

MOBILITY ON DEMAND (MOD) SPECIAL STUDIES

Opportunities for Supplementing Off-Peak (Fixed-Route) Transit Services



Photo Source: U.S. DOT

Public agencies confront numerous challenges providing off-peak and low-density public transportation services. Low ridership means high-frequency public transportation may not be financially viable. Current demographic shifts—including population growth and increasing suburbanization—may exacerbate these existing challenges. Mobility on Demand (MOD)—a concept based on the principle that transportation is a user-centric commodity—is a potential opportunity for public transportation agencies to bridge these spatial and temporal public transportation gaps. The U.S. Department of Transportation conducted a research study to understand how MOD can be effectively used to address existing service gaps during off-peak periods and in low-density built environments.

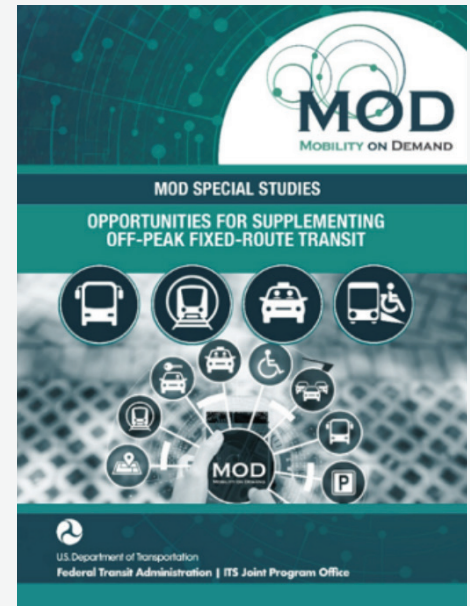
Study Approach

To meet these objectives, the research team used a three-phased, multi-method approach:

Step 1: The research team conducted a literature review on low-density and off-peak public transportation services. The research team supplemented the literature review with an internet search to fill the gaps where existing publications have not kept pace with innovative and emerging practices and trends impacting low-density and off-peak transportation services.

Step 2: The research team conducted interviews with nine experts representing public agencies that are employing MOD to fill gaps in their transportation network. The team gathered insight from interviewees on three main topic areas:

- Challenges in providing service in low-density environments and/or during off-peak periods
- Potential MOD strategies to address current challenges
- Potential evaluation metrics for MOD strategies, assessing the efficiency and efficacy of MOD deployments to supplement fixed-route transit.



Agencies Interviewed:

- Alameda-Contra Costa Transit District
- City of Santa Monica (Big Blue Bus)
- Pierce County Public Transportation Benefit Area Corporation
- Pinellas Suncoast Transit Authority
- City of Monrovia
- Dallas Area Rapid Transit
- Kansas City Area Transportation Authority
- Livermore Amador Valley Transit Authority
- Valley Metro Regional Public Transportation Authority



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Step 3: Based on findings from the expert interviews, the research team selected three public transit agencies for in-depth case studies based on their policies and programs using MOD to overcome spatial and temporal service gaps.

Findings

Based on the research, some of the challenges public agencies face in delivering off-peak and low-density services include:

- High cost of providing fixed-route transit in low-density areas and during off-peak times
- Difficulties with meeting rider demand
- Challenge of estimating off-peak rider demand
- Inaccessibility of services by vulnerable groups (e.g., people with disabilities, low-income households)
- Geographic limitations (i.e., providing equitable service across the entire service area)
- Inflexibility of current regulations and government requirements (e.g., drug and alcohol testing for drivers makes formal partnerships with transportation network companies (TNCs) to provide low-volume coverage more difficult).

The interviewed agencies took various approaches in addressing these challenges, such as:

- Partnering with TNCs to maximize availability (e.g., greater driver availability because they operate on demand) for increased flexibility and demand responsiveness

- Effectively administering MOD through private technology companies (e.g., use of Via's routing service for agency-operated microtransit programs)
- Collaborating with community organizations for demand and cost management (e.g., offering transit discounts or passes to organizations to increase ridership).

The potential benefits for public agencies to use MOD to address service gaps may include:

- Cost savings from eliminating the need to maintain a vehicle fleet and/or rightsizing a fleet
- Flexibility to match rider demand to on-demand services
- Increased modal connectivity to public transportation (e.g., through late-night and low-density first- and last-mile partnerships)
- Improved ride quality for travelers and service efficiency for operators.

Findings indicated that future research should investigate three key areas:

- 1. More flexible regulations:** Greater regulation flexibility will allow for a wider variety of partnerships and funding options in the near term.
- 2. Performance metrics specifically for MOD:** To fully understand the impacts of MOD, standardized metrics relevant to MOD must be established.
- 3. Best practices:** Strategies did not prove ubiquitously relevant to agencies, so there is a need to develop context-specific recommendations (e.g., for rural versus urban locations).

For more information about this initiative, visit https://www.its.dot.gov/research_areas/mod/index.htm or contact:

Robert Sheehan, Program Manager, Multimodal ITS Research and Deployment
Intelligent Transportation Systems Joint Program Office
(202) 366-6817 | robert.sheehan@dot.gov

Hendrik (Rik) Opstelten, Program Manager
Federal Transit Administration Office of Mobility Innovation
(202) 366-8094 | hendrik.opstelten@dot.gov

