



UNIVERSITY TRANSPORTATION CENTER RESEARCH BRIEF

Enabling a New Data Science for Urban Accessibility for All

Jon Froehlich PhD, Anat Caspi, PhD



Background

In our work, we are exploring new sidewalk auditing approaches that are fast, reliable, and low-cost using a combination of remote crowdsourcing, machine learning, and online map imagery. Previously, we received PacTrans funding for Project Sidewalk, a web tool

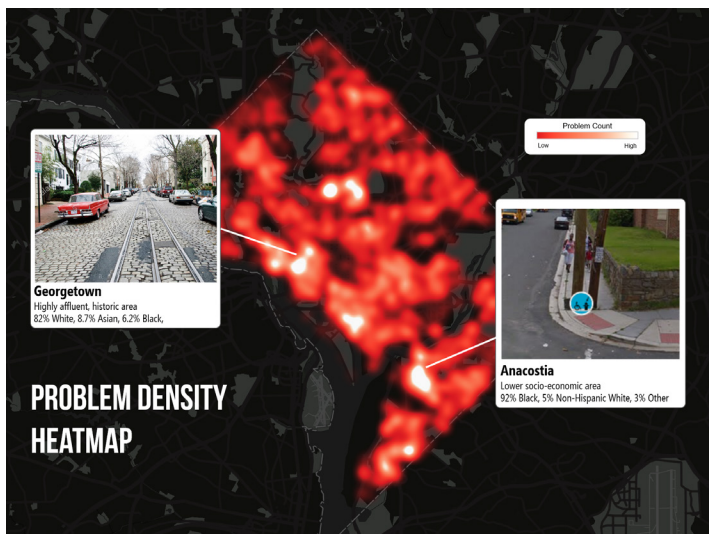
that enables online users to remotely label sidewalks and identify accessibility problems by virtually walking through city streets—similar to a first-person, immersive video game (Figure 1). For each label, users provide a severity score, mark relevant tags, and can also supply open-ended descriptions. Rather than relying solely on local populations, our potential user pool scales to anyone with an Internet connection and a web browser. In a 2018 pilot deployment, 1,400 users from across the world virtually audited 2,934+ km of Washington DC streets, providing 255,000 sidewalk accessibility labels with 92% accuracy. Aided in part by previous PacTrans funding, we have now established new partnerships with Open Columbus, the Newberg City Council, and Liga Peatonal to deploy Project Sidewalk into six additional cities: Seattle, WA, Newberg, OR, Columbus, OH, Pittsburgh, PA (private beta), Mexico City, MX, and

San Pedro, MX. Thus far, our users have contributed over 450,000 geo-located sidewalk accessibility labels.

Research Project

In this proposal, we aim to leverage Project Sidewalk's unique cross-regional sidewalk dataset to investigate the following research questions via new data analytics and visualization tools:

- What are the geo-spatial patterns and key correlates of urban accessibility? How does accessible infrastructure correspond to racial and socioeconomic factors or other metrics such as house pricing, school ratings, park density, and transit access.? Who appears to be primarily impacted?
- How do sidewalk patterns compare across cities? What are the main accessibility barriers and how can/should we categorize them? How do these barriers reflect the socio-cultural, economic, and political context of those regions?
- How does urban accessibility change over time? We propose adapting our crowdsourcing + machine learning techniques to examine street scene imagery across time, which will enable new temporal analyses focused on how and where sidewalks and sidewalk accessibility change over time.



ABOUT THE AUTHORS

The research team consisted of Jon Froehlich and Anat Caspi of the University of Washington.

ABOUT THE FUNDERS

This research was funded by the Pacific Northwest Transportation Consortium, with additional support from the Center for Research and Education on Accessible Technology and Experiences and the University of Washington.

EXPECTED DATE OF COMPLETION

March 2022

FOR MORE INFORMATION

<https://depts.washington.edu/pactrans/research/projects/enabling-a-new-data-science-for-urban-accessibility-for-all/>