



THE CLIMATE IS
CHANGING



SO SHOULD WE!

#ACTNOW





OpenInfra



OpenInfra

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Aims to **explore** how **OpenStreetMap (OSM)** can be used to **understand, prioritise, and design** active travel infrastructure.

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Focus on **accessible** pedestrian infrastructure.

Methods and tools

- Exploratory data analysis
 - High-level overview
 - Present/absent data
- Tools
 - R
 - `osmextract`
 - GitHub for reproducibility

- Case studies:
 - West Yorkshire
 - 183112 highways



- Case studies:
 - West Yorkshire
 - Greater Manchester
 - 179976 highways

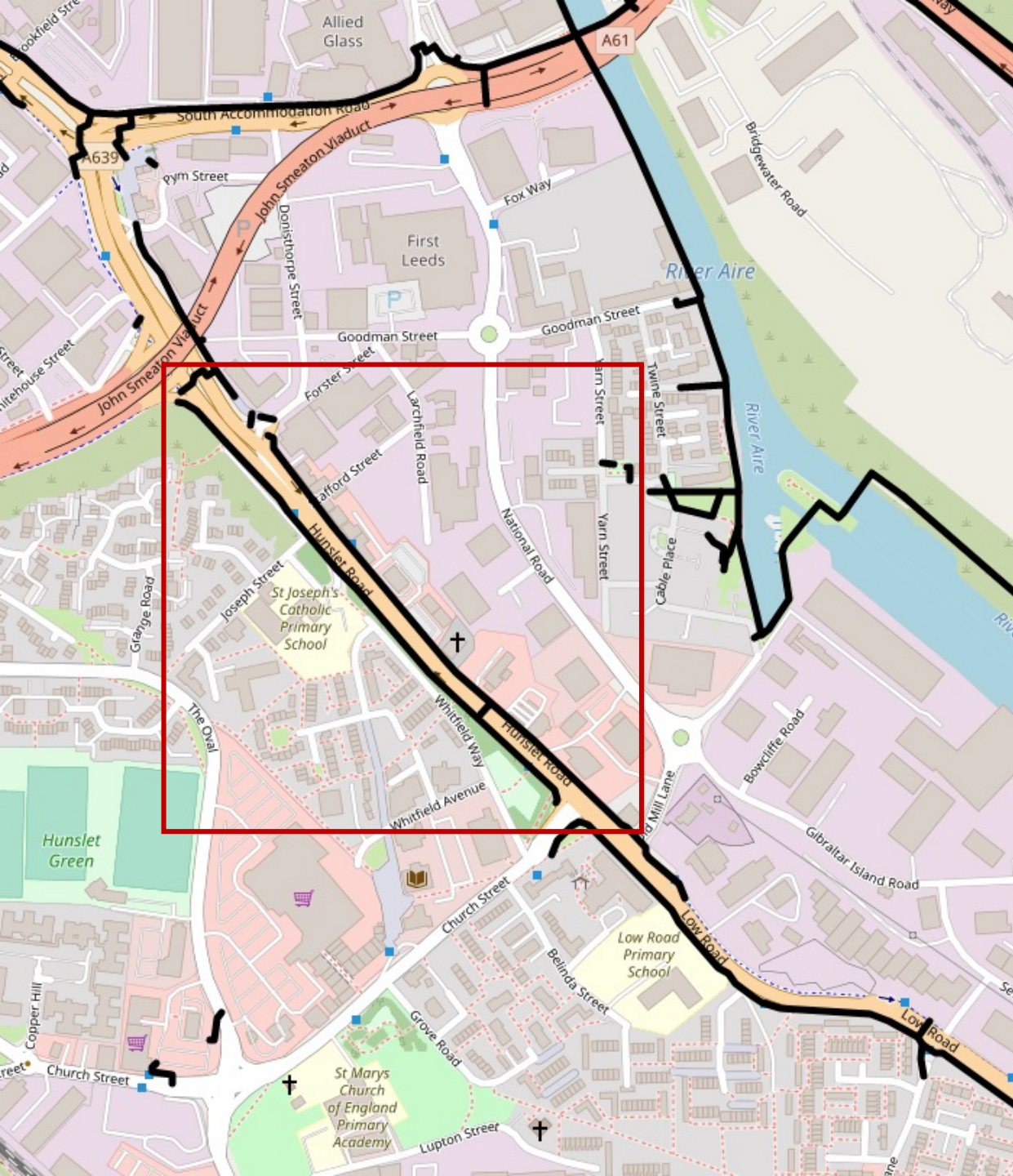


- Case studies:
 - West Yorkshire
 - Greater Manchester
 - Merseyside
 - 75090 highways



- Case studies:
 - West Yorkshire
 - Greater Manchester
 - Merseyside
 - Greater London
 - 381590 highways





highway == "cycleway"

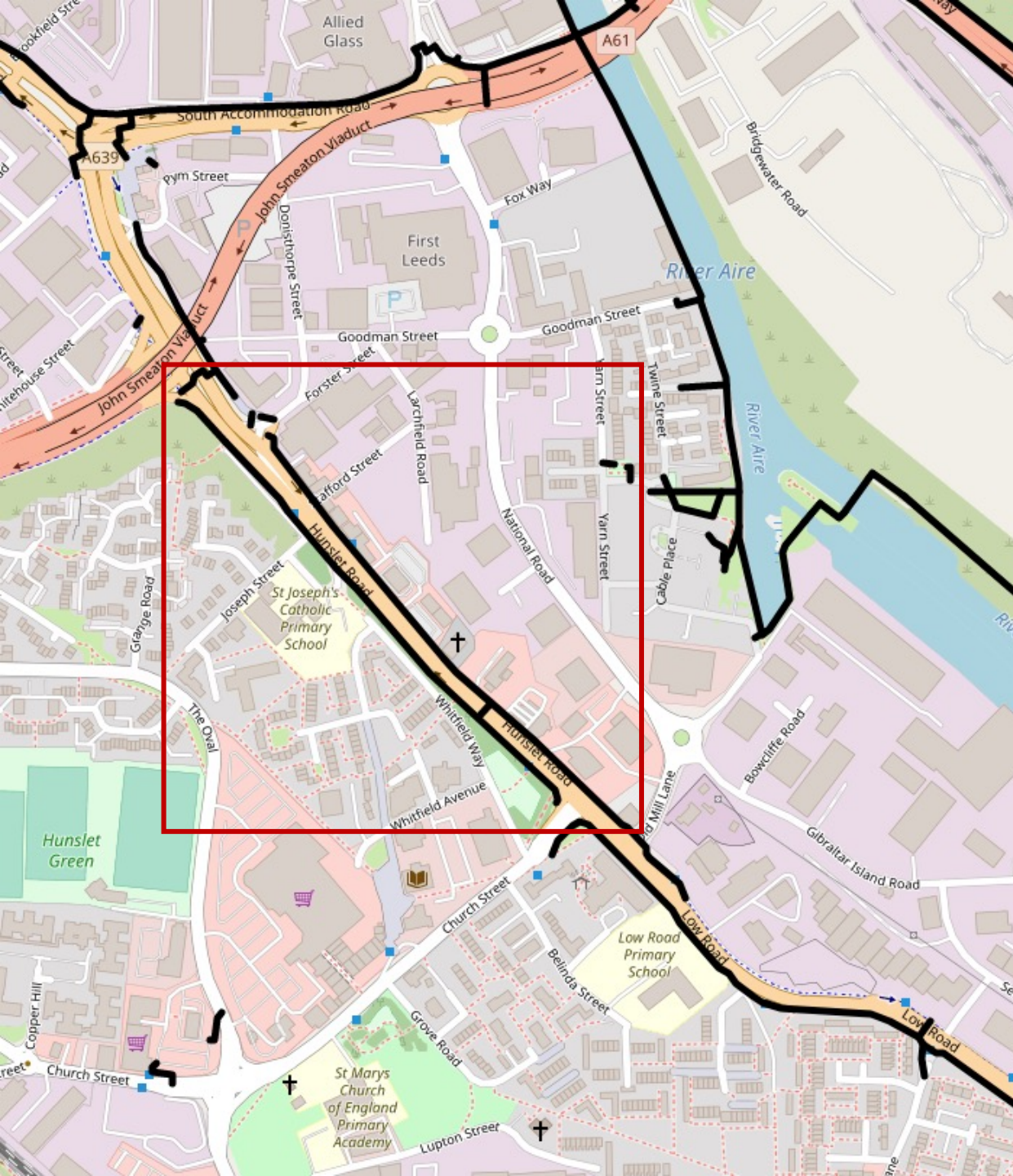
bicycle == "designated"

foot == "designated"

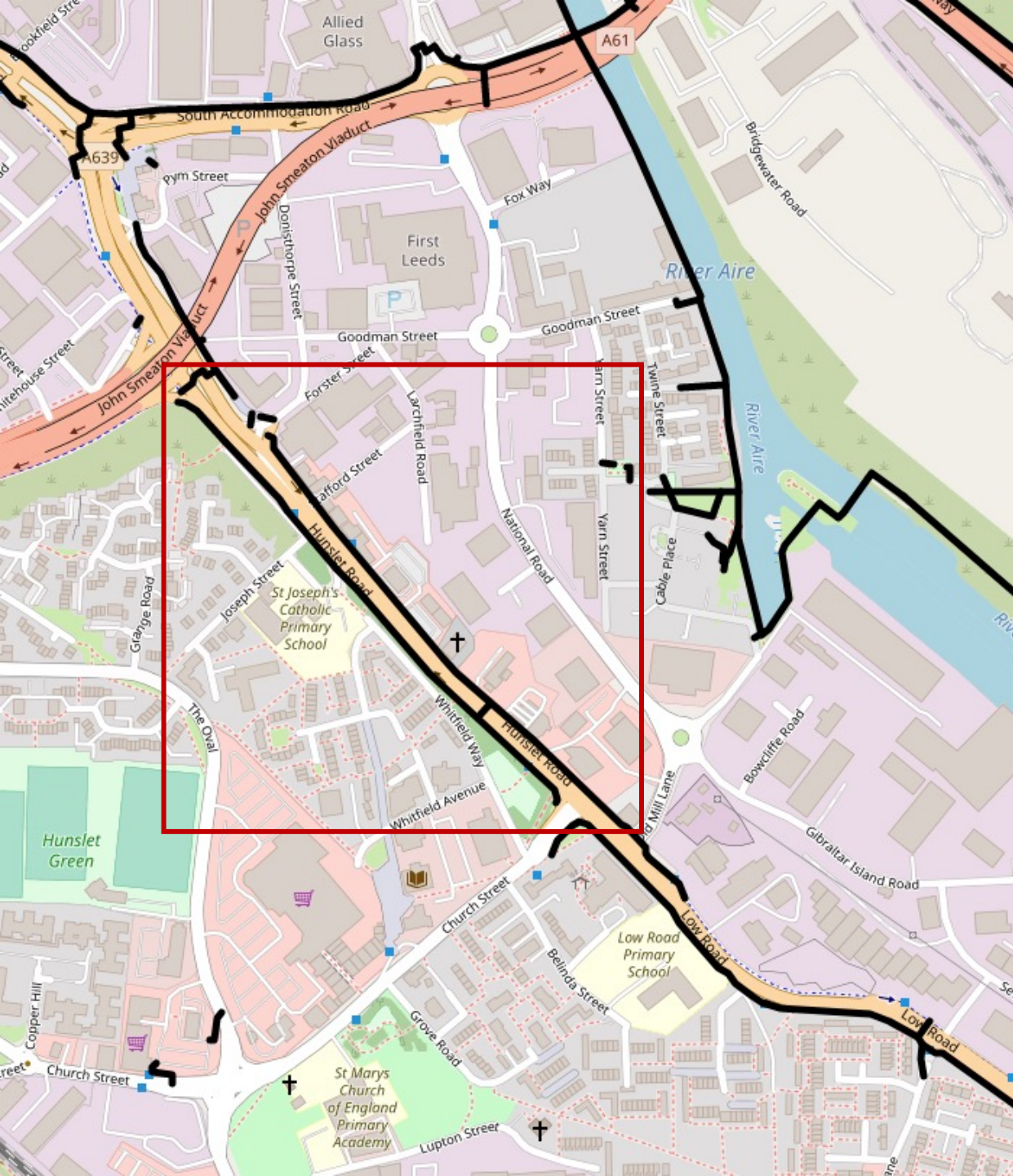
footway == "sidewalk"

segregated == "yes"

oneway == "no"



Google Maps (2022), Hunslet Road, Leeds, Google Maps[online], available: <https://www.google.com/maps/@53.7882438,-1.5356027,3a,75y,318.81h,73.24t/data=!3m6!1e1!3m4!1snd42l7oD6byWzBA1qKcczQ!2e0!7i16384!8i8192>



highway = "cycleway"

Tag

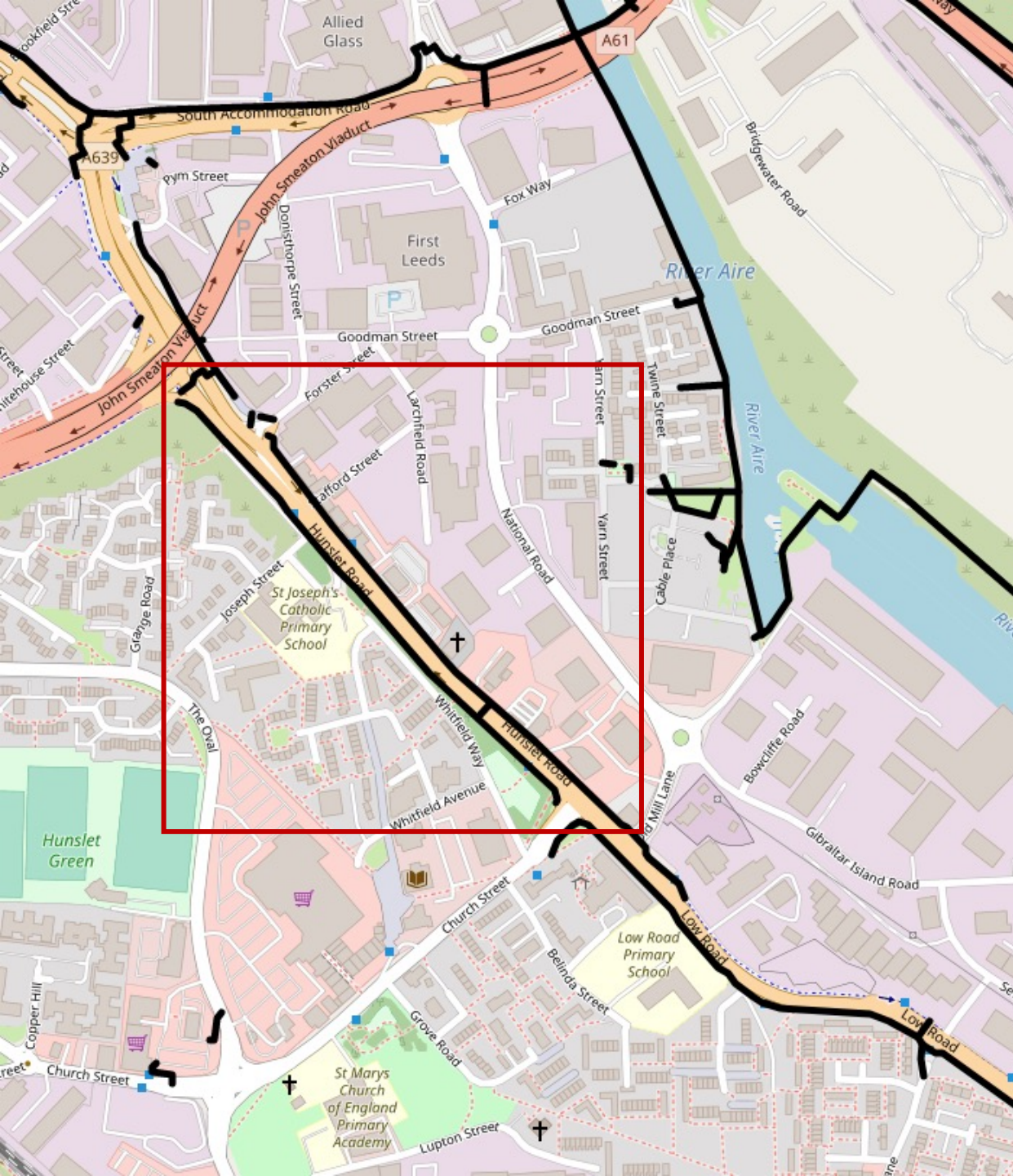
bicycle = "designated"

foot = "designated"

footway = "sidewalk"

segregated = "yes"

oneway = "no"



Key

Value

highway = "cycleway"

Tag

bicycle = "designated "

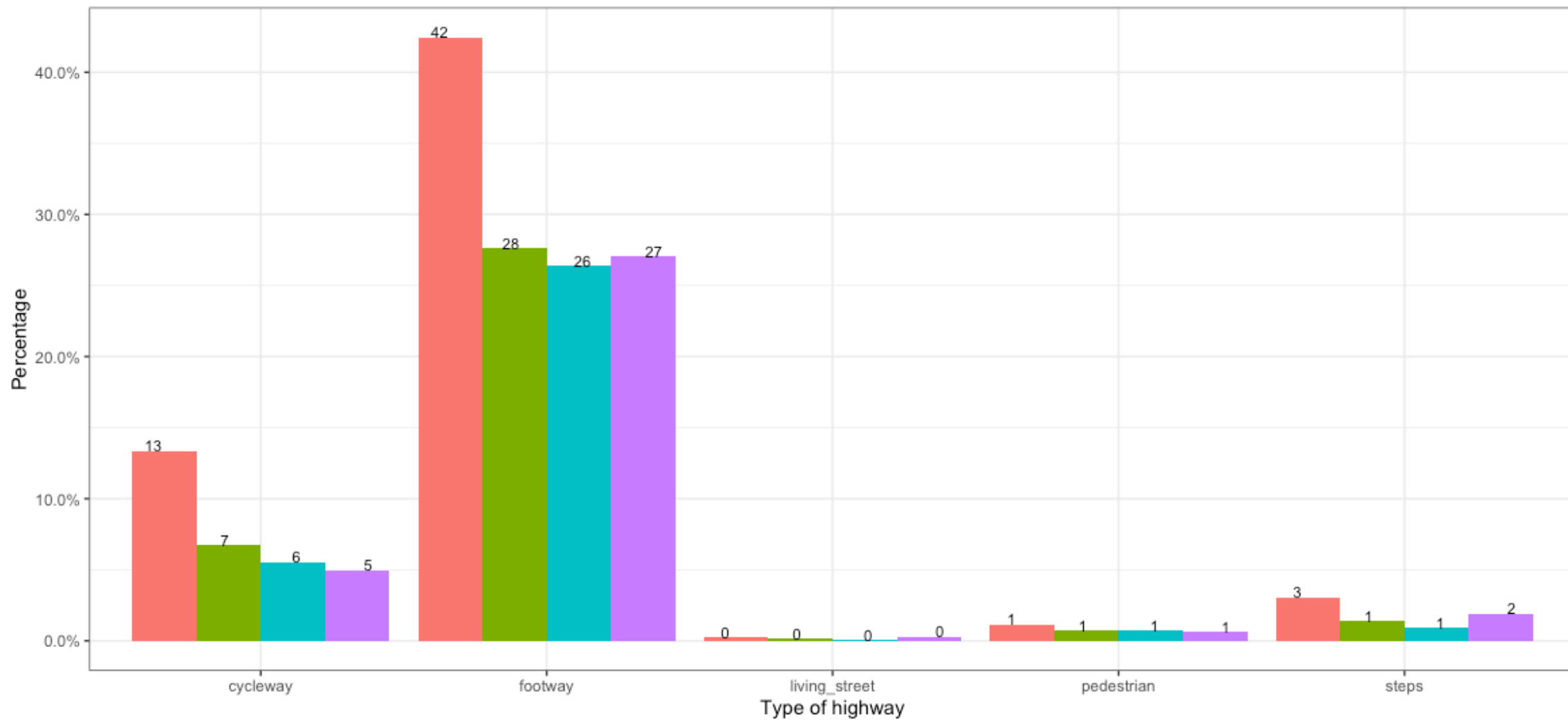
foot = "designated"

footway = "sidewalk"

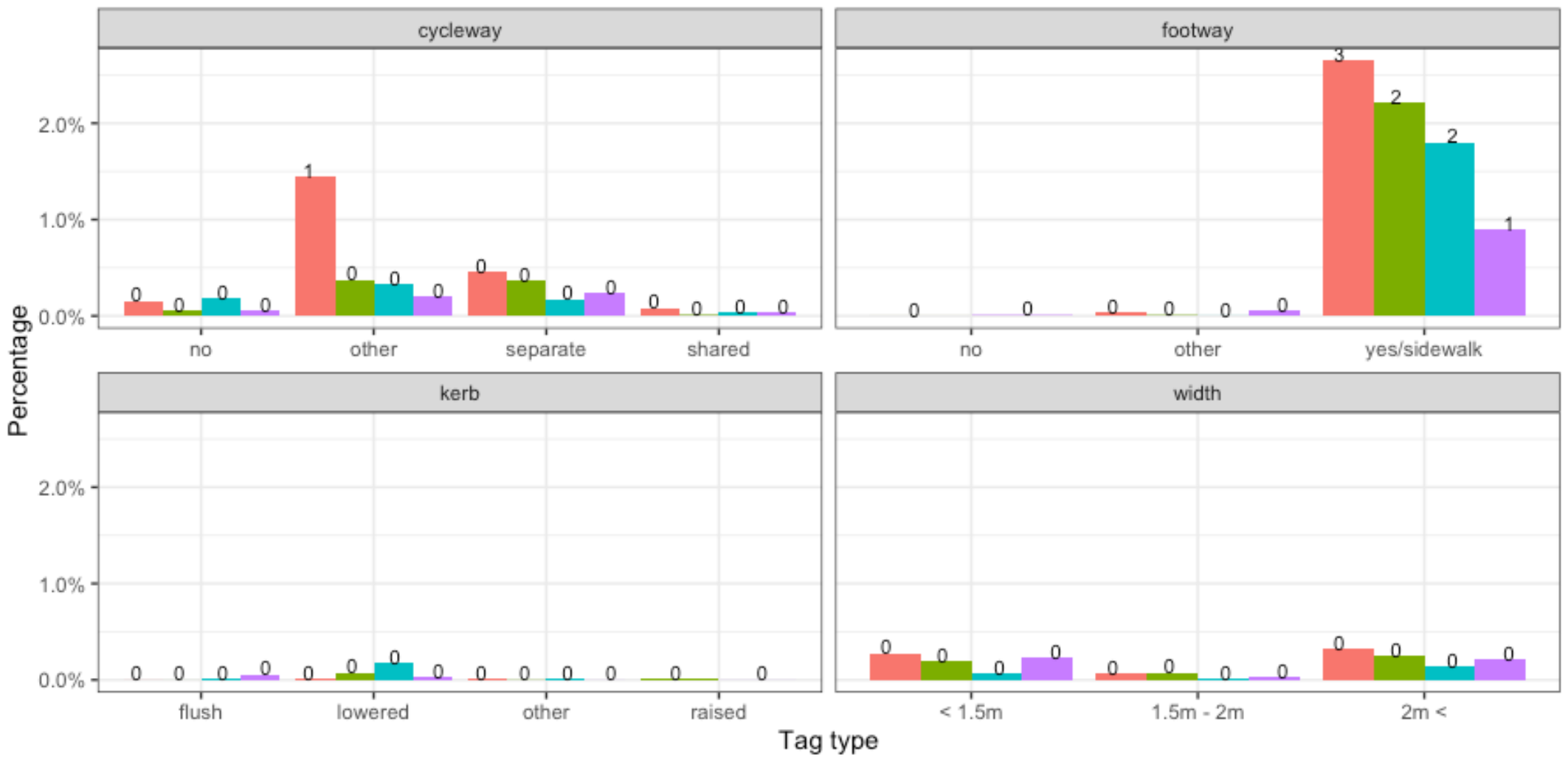
segregated = "yes"

oneway = "no"

Case Study Greater London Greater Manchester Merseyside West Workshire



Case Study ■ Greater London ■ Greater Manchester ■ Merseyside ■ West Workshire



The purpose of the `inclusive_mobility_get` function is to recategorize OSM data based on the recent Inclusive Mobility (IM) guide UK. The goal behind this is to encourage the use of crowd-sourced open data in the inclusive infrastructure planning. Indeed, the function has been written to encourage discussions around the applicability of open data and act as a starting point.

```
```{r}
inclusive_mobility_get = function(osm_sf) {
 osm_sf_im = osm_sf %>%
 # kerb: flush or not
 dplyr::mutate(im_kerb = dplyr::if_else(kerb == "flush" | kerb == "no", "flush", "other")) %>%
 # footway is a 'pavement' adjacent to a road
 dplyr::mutate(im_footway = dplyr::case_when(
 footway %in% c("left", "right", "both", "sidewalk") |
 sidewalk %in% c("left", "right", "both", "yes", "separate") |
 # trying to capture footways shared with cyclists
 !is.na(cycleway) & # map cycling infrastructure that is an inherent part of the road
 foot %in% c("yes", "designated") |
 segregated %in% "yes"
 ~ "yes",
 TRUE ~ "no"
)
) %>%
 # footpath is any other right of way for pedestrians, that does not run adjacent to a road.
 dplyr::mutate(im_footpath = dplyr::case_when(
 highway %in% "footway" &
 im_footway %in% "no" |
 # not (always) an inherent part of the road
 highway %in% c("cycleway", "bridleway", "path") & # foot = "designated" is implied
 im_footway %in% "no" &
 ! foot %in% c("no", "private") |
 ! access %in% c("no", "private") &
 segregated %in% "no" # shared space
 ~ "yes",
 TRUE ~ "no"
)
)
}
```



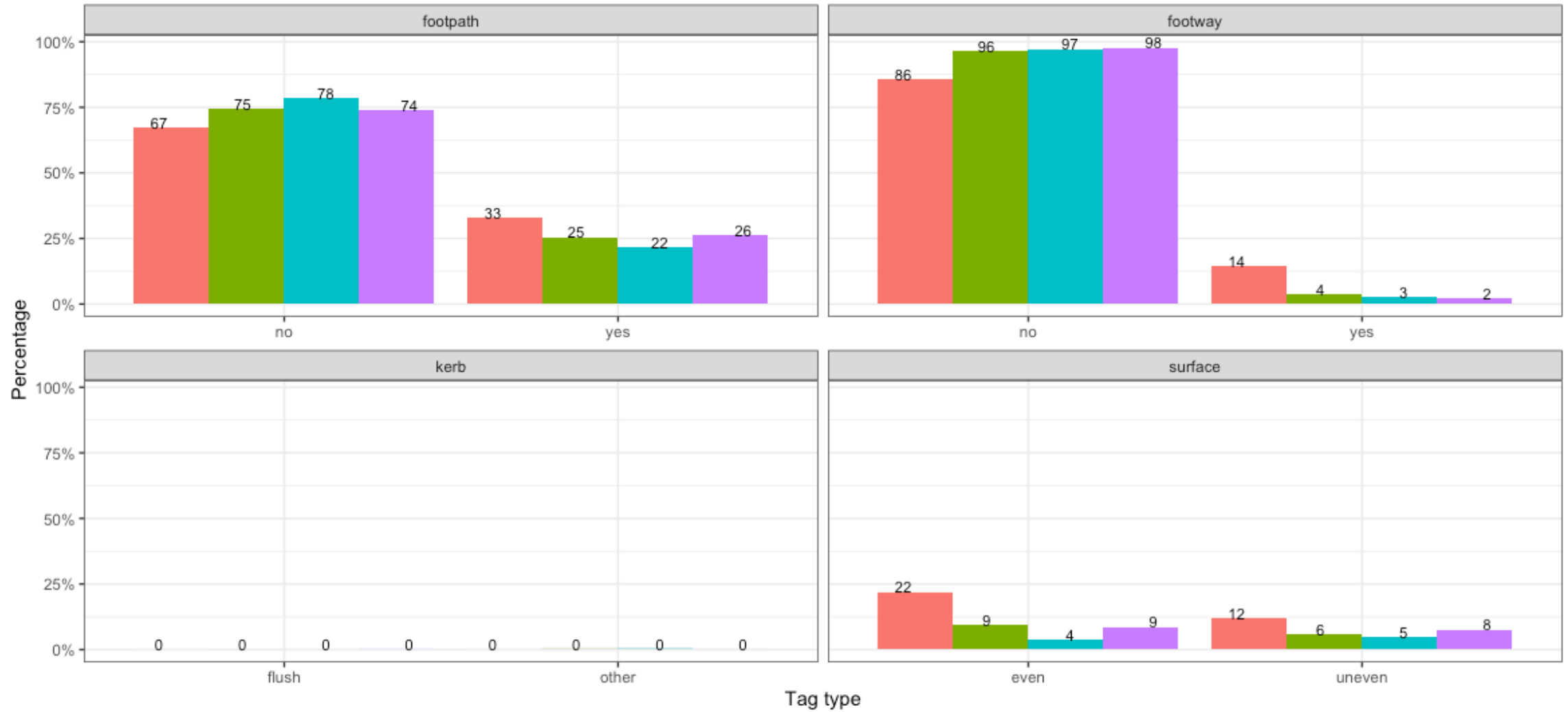
## Inclusive Mobility

### A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure



December 2021

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## Good

- Provides a (comprehensive?) active travel network;
- Tags are flexible enough to represent cycling and walking infrastructure (e.g., cycle tracks, shared spaces);
- Up-to-dateness;
- Encourages citizen science and bottom-up approach to planning;

## Good

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## Limited

- The more specific highway attribute is, the less data there is;
  - A problem for planning accessible infrastructure!
- Tag values lack homogeneity (e.g., width = -1 (!) in WY but also 20cm, 2m, 1-1.5m);
- Not straightforward to recategorize;



# The potential of OpenStreetMap for (accessible) active travel planning

Greta Timaite\*<sup>1</sup>, Robin Lovelace<sup>1</sup> and Victoria Houlden<sup>2</sup>

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January 17, 2022

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## An introduction to getting and using OSM data for transport planning

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### Getting and using OSM data

In this section we will focus on two basic aspects necessary to work with OpenStreetMap (OSM) data for transport research:

1. Downloading OSM data using command line
2. Plotting OSM data as a method to grasp data and its structure

The ability to download OSM data via command line might sound more intimidating compared to Graphical User Interface (GUI) but it can provide a much more flexible approach to working with OSM, including data analysis which will be covered in the later sections.

# The potential of OpenStreetMap for (accessible) active travel planning

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### Getting started with open data on transport infrastructure

#### What is OpenStreetMap?

OpenStreetMap (OSM) has contributed to the shift in perception of who can map and how it can be done (Haklay and Weber 2008). Conceived in 2004 by Steve Coast, the project aims to create a free and editable map that everyone could access and use. The project's focus on making its data accessible to local communities is one of the reasons behind OSM being community-driven with an emphasis on local knowledge in mapping. Putting community and local knowledge at the heart has many benefits, such as:

- keeping data up-to-date;
- empowering citizens to represent their local environments;
- encouraging the participation of citizens in policy making;

The importance of local knowledge is also highlighted in the [LTN 1/20 guide](#) in the context of ensuring successful implementation of a scheme. Hence, OSM can be a tool to foster a bottom-up approach in active travel planning through the inclusion of citizens in the data generation process. This, consequently, can be used to vocalise their needs leading to an increased likelihood of achieving higher uptake levels.

#### What is the structure of OpenStreetMap data?

OSM relies on a simple data structure and flexible tagging to describe geographical objects. Indeed, OSM deliberately chose not to adapt the existing standards for geographic information (Haklay and Weber 2008) as the goal was to simplify the use and maintenance of a project.

#### Contents

- What is OpenStreetMap?
- What is the structure of OpenStreetMap data?
- OSM in transport research
- The role of OpenInfra in transport research



<https://github.com/udsleeds/openinfra>



<https://udsleeds.github.io/openinfra/>



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Department for Transport, 2021. Inclusive mobility: a guide to best practice on access to pedestrian and transport infrastructure.

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