HOW FAR CAN PUBLIC TRANSPORT TAKE YOU ?

AUTHORS
Markus Trainer - Johannes Kepler University Linz
Christina Humer - Johannes Kepler University Linz
Patrick Adelberger - Johannes Kepler University Linz
Marc Streit - Johannes Kepler University Linz
Contact us: markustrainerooo@gmail.com

ABSTRACT
In addressing sustainable mobility, we introduce a web application for evaluating public transport networks, focusing on user-defined location connectivity. While initially tailored for Austrian data, it supports diverse data sources. Access the code at github.com/jku-vds-lab/publictransport and the live tool at publictransport.jku-vds-lab.at.

1. INTRODUCTION

Many tools in transport network analysis often lack comprehensive functionality or accurate representation [5,6,7,8]. Our web application tries to overcome these gaps, offering a robust tool that ensures accurate and consistent public transport data. (see Fig. 1). With a user-centered design, it offers an interactive visualization of public transport coverage, featuring comparative accessibility analysis and start-time inputs. This tool enhances user experience and provides useful insights, benefiting commuters, urban planners, and policymakers.

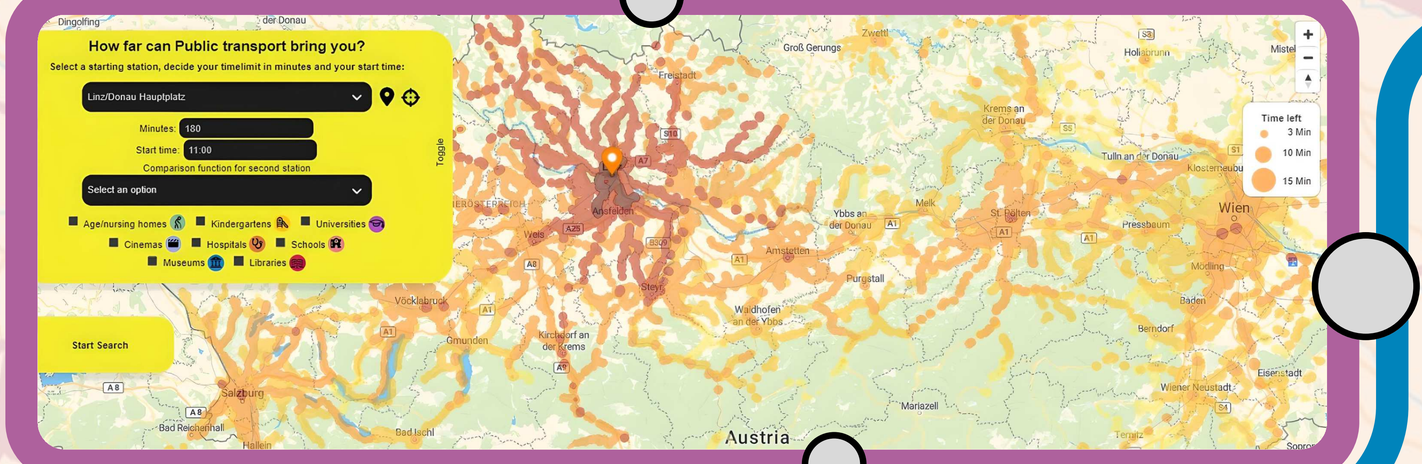

Figure 1: The web application visualizes Austrian public transport connectivity based on user-specified parameters.

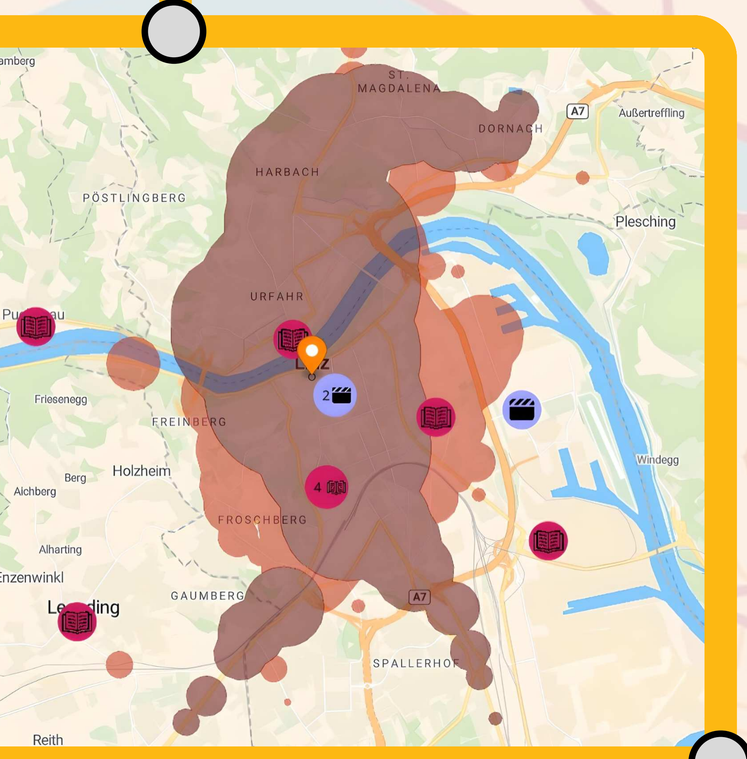

Figure 3: The tool can highlight public facilities such as cinemas, schools, libraries, and more.

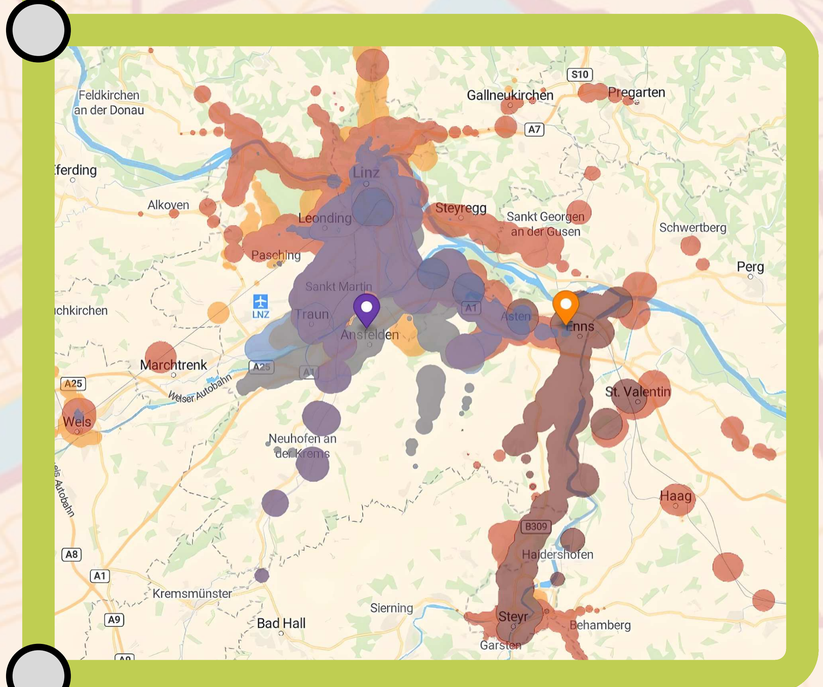

Figure 2: The tool allows comparison of two start stations.

https://jku-vds-lab.at/publictransport

2. DESIGN AND IMPLEMENTATION

Built on the Svelte JavaScript framework [3] and leveraging Python's FastAPI [1] with Uvicorn ASGI [4] for back-end tasks, our application integrates nationwide transport data. Users can define travel parameters, and the system visualizes reachable areas on a map, using color gradients to indicate transit transitions. Key features include multilingual support, tutorial guidance, dual starting point analysis, and proximate station selection. Public facility markers, such as schools, enhance its utility. A pilot study with data visualization experts affirmed its effectiveness and user-friendliness, as seen in Fig. 5.

Figure 4: The tool shows nearby stations for the user

3. LIMITATIONS

Developing the application presented challenges due to the huge volume of public transport data [2], which encompassed 71,371 stations and over 20 million visits. The inclusion of 'start time' as a parameter increased computational complexity, leading to extended loading times of several minutes for time frames beyond two hours, even after optimizations.

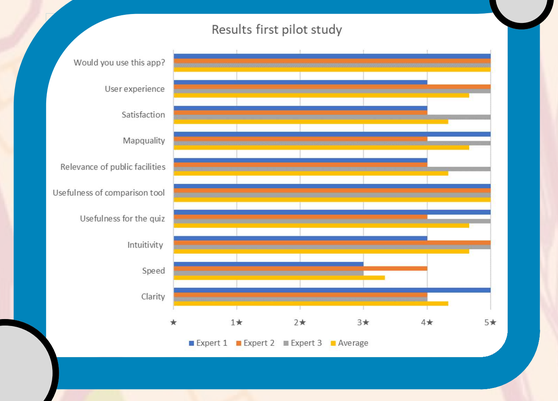

Figure 5: Results from the post-study questionnaires.

4. CONCLUSION

Our application advances user-centered, data-driven evaluation of public transport accessibility, paving the way for further research and decision-making support. Future endeavors should target efficiency in handling large-scale data, expanding the tool's reach and improving the bridge between transit data and public comprehension.

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