Spatial Analytics on Urban Farming and Sustainable Transport

Summary

The overall goal of the project is to examine how urban food systems and sustainable transport systems interact spatially and temporally in the context of 15-minute cities and transit-oriented development. This early stage researcher (PhD) position is part of the TalTech-led research project Hyping Agriculture and Transit (HAT) in 15-minute Cities (15mC), which explores how food-growing, public transport-oriented communities can support urban transitions as green Proximity Oriented Developments (PODs).

Research field:	Building and civil engineering and architecture
Supervisor:	Jenni Vilhelmiina Partanen
Availability:	This position is available.
Offered by:	School of Engineering Department of Civil Engineering and Architecture
Application deadline:	Applications are accepted between June 01, 2025 00:00 and June 30, 2025 23:59 (Europe/Zurich)

Description

The research

Cities increasingly face challenges in supporting sustainable urban lifestyles while ensuring access to food and low-emission mobility. The 15-minute city and transit-oriented development models offer promising frameworks, yet their spatial co-evolution with food systems remains underexplored. This PhD project investigates how urban food production and distribution interact with mobility systems using spatial analytics (GIS) and statistical tools. It focuses on identifying spatial and typological regularities, dependencies, and long-term changes, with Tallinn as the core case. Depending on the candidate's skillset, the research may apply machine learning tools or appropriate computational models to support analysis.

The project contributes to the wider HAT research initiative coordinated in Estonia and supported by an international consortium. It aims to provide data-driven knowledge for designing accessible and ecological urban food systems embedded in future mobility infrastructures.

The thesis should address tentatively the following questions:

1. What are the spatial patterns of urban farming and food distribution in relation to transport systems?
2. What spatial and statistical dependencies exist between these systems?
3. How can spatial analysis inform policy and design interventions in food-oriented urban developments?
4. What tools and models are appropriate for integrating data on food and mobility systems in urban planning?

Responsibilities and (foreseen) tasks

• Conduct spatial and temporal analyses using GIS and statistical tools
• Compile and process current (and historical if available) data on food and transport systems
• Identify patterns and dependencies in food-mobility interactions
• Apply or develop computational models or machine learning methods (if applicable)
• Contribute to project publications, workshops, and comparative activities
• Participate in project coordination and communication tasks

Applicants should fulfil the following requirements:

• A master's degree in geoinformatics, geography, landscape architecture, or a related field
• A clear interest in spatial analytics and planning, sustainability, and urban systems
• Strong and demonstrable skills in GIS and statistical analysis
• Familiarity with QGIS, ArcGIS, or similar spatial platforms
• Basic programming skills (e.g., Python, R)
• Excellent command of English
• Capacity to work independently and as part of a research team
• Willingness and ability to reside in Tallinn and start in September 2025

The following experience is beneficial:
• Experience with urban food systems or mobility planning
• Knowledge of machine learning or spatial modeling tools

The candidate should submit a research plan for the topic, including the overall research and data collection strategy. The candidate can expand on the listed research questions and tasks, and propose theoretical lenses or analytical approaches to be used.

We offer:
• A 4-year PhD position (early stage researcher contract) in one of Estonia's leading academic environments for planning, architecture, and urban spatial studies
• The chance to contribute to interdisciplinary research shaping future sustainable urban systems
• Participation in a nationally coordinated and internationally supported research consortium
• Opportunities for conference participation, academic exchange, and collaboration with top European universities

About the department

The **Academy of Architecture and Urban Studies** at Tallinn University of Technology (TalTech) is a research-intensive unit within the School of Engineering. The Academy is internationally recognized for its interdisciplinary approach combining architecture, urban planning, spatial analytics, and sustainability.

Its research focuses on:
• Urban planning and spatial analytics in technology-mediated cities
• Digital planning, design, and participatory methods
• Sustainability metrics and spatial adaptation strategies

The Academy's curriculum combines design, data, and systems thinking in preparing future professionals to address complex urban challenges.

Additional information
For further information, please contact Prof. Jenni Partanen (jenni.partanen@taltech.ee)
TalTech homepage: https://taltech.ee/en

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