

# The role of street design: How perception shapes our walking routes

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## INTRODUCTION

Norwegian cities aim to increase active mobility, but lack the necessary tools and models to predict which measures are most effective. Analyzing pedestrian behavior is the key for understanding what factors are needed to create livable streets for our future selves.

### **We need to do something, but we don't know what**

As achieving climate goals becomes increasingly important, cities are under growing political pressure to create more livable environments. The city of Trondheim frequently uses GIS tools (such as the ATP model), travel survey data, and Telia data to estimate pedestrian flows at an aggregated level.

However, there are few tools and models available to evaluate how changes in the built or natural environment affect pedestrian route choices and to identify which impacts should be prioritized. Given limited financial resources, it is essential to focus on the most impactful measures. The first step is to understand what matters to us, pedestrians.

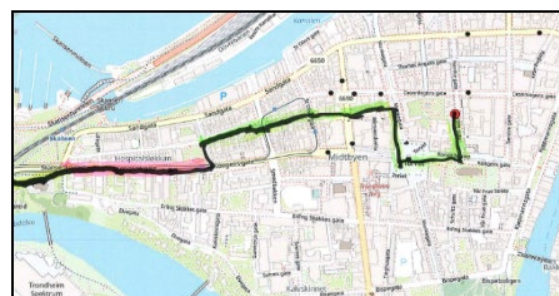
In this article, we describe the factors that influence pedestrians' route choices. With this knowledge, it becomes possible to estimate how much more people are likely to walk on average if, for example, a new sidewalk is built or a road has less traffic. This provides valuable input for simulating measures in the planning of future cities.



## METHOD

### **Let's ask the people!**

To understand what matters to people when choosing their walking routes, we set up a booth in the pedestrian area of Nordre Gate in Trondheim on a weekend in June 2024. We asked passersby what they found attractive or unattractive along their routes, and whether these aspects influenced their route choices. We then combined their responses with geospatial street data information and used a larger dataset of GPS-tracks to estimate a preliminary route choice model.





## RESULT

### People choose their route because it's attractive

Most participants reported choosing their routes based on attractive features. The most important factors influencing their choices were the presence of shops, appealing architecture, the absence of car traffic, and views of greenery and the river.

### People are right?

Surprisingly, many people showed a moderate level of agreement between what they perceived and what was actually present on the street. Excellent agreement, indicating no mismatch between perceived and objective variables, was found for areas that were very crowded, with 'nice architecture', shopping opportunities, wider sidewalks, reduced or no car traffic, and river views.

This suggests that these objective variables can be reliably used in transport models, as they reflect what people actually notice and value.

### Street design matters

Based on the variables that showed strong agreement between perception and reality, we estimated a route choice model. The presence of shops, reduced traffic, and wider sidewalks along a route leads to an increase in walking distance

compared to the shortest path. With this knowledge, we can estimate how a car-free city center would influence pedestrian behavior. This represents a first step towards evaluating measures for decision-makers.



## CONCLUSION

### Well, something is missing.

Despite our initial findings, important factors still need to be better understood to fully capture pedestrian route choices. Therefore, we are currently developing a more refined model to examine how personal characteristics and trip purposes influence these choices, while also exploring the interaction between pedestrians and other transport users in greater detail.

Parts of this research will be presented at the 12th International Conference on Pedestrian and Evacuation Dynamics in Prague, 2025.

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