Impact of Mobility as a Service on Transit Access
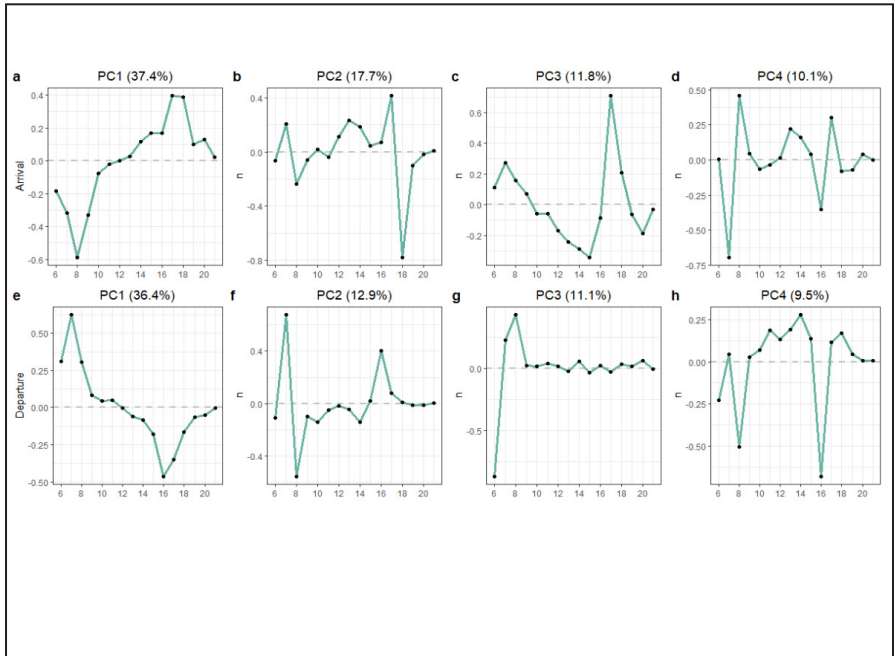
the ISSUE

A new mode of personal mobility, mobility as a service (MaaS), has been most often characterized as the ride-hailing mode provided by companies such as Uber and Lyft, but also includes short-term rentals of cars, bikes, and scooters, as well as peer-to-peer ride sharing. There has been considerable research into MaaS as a stand-alone service. However, there has been little research into the use of MaaS for transit access, such as providing on-demand ride service to commuter rail or bus stations. Known as microtransit, this form of MaaS is more nimble than traditional transit and allows riders to make greater use of current public transit systems, often providing or improving first/last mile connections to fixed transit stops and stations. It is important to understand if microtransit services can provide cost-effective connectivity to the places that people want to go when they want to go. Methodas are also needed to effectively model MaaS and its connections to transit so they can be applied and used to estimate travel demand.

the RESEARCH

The project aims to create a methodological pipeline to effectively model MaaS as one of the first/last mile options for accessing transit; and it takes a closer look at the microtransit service in order to develop a modeling approach to analyze activity patterns. This project leverages trip data from Utah Transit Authority's microtransit pilot for developing a methodological framework that unravels the spatio-temporal patterns of microtransit activities in the region. The framework utilizes statistical techniques to uncover the rhythms and structures of microtransit trips. Using seven months of microtransit data, researchers constructed the spatiotemporal patterns of microtransit activities in pre-

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the RESEARCH cont.

and post-COVID periods, respectively. Then, they systematically analyzed how these patterns deviate from the average pattern in both periods and what possibly caused such variation. We use statistical analyses to unravel the hidden temporal structures and explore the potential spatial communities formed in the service region. Also, for both periods, they examined which locations are connected, how strong the connections are, what roles shared nodes (by different communities) play in different network structures, and how patterns evolve as COVID-19 progresses.

the FINDINGS

Modeling MaaS as an access mode to transit involves seven steps, described in this research, which must be conducted for both the origin (accessing transit on the origin end of the trip) and the destination (accessing the final destination from the transit stop on the destination end of the trip) ends of the trip. Within the current framework of the Wasatch Front Travel Model, including MaaS-to-Transit involves custom scripting using the Cube software scripting language.

To further explore one of the newest variations of MaaS, we unravel the spatio-temporal structures of microtransit activities utilizing empirical data from a pilot program in the Salt Lake City, Utah, area, UTA Via. The results compare microtransit activity during pre- and post-COVID periods, highlighting how some use patterns persist and change after the outbreak.

the IMPACT

By understanding the patterns and possible causal factors for microtransit network development, use, and underlying spatio-temporal patterns, researchers can enhance the transferability of microtransit programs without additional cost. Furthermore, a better understanding of the microtransit activity structures can improve identification of customer segments and enhance vehicle dispatching for all microtransit programs. Finally, by comparing results between pre- and post-COVID periods, it is possible to inform transit agencies on people's behavioral changes and the evolution of their travel patterns to guide future operational strategies.

For more information on this project, download the Main report at https://www.ugpti.org/resources/reports/details.php?id=1061

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