

# Cycling frequency measurement from anonymized mobile phone movement data for the 10 top Lower Austrian cycling routes (NOEVelo\_19+).

Brief description of the project

Ihr Service  
mit dem Plus.  
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des Landes Niederösterreich

- ➔ **Initial situation and project idea**
- **Results**
  - **Résumé: Summary and outlook**



# Initial situation and project idea

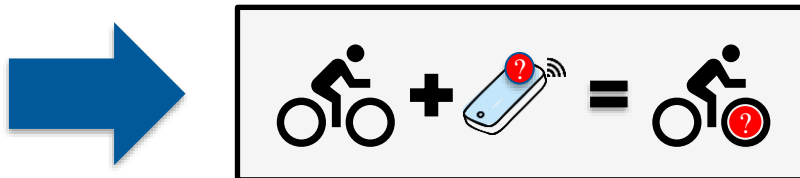
## Lower Austria

- Cycle paths of great importance for tourism
- > 3300 km of cycle paths\*
- Top 10 Lower Austrian cycling routes: Investments of > €60 million since 2006\*

## Traditional traffic data collection: Counting stations (sensors)

- Cross-section of traffic volumes in (point-by-point recording)
- Maintenance (= costs)
- Collection of additional data (such as age distribution, nation split)

 additional costs



Use of existing data!

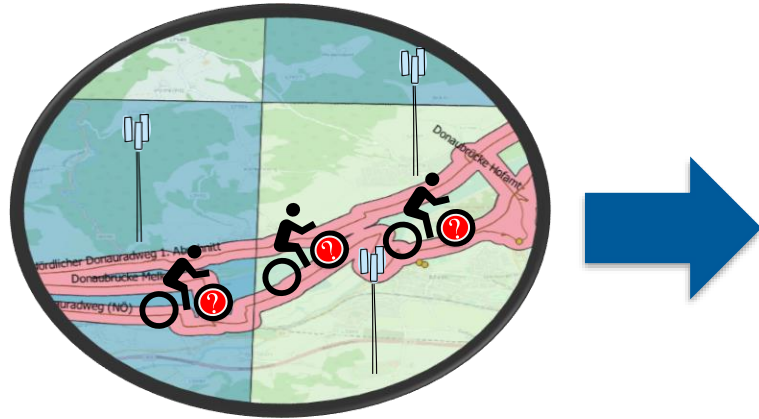
### *Top 10 Lower Austrian cycling routes*

1. Danube Cycle Path (EuroVelo 6),
2. Brno – Vienna cycling route (EuroVelo 9)
3. Kamp-Thaya-March cycling route,
4. Traisen Valley cycle path,
5. Triesting-Gölsental cycle path,
6. Thaya Circuit Cycle Route
7. Iron Curtain Trail (EuroVelo 13),
8. Ybbs Valley cycle path
9. Triestingau cycle path
10. Piesting Valley cycle path

Overall objective:

<sup>3</sup> Recording of tourist cycling trips along the top 10 Lower Austrian cycling routes by means of mobile signal analysis

# Initial situation and project idea

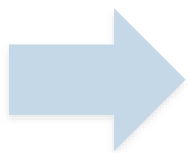


## Derivable information from anonymized mobile signals

- Describe daily mobility based on signal trajectories
- Stationary stays (breaks) (such as > 10 min)
- Country of origin (SIM: Mobile Country Code)
- Age distributions
- ...

## Project objectives:

- Development of an algorithm for the **recognition of tourist cycling trips** from anonymized mobile phone data
- Analysis of the 2020\* cycling season and appropriate presentation of the findings



### Tourist cycling trips:

- Cyclist rides part or all of a cycling path

### Everyday bicycle rides = not a tourist bicycling trip:

- Trip to work / shopping etc...



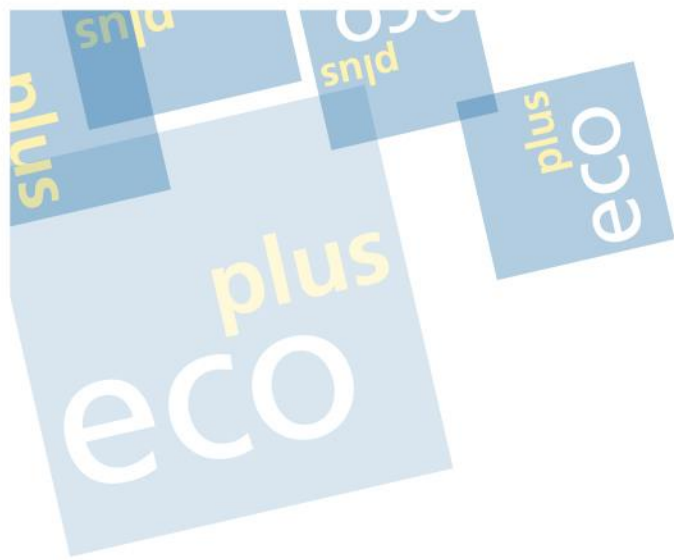
**Algorithm:**  
Differentiation by  
Trajectory features



## Overall objective:

Recording of tourist cycling trips along the top 10 Lower Austrian cycling routes by means of mobile signal analysis

\*April 1 to September 30, 2020



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## ➔ Results

- Résumé: Summary and outlook

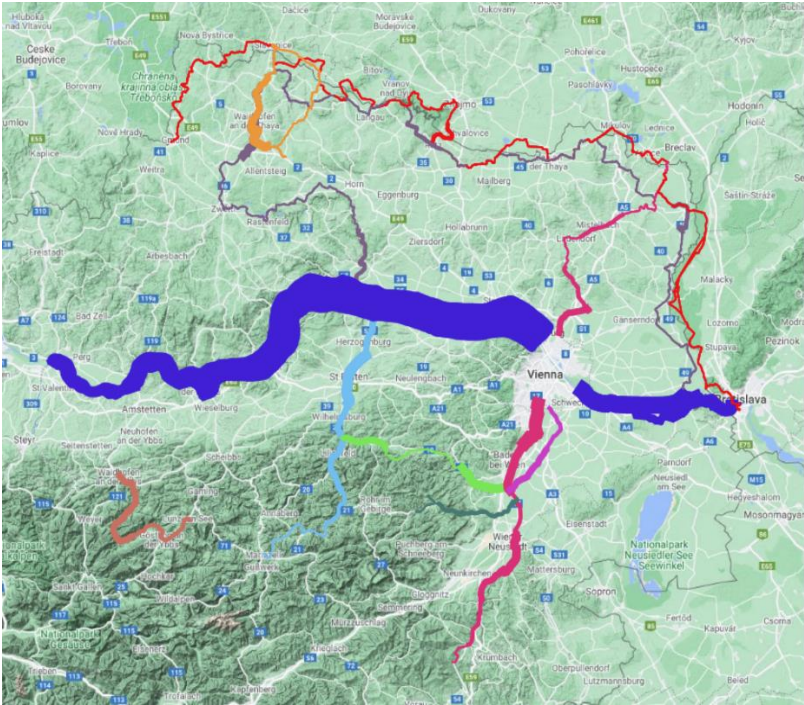




# Mobile radio signal analysis – counting station analysis

Cycling traffic volume per section

Year-to-year comparison: 2015 2020 (mobile signal analysis)



## Top 10 Radrouten

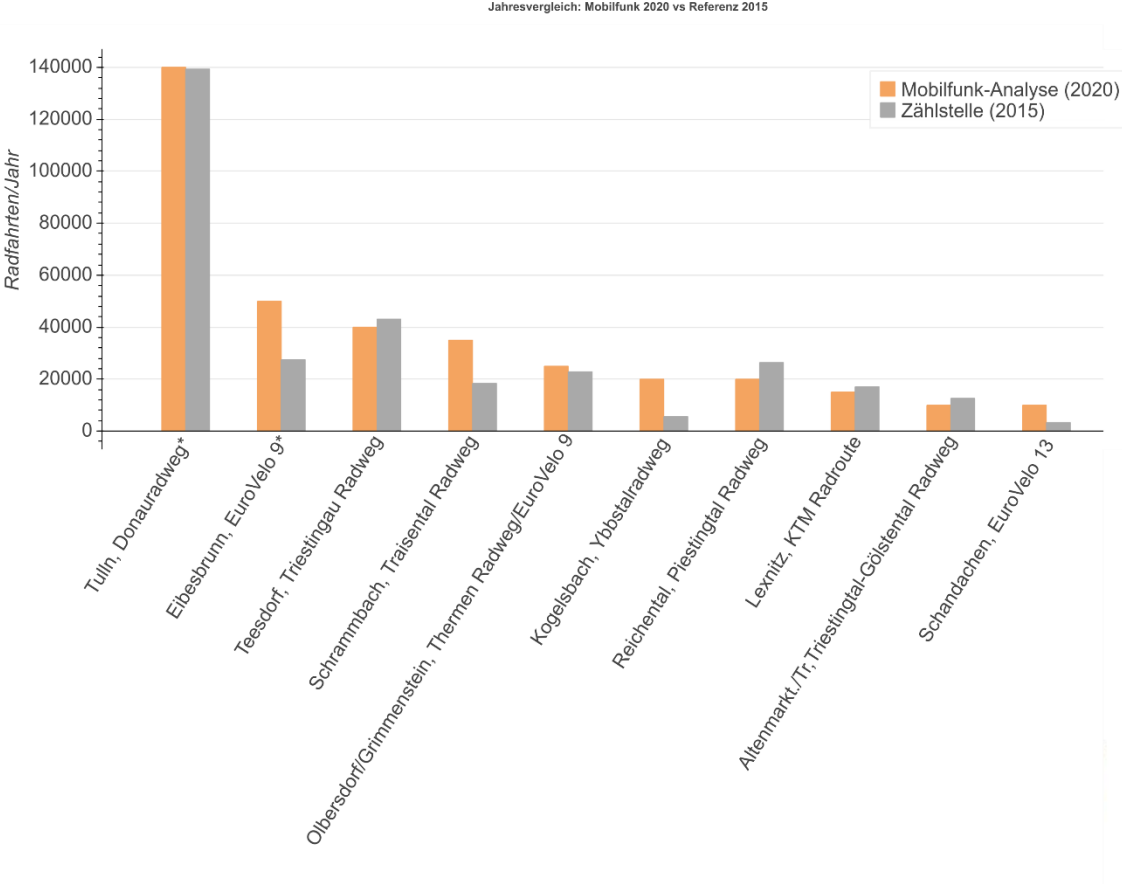
- Donauradweg
- EuroVelo 9
- EuroVelo 13 - Iron Curtain Trail
- Kamp-Thaya Radweg
- Piestingtalradweg
- Thayarunde Radweg
- Traisental Radweg
- Triesting-Gölsental Radweg
- Triestinggau Radweg
- Ybbstalradweg

## Radverkehrsstärke (1. April - 30. September 2020)

- 0 - 10000
- 10000 - 25000
- 25000 - 50000
- 50000 - 75000
- 75000 - 100000
- > 100000

(Mobile signal analysis 2020 season\*)

Seasonal review covers about 85% of the trips for the whole year:  
Mobile signal analysis extrapolated for year-on-year comparison

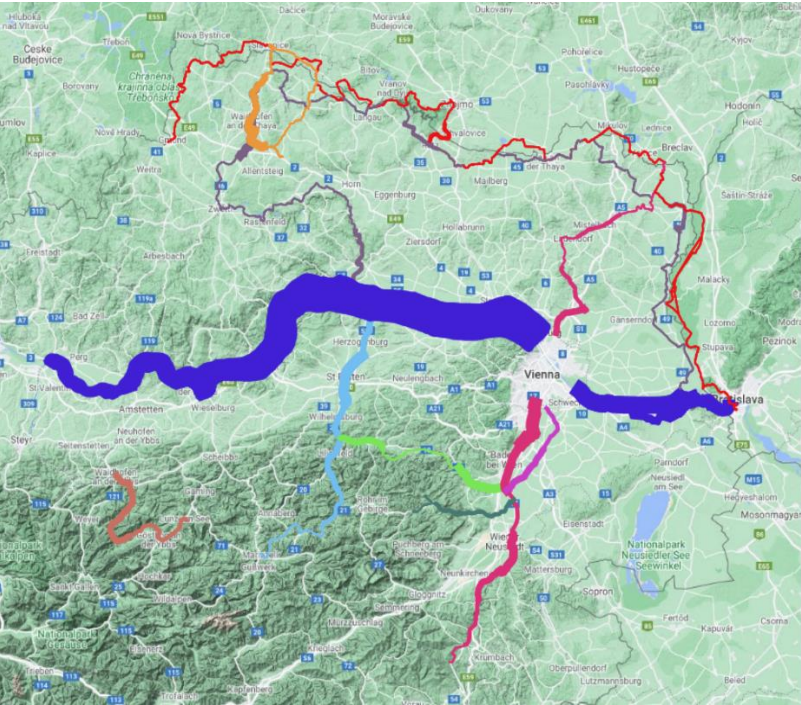


\* Values due to availability from previous counts (2006 – 2012)  
\*\*Season: \*April 1 to September 30, 2020

# Mobile signal analysis

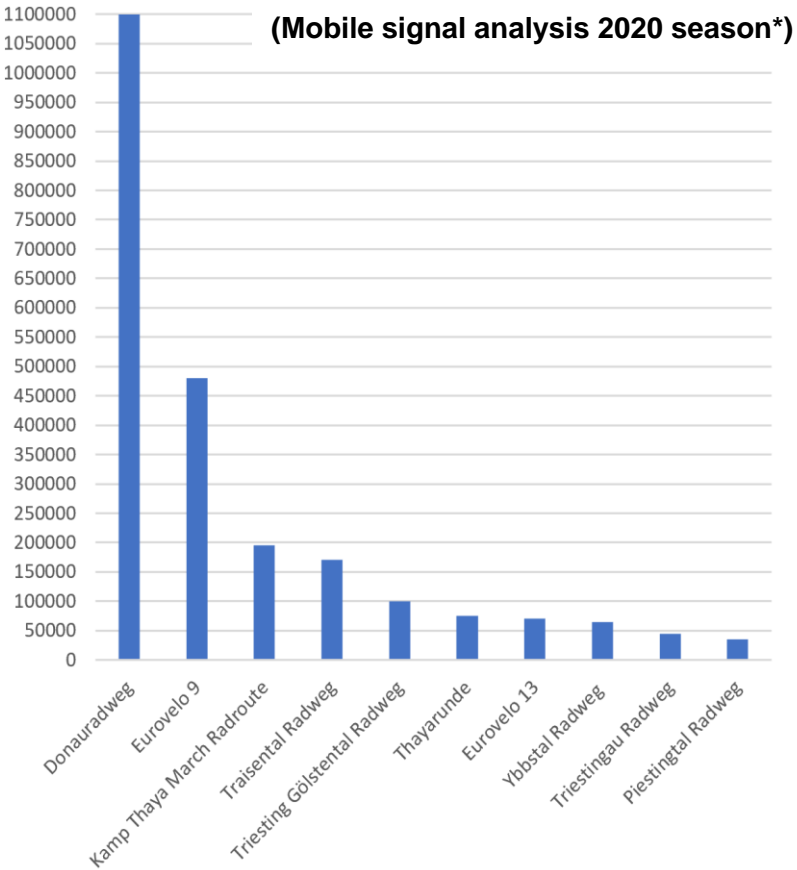
## Tourist cycling trips along the cycle paths

Cycling traffic volume per section



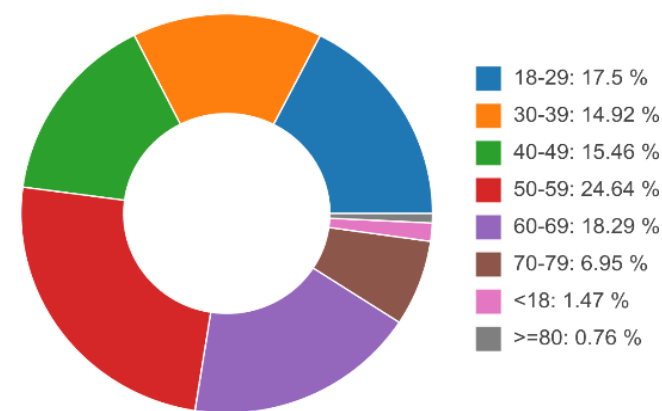
(Mobile signal analysis 2020 season\*)

Number of tourist cycling trips per cycling route



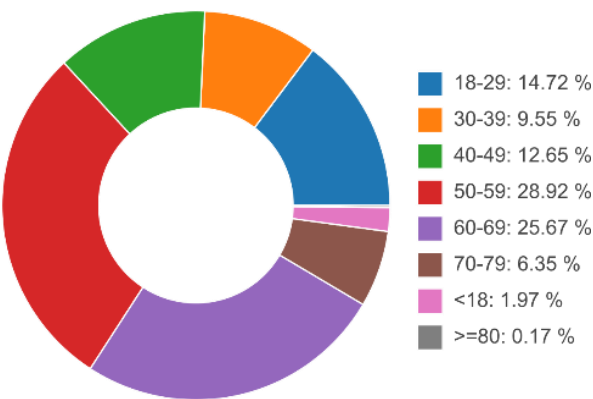
# Age distribution analysis based on anonymized mobile phone signal data

Example – entire Danube Cycle Path



Age distribution (2020 season\*)

Example – area counting station dr-07



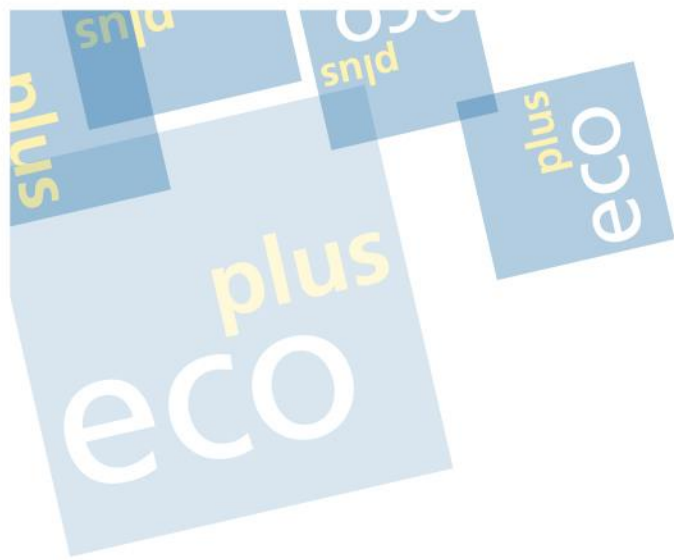
Age distribution (2020 season\*)

Evaluations can generally be done “globally” and “locally”



\*Season: \*April 1 to September 30, 2020





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# Résumé:

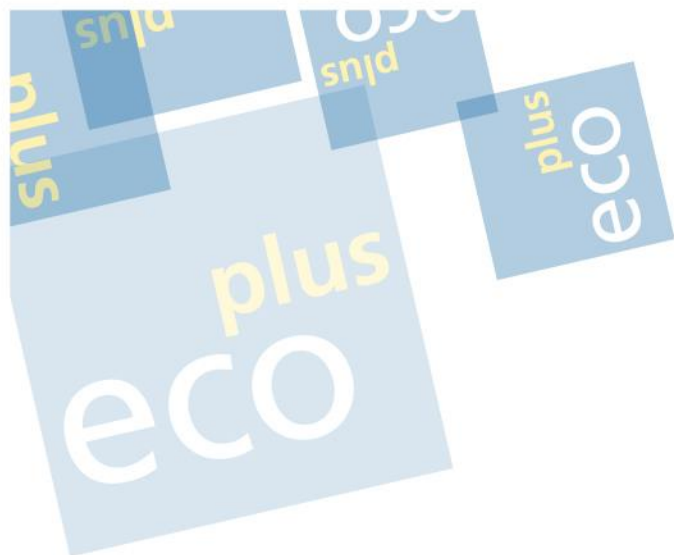
## Summary

- Evidence for the detection of tourist cycling trips from anonymized mobile phone signal data provided ✓
- Mobile signal analysis allows global (not just specific points) coverage of tourist cycling trips ✓
- Analysis of the 2020 season: Bicycle traffic volume and age distribution ✓
- Evaluations ➡ Global and local evaluations possible ✓
- Evaluations ➡ Annual to daily evaluations possible ✓

## Outlook

- Transfer of the developed method into an application with a user-friendly interface (online dashboard) → **BikeAlytics**
- Application of the methods to further tourist cycling routes throughout Austria





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