CRUSE Tool project: Milestone 4 Report

Robin Lovelace, Joey Talbot, Eugeni Vidal-Tortosa and Nathanael Sheehan, ITS Leeds

Last updated 2024-03-07

Table of Contents

1   Introduction

The Cycle Route Uptake and Scenarios Estimation (CRUSE) Tool is a research and data science/web development project funded by TII and stakeholders. The project builds on and extends the methods underlying the Propensity to Cycle Tool, an open access strategic cycle network planning tool that has transformed the practice of cycle network design in England and Wales (Lovelace et al. 2017; Morgan and Lovelace 2020; Lovelace, Parkin, and Cohen 2020).

We have developed a web application for cycle infrastructure planning, to meet the needs of Transport Infrastructure Ireland (TII). The CRUSE Tool project is undertaken by the University of Leeds and managed by AECOM.

2   Current state of progress

Progress on the project is divided into four milestones. The first three milestones have been completed, these were:

- Milestone 1: establishment of baseline cycle route networks for pilot counties
- 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

Within Milestone 4, the following developments have taken place:

- Conducted a full national build of the CRUSE Tool
- Deployed a web application at https://cruse.bike/
- Presented CRUSE at the TII National Roads and Greenways Conference, Sligo

- Briefed the NTA and additional (non-pilot) Local Authorities and gained feedback
- Made refinements to the web interface and methodology
- Improved documentation in FAQs and definition of tool uses and purposes

2.1 National build

Amendment of the build process to streamline the full national build meant we could make results available for all counties in Ireland. We used a new batch method to speed up the routing process, which is the slowest part of the build.

The build required some adjustment to deal with county-specific issues. To minimise webpage loading times, we used only the top 10,000 route segments in each county. However, in the largest counties, especially Dublin, this meant the route networks visible on the county webpages were very "gappy", with missing links in the network. Therefore, we changed the approach to ensure that at least one sixth of the route segments in each county would be visible, showing the segments with the highest cycling potential.

Independently of this, we made sure it is possible to access complete county route network data using the data downloads webpage. Finally, following feedback, we also introduced a 1km buffer around each county to allow cross-county trip origins, destinations and routing to be incorporated into the network algorithms (see Section 2.5).

2.2 Web application deployment

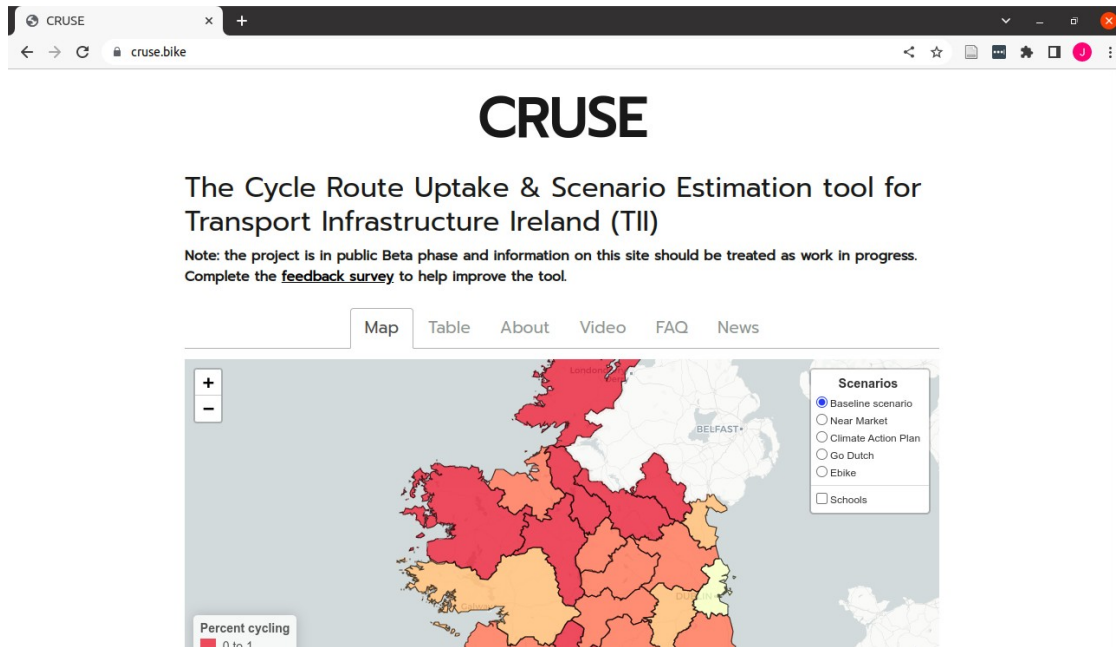The CRUSE website is now up and running and freely accessible to all (Figure 2.1).

Figure 2.1: Main website landing page

This directs you to a national landing page with six tabs:

- *Map*

A map of Ireland which shows percent cycling by county and at low zoom levels, and cycle route networks at high zoom levels, with legends that automatically change to suit the appropriate zoom level

- *Table*

A table of county cycling statistics for each county.

- *About*

Summary information on the tool's aim and scope provided by TII, the CRUSE team, and acknowledgements. It also contains links for contact and to a feedback survey.

- *Video*

Placeholder for a CRUSE "practitioner to practitioner" instructional video

- *FAQ*

Summary of the FAQs with a link to the full FAQ page

- *News*

Placeholder for brief updates on the project

2.2.1 County pages

Selecting a county in the map or table tabs takes you to a county landing page (Figure 2.2). This contains key information for the county, including a cycle route network map and a graph showing cycle uptake against distance for each uptake scenario (Figure 2.3).
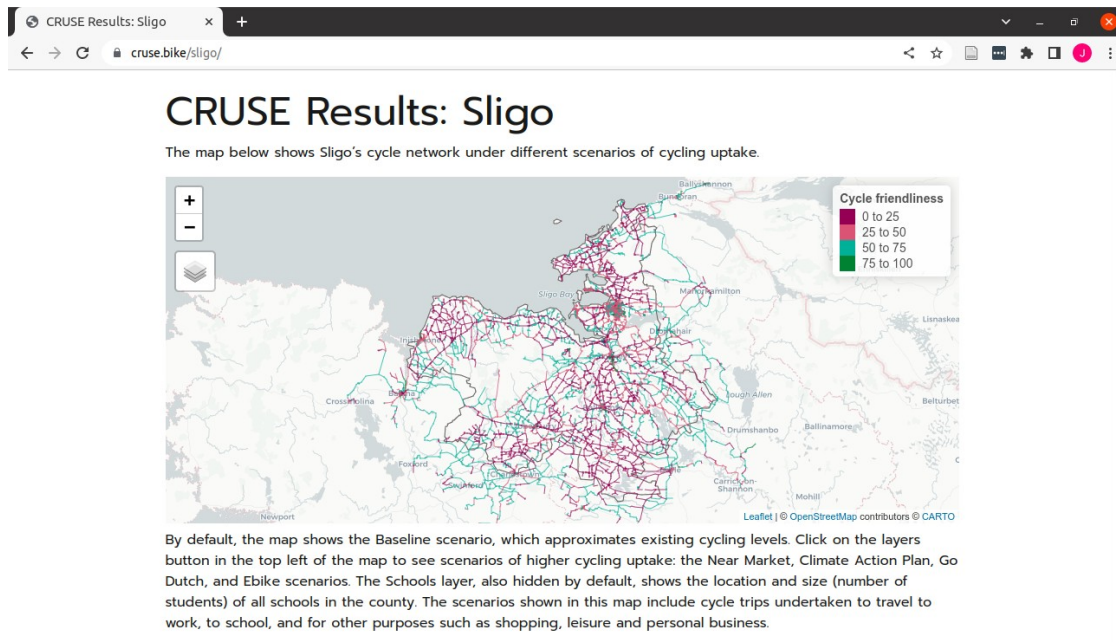

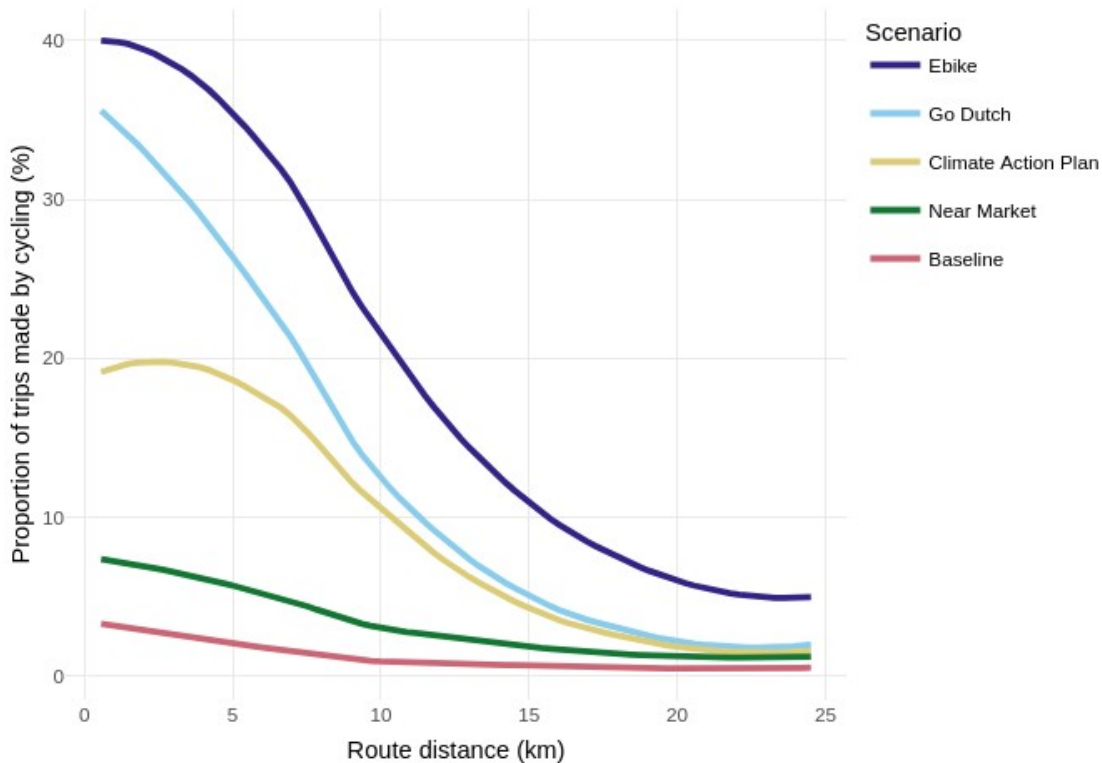*Figure 2.2: Sligo county landing page*

Figure 2.3: Sligo county landing page: uptake graph

It also contains links to further county-specific pages:

- *County statistics*

These contain a set of graphs and maps showing trip breakdowns by mode, purpose, and distance. The graphs allow interactive reporting of data through hovering over features.

- *Quietest and fastest route networks*

The main pages show "balanced" route networks. This page gives the equivalent for the "fastest" and "quietest" route networks.

- *Data downloads*

Here you can download the full route networks for the county in the standard GeoJSON format.

2.3 TII National Roads and Greenways Conference

We gave a presentation to Local Authority planning officers and held a stall at TII's National Roads and Greenways Conference in Sligo on 22/23rd September 2022. The response was positive. Representatives from several counties tested the tool at our stand before and after the presentation.

Stakeholders involved in cycle network planning who tested the tool said it would be useful for their work.

2.4 NTA and Local Authority briefings

As part of the process of raising awareness about the tool and gaining feedback for development, we held meetings with officers from the NTA and from Kildare, Carlow, and Kerry Local Authorities.

Feedback included the following:

- since trips that begin outside the county are not shown, this makes it difficult to assess uptake on roads close to county boundaries

- the age of census data, together with recent university expansion in the south of Carlow, will mean some flows are missed

- in Kerry, most trips are likely to be related to greenways or tourism

2.5 Refinements to the web interface and methods

Considerable work was undertaken to improve the clarity and usability of the website. Much of this related to the appearance and user-friendliness of the landing page map, which shows different data at different zoom levels. Improvements were also made to the popups on maps and graphs. More broadly, we enhanced the website appearance by using a consistent visual theme.

Feedback from Carlow was that the tool didn't represent well the number of trips on roads close to county boundaries. This was a particular problem in Carlow because the western fringes of Carlow town lie within County Laois. To improve this, we changed the county maps so that they showed all trips within 1km of the county boundary, instead of only trips that originate within the county (Figure 2.4).
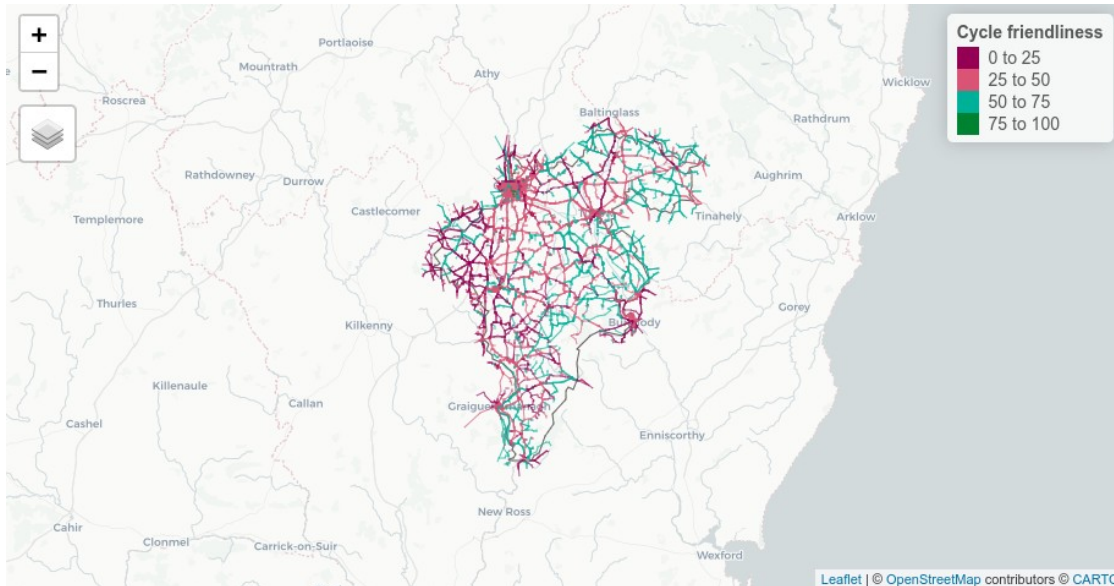
Figure 2.4: New Carlow map including all trips within 1km of county boundary

We recalculated the number of trips for each trip purpose, taking into account data on the number of recreational cycle trips, as well as the NHTS survey results. According to PAG Unit 13 there are a mean of 5 daily recreational trips per 100 people. This lays the groundwork for the upcoming addition of a recreational trip layer.

- The first graph on this page now shows all trip purposes, but the remaining graphs and maps show only POWSCAR trips, for which the data quality is highest.
- The y-axes on these graphs now show proportion of trips instead of trip numbers.
- A new graph breaks down POWSCAR trips by purpose and mode.
- The distance bands on the final graph have been standardised. Finally, the map includes data for all scenarios, not just the baseline scenario.

2.6 Documentation

The purpose of the CRUSE tool was respecified to make clear that it supports TII's remit for road safety under the RISM Directive and for active mode scheme appraisal through PAG Unit 13. More text was included in the FAQ relating to the uses and limitations of the CRUSE tool. A new FAQ section refers to the use of the CRUSE tool for the appraisal of active mode and greenway projects. Within the FAQ, summary tables explain the uptake scenarios and the breakdown of trip purposes, with the trip purpose table updated to represent the recalculated trip numbers. Team member names and contact details were provided.

To facilitate productive feedback on the tool, we created an online survey form where users can record responses.

3 Extensions

Two extensions to the project have been agreed in principle with TII. The two extensions will be used to ensure the CRUSE Tool provides consistent and complete datasets for the agreed purposes and is in the best possible position to be hosted by TII and used by practitioners. The scope, costs, and timings for the extensions are currently being reviewed, with the focus on:

1. Allowing the recreational trip layer to be completed.
2. Developing and delivering a programme of training sessions for users of the tool. A separate element may also include regular updates to the route networks – frequency to be agreed.

References

Lovelace, Robin, Anna Goodman, Rachel Aldred, Nikolai Berkoff, Ali Abbas, and James Woodcock. 2017. "The Propensity to Cycle Tool: An Open Source Online System for Sustainable Transport Planning." *Journal of Transport and Land Use* 10 (1). https://doi.org/10.5198/jtlu.2016.862.

Lovelace, Robin, John Parkin, and Tom Cohen. 2020. "Open Access Transport Models: A Leverage Point in Sustainable Transport Planning." *Transport Policy* 97 (October): 47–54. https://doi.org/10.1016/j.tranpol.2020.06.015.

Morgan, Malcolm, and Robin Lovelace. 2020. "Travel Flow Aggregation: Nationally Scalable Methods for Interactive and Online Visualisation of Transport Behaviour at the Road Network Level." *Environment & Planning B: Planning & Design*, July. https://doi.org/https://doi.org/10.1177/2399808320942779.