

Bicycle frequency measurement from anonymized mobile phone movement data for the top 10 Lower Austrian cycling routes 2020

Project description

References	EZL 7324, RB 2019.011
Client	ecoplus. Lower Austria Business Agency GmbH
Contractor	Invenium Data Insights GmbH
Project partner	A1 Telekom Austria Kondeor GmbH Radlobby Austria Snizek + Partner Verkehrsplanungs GmbH

Project background

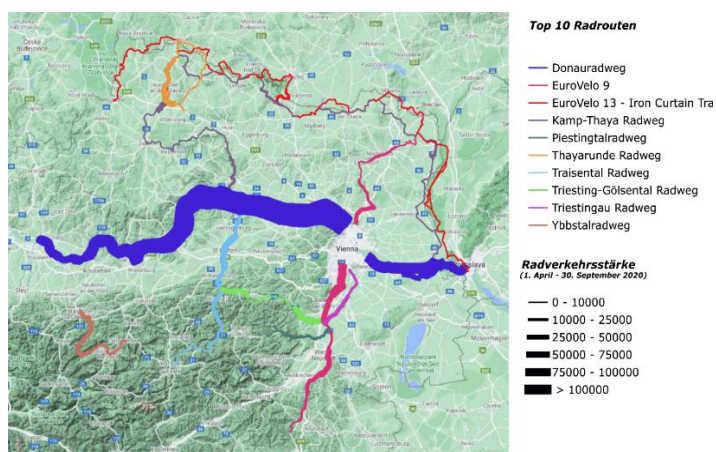
In order to collect usage statistics, cycling trip frequency surveys have been carried out for years to determine the volume of bicycle traffic on Lower Austria's top 10 cycling routes, as well as surveys for origin market analyses. The NOEVELO_19+ project aimed to investigate the possibility of data collection in the field of tourist cycling based on the analysis of anonymized mobile signal and metadata, and to perform an analysis of a cycling season.

Objectives

The objectives of the NOEVELO_19+ project can be summarized as follows:

- Development of an algorithm for the detection of tourist cycling trips along cycle paths based on anonymized mobile phone signal data.
- Analysis of a given cycling season using the newly developed algorithm

Results



As an example of the analysis results, Figure 1 shows the tourist cycling trips traffic volumes for the 2020 season along the 10 top Lower Austrian cycling routes.

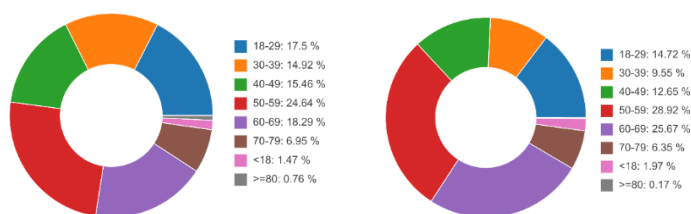


Figure 2 shows representative results regarding age distributions during the 2020 season on the Danube Cycle Path (left) and in the area of counting station dr-07 (right).

The NOEVELO_19+ project developed an algorithm that can filter the daily movement trajectories of mobile users going on tourist cycling trips from the approximate geographic positions of mobile devices (determined from anonymized mobile signal data). For this purpose, specific characteristics were determined within the project, which to a large extent can only be attributed to tourist cycling trips. Among other things, the distances of the geographical positions to the examined cycling route, the movement speeds as well as the daily covered distances of the mobile phone subscribers were used.

The algorithm was used to analyze the 2020 cycling season of the top 10 cycling routes in Lower Austria (compare with Figure 1) and to conduct an analysis of the age distribution based on the anonymized mobile communications metadata (compare with Figure 2). The verification of the analysis results as well as the calibration of the algorithm was done based on counting station values.

Next steps

Based on the newly developed algorithm, an application with the possible name *BikeAlytics – The Bicycle Traffic Analyses of the Future* will be developed for the analysis of additional cycling route. The developed algorithm is to be provided in an online dashboard, which enables the user to carry out analyses independently by means of an intuitive and simple structure.

Data protection in the processing of mobile data

Invenium Data Insights GmbH strictly adheres to the applicable regulations based on the Data Protection and Telecommunications Act. The processing of raw mobile data and mobile movement data at Invenium complies with the European Union's General Data Protection Regulation (GDPR-compliant data processing). The handling of personal customer data in compliance with data protection regulations and applicable laws is continuously audited and certified by TÜV Saarland.