

## Demand learning and supply optimization for last-mile transportation in disadvantaged neighborhoods

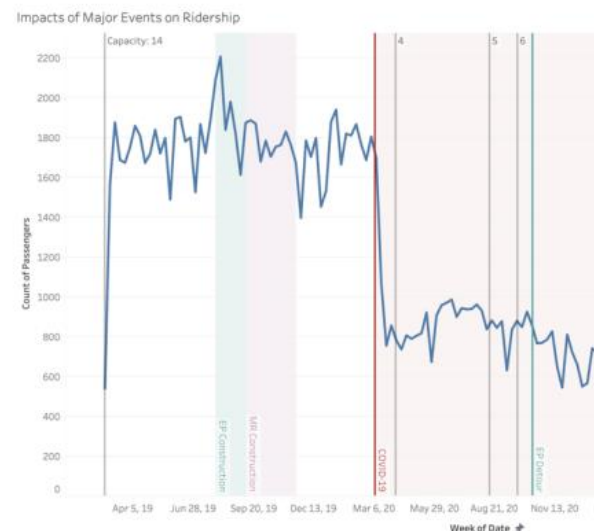
**Purpose:** To analyze three key operational issues faced by a transportation provider in southwestern PA: high cost, length of rider wait times, and COVID. Service data and public data were analyzed to ensure the service was utilizing the best available routes and operating in the most cost-effective, rider-focused manner and analyze if other transportation options could be integrated into the service to better serve riders.

**Approach:** The team used the datasets provided by transportation provider on ridership and pass-ups between 2019 and 2021. A pass-up is recorded by the provider when there are passengers waiting at a stop, but they are unable to board due the vehicle already being at capacity limit. This was followed by supply side analytics to find out if the service quality and reliability changed during COVID. The demand side analytics entailed analyzing changes in people's overall demand level, and changes in people's transportation mode choice.

### Key Findings:

- ✓ Riders using this service are mostly residents in neighborhoods with lower levels of income and vehicle ownership.
- ✓ Ridership declined by more than 60% during COVID.
- ✓ Temporary service changes such as shuttle capacity limit due to COVID restrictions, and route changes due to road constructions, were not the causes for the current lower level of ridership.
- ✓ Travel demand has slowly recovered but by early 2022 was still significantly below pre-COVID levels and some residents have shifted their transportation choice and opted to use more expensive but also more flexible and non-shared individual transit options (jitneys, TNC rides).
- ✓ The maximum potential economic value of a first-mile and last-mile transportation service is equal to \$55.73 per person per day in the service area for work trips alone.

**Conclusion:** Since the potential economic value of the provider's service is very high, the recommendation is to maintain current service and wait for the ridership to rebound. In addition, the provider may want to consider a few service modifications to recover its ridership level faster.



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### Project Record:

<https://ppms.cit.cmu.edu/projects/detail/368>

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