



CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

Research Results

All Aboard! Easier Transit Travel with Standardized Payments

This study addresses the Caltrans goal of Exploring Distributed Ledger Technology for reducing friction in fare payments.

Modal

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Project Title:

All Aboard! Easier Transit Travel with Standardized Payments

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WHAT WAS THE NEED?

The proposed research was to examine the potential for the adoption of a standardized fare payment system throughout California's transit operators; to better serve their customers and provide seamless trip-planning and payment. This study would address the Caltrans goal of Exploring Distributed Ledger Technology (DLT) for reducing friction in fare payments. This project was to investigate the challenges faced by California's rural and urban transit agencies and operators in the adoption of DLT for fare payments. Challenges with cash payments and the growing abilities of digital payments have led to growing interest in DLT and integrated payments in the future of California's public transit. This will require transitioning over 350 transit agencies operating in the state to coordinated fare payment systems. There is a huge diversity among transit agencies in California, and as such, these agencies face different challenges and to different degrees, when considering the adoption of DLT, as well as participation in the California Integrated Travel Project (Cal-ITP).

Cash is a universally accepted payment method among transit operators and provides a mechanism for riders who are underbanked or unbanked to access transit services, even when digital payment systems are introduced. However, cash is not seamless for transit operators or passengers. Cash is also a challenge for agencies. It presents security concerns for drivers, and administrative burdens for agencies. While the full costs of cash handling vary per agency the cost of handling and moving cash may be considerable.

Digital payments platforms are increasingly popular across many industries and have been adopted by transit agencies throughout the world. These systems have many benefits, including improved passenger experience, more efficient boarding, safety for drivers, discount verification, and fare validation. However, in the US,



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these systems typically serve one operator, or a limited regional network of operators. Other shortcomings of the current implementation include a need to continue to allow cash payments and these systems typically have limited locations for passengers to purchase or add fares to cards. This can also lead to missing your ride while waiting to purchase more fare.

Cal-ITP envisions a seamless fare payment system for all of California's transit passengers and agencies. This will enable passengers to easily plan travel even when they will use multiple transit operators and will reduce friction caused by cash payments. For fare payment integration to work at the statewide scale the leading best practice is DLT which is an open-loop system that will allow payment processing using riders' credit or debit card, industry-based prepaid cards (i.e., Visa debit cards), or phone-based payments. Further, open-loop systems will enable an easier integration with other mobility services such as ridehailing and bikeshare that are increasingly termed "an extension of transit."

Introducing this technology throughout the transit systems of California will require updating and integrating hundreds of agencies serving different types of passengers, geographies, at different scales, and with different levels of capacity and knowledge. Key stumbling blocks include how to a) equitably transition away from cash payments; b) streamline discount verification procedures; and c) understand the options for implementing affordable DLT compatible fare collection systems, including hardware and software requirements. Making this system accessible for those without credit cards or bank accounts is critical as this can be up to 20% of passengers. Some argue that the digital options may be easy for transit operators to implement because the technologies have been designed to use across many industries and are increasingly small in size. However, even these smaller devices may be difficult to implement at scale or remain expensive for smaller agencies.

WHAT WAS OUR GOAL?

The outcomes of this research would help to identify what passengers need, and therefore what transit operators must implement to continue to equitably serve these groups, while achieving goals of providing easy to access, quick boarding, etc., through a universal means of payment. Meeting the needs of passengers is one factor that must be considered by transit agencies as they explore the potential adoption of DLT systems and the software and equipment necessary to offer these options to all travelers in the state.

WHAT DID WE DO?

This study examines the concerns and challenges of transit agencies when considering the adoption of open-loop payments systems. In the fall of 2022, a survey was conducted among a small sample of California's transit agencies and received 21 responses. The survey was informed by informational interviews, and through conversations with members of Cal-ITP.

WHAT WAS THE OUTCOME?

No agencies in the sample have already implemented open payments. Half the respondents reported that they are considering implementing open payments, while another 30% reported they have considered it. This was not a surprise since only a very small number of agencies in California are currently piloting open payments in coordination with the California Integrated Travel Project.

When asked about their agreement with the impacts of open payments systems, notable results include:

- Of the survey participants, 70% agree or strongly agree that open payments would improve operational efficiency; 47% agree or strongly agree that open payments would help passengers

transfer more easily between agencies. Similarly, 53% disagree with the statement that open payments would increase the risk of passenger robbery.

- When it comes to saving the agency money, they were split; 40% agree and 40% disagree. Participants were also split, when asked whether open payments would not meet the needs of passengers (48% disagree vs. 37% agree).
- Most respondents (47%) are neutral when asked if open payments would improve discount eligibility, although many (34%) also disagree.

We also looked at agency perspectives related to the challenges passengers would face with the implementation of open-loop payments.

- Technological complexity and backend payment infrastructure were the most frequently selected challenges of open payment systems (65% of the sample selected each of these). The next most selected items included the cost of equipment (60%), staff or other capacity limitations (55%), concerns about rider experience (55%), and equipment installation (50%).

Breaking down these results by agency size, we found that for small agencies (vehicle fleets < 25) the cost of open payment equipment is a top challenge; selected as a top challenge by six out of the 10 small agencies. For medium sized agencies (fleets larger than 25 and smaller than 500) technological complexity and staff or other capacity limitations are the top two challenges to implementing open payment systems: each selected by five out of the 10 medium agencies.

The ease with which current passengers would be able to transition away from cash is also relevant to agencies considering open-loop payments. The most important passenger-related challenges are new technology and banking. The four statements most frequently selected (and the number of agencies selecting the item) were:

- Lack of familiarity with new technology
- Lack of a bank account, cards, or mobile devices
- New technology does not meet the needs of passengers

- Difficulties obtaining bank accounts, cards, or mobile devices

In addition to passengers', respondents reported their perceptions of sentiments towards open payments among groups connected to their agencies; this included planners, the board, operations, and information technology staff, regular and infrequent passengers, as well as the local government and community.

- Among all these groups our respondents reported a minimum of 54% and all the way up to 80% "supports", with the balance reporting "neutral" save two instances when does not support was selected by one agency each for agency IT staff and regular passengers.

Overall, the agencies that participated in our survey have positive perceptions of open payments and the potential for their agency and passengers to adopt and adapt to these systems. However, there are a combination of notable real and perceived challenges. Challenges of both types will need to be overcome to make open, integrated fare payment systems a reality throughout California.

WHAT IS THE BENEFIT?

This research identified the issues and challenges faced by transit agencies, and their views on how to best address those challenges, i.e., what would enable transit operators to overcome these challenges, and what kind of support/assistance from the state or other entities to allow them to adopt an integrated system.

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IMAGES

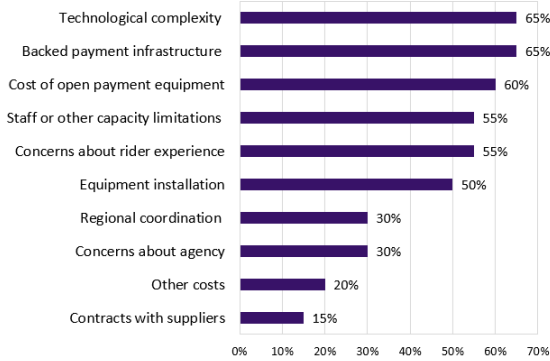


Image 1: Challenges to open payment implementation (N=20)

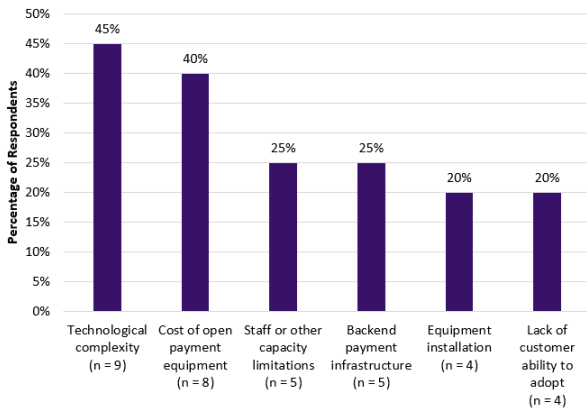


Image 2: Top challenges to open payment implementation

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