has developed research projects focused on climate action inclusive of both mitigation and adaptation. Specifically these projects include urban resilience enhancement, energy retrofit, sustainable travel and engagement analysis. The programme has delivered projects valued at over €1 million for the partners.

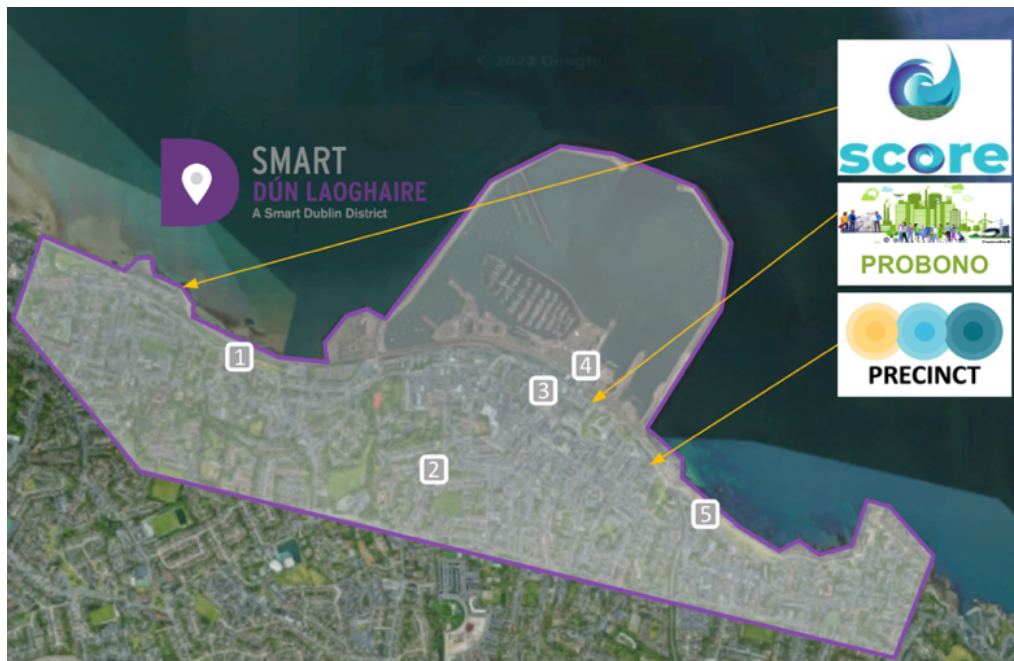


Figure 1: Locations of Smart Dún Laoghaire Project Interventions

Dún Laoghaire as a Living Lab

A testbed gives researchers an opportunity to trial new technology and solutions in a real world environment. Towards the push for sustainability and resilience in cities, Smart Dún Laoghaire facilitates research leading to large scale exemplars. These testbed projects involve world leading researchers and cutting edge technology; to date we have been successful with three multi-million euro project submissions for EU funding – SCORE, PRECINCT and PROBONO. Where Smart Dún Laoghaire is the testbed for Dublin, we are now developing Dublin as the testbed for Europe.

To give an indication of the competition; for our latest project ‘PROBONO’, 5 EU experts reviewed 170 applicants, with 114 shortlisted, and our project was one of three funded. DLR (Dublin) and Madrid are the lead cities among 40 partners.

EU Research Projects

1. SCORE

'Smart Control of the Climate Resilience in European Coastal Cities', this project offers new frameworks and approaches to managing cities and improving their resilience. The ecosystem-based approach, adopted in SCORE will ensure sustainable management, conservation, and restoration of ecosystems that



can generate social, economic and social benefits. The project will provide DLR access to cutting edge technologies, including digital twin and flood sensor technologies. In March we welcomed the partners to DLR County Hall where we held a workshop analysing Dublin specific challenges and stakeholders.

2. PROBONO

'The Integrator-centric approach for realising innovative energy efficient buildings in connected sustainable green neighbourhoods' aims to create more sustainable and environmentally friendly European locations by developing greener communities with local stakeholders. The project will provide strong examples of GBNs' technological and social innovation implementation by focusing on building infrastructure and exploiting digitalisation and smart technologies. Working with UCD we have hired a Dublin living lab coordinator who will commence in September.



3. Precinct

'Preparedness and Resilience Enforcement for Critical Infrastructure Cascading Cyber-Physical Threats'. This project aims to connect private and public infrastructure stakeholders, in this case transport. The 'common cyber-physical security management approach' will yield a protected territory for citizens and infrastructures. This 'PRECINCT' can then be replicated efficiently in other cities for a safer Europe. The goal is to supervise and control complex interdependent networks and Cyber Physical Systems of Systems (CPSoS) with distributed ownership and management structures.



Engagement Research

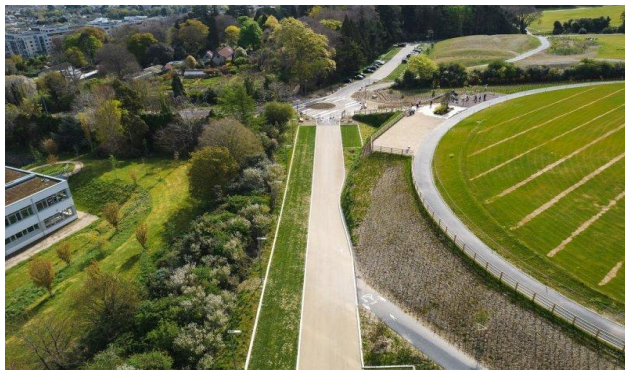
Recognising the importance of engagement in creating smart and sustainable places, Enable researchers Prof. Anna Davies and Dr. Hannah Devine Wright from the Geography



Department in Trinity College Dublin are focused on how engagement is understood and practised within smart urban projects using a novel tool called 'Pattern-IT'. In 2021, they will work with us to invite Smart Dún Laoghaire stakeholders and residents to participate in facilitated 'Pattern-IT' workshops and interviews to explore this important issue.

Insights from these workshops and interviews will be used to identify and evaluate engagement practices with the goal of supporting effective and meaningful engagement strategies for smart and sustainable places, both in Dún Laoghaire, Dublin and beyond.

Fernhill Augmented Reality Project



Last year we won an SFI Discover award to develop an interactive educational exhibit based on the new Fernhill Park and Gardens. As part of the project we worked with DLR, Enable and IADT based teams to develop an exhibit with both a physical scaled model and an Augmented Reality (AR) tool. We aim to encourage community engagement in STEM through novel use cases. The model has been

developed and we will launch it in Marlay park with workshops and outreach in DLR Libraries in Q4 this year.

Active Travel

Promoting active travel and furthering its research is a key objective for Smart Dún Laoghaire: Over the past two years we have worked closely with the DLR active travel team in designing, managing and analysing these projects.

With considerations of safety of cycle infrastructure and the diversification of cycling in mind, we have commenced a programme of research led by Professor Brian Caulfield as Principal Investigator to analyse existing challenges in DLR and to suggest and test potential solutions using a trial approach with a view to scaling across the County.

eCargo Bikes

Our e-Cargo bike project saw bikes rented at a discounted rate to local businesses as delivery and freight solutions. Since its inception last year, 20 companies in DLR and a further 40 companies in DCC have taken part. This is a collaborative project with Bleeper, DLR, DCC, and Enable Smart Dún Laoghaire teams working together.

RTÉ News Coverage:

<https://www.rte.ie/news/dublin/2021/0513/1221419-e-cargo-bikes/>

We have carried out a detailed mixed-methods evaluation of the schemes impacts with initial analysis results highlighting the positive impact the scheme is having on carbon reduction. This evaluation involves focus groups, GPS data analysis and staff interviews to understand how eCargo Bikes are used and how they can contribute to local freight and deliveries for businesses. This evaluation is inform future eCargo Bike schemes that aim to transition freight and delivery practices away from private vehicles and toward sustainable modes.

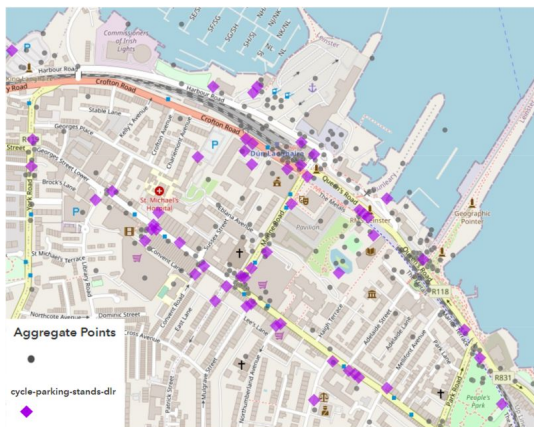
The e-cargo bike project was recently shortlisted for the transport section of the SEAI Energy Awards 2022 - fingers crossed!

<https://www.seai.ie/events/sustainable-energy-awards/seai-awards-finalists/>



The council says 20 bicycles are available under the scheme

Bike Parking



As part of our active travel research projects we have analysed the bike parking available across the county. Traditionally this has been deployed in an ad hoc manner as needs from the public arise. Following a review of transport planning literature along with original survey and GIS data research based in DLR, we identified where demand for parking is most prevalent. Working with DLR staff we selected priority

areas and implemented cycle parking solutions. The project successfully led to the deployment of bike lockers at priority commuter Dart stations among other planned interventions. An ongoing evaluation is taking place that will inform future roll-outs of cycling parking.

This research has been published in ‘Case Studies for Transport Policy’:

<https://www.sciencedirect.com/science/article/pii/S2213624X22001559>

NTA funding

To decarbonise our transport system, replacing automobile infrastructure with active travel infrastructure – particularly in areas of high-density – is imperative. In June we were successful with an application to the National Transport Authority to fund an active travel research project. The aims of this



project are to identify barriers to cycle lane implementation, particularly in the form of public cycle lane opposition, which are arguably greater than challenges related to cycle lane design, and present a major obstacle to transport decarbonisation efforts. These barriers are currently poorly understood. In this project, we are exploring patterns of opposition and support to cycle lane schemes in DLR through analysing data from public consultations submissions.

Engagement

Cities are becoming smarter by using technology to make better decisions about how we plan, build and deliver services. By demystifying Smart Cities, we can bring communities together to tackle the major challenges they face. We are engaging communities to develop an understanding of how we can use smart city technology to improve the sustainability and resilience of cities across the world.

ENGAGEMENT EVENTS



Smart Dún Laoghaire Launch



TCD MSc Student Career Development



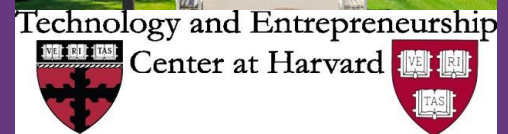
CONNECT Stand – IoT Week in Croke Park



Mason Hayes & Curran – Future of Property Panel



BABLE Smart City Podcast



Harvard Public Sector Executive Summit



Construction Summit Future Cities Session



Barcelona Smart City Congress



First DFEI Internship Placement



Cellnex Connectivity Day IoT Panel

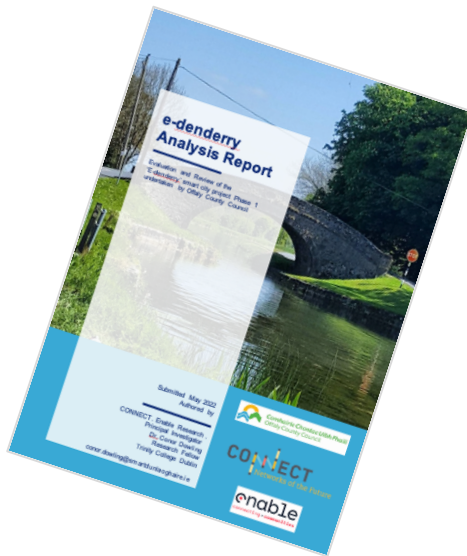
DLR Digital Strategy 2021-2024

The DLR Digital Strategy will ensure that Dún Laoghaire Rathdown as a county makes the most of the opportunities afforded by digital. Smart Dún Laoghaire played a key role in the development of this strategy and will continue as a flagship project for the development of digital in DLR.

“Like generations before, we – governments, businesses and individuals – have a choice to make in how we harness and manage new technologies.”



E-denderry Analysis Report



We reviewed Offaly’s ‘e-denderry’ smart town project: This research analysed how a smart city programme could help develop the town and make it a more attractive place to live and work. The study focuses on the social, economic and technological impacts of the IoT case studies for the council, local business and the society with suggestions for developing these going forward. This was a great collaboration, adapting the Smart Dublin approach to counties outside of Dublin.

Innovation Review 2022

We reviewed current approaches to innovation in Smart Dublin with the aim of informing our direction and our ‘why’. We interviewed Smart Dublin employees and key stakeholders analysing seven domains contributing to innovation. The review highlighted the high level of cooperation across industry, academia and government. It also provided us with a strong baseline of information for the development of the Smart Dún Laoghaire engagement strategy.



Smart Prague



Following a series of online engagements, we welcomed the Smart Prague team to Dún Laoghaire for a collaborative workshop with the Enable, Connect and Smart Dublin teams. Through the workshop we developed avenues of collaboration between the two cities. We gained valuable insight on Smart Dublin activities and had constructive talks on how we can work together to build on the smart programmes for both cities.

Engagement Strategy 2022-2024

Our new strategy focuses on four pillars: education, collaboration, participation and empowerment. What is coming down the track? We need to help citizens understand relevant trends and involve them in innovation implementation. A new programme **'Trendhunters'** has been designed for students from Dún Laoghaire to engage them on smart city and climate change topics and to develop their skills to become trendwatchers.



Climate Action Week

12 – 17 September 2022



Dublin Climate Action Week will take place from the 12th-17th of September 2022 and is organised by the four Dublin Local Authorities, the Dublin Climate Action Regional Office (CARO) and Dublin's Energy Agency Codema. As part of our SCORE project we are working with UCD researchers to host an online Minecraft workshop. This workshop will help families envision a new future to help shape our city more sustainably.

For details see:

<https://dublinclimatechange.codema.ie/climate-action-week/>

Partners

Smart Dún Laoghaire is a collaborative research programme co-funded by the Science Foundation Ireland, Enable Research Programme through CONNECT, and Dun Laoghaire–Rathdown County Council. The Smart Dún Laoghaire steering committee include smart city leaders from academia and the public sector:

Professor Siobhán Clarke

Principal Investigator
Trinity College Dublin
ENABLE, CONNECT



Stephen Brady

Director of Corporate Affairs
Dún Laoghaire Rathdown County Council

Ronan Herron

Digital Strategy Officer
Dún Laoghaire Rathdown County Council



Alan Murphy

Regional Manager
Smart Dublin

Meet the Team

Dr Conor Dowling
Post-Doctoral Research Fellow
Programme Manager



Dr Robert Egan
Post-Doctoral Researcher
Active Travel Research



EU Research Coordinator
Post-Doctoral Researcher
Commencing September 2023



Amber Desprets
Innovation &
Engagement Lead



We will be hiring a second EU research coordinator this year, competition details will be announced in Q4

Contact

For more information on any of our projects get in touch: info@smartdunlaoghaire.ie

Check out the **Smart Dún Laoghaire** District page on the Smart Dublin website for detailed project descriptions and blog posts: <https://smartdublin.ie/>

Connect with our company page on **LinkedIn**:
<https://www.linkedin.com/company/smart-dun-laoghaire/>

For regular updates follow us on **twitter**:
[@Smart_D_L](https://twitter.com/Smart_D_L)

