

# DEFINING A GENERAL METRICS AND RECOMMENDATIONS FOR ACCESSIBILITY OF PUBLIC TRANSPORT IN TALLINN AND HARJUMAA REGION



Ordered by

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Accessibility is defined as the inclusion of the whole population in the living and information environment, meaning that all people, regardless of their age or health status, are guaranteed equal opportunities to participate in society. Accessibility can be understood as the accessibility of physical space, information and services (Chancellery, 2021).

In the framework of the INTERREG Baltic Sea Region project SUMBA+, the accessibility of public transport stops was analysed. According to the baseline, the work consists of two main components:

Development of the concept, indicators and methodology for the assessment of the mobility situation.

Recommendations to improve the accessibility of mobility spaces and stops.

Although the project aims and focuses on the accessibility of public transport stops at local level, the concept and methodology address accessibility and accessibility in a broader sense. There are several reasons for this broader approach: firstly, public transport is not an end service for the user, but a means to access services and other locations. This implies that, for the sake of accessibility to services, the street network should be of sufficient quality for walking even without a public transport focus. Secondly, by focusing only on distances to public transport stops, the methodology would not be able to provide sufficiently useful input for spatial planning – spatial planning must also consider the structure of the street network and the overall competitiveness of public transport in each area.

The main idea behind the methodology developed is to define priorities. Resources are always limited, and therefore the planning of activities must be based on their impact. Simply mapping problem areas does not tell us anything about priorities. Tallinn and Harju County are full of problem areas in terms of pedestrian accessibility and this is not unique to Estonia. Setting priorities is a practical challenge for many cities, and this is what the concept of this methodology aims to address.

### **General principles of the methodology**

The methodology developed for public transport accessibility is based on three steps:

- First, the entire road network in the analysis area is defined and parameterised;
- Second, the competitiveness of all public transport stops in reaching the destinations is evaluated;
- Thirdly, the paths to the public transport stops are analysed, resulting in an assessment of the accessibility of the stops.

**Definition and parameterisation of the whole network.** This step is a prerequisite for the analysis of accessibility, as there is currently no detailed digital representation of the road network in Estonia to analyse the possible routes for walking. In this context, the road network refers to all the segments of the whole area that can be used for access, regardless of the mode of transport. Roads in this definition include stairs, tunnels, car parks, crossings and informal paths. While the overall digitised street network is sufficient to estimate the approximate stopping distance, the assessment of accessibility requires the attribution of physical and environmental characteristics to all road segments. Parameters do not always uniquely define the characteristics of a road segment; several characteristics are defined by a combination of several parameters.

**Assessment of the time competitiveness of public transport stops in order to reach destinations.** This stage defines the significance of the stop. The number of lines serving stops, their frequencies and the service areas vary widely, and therefore even stops in close proximity may have very different competitiveness in order to reach the destination. As a result, it is not always practical for people to go to the nearest stop, there are often several stop choices and different stops are used to go to different destinations. By calculating the journeys from the stops to all services in the region, it is possible to calculate the competitive weights of the stops. However, the stop weights are different for each property, so the competitiveness of stops is calculated for each property. The journeys to the stops are calculated at this stage along the general simplified street network, without taking into account the more detailed conditions for walking.

**Analysis of pathways to the public transport stops.** Once the stop weights have been found, paths to the public transport stops are analysed on the local parameterised road network. The analysis finds the obstacles for all paths to the public transport stops, calculates the paths corresponding to the obstacles and compares these paths with the optimal paths. The obstacles identified highlight both individual and complex problem areas. For all segments of the stopping distances, a betweenness centrality index is calculated, indicating how important/useful each segment is in the path to public transport stops.

## **RECOMMENDATIONS FOR IMPROVING ACCESSIBILITY**

Recommendations for improving public transport accessibility are based strictly on the methodology described in the study. The recommendations are set out under the following headings:

The analysis of the competitiveness of stops will identify which stops and wider areas are not competitive. In such cases, there is relatively little benefit from investing in pathways to the public transport stops – the impact will be limited. The strategic level of public transport – the route network and the overall level of service – needs to be addressed first. The service levels of the route network in Tallinn and Harju County and how to improve its competitiveness will be addressed in (FLOU, Inphysica, 2021). Of course, stops must also be accessible at a basic level: existence of roads, provision of minimum passing parameters, absence of obstacles, crossing facilities near the stop. One would assume that such a check would be necessary for stops with a lower turnover in Harju County, but in reality, according to the observations of various street space mapping exercises, there are also many stops in the centre of Tallinn which do not meet basic accessibility needs. On the other hand, the competitiveness analysis also identifies competitive stops with good accessibility to destinations. The competitiveness of stops highlights the priority to be given to investing in routes. Priority does not imply that it has to be followed in absolute terms, but if resources are systematically invested primarily in low-impact locations (by analogy with the construction of cycle paths in the suburbs), the results will be modest.

The analysis of distances to public transport stops first identifies the most important segments of stopping distances, where trips are most concentrated. On the other hand, the analysis identifies the trips where directness suffers due to the quality of the trip. These analyses outline the priority of the segments of the local street network for each stop and for each area. As in the previous point, the resources available for improving accessibility must be targeted accordingly.

Priorities for action. For priority routes and segments, the validity of all basic accessibility needs must first be checked according to the parameters of the road network characteristics. Inadequate coverage of these needs creates real and insurmountable obstacles to mobility for the elderly, people with reduced mobility and wheelchair users. Winter maintenance, although not an annual issue, is also part of the basic parameters. The final step is to check the environmental parameters of the road network, as these are factors that influence everyday mobility decisions and the quality of the living environment.