CRUSE Tool project: Milestone 2 Report

Robin Lovelace, Joey Talbot, and Eugeni Vidal Tortosa, ITS Leeds

Last updated 2022-05-13

1   Introduction

The Cycle Route Uptake and Scenarios Estimation (CRUSE) Tool is a research and data science/web development project funded by Transport Infrastructure Ireland (TII). The output will be an open source web application for Local Authorities and others across the Republic of Ireland to guide cycling infrastructure development. The CRUSE Tool project is conducted by the University of Leeds and managed by AECOM.

The project name has changed to the CRUSE Tool since the completion of Milestone 1 due to the name TURAS[1] Tool already being in use elsewhere.

2   Current state of progress

Within the CRUSE Tool project, work has been assigned to four milestones.

- Milestone 1: establishment of regional baseline networks
- Milestone 2: generation of mode shift scenarios and route networks for additional trip purposes
- Milestone 3: completion of a prototype tool for the pilot counties
- Milestone 4: scaling-up, refinement and deployment of a national tool

For Milestone 1, we undertook the following tasks:

- identified suitable locations for cycle counters in the pilot counties of Kildare and Limerick
- obtained origin-destination (OD) data for work and education trips from 2016 Census data using POWSCAR (Place of Work Census Anonymised Results)
- routed work and education trips on the road network
- converted routes into route networks
- visualised the route networks

As part of Milestone 2, we have done the following:

- refined the modelling and route network algorithms to improve calculations and performance of the tool
- specified additional trip purpose categories
- estimated the number of trips assigned to each trip purpose category
- developed a spatial interaction model for the trips for which OD data is not available

---

[1] TURAS – Trip Uptake and Routing for Alternative Scenarios Tool

- developed the 10% car km reduction and 30% car km reduction scenarios

3   Trip purpose categorisation

An important element of milestone 2 was to model cycle trips corresponding to a range of different purposes going beyond POWSCAR. The destinations for many of these trip purposes are identified using Geodirectory data.

The overall classification of trip purposes has been guided mainly by the trip purpose classification found within the National Household Travel Survey (NHTS). However, for commuting and education we have used categories based on the comprehensive POWSCAR data.

In total, we plan to model trips according to the following categories, based on classifications used by POWSCAR data and the NHTS:

POWSCAR-based categories:

- work (commute)
- primary education
- secondary education
- tertiary education

NHTS-based categories:

- social
- shopping
- personal/other

Other categories:

- tourism/recreational
- public transport

Trips to public transport hubs do not represent a unique trip purpose but can be thought of as an independent trip type which complements the other trip purpose categories as part of a multi-modal journey.

A summary of the trip purposes and data sources, along with limitations associated with them, is presented in Figure 3.1.

Trip purpose	Work (commute)	Primary Education	Secondary Education	Tertiary Education	Social	Shopping	Personal/other	Tourism/recreational	Public Transport
Description	Commuting to/from workplaces	Primary school trips	Secondary school trips	Tertiary education trips	NHTS classification, including trips to/from sports facilities, leisure, and cultural destinations (e.g. restaurants, cinemas, gyms etc.)	NHTS classification, including trips to/from supermarkets and shops	Combination of two NHTS classifications, and includes trips to medical, personal services and others.	Trips by non-resident visitors to/from visitor attractions	Trips to/from public transport
Primary source(s)	> Census 2016 POWSCAR Data	> Census 2016 POWSCAR Data > Dept. of Education Schools database	> Census 2016 POWSCAR Data > Dept. of Education Schools database	> Census 2016 POWSCAR Data > Geodirectory categories for 'Tertiary Education' and 'Other Education'	> Trip rates from NHTS > Geodirectory businesses classified according to relevant NACE codes	> Trip rates from NHTS > Geodirectory businesses classified according to relevant NACE codes	> Trip rates from NHTS > Geodirectory businesses classified according to relevant NACE codes	> Geodirectory listings for accommodation (origins) and destinations (destinations) > F<e1>ilte Ireland accommodation database > F<e1>ilte Ireland attraction database	> NTA Heavy Rail Census
Confidence	High confidence - data both origins and destinations for trip purposes	High confidence - data both origins and destinations for trip purposes	High confidence - data both origins and destinations for trip purposes	High confidence - data both origins and destinations for trip purposes	Medium Confidence - Method should identify clusters of activity for this trip purpose, although individual trips or destinations come with signficant uncertainty	Medium Confidence - Method should identify clusters of activity for this trip purpose, although individual trips or destinations come with signficant uncertainty	Medium Confidence - Method should identify clusters of activity for this trip purpose, although individual trips or destinations come with signficant uncertainty	Low confidence - lack of data regarding tourist trip rates	

Figure 3.1: Trip purposes and data sources

3.1 POWSCAR-based categories

3.1.1 Work (commute)

In the NHTS, commute to work and business trips are combined into a single category. However, POWSCAR 2016 Census data represents commute trips only and does not include business trips. Full OD data at the Electoral Division (ED) level is available for travel to work as part of the POWSCAR 2016 Census data. We have used this to create route networks for commuter trips.

Demand associated with business trips are currently not planned to be included in the tool. This is in part due to limited data availability, but also demand is likely to remain more central to urban areas. Furthermore, the demand is relatively low in comparison to other trip purposes, estimated to be only 5-7% of total trips.

At a future stage it could be possible to expand the CRUSE Tool to cover "business" trips if reliable datasets are available, which could be useful for infilling demand, particularly in more urban areas.

3.1.2 Education

Education is represented as a single category in the NHTS. To be consistent with POWSCAR data, we have created separate route networks for three different levels of education.

3.1.2.1 Primary education

Full OD data at the ED level is available for travel to primary education using POWSCAR 2016 Census data. We have adapted this so that primary school locations are used for the destinations. Where an ED contains more

than one primary school, we use total student numbers to weight the proportion of trips to each school.

3.1.2.2 Secondary education

Full OD data at the ED level is available for travel to secondary education using POWSCAR 2016 Census data. We have adapted this so that secondary school locations are used for the destinations. Where an ED contains more than one secondary school, we use total student numbers to weight the proportion of trips to each school.

3.1.2.3 Tertiary education

Full OD data at the ED level is available for travel to tertiary education using POWSCAR 2016 Census data. We have used the Geodirectory categories 'Tertiary education' (which typically refers to universities and colleges) and 'Other education' (which typically refers to a range of institutions such as adult education colleges and language schools) to represent destinations for these trips. We do not have information on student numbers so do not attempt to use weighting to determine the breakdown of trips in cases where there is more than one institution within an ED.

3.2 NHTS-based categories

The NHTS[2] provides a breakdown of trips from a household travel diary with six broad trip purposes (see Figure 3.2). To generate a network for travel to these locations, the CRUSE Tool uses Geodirectory directory categories to assign locations for different trip destinations. For each purpose, the selected locations have been assigned to a 500m grid cell, with a count of those per cell, i.e. representing a density of demand. These are then used for the "jittering" process as set out in Milestone 1 report.
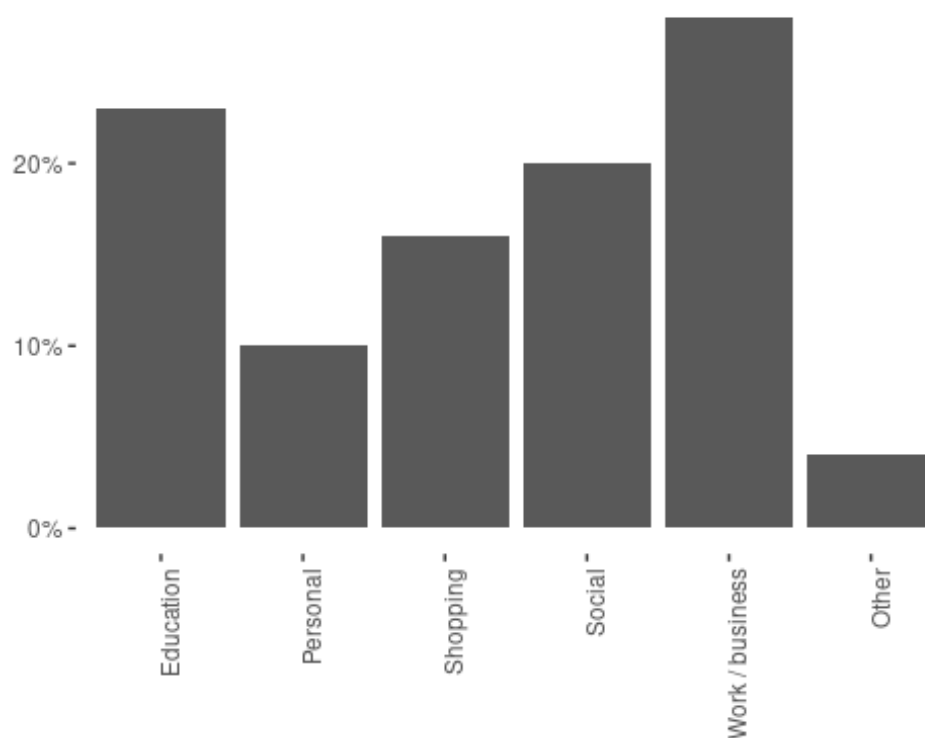
---

[2] National Household Travel Survey 2017

Figure 3.2: National trip purpose breakdown according to the NHTS

3.2.1 Social

This follows the NHTS classification and includes destinations associated with leisure and entertainment We have included trips to 20 categories of locations identified in Geodirectory data, such as sports facilities, leisure, and cultural destinations. This includes places such as restaurants, pubs, cinemas, leisure centres, sports clubs and gyms. A full list of the Nomenclature of Economic Activities (NACE) codes used is available in the Appendix 1.

3.2.2 Shopping

This is another NHTS category that uses the density of retail destinations identified in Geodirectory data to estimate the locations of town centres. Retail destinations are classified as those dedicated to the sale, leasing, or repair of goods. 44 NACE codes have been used to specify the shopping destinations (see Appendix 1). These are being used to model trips to these town centres.

Further work is underway to explore additional refinement options for presenting trip demand based on the six categories of urban areas in Ireland.

3.2.3 Personal/other

We have combined the two NHTS categories of personal and other.

These will include trips to 'personal business' destinations such as hairdressers, medical practices and other services. We also include trips to children's daycare and visits to residential care facilities. A full list of the 17 NACE codes used is available in Appendix 1.

3.2.4 Trips made by mode, purpose and area type

The NHTS data can be broken down by trip purpose and mode, which varies for the six classifications of development areas in Ireland. See Figure 3.3 and Figure 3.4.

The six geographic area types are defined as follows:

- Dublin City
- Greater Dublin Area (including Kildare, Meath and Wicklow and outlying parts of Dublin)
- Regional Cities (including Cork, Galway, Limerick and Waterford)
- Large Urban Towns (with population > 10,000)
- Other Urban Areas (population > 1,500)
- Rural Areas

Further work is underway to incorporate these area types into our cycling uptake scenarios and to explore additional refinement options for presenting trip demand based on the different classifications of development.
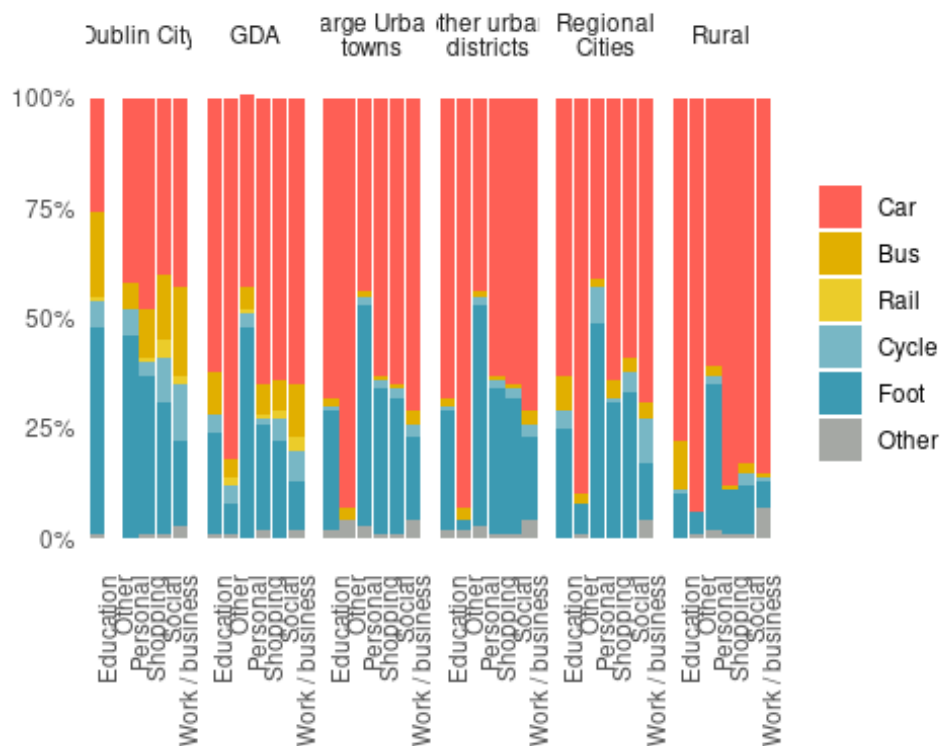

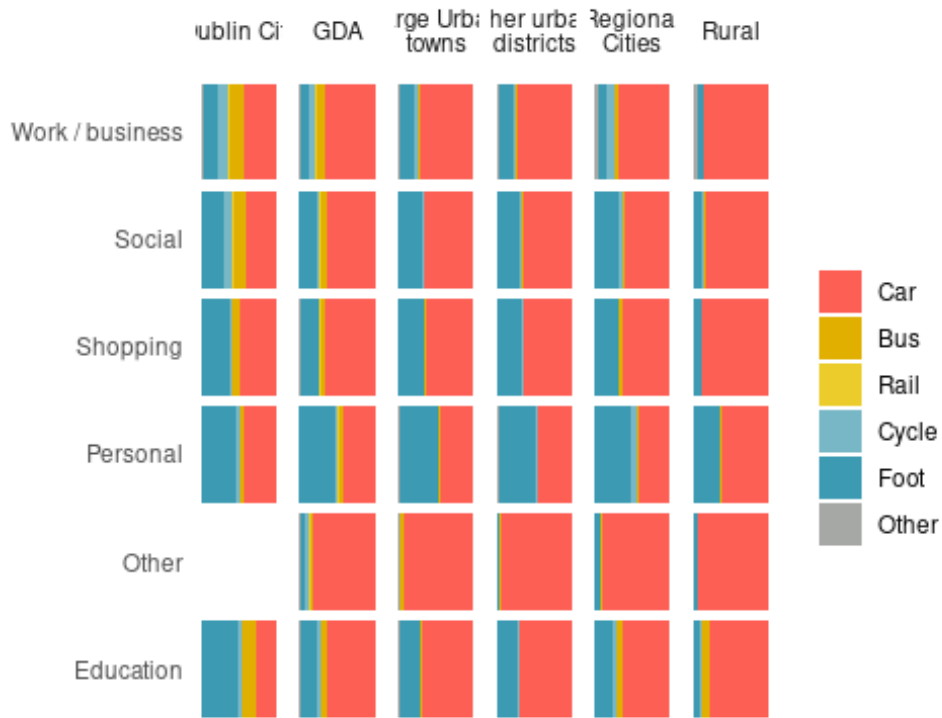*Figure 3.3: Mode share by purpose and area type*

Figure 3.4: Mode share by area type and purpose

For each mode, the following charts in Figure 3.5 show the proportion of total trips it represents, broken down by trip purpose and area type.
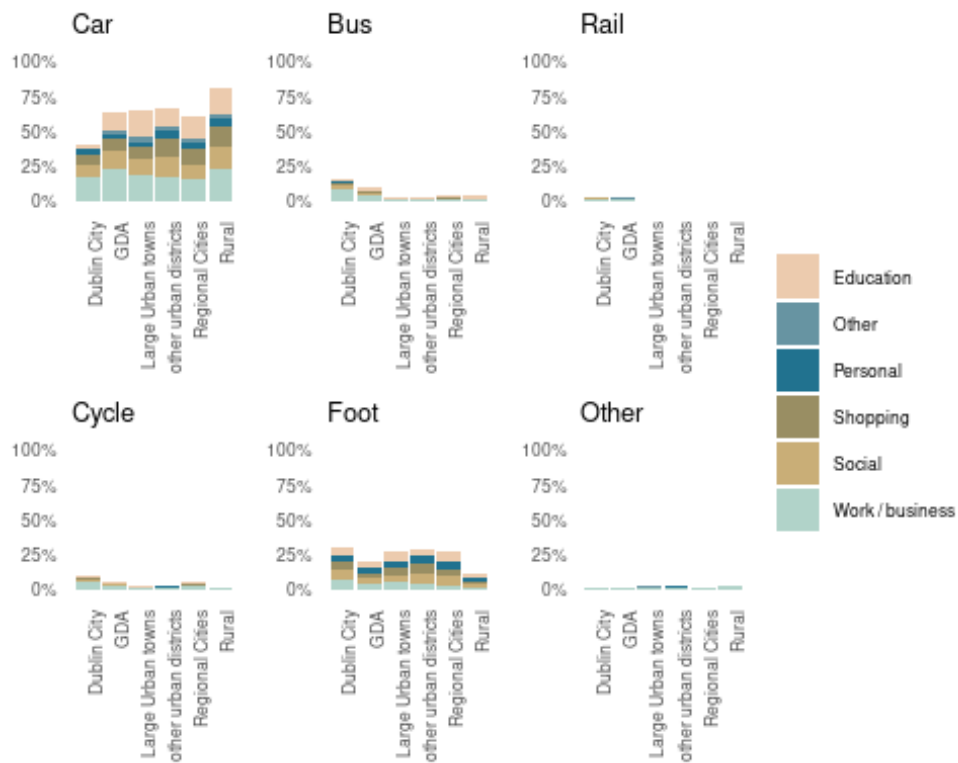

Figure 3.5: Proportion of trips by purpose and area type and mode

For example, we can see that cycling overall has a much higher mode share in Dublin and in regional cities than elsewhere, and that around half of these trips are for cycling to work. Walking is much lower in rural areas

than elsewhere, and is particularly low for trips to work. In rural areas, buses are fairly well used for travel to education, but rarely for travel to work or any other purpose.

3.3 Other categories

3.3.1 Tourism/recreational

This does not match with a specific NHTS category. However, it may be useful to model tourist trips separately from other trip purposes. Within the Geodirectory it is possible to identify locations that represent both origins and destinations for tourist trips. This is different from the other trip types, in which all trips are assumed to originate from the home.

Origins for tourist trips include hotels, campsites and other holiday accommodation.

- CAMPING GROUNDS, RECREATIONAL VEHICLE PARKS AND TRAILER PARKS
- HOTELS AND SIMILAR ACCOMMODATION
- HOLIDAY AND OTHER SHORT-STAY ACCOMMODATION

Destinations for tourist trips include visitor attractions, museums, zoos and nature reserves.

- OTHER AMUSEMENT AND RECREATION ACTIVITIES
- BOTANICAL AND ZOOLOGICAL GARDENS AND NATURE RESERVE ACTIVITIES
- MUSEUMS ACTIVITIES
- OPERATION OF HISTORICAL SITES AND BUILDINGS AND SIMILAR VISITOR ATTRACTIONS
- TRAVEL AGENCY AND TOUR OPERATOR ACTIVITIES

3.3.2 Public transport

This is different to the other categories because trips to public transport are not in themselves an independent trip purpose. Indeed, any trip purpose can involve cycling to a public transport node as a stage within a longer multi-modal trip. To estimate the total number of cycle stages to public transport, we first need to estimate the total number of public transport trips. We do this by assuming that the journeys to work and school in the POWSCAR data represent half of the total public transport trips, and that the remaining trips will be made from the same set of public transport nodes. We can then assume that a certain proportion of these trips involve cycling to the station. The rate of cycling to the station will vary between scenarios, in line with the modelled cycling uptake rate for cycle trips of equivalent distance.

4 Estimation of trips for the additional purposes

Currently, we use the mean national trip purpose breakdown and national mean trip rate per person per day, to estimate the number of trips for each purpose. We use the existing POWSCAR data for commute to work and

travel to school to calculate the expected number of trips from that ED for each of the other trip purposes listed. For each trip purpose, we can then calculate the number of trips we expect to be carried out by each mode of travel.

In future, if we can assign each EDs to one of these six area classifications, to get more accurate breakdowns of trip purpose. See Figure 4.1 for the proportion of trips in different area types by purpose. If we can find a way to assign each ED with each area type shown in the figure we can refine the model results.
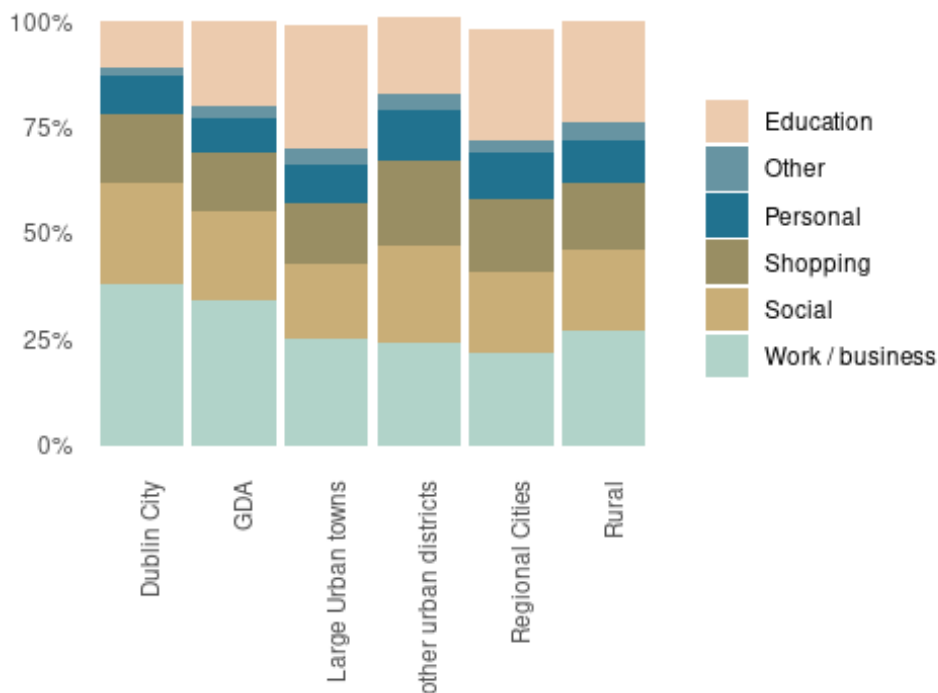

Figure 4.1: Proportion of trips by purpose and area type

5   Spatial interaction model

For trip purposes where OD data is not available, we developed a spatial interaction model as a method for assigning and matching trip origins and destinations.

Destinations were selected from the Geodirectory point data (although other sources e.g. OSM data which has many buildings but which is generally less comprehensive could be used). Rather than routing separately to each Geodirectory destination, we have assigned these points to their nearest 500m grid cell. Each grid cell is given a weighting, based on the number of Geodirectory destinations within that cell. This clustering reduces the computational demand of the routing process. Trips must be within a maximum distance threshold of 20km, using a distance decay function.

Figure 5.1 shows the results of the spatial interaction model for all social trips.
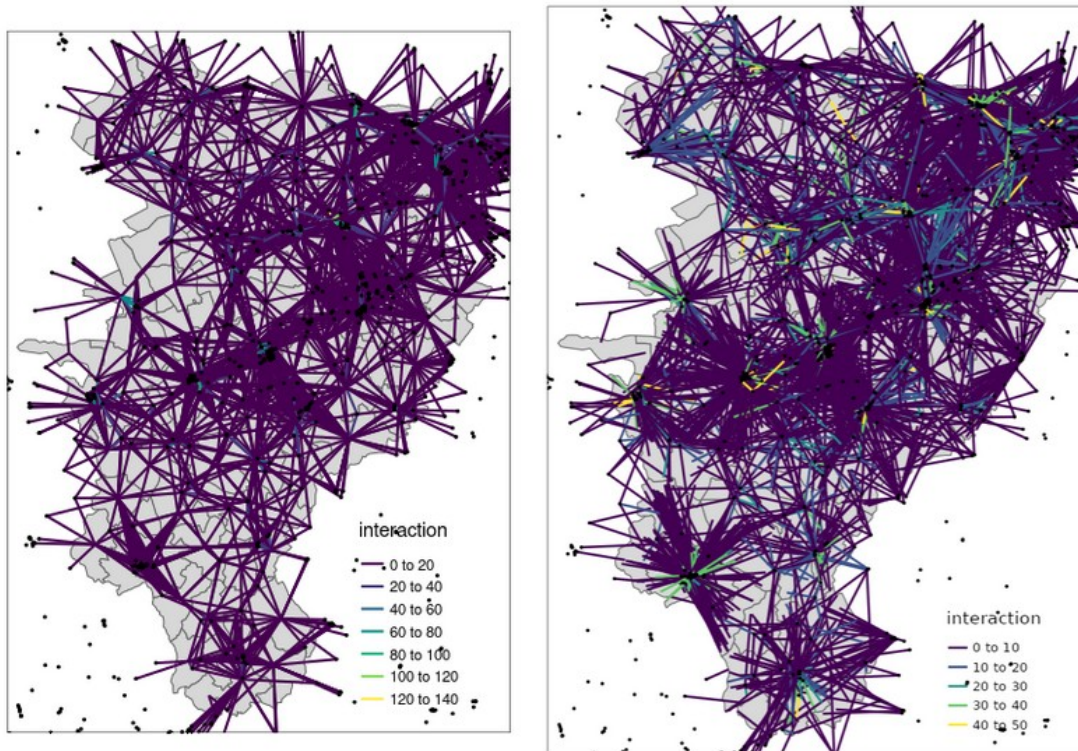
Figure 5.1: Desire lines created by Spatial Interaction Model for social journeys, with jittered results shown on the right

6 Scenarios

For the purposes of the Pilot development we are using several exploratory scenarios to determine potential cycle uptake and routing. In each scenario, the origins and destinations of trips do not change, but the modal shares can be altered to model potential future increases in cycling uptake and/or reductions in car driving. The total number of trips remains the same in each scenario, except for the demand reduction scenario. The likely trend in levels of cycling trip uptake move from low to high as shown in Table 6.1.

For Milestone 2, we have run the following scenarios:

- baseline
- decarbonisation
- demand reduction

Additional scenarios are being considered for Milestone 3 work. A summary of each is set out in Table 6.1 and is described below.

Table 6.1: Scenarios to determine potential cycle uptake and routing

Scenario	Basis	Key aspects
Baseline	Existing cycling levels	Derived from POWSCAR and NHTS data
Near market	Near-level ambition	Reflects county priorities
Residential network	Highlighting the impact of modal filters	Increased cycling uptake for schools and short journeys
Go Dutch	Based on Dutch cycling levels	Would require Dutch-style infrastructure and behaviour shift
Ebike	Impact of new technology	Greater cycle uptake for longer journeys
Decarbonisation	Based on Climate Action Plan 2021	Includes Go Dutch cycling uptake
but only for existing car journeys		
Demand reduction	The most ambitious scenario	Includes Ebike cycle uptake from car journeys
greater public transport uptake	and reduction in travel demand	
Back to the nineties	Cycle to school data from 1991 Census	Models a recent time period when cycling was more widespread in Ireland

6.1 Baseline

The baseline scenario uses existing modal shares for all trips. These are derived from the 2016 Census.

6.2 Near market

This could reflect near-term county level ambition or national policy recommendations. A question related to this scenario is whether and how to link cycling potential to demographics. In the Propensity to Cycle Tool there are two demographic-based scenarios: one in which uptake is expected to be higher among people with a similar demographic profile to those who already cycle, and the other in which cycling uptake among women rises to match current cycling levels for men. Feedback from a policy perspective, e.g. to identify the level of ambition it should contain and how to identify the near market, will help guide this possible scenario.

6.3 Residential network

To highlight the potential associated with modal filters in/around residential areas, a scenario could be developed in which cycling uptake increases for shorter trips and for the trip purposes, such as education, which are most likely to take place in residential areas. This could be included in another scenario, e.g. the Near Market scenario or be a self standing scenario, e.g. that has disproportionately greater increase in cycling to school and in/around residential areas.

6.4 Go Dutch

In this scenario cycling reaches levels equivalent to those found in the Netherlands, taking account of the effects of route hilliness (measured as mean gradient) and route distance. Trips can shift from any other mode to cycling. This scenario is used in the decarbonisation (10%) scenario outlined below.

6.5 Ebike

The ebike scenario takes Go Dutch cycling uptake, and adds onto this the impact of increased ebike usage, which allows for longer cycle trips. However, travel to primary and secondary schools still uses Go Dutch uptake, since no ebike scenario has been developed for school journeys, and children may be less likely to own ebikes than adults. This scenario is used in the decarbonisation (30%) scenario outlined below.

6.6 Decarbonisation (10% car km reduction)

This scenario is loosely based on the Irish Government's Climate Action Plan 2021, which contains policies for action to achieve a 51% reduction in overall greenhouse gas emissions by 2030, on a path towards net-zero by 2050. For transport, this includes 500,000 extra walking, cycling and public transport trips per day by 2030. In terms of car travel, the target is to "Increas[e] the proportion of kilometres driven by passenger electric cars to between 40 and 45% by 2030, in addition to a reduction of 10% in kilometres driven by the remaining internal combustion engine cars." This equates to a 5.5 - 6% reduction in total car km driven.

To model this decrease in car driver km, cycling uptake increases in line with the Go Dutch scenario. However, we only model shift from driving to cycling. There is no shift from other modes of transport to cycling.

6.7 Demand reducation (30% car km reduction)

This scenario models a 30% reduction in car driver km. To enable this major shift, we assume an overall 10% demand reduction for travel across all modes. On top of this is a 20% increase in public transport modal share, across the origin-destination pairs where some trips are already made by public transport. Added to this is modal shift from car driving to cycling. This follows the ebike cycle uptake scenario for travel to work and to tertiary education. For travel to primary and secondary schools, it uses the Go Dutch school uptake, since no ebike scenario has been developed for school journeys, and children may be less likely to own ebikes than adults.

6.8 Back to the nineties

Making use of educational travel data from the 1991 Census, we could model the effect of returning to a period when cycling to school was much more popular than it is today. Due to the danger of confusing people with too many scenarios, we suggest this is part of the Near Market scenario.

7 Feedback and next steps

7.1 Feedback

Two workshops were organized to obtain feedback from stakeholders in Limerick (08/04/22) and Kildare (05/05/22), which are the case studies of the project. The questions requested were the following:

1. What are main issues you face in planning/understanding infrastructure requirements?, e.g.

    a. What is happening at the moment?
    b. Where to invest in the future?
    c. What will change?
    d. How will planning vary depending on trip purpose?

2. What sort of scenarios are you interested in testing?
3. How useful is having different networks for planning infrastructure and/or more detail, e.g. there could be an option for variation in access for professionals and public (the latter remaining simple). A summary of each meeting is presented below.

7.1.1 Limerick County Council
- The tool was praised for matching well with local knowledge
- The tool highlighted the same sections on the transport network that experienced planners identified as priorities for investment in cycling, such as South Circular Road
- Limerick County Council would find each network layer useful, especially the quiet network for supporting new cyclists
- They have a specific strategy they would like to align with the scenarios
- They asked whether future development areas could be included in the tool
- They would benefit from the data being provided as ShapeFiles

7.1.2 Kildare County Council
- Kildare County Council found the tool useful in providing evidence to make the case for new cycle routes eg at planning applications
- They argue that cycle networks are patchy. Sometimes a particular local scheme has to come first (eg due to political/local support/planning/easiness). With CRUSE you can show how that will form part of a larger network
- They preferred visualisations where they can directly compare the fast and quiet routes
- Both the quiet and fast routes are important
- They see the value in the tool's ability to estimate future potential
- Regarding the NTA's cycling propensity tool, "we've used it and have tried to avoid it" and stated that the CRUSE tool will better meet their needs
- "It's a missing piece of evidence that will help new projects built" said Donald Hodgings

7.2 Next steps

Building on the work presented in the report, during the Milestone 3 phase of the project we will:

- Route prioritisation

- Model refinement based on feedback from user testing sessions and feedback on the results presented in this report
- Explore scenarios of infrastructure change, e.g. highlight route segments that could comprise a core network in each county, including scheme identification and feedback on these
- Explore hosting of maps for use by stakeholders others

We require data/guidance on the following Milestone 3 tasks:

- Develop a physical activity baseline model (data/input from health research/researchers in Ireland will help here, we can explore using the WHO's HEAT methodology)
- Model tourism/recreational trips to public transport (we have some input datasets but there are a few questions on how we model these trips and associated cycling potential)
- Seek to obtain monitoring data to validate baseline results
- Specify the scope for web application

Appendix 1: NACE codes used for alternative trip purposes

Social

The destinations used for *Social* purposes are associated with the following NACE codes:

Table 7.1: NACE codes used as destinations for social trips

Num	NACE Category	NACE Code
1	PHYSICAL WELL-BEING ACTIVITIES	S.96.04
2	FITNESS FACILITIES	R.93.13
3	ACTIVITIES OF SPORT CLUBS	R.93.12
4	OPERATION OF SPORTS FACILITIES	R.93.11
5	OTHER SPORTS ACTIVITIES	R.93.19
6	SPORTS AND RECREATION EDUCATION	P.85.51
7	BEVERAGE SERVING ACTIVITIES	I.56.30
8	EVENT CATERING ACTIVITIES	I.56.21
9	LIBRARY AND ARCHIVES ACTIVITIES	R.91.01
10	MOTION PICTURE PROJECTION ACTIVITIES	J.59.14
11	CREATIVE ARTS AND ENTERTAINMENT ACTIVITIES	R.90.00
12	RESTAURANTS AND MOBILE FOOD SERVICE ACTIVITIES	I.56.10
13	OTHER FOOD SERVICE ACTIVITIES	I.56.29
14	CULTURE EDUCATION	P.85.52
15	OTHER AMUSEMENT AND RECREATION ACTIVITIES	R.93.29
16	BOTANICAL AND ZOOLOGICAL GARDENS AND NATURE RESERVE ACTIVITIES	R.91.04
17	MUSEUMS ACTIVITIES	R.91.02
18	OPERATION OF HISTORICAL SITES AND BUILDINGS AND SIMILAR VISITOR ATTRACTIONS	R.91.03
19	PERFORMING ARTS	R.90.01
20	OPERATION OF ARTS FACILITIES	R.90.04

Shopping

The destinations used for *Shopping* purposes are associated with the following NACE codes:

Table 7.2: NACE codes used as destinations for shopping trips

Num	NACE Category	NACE Code
1	DISPENSING CHEMIST IN SPECIALISED STORES	G.47.73
2	RETAIL SALE IN NON-SPECIALIZED STORES WITH FOOD BEVERAGES OR TOBACCO PREDOMINATING	G.47.11
3	RETAIL SALE OF BEVERAGES IN SPECIALISED STORES	G.47.25
4	RETAIL SALE OF NEWSPAPERS AND STATIONERY IN SPECIALISED STORES	G.47.62
5	RETAIL SALE OF BREAD CAKES FLOUR CONFECTIONERY AND SUGAR CONFECTIONERY IN SPECIALISED STORES	G.47.24
6	RETAIL SALE OF CLOTHING IN SPECIALISED STORES	G.47.71
7	RETAIL SALE OF COSMETIC AND TOILET ARTICLES IN SPECIALISED STORES	G.47.75
8	RETAIL SALE OF ELECTRICAL HOUSEHOLD APPLIANCES IN SPECIALISED STORES	G.47.54
9	RETAIL SALE OF FISH CRUSTACEANS AND MOLLUSCS IN SPECIALISED STORES	G.47.23
10	RETAIL SALE OF FOOD BEVERAGES AND TOBACCO IN SPECIALISED STORES	G.47.20
11	RETAIL SALE OF FOOTWEAR AND LEATHER GOODS IN SPECIALISED STORES	G.47.72
12	RETAIL SALE OF FRUIT AND VEGETABLES IN SPECIALISED STORES	G.47.21
13	RETAIL SALE OF HARDWARE PAINTS AND GLASS IN SPECIALISED STORES	G.47.52
14	RETAIL SALE OF MEAT AND MEAT PRODUCTS IN SPECIALISED STORES	G.47.22
15	RETAIL SALE OF MEDICAL AND ORTHOPAEDIC GOODS IN SPECIALISED STORES	G.47.74
16	RETAIL SALE OF TEXTILES IN SPECIALISED STORES	G.47.51
17	RETAIL SALE OF OTHER GOODS IN SPECIALISED STORES	G.47.70
18	OTHER RETAIL SALE OF NEW GOODS IN SPECIALISED STORES	G.47.78
19	RETAIL SALE OF BOOKS IN SPECIALISED STORES	G.47.61
20	RENTING OF VIDEO TAPES AND DISKS	N.77.22
21	RETAIL SALE OF SECOND-HAND GOODS IN STORES	G.47.79
22	RETAIL SALE OF TELECOMMUNICATIONS EQUIPMENT IN SPECIALISED STORES	G.47.42
23	RETAIL SALE OF FLOWERS PLANTS SEEDS FERTILISERS PET ANIMALS AND PET FOOD IN SPECIALISED STORES	G.47.76
24	RETAIL SALE OF WATCHES AND JEWELLERY IN SPECIALISED STORES	G.47.77
25	RETAIL SALE OF MUSIC AND VIDEO RECORDINGS IN SPECIALISED STORES	G.47.63
26	RETAIL SALE OF GAMES AND TOYS IN SPECIALISED STORES	G.47.65
27	OTHER RETAIL SALE OF FOOD IN SPECIALISED STORES	G.47.29
28	REPAIR OF COMPUTERS AND PERIPHERAL EQUIPMENT	S.95.11
29	RETAIL SALE OF SPORTING EQUIPMENT IN SPECIALISED STORES	G.47.64
30	REPAIR OF ELECTRICAL EQUIPMENT	C.33.14
31	REPAIR OF OTHER PERSONAL AND HOUSEHOLD GOODS	S.95.29
32	OTHER RETAIL SALE IN NON-SPECIALISED STORES	G.47.19
33	RENTING AND LEASING OF OTHER PERSONAL AND HOUSEHOLD GOODS	N.77.29
34	OTHER RETAIL SALE NOT IN STORES STALLS OR MARKETS	G.47.99
35	REPAIR OF COMMUNICATION EQUIPMENT	S.95.12
36	REPAIR OF HOUSEHOLD APPLIANCES AND HOME AND GARDEN EQUIPMENT	S.95.22
37	REPAIR OF FOOTWEAR AND LEATHER GOODS	S.95.23
38	REPAIR OF CONSUMER ELECTRONICS	S.95.21
39	RENTING AND LEASING OF RECREATIONAL AND SPORTS GOODS	N.77.21
40	RETAIL SALE VIA STALLS AND MARKETS	G.47.80

Num	NACE Category	NACE Code
41	REPAIR OF WATCHES CLOCKS AND JEWELLERY	S.95.25
42	RETAIL SALE OF INFORMATION AND COMMUNICATION EQUIPMENT IN SPECIALISED STORES	G.47.40
43	REPAIR OF OTHER EQUIPMENT	C.33.19
44	RETAIL SALE OF AUDIO AND VIDEO EQUIPMENT IN SPECIALISED STORES	G.47.43
45	REPAIR OF ELECTRONIC AND OPTICAL EQUIPMENT	C.33.13
46	RETAIL SALE OF TOBACCO PRODUCTS IN SPECIALISED STORES	G.47.26

Personal/other

The destinations used for *Personal/other* purposes are the following NACE codes:

Table 7.3: NACE codes used as destinations for personal/other trips

Num	NACE Category	NACE Code
1	ACTIVITIES OF POLITICAL ORGANIZATIONS	S.94.92
2	ACTIVITIES OF RELIGIOUS ORGANIZATIONS	S.94.91
3	DENTAL PRACTICE ACTIVITIES	Q.86.23
4	FUNERAL AND RELATED ACTIVITIES	S.96.03
5	GAMBLING AND BETTING ACTIVITIES	R.92.00
6	HAIRDRESSING AND OTHER BEAUTY TREATMENT	S.96.02
7	HOSPITAL ACTIVITIES	Q.86.10
8	JUSTICE AND JUDICIAL ACTIVITIES	O.84.23
9	ACTIVITIES OF EMPLOYMENT PLACEMENT AGENCIES	N.78.10
10	GENERAL MEDICAL PRACTICE ACTIVITIES	Q.86.21
11	OTHER PERSONAL SERVICE ACTIVITIES	S.96.09
12	POSTAL ACTIVITIES UNDER UNIVERSAL SERVICE OBLIGATION	H.53.10
13	WASHING AND (DRY-)CLEANING OF TEXTILE AND FUR PRODUCTS	S.96.01
14	RESIDENTIAL NURSING CARE ACTIVITIES	Q.87.10
15	CHILD DAY-CARE ACTIVITIES	Q.88.91
16	RESIDENTIAL CARE ACTIVITIES FOR THE ELDERLY AND DISABLED	Q.87.30
17	RESIDENTIAL CARE ACTIVITIES FOR MENTAL RETARDATION MENTAL HEALTH AND SUBSTANCE ABUSE	Q.87.20