Exploring the costs of addressing equity in the transition to cashless fare collection

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BACKGROUND & PURPOSE

As fare technologies automate, many riders will find it difficult to ride because of barriers to access smartphones, internet and banking needed to use fare payment systems. This project explores the practices used to address equity issues in cashless fare payment systems, using Portland, OR, Eugene, OR, and Denver, CO as case study cities.

METHODS

1. **Transit rider focus groups** conducted in Portland, OR and Eugene, OR. Questions focused on understanding the potential impacts on vulnerable riders if agencies transitioned to cash-less fares and the barriers to transit access such a transition may engender.

2. **Rider intercept survey**
   2,303 riders surveyed across 3 cities
   - Current fare payment methods
   - Bank/internet/data access
   - Perceptions of cash-less fare system
   - Demographics (income, race, etc.)

3. **Spreadsheet cost model**

Inputs

Revenue & cost assumptions
- Annual replacement of infrastructure (10%)
- Passenger ridership/revenue adjusted for cash acceptance
- Passenger revenues remain flat for years 1-10
- 10% of smartcards replaced each year
- Cost of handling cash proportional to cash total

Unit cost inputs
- Cost of ticket vending machines (TVMs)
- High cost, low cost scenario
- Cash / not-cash accepting scenario
- Annual maintenance costs
- Web/mobile ticketing assumed in all scenarios

Case parameters
- Specific agency/city modal numbers (# of strops, vehicles, farebox & TVM numbers)

Cash handling scenarios
- Defined by different combinations of allowing TVMs and fareboxes to accept cash along with retail network.

Quantitative cost and revenue analysis

Costs
- Year 1: initial capital (Fareboxes, TVMs, smartcards), capital, installation, training
- Years 2-10: annual capital replacement (10%)
- 10% of Year 1 smartcards are reissued

Revenues
- Years 1-10: Assume constant ridership/fares/revenues

Qualitative equity analysis

Access
Overall access rating compared to full cash acceptance

Disparities
Inequalities in access by race/ethnicity, age, income, and language

Scenario results and comparison
Scenarios 1-4: total and marginal costs, total and marginal revenues

RESULTS

- ~30% of riders still pay cash on-board buses
- Many could stop using cash, but say they will continue to rely on cash where available
- A small number of riders say they would not be able to ride transit if cash options were removed
- Efforts to continue some cash collection is quite cost effective given marginal fare revenues of added riders
- Marginal cost of adding new riders through cash mitigation measures varies by agency
- Adding cash payment on board buses (but not at TVMs) maximizes net revenues

CONCLUSIONS

Large agencies spend less to collect fares	May be prudent for larger agencies to expand cash collection capabilities as they more than pay themselves back from increased revenues.
Cash collection on buses could be an important bridge	Collecting cash on buses is a lower-cost way to expand cash collection (but not cash verifying) capabilities.
Retail is the lowest cost option	Retail is the lowest cost option to add cash capabilities. Retail network may, however, still pose significant geographical barrier to some riders.
When more riders excluded at base-line, equity mitigation is cheap	When more riders are excluded, the bigger impact equity mitigation measures have and the cheaper they are per additional rider.

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