Supplementary materials to: Bikeability of the infrastructure: an open, adjustable and extendible model

This repository contains data, code and results of the work presented in the paper "Bikeability of the infrastructure: an open, adjustable and extendible model". With this document we provide an overview of the structure and contents.

In case you want to reference these supplementary materials please use the DOI 10.5281/zenodo.10724362. For NetAScore V1.0.1-fix, the DOI is 10.5281/zenodo.10666445

1. Code

- The Bikeability Model - **NetAScore**: V1.0.1-fix (file `1_netascore-1.0.1-fix.zip`). Code and documentation is also available on GitHub: https://github.com/plus-mobilitylab/netascore/releases/tag/v1.0.1-fix. For citation please refer to https://doi.org/10.5281/zenodo.10666445.
- Code for the evaluation study: file `2_netascore-validation-main.zip` or https://github.com/plus-mobilitylab/netascore-validation
  - Code for sampling of street-level imagery based on NetAScore output (stratified random sample across bikeability classes)
  - Assessment of survey and conference results including plot generation.

2. Data

- **Bikeability assessment** with NetAScore V1.0.1-fix (https://doi.org/10.5281/zenodo.10666445)
  - Input **network data** from OpenStreetMap: files `osm_salzburg.xml` and `osm_wuppertal.xml` within `OSM input` directory
  - Digital elevation models (DEMs) are available as open data:
    - For Salzburg/Austria as GeoTIFF download: https://www.data.gv.at/katalog/en/dataset/b5de6975-417b-4320-afdb-eb2a9e2a1dbf
    - For Wuppertal via OGC WCS (Web Coverage Service): https://www.wcs.nrw.de/geobasis/wcs_nw_dgm?REQUEST=GetCapabilities&SERVICE=WCS
  - **Assessed networks** (NetAScore output): files `netascore_salzburg.gpkg` and `netascore_wuppertal.gpkg`
- **Image sampling**: road segments and location of sampled images (including metadata) are provided in `salzburg_sample.gpkg` and `wuppertal_sample.gpkg` within `2_image_sampling`. The column `removed` for edges indicates images that were removed from the sampling set during manual filtering. For details on the sampling process and manual filtering please check the documentation at https://github.com/plus-mobilitylab/netascore-validation.

3. Images

The directory `3_images` contains all **60 images used in the evaluation study**. Files are named according to their ID which consists of the place name, bikeability class and sample identifier.

4. Results

- Responses of the **online survey** are provided in `1_online_survey.csv`. Column names as well as response values should be self-explanatory.
    - Columns named by image IDs contain the numeric (integer) values of ratings. A value of `0` indicates infrastructure rated unsuitable, with `100` being the best possible rating.
    - For preserving anonymity of respondents, we re-sampled the year of birth to 10 year increments.
    - Columns `continue_p#` refer to whether participants opted to continue rating another page of 10 images (`yes`) or opted out (`no`). In case of no answer (empty column), the survey proceeded (unless answered `no` on a previous page).
- Quantitative **image ratings** from the CRBAM conference (numeric suffix of column names refers to the modeled bikeability class)
    - digitized ratings from the two **workshop** sessions are provided in `2_img_workshop.csv`
    - digitized results of images available **throughout the conference** (in the so-called "arena") are available in `3_img_conference-arena.csv`
- Digitized results of **indicator ratings** and proposed new indicators are provided in `4_indicators_workshop`. These results were generated during both conference workshops.
- Photographic documentation of the workshop outcomes is available in `5_workshop_documentation`. This contains both indicator ratings as well as image ratings with qualitative feedback.
- Photographic documentation of image ratings collected in the conference arena are found in `6_conference-arena_documentation`.
- Figures of the paper are included in the subdirectory `7_figures`.
- In `8_detail_plots` we provide plots of survey ratings per image with modeled bikeability visualized as red line.

5. Full set of image samples

Here we provide all images considered during the sampling process. Images that were filtered out are contained in the subdirectory `bin`. The directories `c1` to `c5` contain images eligible for final random sampling per bikeability class. For details on the sampling process please read the documentation at https://github.com/plus-mobilitylab/netascore-validation.