INTEGRATED PERFORMANCE MEASURES:
TRANSIT EQUITY & EFFICIENCY

Assessing the performance of public transit services has long been an important yet challenging issue for transportation agencies and researchers. Transit service performance measurement reflects a very first step towards an efficient and proactive management, where public transit agencies are increasingly pressured to provide high-quality services in spite of constrained resources. However, the performance evaluation of transit services is complicated by an array of quantitative measures available to assess the goals and the diversity in the goals themselves, which usually include improving operational efficiency and providing equitable access. While much previous work has examined public transit services for achieving optimal operational efficiency and/or access equity separately, the interplay of the two has rarely been investigated to date.

This project developed a comprehensive framework and an open-source toolbox for evaluating and enhancing the overall performance of public transit systems by using a combination of mathematical programming methods, GIS-based analysis and multi-objective spatial optimization techniques. This framework enabled both **operational efficiency** and **access equity** of transit systems to be assessed in an integrated manner. The python open-source toolbox operationalized the framework and make it accessible to transit planners, decision-makers and the public. The framework and the toolbox are applied to assessing the performance of fixed-route bus services operated by the Utah Transit Authorities (UTA) in the Wasatch Front, Utah, and transit services operated by TriMet in the Portland metropolitan area. Results demonstrate that the developed framework and toolbox can effectively account for operational efficiency and access equity in an integrated manner, providing a more comprehensive assessment for transit service performance.

A new tool provides a comprehensive framework for measuring transit performance. The innovative methodology evaluates both operational efficiency and equitable access, for holistic service improvement.

Evaluating and Enhancing Public Transit Systems for Operational Efficiency, Service Quality and Access Equity (#2018-1024)

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