Planning Tools for Transit Managers to Improve Efficiencies & Prepare for the Post-Covid Environment

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Background

Transit network design involves selecting network characteristics to optimize system efficiencies. Where should bus stops be located? How frequently should each stop be serviced? How can transit managers reduce costs while maintaining service quality? The answers to these questions, and many others like them, are critical to transit providers' operating decisions. The answers to these questions, however, have proven difficult to come by.

Several studies have offered solutions to the transit network design problem, but most assume for simplicity that ridership demand is independent of network characteristics (see Ibarra-Rojas et. al., 2015 for review). This is problematic because network characteristics determine riders' experiences with the transit system (wait times, travel times, travel cost, etc.), which we know affect ridership demand. Furthermore, even when solutions are provided to the transit network design problem, they are often too technical/abstract to be useful/accessible to transit providers.
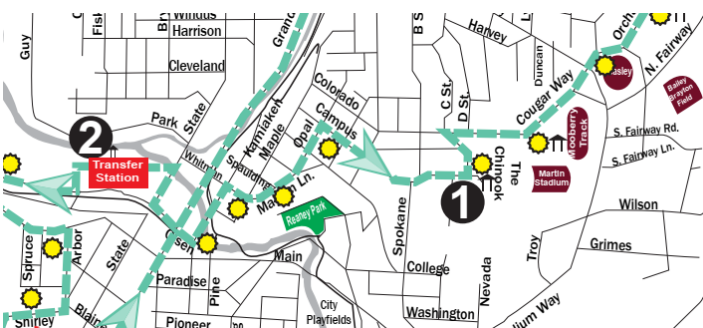
Research Project

Pullman Transit is the leading rural transit system throughout Washington and within the region, providing over 1.4 million rides annually. Like most transit networks, Pullman Transit is faced with challenging questions in their effort to meet service demands and community needs in a financially sustainable way. Where should bus stops be located? How frequently should each stop be serviced? Which routes should be driven to ensure all stops are serviced while minimizing rider travel time? What should the rider fare be? The answers to these questions are vital to the smooth and efficient operation of any transit network, but transit planners are typically left without the tools they need to make these important decisions.

The objective of this project is to develop a spatial transit demand model that will serve as the foundation of a transit planning decision support tool. This tool will further empower local transit planners with the timely information they need to make informed transit planning decisions. The tool will help planners optimize daily operation decisions, identify transit service gaps, and efficiently respond to both demand shocks (such as the COVID-19 pandemic) and supply shocks (such as a temporary reduction in fleet size).

ABOUT THE AUTHORS
The research team consisted of Jake Wagner of Washington State University.

ABOUT THE FUNDERS
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FOR MORE INFORMATION
https://depts.washington.edu/pactrans/research/projects/planning-tools-for-transit-managers-to-improve-efficiencies-prepare-for-the-post-covid-environment/