



## **Comparison of Rides on an Electric and a Conventional Bicycle in a Naturalistic Cycling Study**

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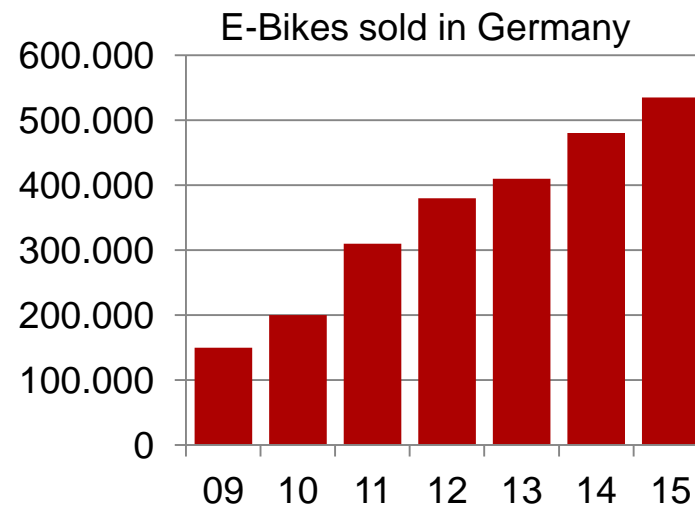
## Motivation for the Study

Pedelecs are e-bikes which only assist the rider while pedalling.

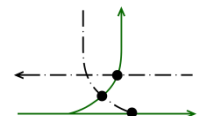
To be classified as bicycles instead of mopeds in Germany,

- 250 W max. continuous rated power
- motor assistance up to 25 km/h

Difference in use compared to conventional bicycles is rarely researched



Data source: Zweirad-Industrie-Verband

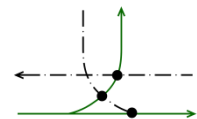




## Field Test

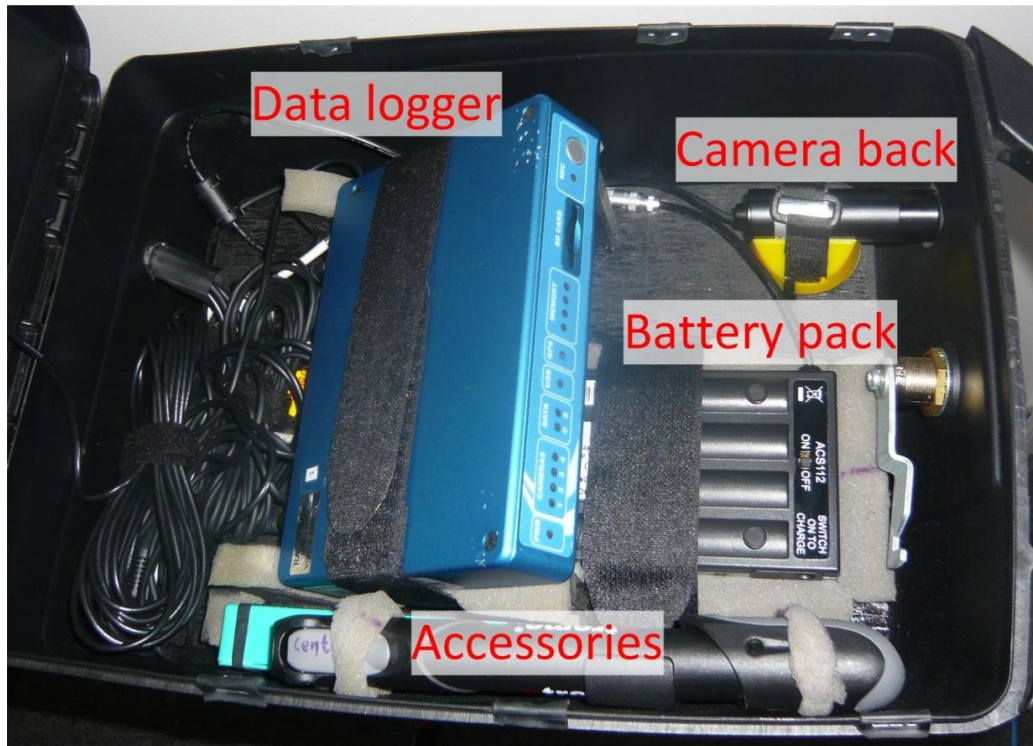


- 7 probands
- Each rode both vehicles for one week
- Mostly trips to the office, but also private trips
- No tasks given to the probands
- 926 km / 51.5 h worth of data

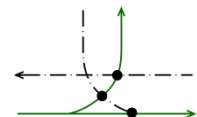




## Data logger in Box on Luggage Carrier

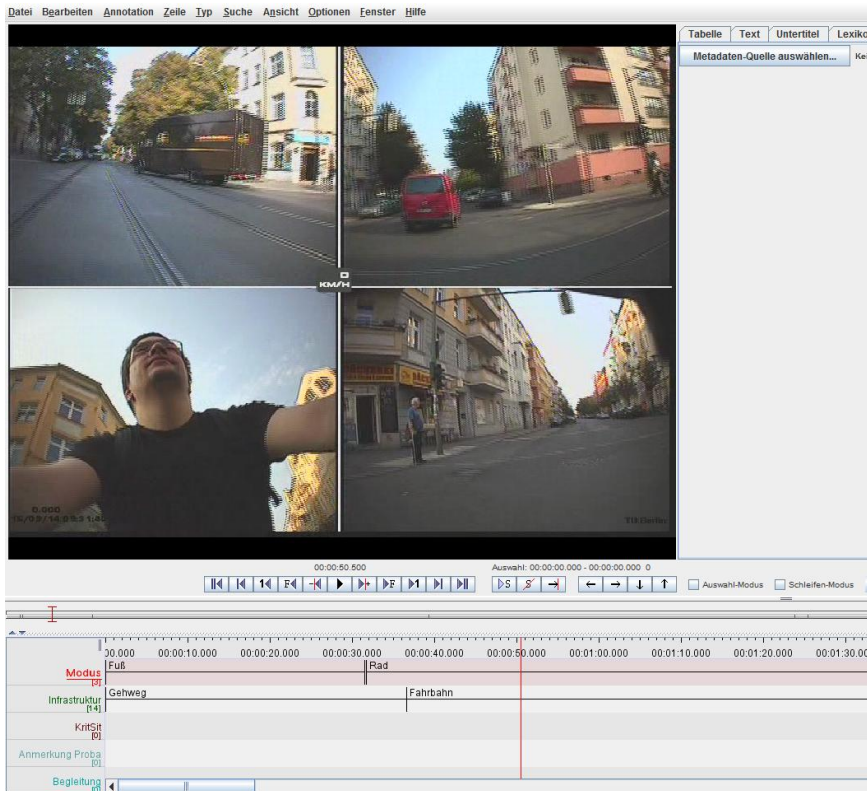


- 4 cameras
- 2 microphones
- GPS
- 10 Hz data rate
- Logging to SD card
- Approx. 3 GB/hour
- Video file with stereo audio track
- Data file with GPS derived data and synchronisation information
- Battery pack for approx. 5 h





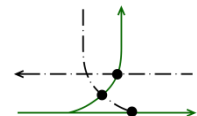
## Video Annotation with 'ELAN' Tool



- Open Source tool \*
- User definable data channels
- Creates .xml-files which can be used by other applications
- Main data analysis with MATLAB

\* <https://tla.mpi.nl/tools/tla-tools/elan/>

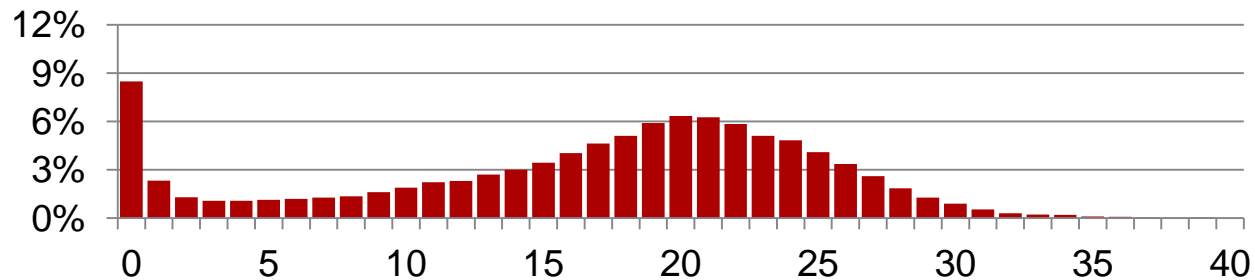
Jan-Philipp Sander, Stefanie Marker. Presentation at International Cycling Safety Conference, Bologna, 2016-11-03  
TU Berlin, Chair of Naturalistic Driving Observation for Energetic Optimisation and Accident Avoidance



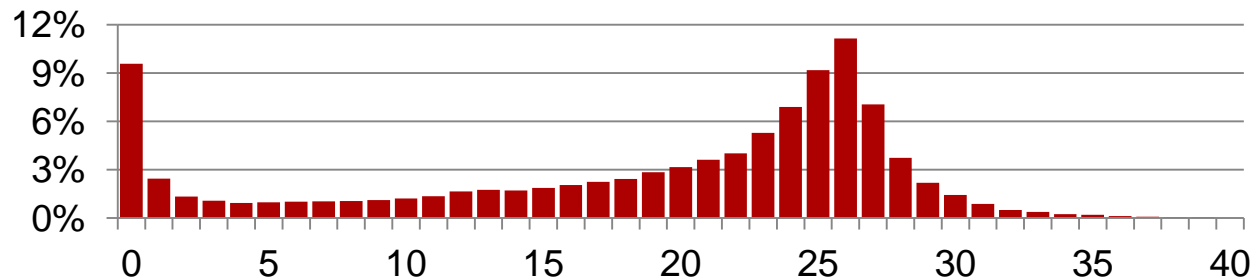


# Speed Distributions

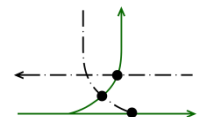
Conventional bicycle



Pedelec

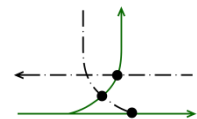
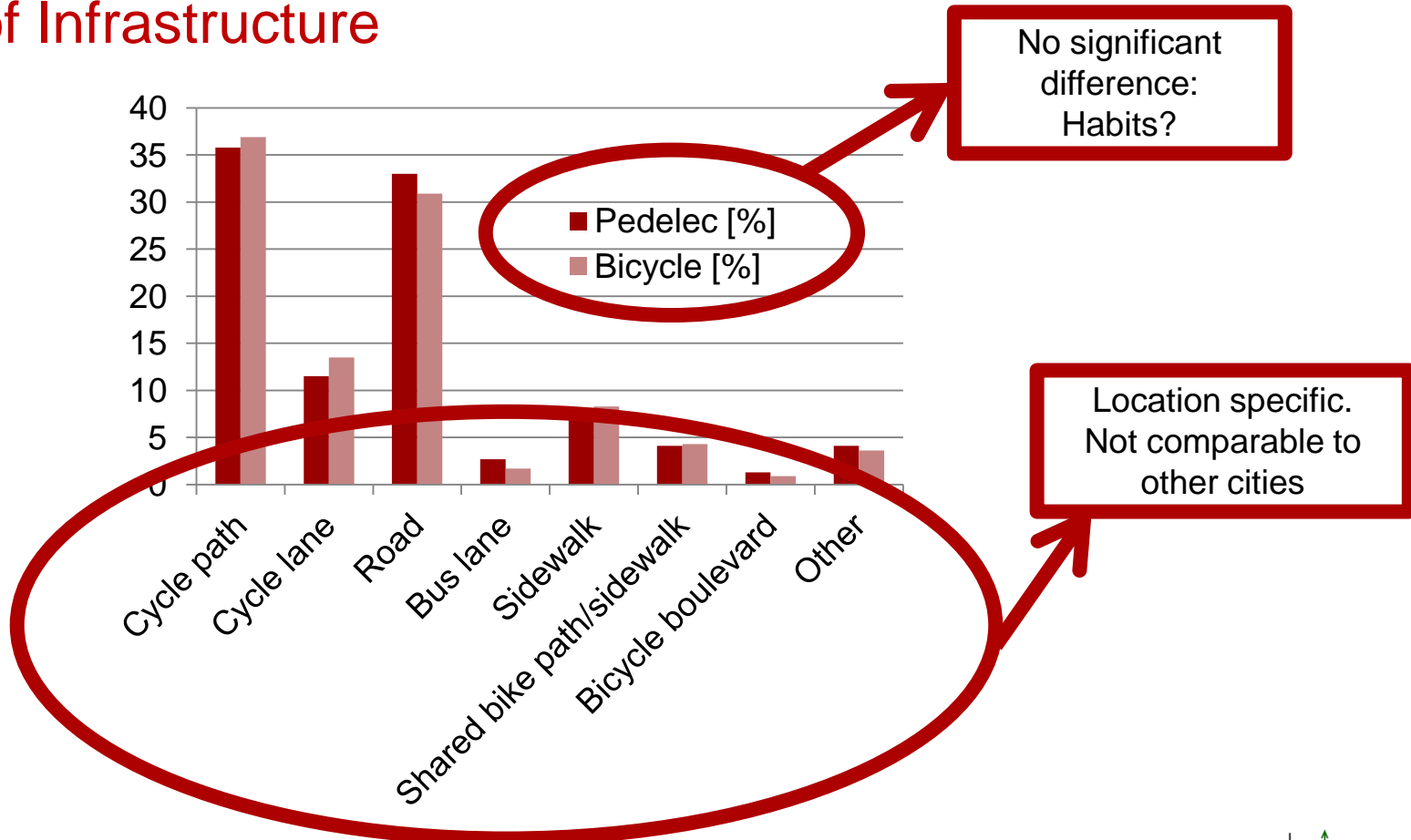


Percentages over time, not distance.





## Use of Infrastructure





## Contact

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