**Predictors of technology adoption by transit agencies: The case of general transit feed specification data**

The development and widespread adoption of the general transit feed specification (GTFS) data format for transit route and schedule data has transformed the way travelers plan transit trips (McHugh 2013). In the fifteen years since this data standard was initially introduced, most –but not all—transit agencies have begun publishing their route and schedule information in this format. What might explain a transit agency’s decision about whether and when to adopt this data format? Rogers’ (2003) work on diffusion of innovation highlights several characteristics of individuals that correlate with being early adopters of new technologies, including social status, social mobility, wealth, and social connectedness. The applicability of these results to institutions is neither obvious nor well-established (Dedehayir et al. 2017). Little prior research has been done on the determinants of GTFS adoption. In one such study focusing on California, Frick et al. (2020) found that small transit agencies (reduced reporters) and rural transit agencies were less likely to have published GTFS feeds. Studies on the adoption of other technologies may be informative in identifying agency characteristics that are generally associated with openness to innovation. Iseki et al. (2007) have found that early adopters of smart cards for fare payment tended to be those with greater funding availability and those with established relationships with other transit agencies.

We identified 498 transit agencies in the United States that were providing scheduled transit service in 2006, when the GTFS data standard was initially published. Drawing on three sources of archived GTFS feeds (OpenMobilityData, GTFS Data Exchange, and transitland), we identified the earliest published GTFS feed for each agency, if any. We used the publication date of the earliest available feed for each agency to estimate the length of time it took for each agency to adopt the GTFS data standard. We estimated a Cox proportional hazards model to determine how geographic and agency characteristics correlate with time between the availability of the GTFS data standard and its adoption by a given agency. We find that smaller agencies and those in closer geographic proximity to Portland (where the standard was initially developed) are more likely to have been early adopters of this technology.

The results of this analysis can inform efforts by state- and national-level agencies seeking to encourage innovation by identifying agencies most likely to be open to adopting new technology. It can also help local agencies identify peers who are likely to have experience with innovation and experimentation.

**Keywords**

Technology adoption, Transit, Open data, Standards, Innovation diffusion

References

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