

Data-driven mobility service design: a case study for Moon Township

Purpose: To provide performance insights and recommendations for existing and proposed first and last mile (FMLM) services by comparing the various supply and operational strategies including user cost, agency cost, and system reliability.

Approach: The team began by evaluating user cost (wait and in-vehicle time), agency cost (the cost to provide mobility services), and system reliability for an integrated public transit, transportation network company (TNC), and FMLM services while considering fluctuating rider demand. By examining various supply and operations strategies, the team sought to provide performance insights for both an existing FMLM service in Robinson Township, PA and a proposed FMLM service in Moon Township, PA.

Key Findings:

- ✓ When considering the existing FMLM service in Robinson Township, PA, the team found that:
 - *Two on-demand 23-passenger vehicles would minimize total user costs.*
 - *Supplementing existing services with TNC's may reduce agency costs by up to 26%.*
- ✓ Considering the proposed FMLM service in Moon Township, PA, the team compared it with existing service and found that:
 - *Fixed route schedule on one shuttle would improve system performance and reduce wait times along the route compared to the case of two on-demand shuttles.*
 - *With anticipated demand of 40 daily trips, TNC's can reduce user costs by 39% at an additional cost of \$50/day.*
- ✓ Stop aggregation strategies improved wait times when considering 40 daily trips.

Conclusions: New technologies can provide increased flexibility to existing FMLM services and improve the overall service level at a reduced cost. Modeling higher demand levels showed the adoption of other operational strategies such as stop aggregation and fixed route seemed to improve the overall service level. Ultimately, once the service demand is better understood, operational strategies can be optimized, resulting in larger improvements to user cost and reliability.

“RideACTA connects transit riders with critical “last mile” service to their job sites. The CMU study gave us a path forward to expand the reach of our current service and suggests a number of options for how best to operate the proposed hub stop on University Boulevard in Moon Township.”

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Project Record:

<https://ppms.cit.cmu.edu/projects/detail/305>

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