

D-BAUG Lighthouse Project: E-Bike City Subproject I

Costs of converting into an E-bike city and the change in accident risks

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1 Motivation

Dreams of a net-zero city facilitated through increased use of e-bikes are admirable, and given our climate crisis, maybe necessary.

While other E-Bike City subprojects address the changes to mobility and the infrastructure required to enable the E-Bike City, and the quantification of the resulting environmental benefits, **this subproject is focused on the costs estimation and accident risk minimisation.**

The particular costs considered are

1. the costs of converting the existing roadway infrastructure into e-bike city infrastructure and
2. the change in the accident risks that can be expected.

2 Methodology

1. Costs to transform a city's existing transport infrastructure into e-bike-city infrastructure have not yet been studied. Previous studies lack the detail to take into consideration local characteristics, e.g., willingness to pay for aesthetics and local planning laws.

→ Data collection from publicly available sources and through collaborations with infrastructure providers will yield insights into the costs of cycling infrastructure conversions.

2. Accidents increase more-than proportionally with the rise in e-bike use. However, most accident data is only available at the city level and is used to analyse problems with existing infrastructure.

→ Analysis of new studies and reanalysis of past studies, and the data upon which they were built, will provide insights into how new cycling infrastructure can be designed to minimise accident risk.

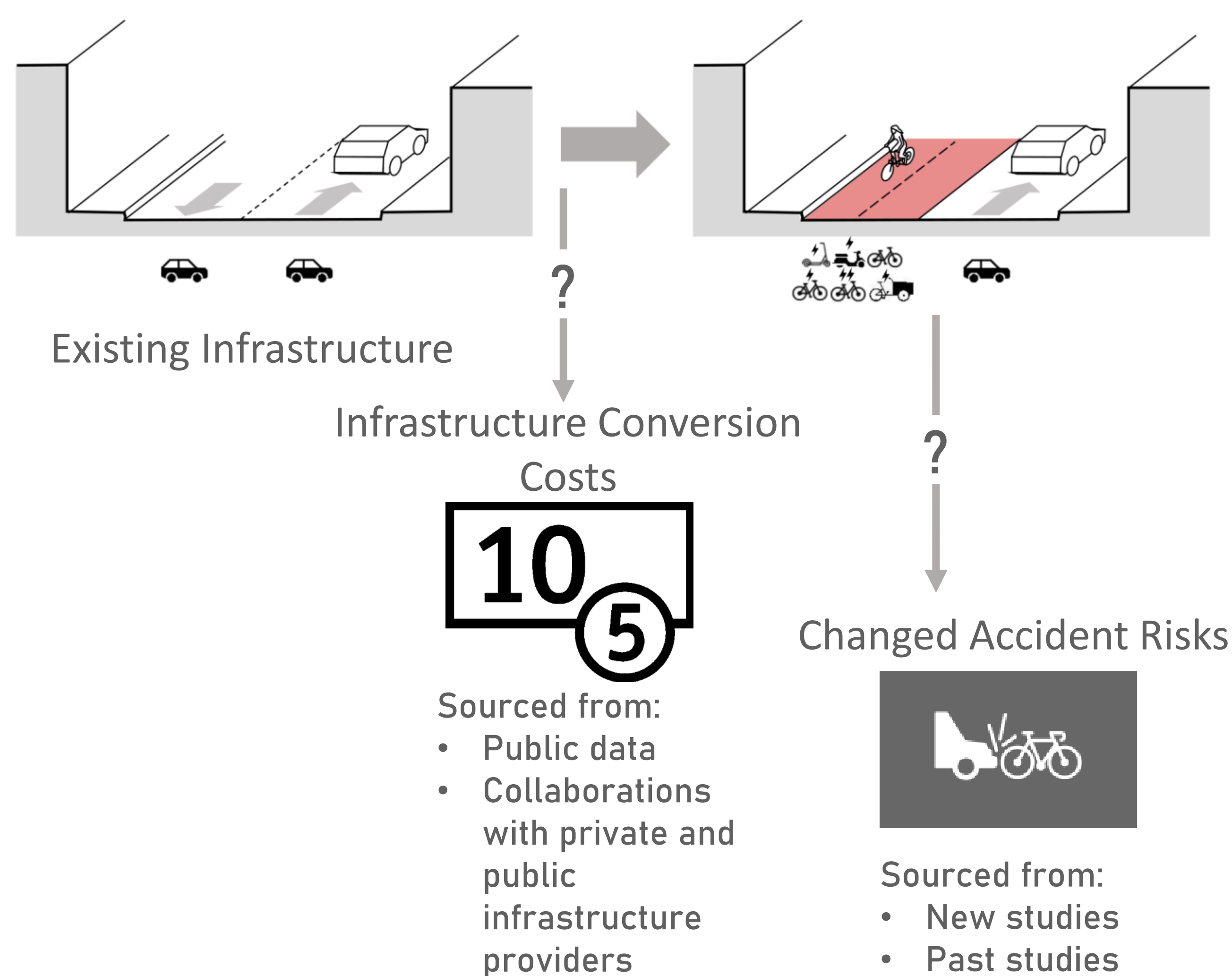


Fig. 1 This subproject's contributions to the overall e-bike city research project

3 Public Sector Collaborations

Along with the reanalysis of past bicycling-related studies, collaborations with municipal and cantonal governments will provide new data for estimating costs and accident risks.

For example, the City of Zurich has provided data on road safety of different types of cycling infrastructures. Together with the infrastructure costs, these data will provide an initial overview of infrastructure-specific costs and accident risks at a local level.

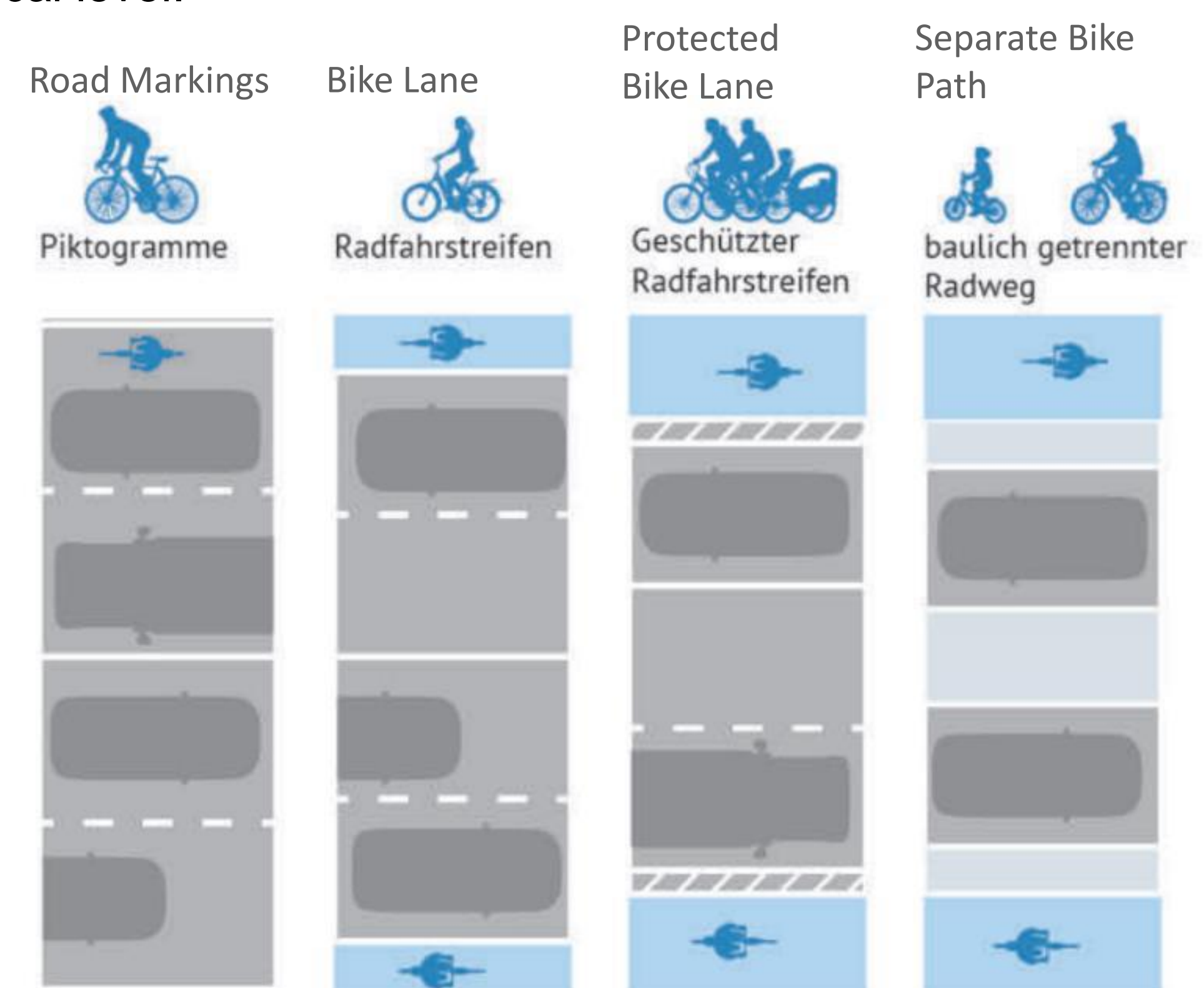


Fig. 2 Different bicycling infrastructure designs. Source: VeloLabor Zürich

4 Expected Results

At the conclusion of this subproject, we will have provided **infrastructure design-specific estimates for**

1. conversion costs and
2. accident risks.

These estimates will help the participating D-BAUG institutes answer the E-Bike City Lighthouse project research question: how can the city be best restructured and design its transport infrastructure to allow transport to reduce its CO2 contribution to net-zero?



Fig. 3 Participating D-BAUG institutes

5 Institute Portrait

The Institute of Construction and Infrastructure Management (IBI) studies how our built environment is constructed, operated, and maintained to support the functioning of our society, in economic, social and environmental terms.

Professor Adey's Infrastructure Management Chair works to improve the construction and management of infrastructure with special attention focused on the improvement of decision making from general planning for entire networks to detailed planning for specific projects.

We would like to acknowledge the support of all involved partners at ETH, public and private partners, and students and staff at IBI whose work supports the E-Bike City Lighthouse project.