

LEVERAGING BEHAVIORAL SCIENCE TO IMPROVE ACCESS TO PUBLIC TRANSIT

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NOVEMBER 2025

MDRC's Center for Applied Behavioral Science (CABS) is an initiative that combines MDRC's expertise in social and education programs with insights from behavioral science. CABS develops innovative, low-cost interventions, tests their impact through experimentation, and provides technical assistance to programs incorporating behavioral insights.

Transit agencies nationwide are modernizing fare systems by adopting digital and contactless payment technologies that enable riders to pay fares using credit and debit cards, reloadable transit cards, mobile apps, and other contactless devices.¹ These expanded payment options can make it easier to board and transfer between transit vehicles, streamlining operations and making public transportation more convenient for many riders.² However, as digital and contactless payments become more popular, transit agencies are considering limiting or eliminating cash as a payment option, which raises the question: Does shifting away from cash have a cost?³

Reducing the places where cash is accepted risks reducing access to public transportation for populations with limited use of banking services and mobile technology, such as immigrants, people from low-income communities, and seniors. Because transportation is essential for gaining access to the many resources that affect people's economic opportunities, health, and social needs, access to public transportation can be particularly important for these groups. This challenge is ripe for a behavioral science approach—a systematic method of addressing barriers to desired behaviors that applies research on how people make decisions and take actions. By uncovering the barriers that specific groups of riders face when adopting new payment methods, transit agencies can develop tailored solutions to help ensure that technological advancements do not widen the access gap for these riders.

In 2020, MDRC partnered with King County Metro, a leading transit agency in Seattle and the Puget Sound region, to help shed light on how transit riders make choices about how to pay their fares and to help inform policy decisions about fare payment options. King County Metro wanted to ensure that riders who historically preferred paying with cash onboard buses could access and use other payment options. The most notable of these options are ORCA cards, the agency's reloadable transit cards.⁴ ORCA cards have benefits for many riders, including reduced fares for riders with disabilities, riders with low incomes,

and seniors. However, riders must ensure they load funds onto their ORCA cards before boarding and paying for bus rides.

The COVID-19 pandemic began near the start of the partnership, and health concerns emerged about handling and exchanging cash. This uncertainty increased the importance of exploring the expansion of contactless payment methods for the agency. From 2020 until 2023, the research team led three sets of behavioral science-driven research initiatives to help King County Metro navigate this rapidly changing landscape and gain deeper insights into how riders make fare payment decisions.

ACTIVITY 1: GATHERING INSIGHTS FROM TRANSIT RIDERS

Gaining a better understanding of the barriers the target population faces with a particular action is key to a behavioral science approach. To gather insights about how King County Metro riders pay for public transportation, the MDRC team conducted an in-depth review of some 100 agency data sources. Recognizing the importance of hearing from a wide range of community voices, MDRC and King County Metro then partnered with four community-based organizations to facilitate interviews with cash-paying riders.⁵ Staff members from these organizations helped to facilitate the interviews with an MDRC team member, and because about half of the 24 interviews were conducted in languages other than English, some staff members also acted as interpreters.⁶

From the scan of King County Metro data sources, the MDRC team initially identified four categories of behavioral barriers faced by riders who preferred to pay in cash:

- 1.** the perception that using cash was cheaper than using other payment options
- 2.** the perception that using cash was easier than using other payment options
- 3.** concerns about sharing personal information to use payment options other than cash
- 4.** a lack of knowledge about payment options

Using interview insights, the MDRC team built on these categories of behavioral barriers to systematically organize rider-level data about attitudes, behaviors, biases, and concerns into examples of typical riders. This approach both protected the anonymity of interviewees and provided an overview of the shared characteristics of riders that preferred to use cash, derived from real riders' experiences. See Box 1 for an example of a typical rider, which was developed as a composite of several riders' experiences. These composite stories did not necessarily capture the ex-

Box 1. Typical Rider Story

Clare is an immigrant who had a habit of paying cash on the bus in another country. When she moved to the area, she began paying with cash on the bus. She briefly had an ORCA card in the past, but lost it and has no interest in replacing it. She didn't like that she was unable to easily track the money on the card. She worried about not having enough to ride and about getting stranded if she lost her card or if it ran out of money.

NOTE: MDRC researchers developed this composite description of a typical rider using information from interviews conducted with riders in 2021. It was originally presented in a memo to King County Metro in 2021.

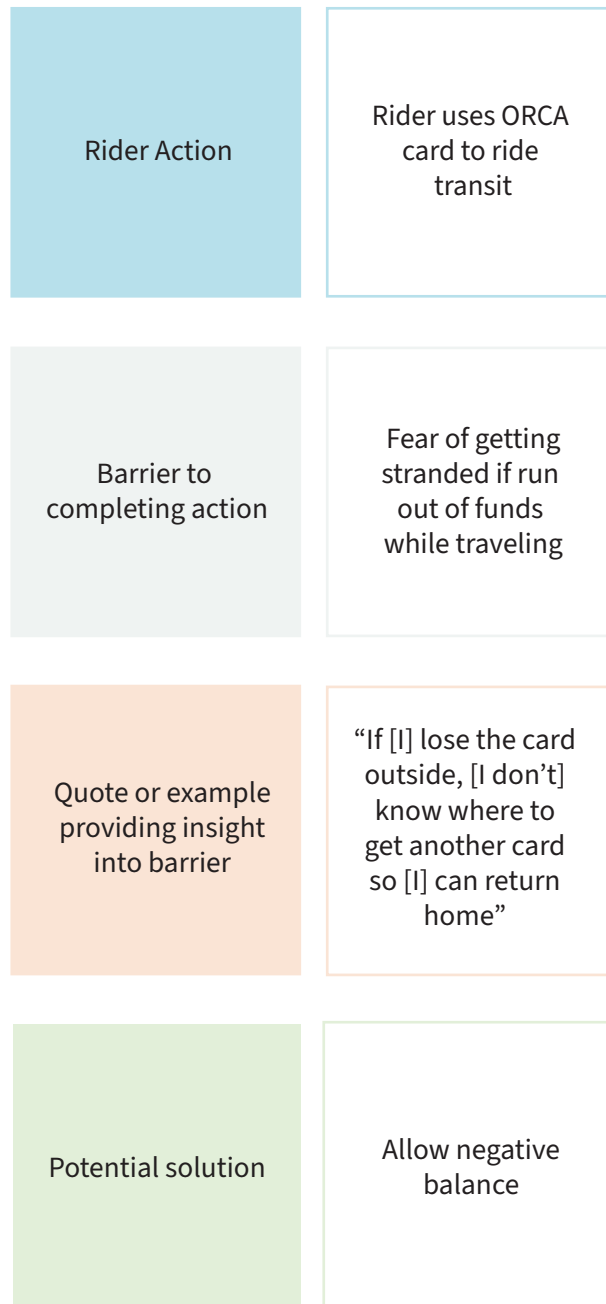
periences of every rider, but rather provided a foundation for developing targeted solutions to address the barriers riders face.

MDRC created a behavioral map outlining the steps riders take to use and reload ORCA cards, along with the challenges they face at each step. This map helped researchers envision potential solutions to these challenges. Figure 1 shows the structure of the behavioral map and an example for each component in the map.

ACTIVITY 2: GETTING INPUT ON MARKETING MATERIALS AND MESSAGING

King County Metro aimed to identify which messages about the ORCA cards would resonate the most with current and potential riders. To support the agency with this goal, MDRC analyzed feedback on messages and marketing materials collected during virtual focus groups and interviews. In collaboration with two community-based organizations, MDRC recruited participants for four focus groups and eight interviews. Participants came from a wide range of communities and included speakers of five languages, ensuring the inclusion of diverse voices.

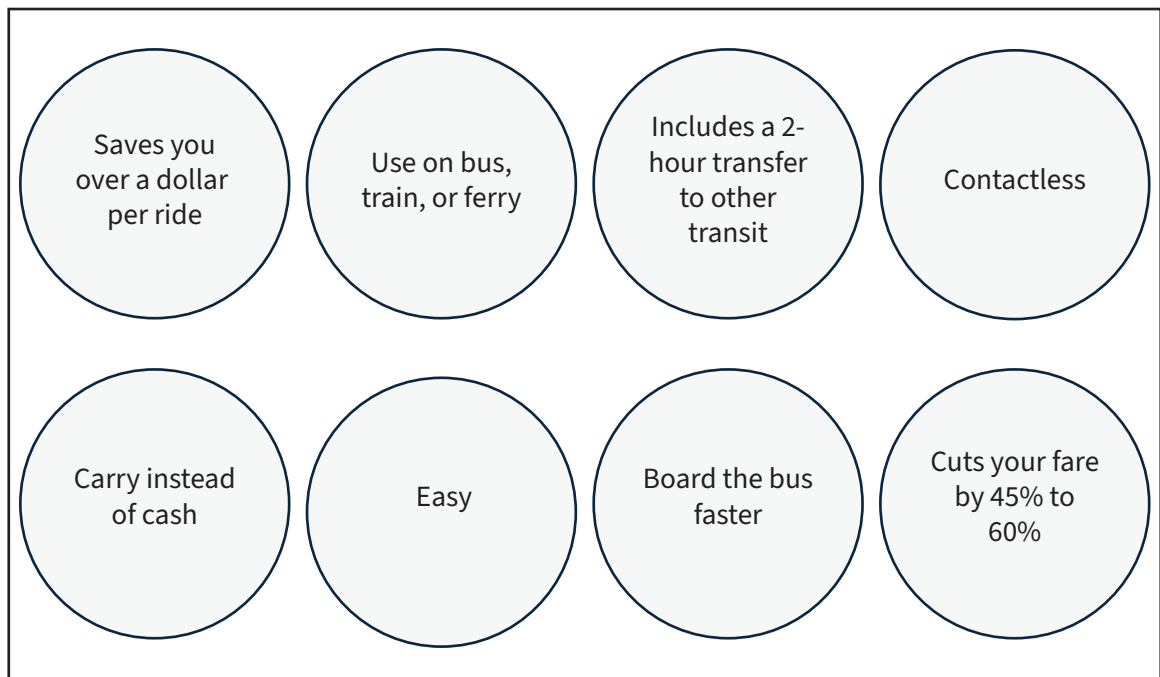
In the first two focus groups, the MDRC team presented messages and screenshots from King County Metro materials to determine which messages resonated and to learn what information participants found helpful or confusing. See Figure 2 for an example of the messages that researchers shared with the focus groups. Through these activities, the MDRC team gathered valuable insights on the graphics, layout, and framing of ORCA benefits, and how to clearly communicate the benefits of using and reloading ORCA cards. For example, the team learned that a two-hour window for free transfers may be perceived as a more useful benefit for people who live near a light rail station, but it was not considered a benefit at all for some riders who thought the transfer window was longer when they paid in cash. The team

Figure 1. Behavioral Map Components

NOTE: This figure is a slightly modified excerpt from a behavioral map shared with King County Metro using information from interviews conducted with riders in 2021.

Figure 2. Example Messages Used in Focus Groups

During focus group discussions with community members, the benefits of ORCA cards were shared on screen and participants could vote on the messages that resonated the most with them. Messages were translated into the language of the participants attending the session.



NOTE: This figure is a slightly modified version of a slide used in virtual focus groups with King County community members in 2021. When presented during the focus group sessions, the text on the slide was translated into the language of the focus group participants.

also learned that messaging about reloading ORCA cards was confusing to some people, and there was variation in how they thought through where and how they might reload their cards.

The MDRC team incorporated the participants' responses into updated versions of the materials and sought additional reactions in two more focus groups. The team then used the participants' input to develop two prototype flyers, which were tested in follow-up interviews with riders. These flyers were intended to promote interest in the ORCA cards and to provide information on how to use the cards. The flyers included updated framing to ORCA benefits. For example, because of the comments about how cash-paying riders perceived the transfer window, the team framed that benefit as the "cheapest and easiest way to transfer between agencies" rather than highlighting the length of the transfer window. The flyers also included two versions of a planning prompt, which is a behavioral science technique that asks people to think through how and when they will complete an action (in this case, using and reloading an ORCA card) to increase the likelihood that they will follow through on it.

These iterative cycles allowed for a deeper understanding of how different riders perceived different messages. At the end of these sessions, the MDRC team finalized a flyer that the King County Metro marketing team updated and produced for use with riders in an outreach project (described below).

ACTIVITY 3: TESTING OUTREACH STRATEGIES

During MDRC's partnership with King County Metro, the agency planned a ridership recovery outreach project as people returned to public transit after the peak of the COVID-19 pandemic. King County Metro engaged two community-based organizations to distribute ORCA cards to members of their local communities that were preloaded with a promotional value. The aim was to help motivate riders to use ORCA cards instead of cash. If riders qualified, the organizations also helped them secure a reduced-fare ORCA card, which allows riders with low incomes to ride public transit at a discounted rate. Each rider also received a flyer about ORCA cards, which was developed from MDRC's earlier work partnering with these two organizations, as described in Activity 2.

King County Metro staff members used this ridership recovery project as an opportunity to better understand what would motivate individuals to sustain the use of ORCA cards over time, including by reloading money onto their cards once the promotional value was used up. To support King County Metro with this learning agenda, MDRC proposed using a randomized controlled trial to distribute cards with different amounts to understand whether the amount of the promotional value affected card adoption.⁷ Additionally, to be responsive to the agency's goal of applying what was being learned throughout the project, the research design also

included rapid learning cycles, a structured process for reviewing available data to strengthen a new solution throughout the evaluation period so that it may become more effective over time. Each community-based organization had two learning cycles, and each cycle included formal reflection sessions with MDRC and King County Metro.

Though the amount on the ORCA cards did not affect the rates at which riders used and reloaded them, the study did gather other insights about how to best support immigrant and low-income communities in using ORCA cards to gain access to public transit. For example, the work highlighted the positive aspects of using community partners to conduct outreach activities. Community members were able to receive support from outreach workers who came from their communities and spoke their language, which allowed King County Metro to get transit information to people who may be more challenging for the agency to reach. Moreover, the different outreach approaches used by the participating community-based organizations had different effects. One community-based organization provided more one-on-one rider education on how to use and reload the ORCA cards. This approach showed greater potential to promote ORCA card use than the other organization's outreach approach, which primarily consisted of short interactions at community events. This suggests that outreach approaches which are more direct and involve more time up front to explain how to use a transit card may be needed to effectively support community members as they make the transition to using ORCA cards. Finally, the data suggest that connecting eligible riders to the reduced fare transit cards may make it more probable that they reload their cards, and therefore may be important for ensuring long-term card adoption.

This work equipped King County Metro with data-driven insights about how to continue to strengthen its outreach efforts. Further developing tailored, community-centered approaches and testing specific program components can enhance service delivery and improve access to public transportation for people with a range of needs and experiences.

NOTES AND REFERENCES

1. U.S. Department of Transportation, Intelligent Transportation Systems Joint Program Office, *Advancements in Electronic Fare Payment Contactless and Open Loop Technologies* (U.S. Department of Transportation, 2021).
2. Daniel B. Shockley, Julia Salinas, and Brian D. Taylor, “Making Headways: An Analysis of Smart Cards and Bus Dwell Time in Los Angeles,” *Transportation Research Record*, 2539, 1 (2016): 40–47.
3. Aaron Golub, Anne Brown, Candace Brakewood, John MacArthur, Sangwan Lee, and Abubakr Ziedan, “Equity and Exclusion Issues in Cashless Fare Payment Systems for Public Transportation,” *Transportation Research Interdisciplinary Perspectives* 15 (2022).
4. ORCA stands for “One Regional Card for All.” ORCA cards can be used to access public transportation operated by nine transit agencies in Seattle and the Puget Sound region.
5. In addition, four riders were identified for interviews because they participated in other King County Metro initiatives.
6. King County Metro provided access to professional interpreters if requested by the community-based organizations.
7. A randomized controlled trial is a type of rigorous evaluation where an intervention’s effects are estimated by comparing outcomes for a program group that receives the intervention with outcomes for a control group that does not receive the intervention. See Michael J. Weiss, Howard S. Bloom, and Thomas Brock, “A Conceptual Framework for Studying the Sources of Variation in Program Effects,” *Journal of Policy Analysis and Management*, 33 (2014): 778–808.

ACKNOWLEDGMENTS

The author would like to thank King County Metro for supporting this work, and for its partnership in advancing behavioral science solutions to ensure transit works for everyone. The author would also like to thank several MDRC colleagues, including Xavier Alemañy, Caitlin Anzelone, Laura Cojocar, and Praveena Javvadi, for their thoughtful feedback and contributions to the preparation of this brief; Luisa LaFleur for editing the brief; and Carolyn Thomas for preparing it for publication. Finally, the author expresses deep gratitude to the staff members and clients of the King County, Washington community-based organizations who participated in the project, including the Chinese Information and Service Center, ECOSS (formerly the Environmental Coalition of South Seattle), Villa Comunitaria, Cham Refugees Community, Congolese Integration Network, Mt. Baker Housing Association, Open Doors for Multicultural Families, and Youth for Equitable Streets. This work would not be possible without their dedication to the project and willingness to share their experiences and insights.

MDRC conducted the work described in this brief with funding from King County Metro.

The following organizations support dissemination of MDRC publications and our efforts to communicate with policymakers, practitioners, and others: Arnold Ventures, Ascendium Education Group, Yield Giving/MacKenzie Scott, and earnings from the MDRC Endowment. Contributors to the MDRC Endowment include Alcoa Foundation, The Ambrose Monell Foundation, Anheuser-Busch Foundation, Bristol-Myers Squibb Foundation, Charles Stewart Mott Foundation, Ford Foundation, The George Gund Foundation, The Grable Foundation, The Lizabeth and Frank Newman Charitable Foundation, The New York Times Company Foundation, Jan Nicholson, Paul H. O'Neill Charitable Foundation, John S. Reed, Sandler Foundation, and The Stupski Family Fund, as well as other individual contributors.

The findings and conclusions in this report do not necessarily represent the official positions or policies of the funders.

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