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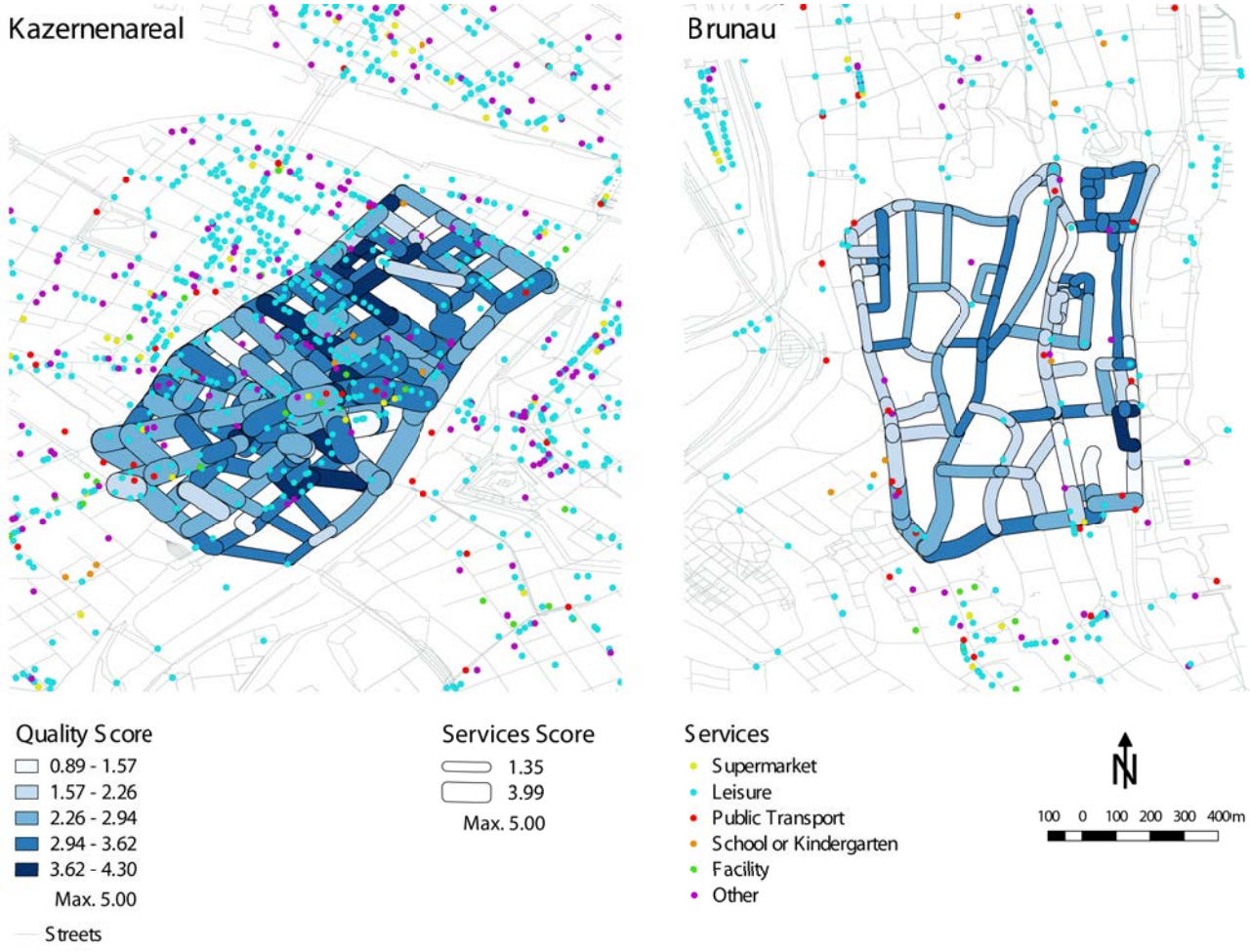
Institut für Verkehrsplanung und Transportsysteme

Projektdatenblatt

A spatial model for neighborhood walkability



Institut für Verkehrsplanung
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A Spatial Model for Neighborhood Walkability

Background

Walk-friendliness, also known as "walkability" is becoming increasingly relevant in the fields of transport- and spatial planning. Public funding, the location choice of business and the value of real estate can all depend in part on the perceived quality of the local public space, which in term influences walk-friendliness.

However, it is unclear if, and how, this walk-friendliness can be modeled, let alone measured quantitatively. Some existing studies define walkability as a measure of the number of destinations that can be reached on foot (Moudon et al., 2006). Another possible interpretation of walkability is in terms of quality of pedestrian environment (Clark and Davies, 2009), for which a number of criteria are defined. Therefore, the goal of this project is to build a spatial framework, in which the concept of walkability and all its relevant parameters can be modeled.

Research questions

In order to address all relevant aspects of walkability, this study attempts to capture both facets of the concept mentioned above. These have been translated into the following two questions:

1. Do pedestrians have reasons to use a certain street segment?
2. Does the street segment provide the desired quality for walking?

In order to answer the first question, a service-score has been defined to measure the accessibility of services for pedestrians, while the second question will be answered by means of a quality-score.

Methodology

The analysis has been carried out for two areas in Zürich, the so called "Kazernenareal", next to the city center, and "Brunau", located in the South-West.

The service- and quality-scores have been computed in QGIS for each street segment between two adjacent intersections.

The service-score measures the proximity to 6 different types of services: public transport stops, supermarkets, facilities, schools & kindergartens, leisure and other. For each type, an individual score has been computed, based on a utility function of the distance between the middle of the street segment and each service, as well as based on a rank function that accounts for the importance of having more services of the same type. The service-score represents the weighted sum of the individual scores.

In order to measure the quality-scores, 6 relevant parameters have been chosen: traffic volumes, walkable sidewalk width, percentage of grass- and trees & shrubs cover along the street, a storefront index, showing the proportion of ground floor façade that consists of show windows, as well as a window index, that shows the continuity of the street wall with windows.

The service- and the quality scores, as well as the individual scores for each service type and quality parameter have been visualized in maps.

Evaluation

This framework has several advantages compared to existing methods, such as integrating both facets of walkability described earlier, and enabling the analysis of each individual segment separately, while also providing an overview of the whole area. This way, shortcomings can be easily located, and solutions can be proposed to improve walkability. Furthermore, the framework can be used to visualize the effects on the walkability scores of certain changes in the built environment.

The method can be expanded by accounting for differences in expectations, as well as for mutual interactions between different parameters. Further research could focus on finding typical scores for different neighborhood types, and on researching the relationship between these scores and the modal share of walking in an area.

Summary

The walkability framework developed in this study provides planers with a complete tool for assessing the walkability of an area. Furthermore, the method can be extended and used for further walkability research.

Client

ETH Zürich

IVT Contributions

Modeling walkability

Applied Methods

GIS Analysis

Contact

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