

# Deployment of zero-emission urban regions: hub and consolidation center location planning



## Problem description

The accelerating climate change calls for decarbonization in all sectors. Reducing emissions from passenger and goods transport is a step towards the decarbonization objective. Some cities are considering zero-emission zones in attempts to reach zero (local) emission from transport and logistics. Successful deployment of such zones requires changing to zero-emission travel and transport modes or decoupling trips making sure the first and last miles that fall within the zero-emission zone are completed by means of zero-emission transport modes. However, this requires new concepts and good planning to be operational. Placing hubs and consolidations centers around the edges of zero-emission zones has been proposed as a solution. This assignment is about planning the locations of these hubs and consolidation centers.

The scope of the assignment will be limited to only passenger or freight transport. This means the assignment is meant for two separate theses.

## Assignment

This assignment will include a literature review to determine existing relevant models and concepts. This should lead to the identification of literature gaps, research questions and scope. Ultimately the student is expected to select a subset of possible transport mode chains to satisfy all demand within the selected scope, develop operating assumptions for hubs and decoupling trips, and develop an optimization model to determine the best placement strategy for hubs and/or consolidation centers.

## Background

Students with familiarity with and interest in mathematical optimization models and ideally with experience with optimization solvers or programming skills to code models (e.g., in Matlab, Python, Java, etc.).

## Research group

The project can be conducted as final thesis project for MSc Civil Engineering –Transport & Planning track or MSc in Transport Infrastructures and Logistics. We are also interested in students from other master programs provided that they have the skills to work on this type of problem.

Feel free to contact Dr. Bahman Madadi ([b.madadi@tudelft.nl](mailto:b.madadi@tudelft.nl)) to discuss these or other related topics for master theses.

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