



AI for increased road safety and space reallocation

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3.9.2025



About REALLOCATE

REALLOCATE transforms streets into inclusive, green, safe and future-proof urban spaces, where communities live and thrive.

- Timespan: May 2023 - April 2027
- Call: HORIZON-MISS-2022-01
- Budget: 12,7 M€
- 37 partners
- Coordinator: University College Dublin

The project enables researchers, mobility experts, urban planners and local citizens to collectively re-imagine our cities and redesign how we move from one place to another.



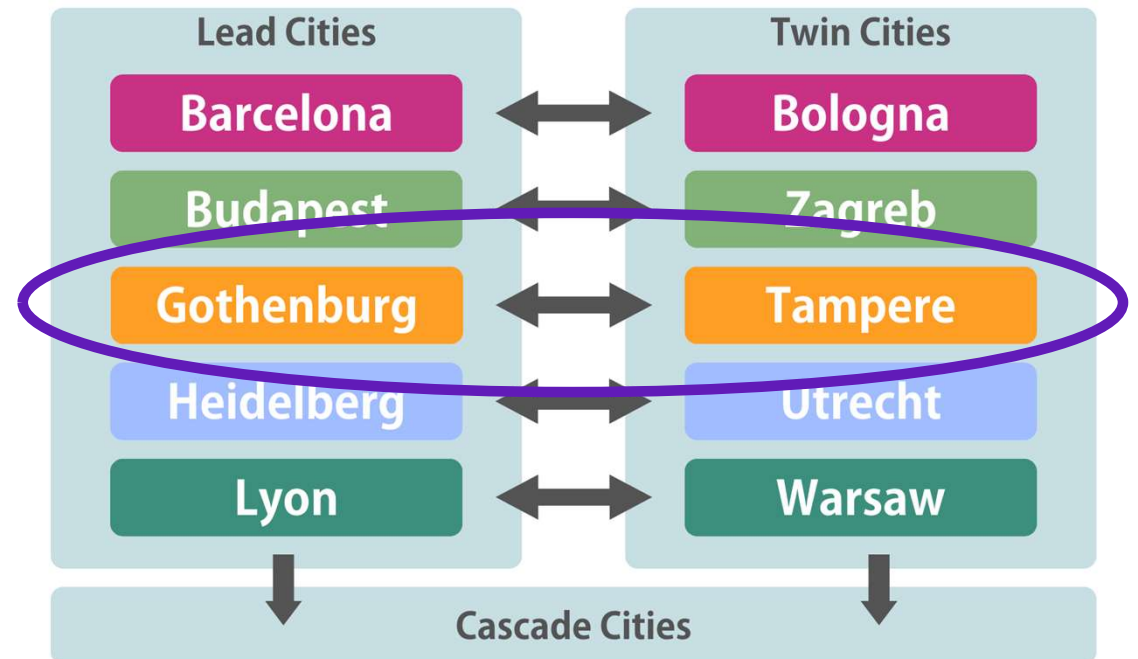


The Cities

During the project, five pairs of twin cities will be formed; each Lead City is twinned with a Twin City.

The cities closely follow each others' activities and collaborate to foster knowledge transfer.

Supported by thematic experts throughout the project, the cities develop their knowledge to implement zero-emission, inclusive, active and citizen-centred mobility interventions.





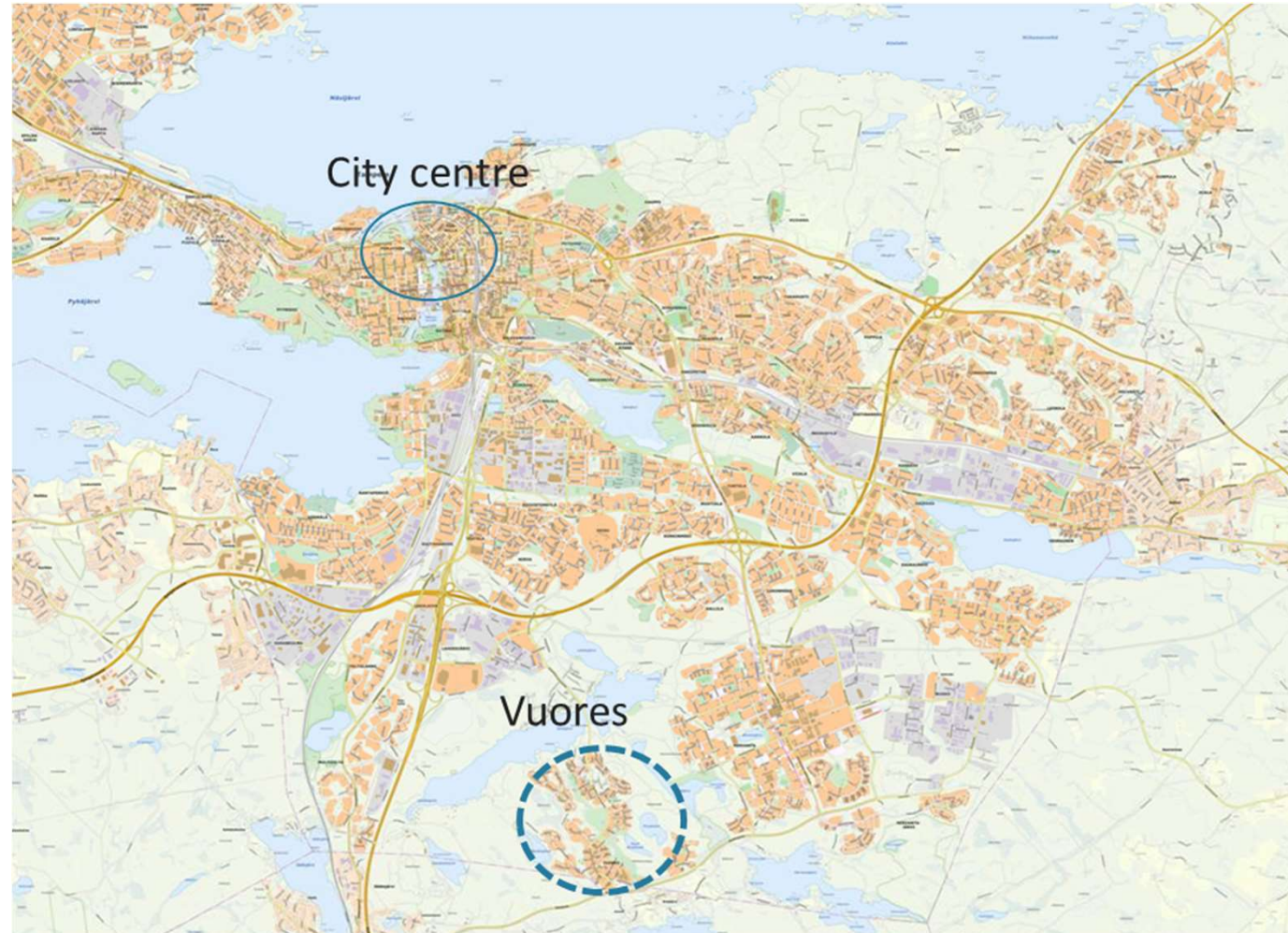
AI for increased road safety and space reallocation

Location: Vuores

- Vuores is a new city district of Tampere
- Locating 7–10 kilometres from city centre
- Two unsafe pedestrian crossings

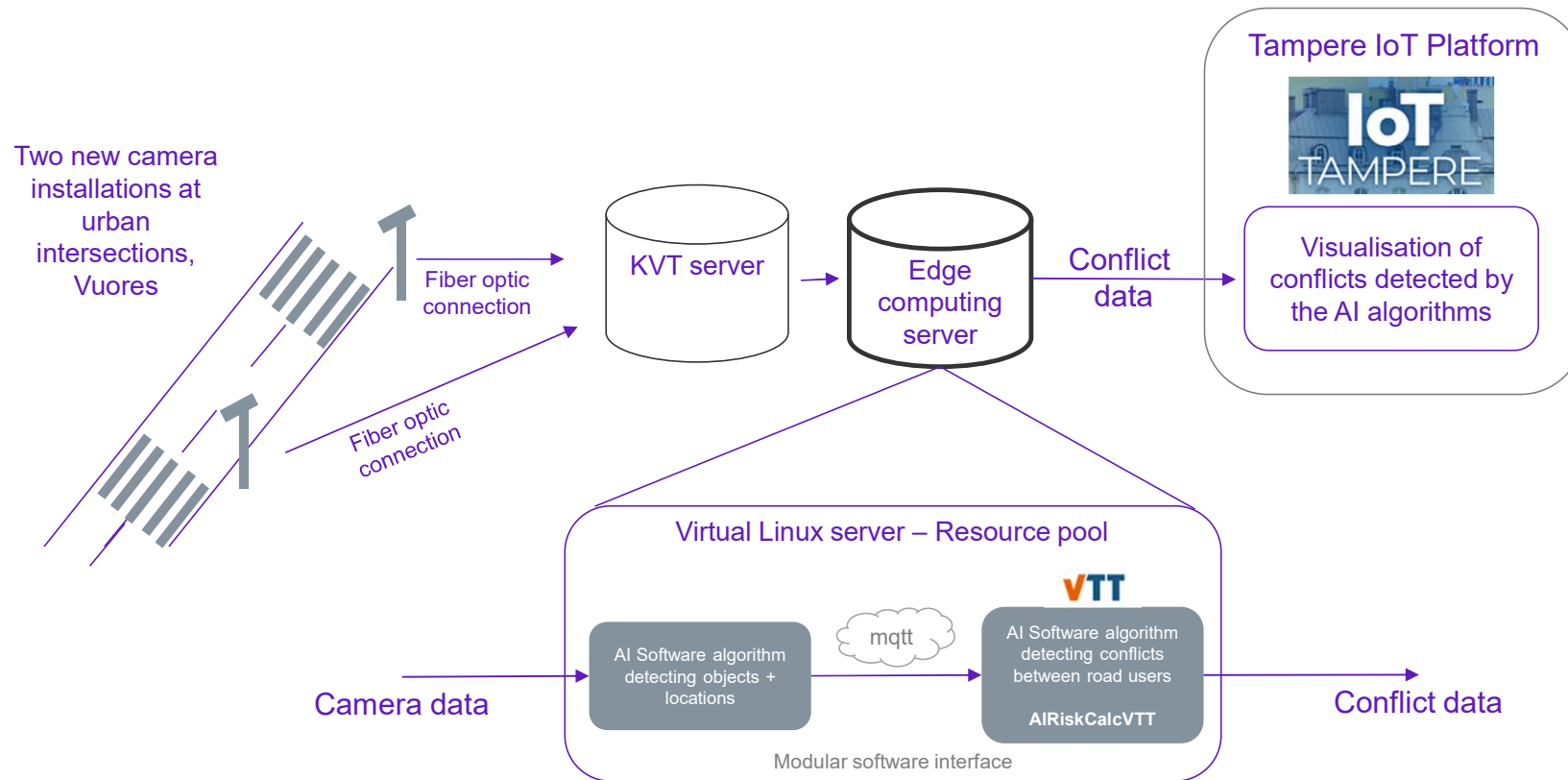
Pilot description

- develop AI-algorithm to recognize pedestrians, cyclists, e-scooters, and cars and their near-miss situations and safety hazards through the Tampere IoT-platform
- implement small traffic calming measures



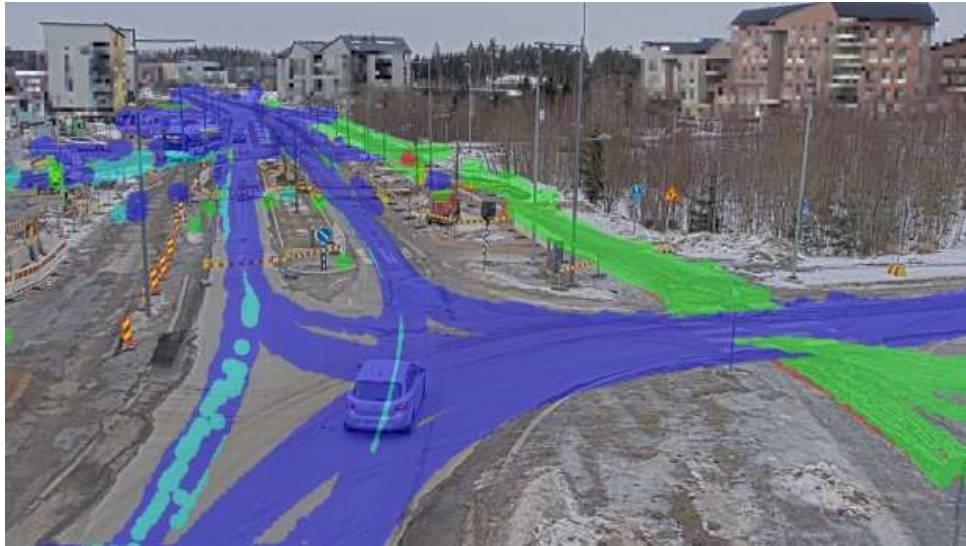


Architecture





Development - Intersection segmentation



Honkakuusenkatu, facing south



Koipitaipaleenkatu, facing north

Vuores N

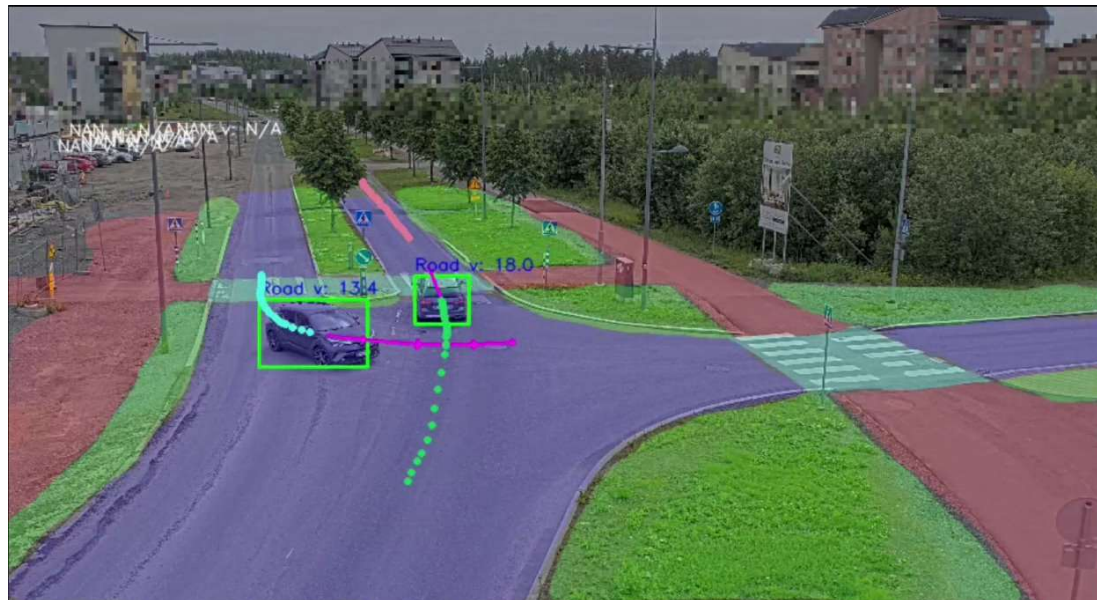
Vuores S



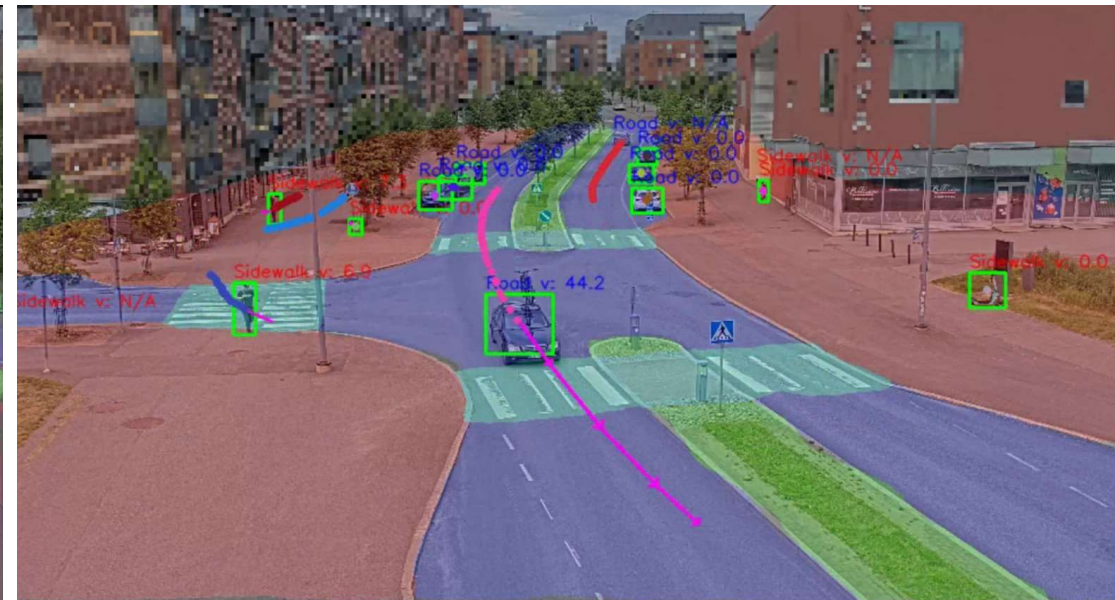


Development – Traffic rules, estimating movement

- Detect situations where a road user causes elevated risk by moving into an area where they shouldn't be:
 - pedestrian jaywalking,
 - car stopped on sidewalk.
- Tracked target positions are compared to label areas, and elevated risk maneuvers can be extracted from data.
- Curved trajectory estimation implemented for more accurate projection of movement.
- PET calculation and categorization implemented based on the tracking data.



Vuores North

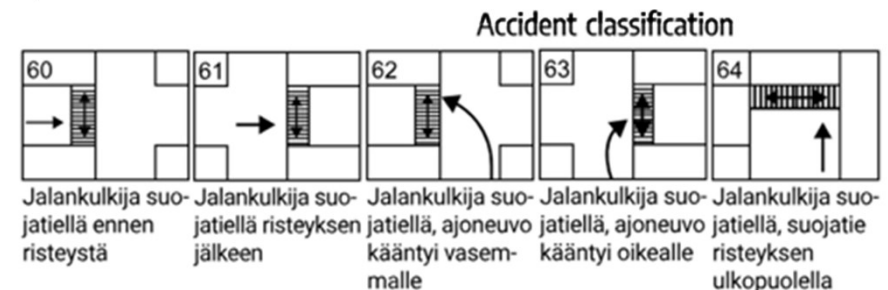


Vuores South



Key Performance Indicators

- Participating road users vehicles, pedestrians, cyclists, scooters ...
- Trajectories of participants (according to accident classification)
- Post-Encroachment Time (PET) – time between the moment the first road user leaves the point where two road users' paths meet, and the moment the second road user reaches said point
- Time-to-Collision (TTC) – time before the collision happens between the road users if their speeds and paths do not change
- Conflicting Speed (CS) - speed of the relevant road user when they take the evasive action
- Algorithm accuracy (numbers of true and false positives/negatives)
- Number of near-miss situations
- Safety index for the intersection



<https://www.lvk.fi/onnettomuustietoinstituutti/otin-maaritelmat/tyyppikuvasto/>



Stakeholder engagement

Selected horizontal partners in Tampere



safety audit



modelling and artificial intelligence



urban data science, data visualisation



safe system approach



behavioral aspects

