Smartphone Travel Incentives Study
Final Report

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16. Abstract.
The Federal Highway Administration Smartphone Travel Incentive Study was designed to examine the ability to sway individual travel decisions away from drive-alone trips through smartphone-based nudging and incentives. The approaches for recruiting and retaining users, along with the significant challenges encountered and related lessons learned, are described. For participants with habitual or repeated drive-alone trips who did not change behavior after being nudged in the absence of any reward offer (such as by highlighting the personal and social benefits of taking travel alternatives), the study then sought to determine their minimum willingness to accept (WTA) financial reward to take different alternatives to a congestion-inducing, drive-alone trip. Such knowledge was sought to help state and local transportation departments and agencies design successful and cost-effective incentive programs to minimize congestion and serve travelers better. A bidding game to discern WTA values was developed and beta tested before the deployment. Too few bidders, logically inconsistent bids, and a lack of follow-through by participants on taking a trip they had promised to take when offered compensation at or above their asserted WTA values when they "won" the game, led to very few true WTA values being learned. The main takeaways of this study relate to the challenges in and possibilities for designing future research into the influence of financial incentives on travel behaviors.

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LIST OF ABBREVIATIONS

BDM	Becker-Degroot-Marschak
DOT	Department of Transportation
ETA	Estimated time of arrival
FHWA	Federal Highway Administration
MOD™	Mobility Options Discovery
MPO	Metropolitan Planning Organization
PII	Personally identifiable information
TDM	Travel Demand Management
VPPP	Value Pricing Pilot Program
WTA	Willingness to accept
WTP	Willingness to pay

CHAPTER 1. INTRODUCTION

Transportation systems management seeks to optimize infrastructure performance—to preserve the capacity and improve the security, safety, and reliability of the transportation system—by implementing multimodal and intermodal cross-jurisdictional systems and services. To mitigate congestion, some transportation agencies use travel demand management and intelligent transportation systems, but these may fall short of reflecting the dynamic element of today's travelers' decision-making process, from selecting departure time to selecting mode choice.

Transportation planners seek to understand traveler decision-making to influence it for the purpose of improving system efficiency and traveler experience. For the transportation planner, understanding and influencing travel decisions is key to (1) managing travel demand, including considering how and when people seek to travel; and (2) managing the traffic on the system to improve transportation system operations to offer travelers a more reliable trip. To achieve these two functions, Federal Highway Administration (FHWA) and transportation agencies around the United States have moved to active travel demand management. This relies on strategies to reduce travel demand or redistribute travel demand to alternative routes, times, or modes of transportation.

The FHWA Smartphone Travel Incentives Study sought to learn about travelers' weighing of travel options that have differing congestion impacts and to determine the degree to which certain types and levels of encouragement and incentives could influence decision-making. In particular, the study sought to determine study participants' minimum willingness to accept (WTA) compensation values to take an alternative to a congestion-inducing, drive-alone trip. Such knowledge would help state and local transportation departments offer transportation services that minimize congestion and serve travelers better.

An experimental framework was used that combined a mobility-as-service phone app and a website. The app was used for trip planning, behavior engagement messaging, and trip verification, and the website was used for ascertaining WTA values.

The original study timeframe was September 2018 to September 2020. But before the WTA experiments began, in spring 2020, the first wave of COVID-19 spread across the United States, and with it an upheaval of life and daily travel. With varying levels of quarantine enacted throughout the country, including the closure of schools and workplaces, traditional travel patterns were disrupted, and the study was delayed.

The decline in transit ridership that was due to concerns about being in close proximity to many other travelers during the COVID waves created the need for additional mode choices in the app—carpooling and bicycling—to be added to the study's experiments. Some people would be more comfortable traveling with someone they know (even tangentially) in a personal vehicle than with many people they do not know on public transit. Cycling, of course, would entail no exposure to "shared air" with other travelers.

By the time quarantines began to lift and daily life began to reflect “a new normal,” much had changed in transit agency operations in large part due to changed travel patterns and preferences resulting in reduced ridership and farebox revenues. Many agencies that in 2019 had expressed an interest in participating by 2021 and 2022 no longer had the capacity to do so, and the number of agencies that remained willing to participate in the study was much smaller than before the COVID-19 pandemic.

This report is organized as follows:

- Chapter 2 discusses the research methodology, the experiment design framework, the mechanisms of the experiments, the use of the smartphone app, the modules of the incentives engine, the WTA experiment, and the data collection process. It also discusses the flow of the experiments for participants in the mode change (to bus, bicycling or walking), departure time change, and carpooling (as distinct from other mode changes) experiments.
- Chapter 3 discusses the methodology used to select markets for the experiment and reviews the institutional support provided by transportation agencies and the outreach channels used to recruit study participants.
- Chapter 4 discusses the very limited results of the experiments.
- Chapter 5 presents conclusions and ponders whether this research could facilitate future incentive design and policymaking. It also highlights lessons learned focused on user recruitment, retention, and understanding, and areas where future programs might improve on the approach used in this study.
- Bibliography.
- The appendix shows the survey that users completed to participate in the study.

CHAPTER 2. RESEARCH METHODOLOGY

The Smartphone Travel Incentives Study sought to learn about participants' weighing of travel options that have differing congestion impacts and to ascertain the degree to which certain types and levels of encouragement and incentives could influence decision-making. In particular, the study sought to determine participants' minimum WTA values to take an alternative to a congestion-inducing drive-alone trip.

INCENTIVE-BASED BEHAVIOR CHANGING STRATEGIES IN TRANSPORTATION DEMAND MANAGEMENT

In the past 20 years, several studies (*1–7*) have field-tested incentives to motivate commuters to explore new mobility options. These studies concluded that using incentives to change travel behavior, such as shifting departure to off-peak times and increasing the use of public transportation services, is effective (*5–7, 8–13*). Unlike the Smartphone Travel Incentives Study, however, most of the studies provided a predetermined reward for an action (such as take transit, bicycle, or leave at a different time) without knowing users' minimum WTA amount. Furthermore, some studies rewarded actions or activities that were either already taking place or thought but not confirmed to be precursors to behavior change, rather than behavior change itself. If taking a rewarded pretravel action doesn't change travel choice, or if travelers were going to take the reward-winning travel action even before joining the incentive program and they were still rewarded, rewards would be handed out without a change in behavior. This results in the loss of effectiveness of incentive spending (*1–4*).

To overcome this limitation and stretch the funding available for incentives, other studies have sought to identify target users through their personally feasible choice set and then reward only behavior change (5, 14). Research has offered evidence that rewards of monetary or other material value may drive behavior change at the outset and may also motivate ongoing change, most especially if ongoing change continues to be rewarded. But if rewards are not designed to be offered continuously, permanent or long-lasting behavior change may not result, except if the traveler was motivated by rewards to try a new travel choice and then found the new choice worthy of continuing even after rewards were no longer offered (*11*).

Empirical evidence from consumer product design suggests that variable rewards are more effective than set rewards for causing habit formation (*14, 15*). Randomized rewards in gamification increase continued participation and engagement, which are critical to building a habit-forming product. When users recognize the benefits of travel options they had not previously used, and when indications are that the behavior change has been sustained, incentive rewards could be tapered down, resulting in a behavior change framework that could be sustainable and cost-effective for scaled-up policies and strategies.

WTA RESEARCH AND APPLICATIONS IN TRANSPORTATION

Although willingness to pay (WTP) research is abundant in marketing and consumer product pricing, research on WTA is limited, especially as applied to the transportation field.[1] Studies on transportation topics focus on investigating commuters' WTP (rather than WTA) for upgrading public transit services (*16, 17*), mobility-as-a-service (*18*), and reducing noise and air pollution (*19, 20*). Although these studies help in the design of policies for public transit fares and subsidies, congestion fees, or pollution fees, they are typically not aimed at directly changing users' behavior to become more environmentally friendly. Even WTA experiments that have been designed around environmental issues, such as agri-environmental and digital schemes, entail offering users payment to accept an outcome rather than to change behavior (*21–25*).

Asking hypothetical questions without a downstream binding mechanism (i.e., requiring an action in conjunction with the accepted offer) may lead to inaccurate responses (*26, 27*). Downstream binding mechanisms to elicit truthful answers include take-it-or-leave-it offers, Vickrey auctions, nth-price auctions (*28, 29*), Becker-Degroot-Marschak (BDM) auctions (*30*), and incentive-compatible stated-preference methods such as contingent valuation and choice experiments. Both hypothetical and Vickrey auction surveys were designed to value the same good. In the Vickrey auction study, participants were asked to make an actual payment using their own funds for the goods in question to achieve accurate results. Vickrey auction's WTP values are lower than the hypothetical values, and the WTP values should be closer to the truth. Bidding behavior was compared using the Vickrey auction and BDM, and in the aggregate, underbidding was found to be more common in Vickrey auctions than in BDM.

RESEARCH OBJECTIVES

The objective of the research study was to learn whether travel behavior (choice of mode or travel time) can be influenced by monetary or nonmonetary incentives. To understand travel behavior and tradeoffs, participants would download a smartphone app that would give them personalized and contextually relevant information about mobility alternatives, coax them (without incentives) to try new congestion-reducing alternatives, and—if coaxing didn't work—enable them to take part in a bidding game that would help determine study participants minimum compensation level to change travel behavior—the WTA value.

Three types of experiments were conducted. The first two were conducted through the smartphone app. They assessed users' behavior responses to nonmonetary coaxing and to monetary incentives for a trip that a user has taken and is expected to take again. The app delivered nudging mechanisms—information of a general nature, an action a user could take in the form of an alternative travel option still meeting their specific travel needs, and an action

[1] WTP differs from WTA in that consumers spend their own money rather than receive rewards for desirable behavior.

combined with a monetary reward. (The app offered the reward, but a separate mechanism delivered the reward.)

If the user did not respond to the app's nudging that did not offer an incentive (i.e., a suggested action), a third, website-based, experiment attempted to identify the user's WTA amount to change their travel mode to an alternative to a drive-alone trip or departure time to avoid some congestion. A simple BDM revelation mechanism was used to reveal individuals' bids, consistent with the dominant demand-revealing strategy used to obtain more information about why people change mode or departure time.

To accomplish these experiments, an incentive engine architecture based on a commercial smartphone app was used. The architecture of the app is described in the following section.

INCENTIVE ENGINE ARCHITECTURE

The app's incentive engine architecture consisted of six modules—the system—that worked together to determine and deliver the right combination of information and incentives and monitored the user's response to incentives. Figure 1 illustrates the app's incentive engine architecture.

1. **Trip planner**. A turn-by-turn navigation and travel planning function with five transportation modes—drive alone, public transit, cycling, walking, and carpooling—integrated different types of transportation services with public transportation.

2. **In-trip multimodal and intermodal navigation.** For trips made by vehicle, the app included turn-by-turn navigation.

3. **Mobility wallet.** Coins were awarded to users for **participating** in challenges and campaigns. Coins were loaded into users' mobility wallets, had no expiration date, and could be redeemed for gift cards in the store integrated with the mobility wallet.

4. **Mode and departure time verification.** The mode and departure time verification module detected and verified the user's mode and departure time for each completed trip.

5. **Mobility Options Discovery (MOD)**. The MOD module, using the concept of utility, searched for options for each recurring trip (mode of transportation, route, and time of departure), calculated the relative attractiveness of each option, and suggested the second-best option for the user after driving in congestion.

6. **Incentive engine**. The incentive engine had basic and advanced functions.

    - The basic function provided incentives for opening the app and making a trip.

        - The open-app incentive rewarded users to check the app by providing a random incentive for doing so. The system checked the user log-in record daily.

- The make-trip incentive offered a randomized incentive to take a trip using the app for the purpose of gathering trip data to subsequently nudge or reward changes in travel mode or time that would contribute less to congestion. The system monitored the user's completed trips and when the app detected that the user logged into the app or made a trip, it sent the user a message notifying them of the earned incentive.

- Advanced functions consisted of nudging mechanisms, called suggestion tiles, to warm the user to the proposed alternative option. There were three kinds of suggestion tiles:

  - **Info tiles**, which aimed to frame the user's thinking about behavior change—for example, describing the benefits of changing travel time or transportation mode.

  - **Action tiles,** which asked users to perform a specific action while showing them how to do it. For example, it may have proposed leaving 30 minutes earlier and set out the expected trip time savings, or it may have promoted taking the bus instead of driving and described the benefit of using commute time more efficiently, while also providing bus departure times and routes.

  - **Action tiles with monetary incentive,** which offered the bonus that if the user took the proposed action, they would receive reward coins. The number of coins varied, and the offer was controlled by the system.

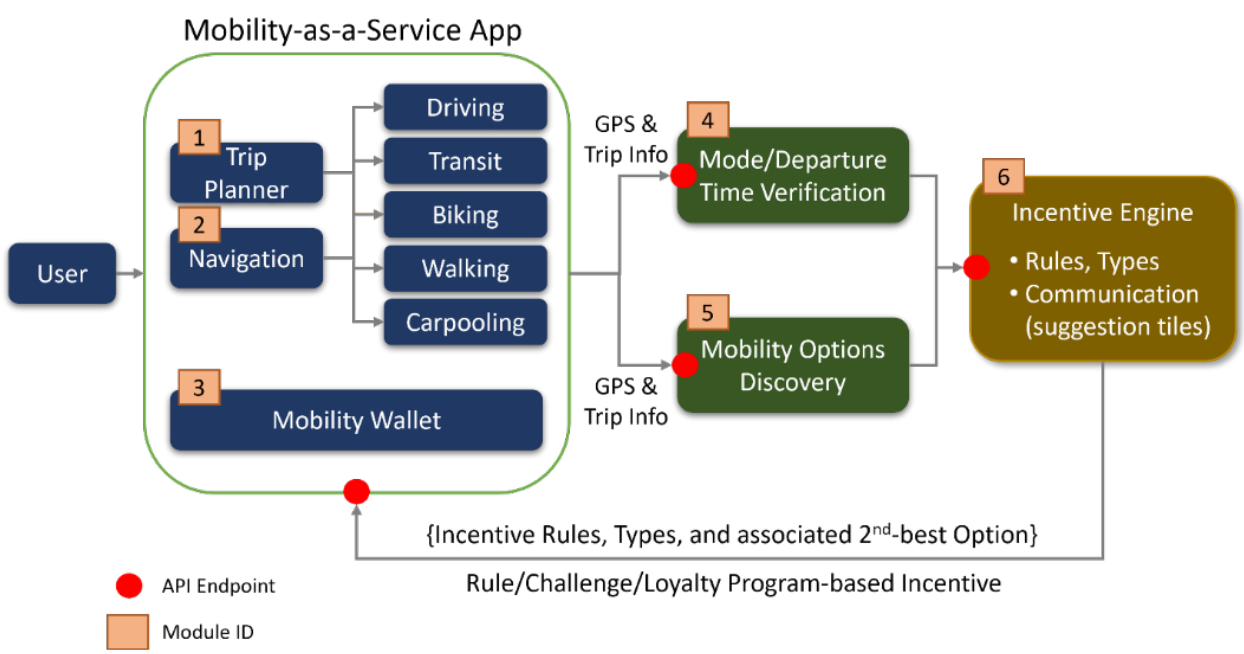

Figure 1. Graphic. Incentive engine architecture

Source: Metropia

EXPERIMENTAL DESIGN AND ORDER OF EXPERIMENTS

Three types of experiments were conducted. The first two were mode change and departure change experiments that assessed the user's response to the information presented in suggestion tiles. Experiments focused on a trip that a user had taken and was expected to take again.

If the user did not make a change after receiving info tiles and action tiles, a third experiment was conducted. In this experiment, the user could receive a monetary incentive. Determining the amount of the incentive required to persuade the user to either change departure time or take an alternative to a drive-alone trip at a similar time the user previously took the same trip—the minimum WTA value—was the point of the experiment (see figure 2). The study used a web-based revelation mechanism to seek WTA values for alternative travel departure times and modes.

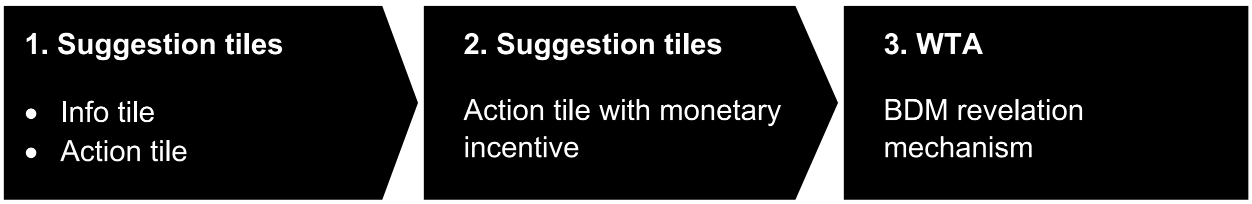

Figure 2. Graphic. Order of the experiments
Source: FHWA

TYPES OF EXPERIMENTS

Mode Change Experiment

The mode change experiment started with a microsurvey (of one question) about bicycle ownership, then provided info tiles, action tiles, and action tiles with variable rewards. If the user did not change behavior, then the user was directed to a website to set their minimum WTA value for changing the mode of their most frequent habitual trip (see figure 3).

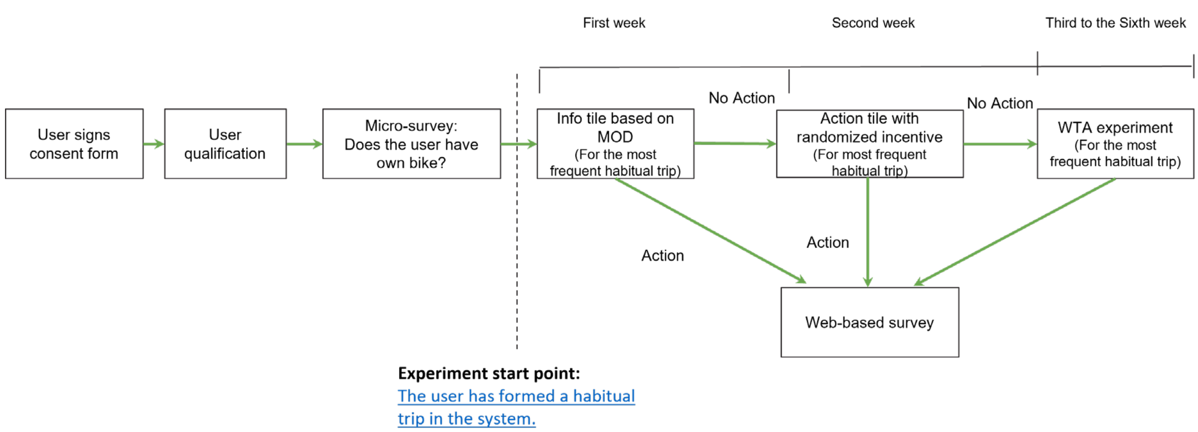

Figure 3. Graphic. Mode change experiment flow
Source: FHWA

Info Tiles

When a user had used the app enough for the app to determine the user's most frequent habitual trip, the user then entered the first week of the experiment. In the first week, the app sent the user info tiles about the user's most frequent habitual trip. For example, during the first week, a transit info tile saying, "Tired of driving in heavy traffic? Consider taking transit and let someone else do the driving!" might pop up. Exhibit 1 summarizes how info tiles were used.

Exhibit 1: Info tile details

- During week 1, info tiles were sent at 8 p.m. on Sunday and Tuesday.
- An info tile was based on the most frequent weekday habitual trip between 7 a.m. and 7 p.m.
- The info tile could vary by market.
- The mode options calculated by the MOD module having a greater than 5% probability of acceptance were considered for the user's choice set and the substitution option with the highest probability of success at acceptance to replace their drive-alone trip was presented to the user.
- The info tile message was relevant to the second-choice mode, whether bus, walk, or bicycle.

Action Tiles

If the user did not change their travel behavior, in the second week of the experiment, the app sent two action tiles with variable rewards daily. Rewards were drawn from a gamma distribution, so the action tile messages may or may not have been associated with a monetary reward. Exhibit 2 summarizes how action tiles were used.

Exhibit 2: Action tile details

- An action tile was sent 60 minutes before the departure time of the most frequent weekday trip, between 7 a.m. and 7 p.m., Monday through Friday.
- A second action tile with variable rewards was sent within 15 minutes of the most frequent weekday habitual trip's departure time.
- Messages were relevant to the second-choice mode as defined by the MOD module and described in Exhibit 1.

WTA

If the user, after receiving the action tiles, did not change behavior, they received an email guiding them to the WTA website. The WTA website displayed the most frequent habitual trip that the user had taken, along with three feasible alternatives to the habitual trip. Users were invited to enter unique WTA bids ranging from 50 cents to $60 (in 50-cent increments) for each alternative presented, according to the amount of compensation they required to switch from their habitual driving trip to the corresponding alternative. A revelation mechanism, described in the next section, was used to confirm that user WTA bids reflect actual WTA values, whether to change mode or departure time.

Revelation Mechanism

For each offered option, the participant stated their WTA value as a bid against a random offer generated by the system. After bids were entered, a random number generator would assign a value—also ranging from 50 cents to $60—for each alternative trip presented.

If the participant's WTA value was lower than the randomly generated reward, the participant was offered the randomly generated reward to make the change. Sometimes, participants would have winning bids for more than one option in which case the participant could choose to take their preferred winning option to redeem the randomly generated award for that option. If the randomly generated reward for all options was lower than the WTA value, the participant was expected to choose to continue with their habitual choice, and they received no reward.

This approach is advantageous from a data collection standpoint because users are incentivized to choose their minimum WTA value; they also receive information on the advantages of accurately choosing a WTA value. Different communication protocols were tested on a commonly used testing platform; the tests indicated that communication relying on visuals combined with text worked better than word-heavy communications, and video communications worked best, for getting participants to understand why bidding an amount other than their actual WTA would not make sense.

The specific information conveyed was that if one "low-ball" bids their WTA and the randomly generated reward amount was between the low-ball bid and the WTA, the participant would be expected to make a change for a reward amount below their WTA. If, on the other hand, the participant bid an amount above their WTA, and the randomly generated reward amount fell above their WTA but below their bid amount, the participant would lose the opportunity to make a trip change for which the reward was above their WTA. Hence, the goal was to persuade the user to bid their actual WTA.

In a BDM game, participants are taught, as described above, to communicate their precise WTA amount for making a change for a trip rather than an algorithm estimating the WTA amount after the participant responds to randomly generated rewards over many trips. Thus, this approach could be both more efficient and more accurate in discerning WTA.

For the BDM experiment to provide confidence in the accuracy of WTA bids, the downstream binding mechanism is needed to ensure that the participant takes the action they committed to before receiving the reward they were informed that they had won from the WTA website game. After the winning mobility option or options have been identified, based on the WTA bids, the participant was expected to select the option they preferred for the habitual trip (if there is more than one winning option). If the participant had more than one winning option, they would be expected to take the option with the highest random award value above their bid amount. For example, if they had bid a WTA of $3 for bus and a WTA of $5 for bicycle and they won bus with a $6 payment offer and bicycle with a $9 payment offer, they would be expected—to maximize personal utility as expressed by their bid selections—to choose bicycle (with a payment of $4 over their WTA) instead of bus (with a payment of $3 over their WTA), even though their WTA bids showed that they prefer bus to bicycle prior to any compensation offer. This would allow an additional check that WTA bids reflect actual WTA values. This mechanism was designed to gather WTA data on multiple alternative trip options with the pilot only having to pay out for a user taking one option.

The algorithms built into the app predict habitual trips. When the app is open 30 minutes before the start of such a predicted trip, it sends a tile to remind the participant to complete the trip as agreed and then claim the reward in the app (where coins are redeemed for gift cards). To allow for participant flexibility, and as an acknowledgment that not all habitual trips are taken every day, a trip with a winning bid would need to be taken within one week of the win for the reward to be redeemable.

Participants were invited to repeat the process—bidding their WTA value, taking the suggested action if the randomly generated award amount exceeded their WTA bid for at least one option, and then claiming the reward—three times. Repeating the process enables capturing whether the WTA value changes after the participant takes the mobility option. If a WTA amount to take the previously selected mobility option again is lower than the first WTA amount, a positive experience with the alternative mobility option can be inferred. Conversely, a higher WTA value to take a mobility option again implies a less satisfying experience with the mobility option than the user had predicted.

Departure Time Change Experiment

Qualified participants for whom the MOD module did not find an alternative mode option with a user acceptance probability of 5% or higher were directed to the departure time change experiment (see figure 4 and exhibit 3). The initial steps in the departure time change experiment were similar to those of the mode change experiment except that info and action tiles were omitted. (Users are typically cognizant of and experienced with dealing with traffic conditions around their normal departure time, while much less so with practical considerations related to alternative modes of travel, and thus the experiment was designed to educate participants about the latter.)

On the WTA website, participants were presented with their most frequent habitual trip and three feasible alternative departure time options. For each option offered, the participant stated their WTA value as a bid against a random offer subsequently generated by the system.

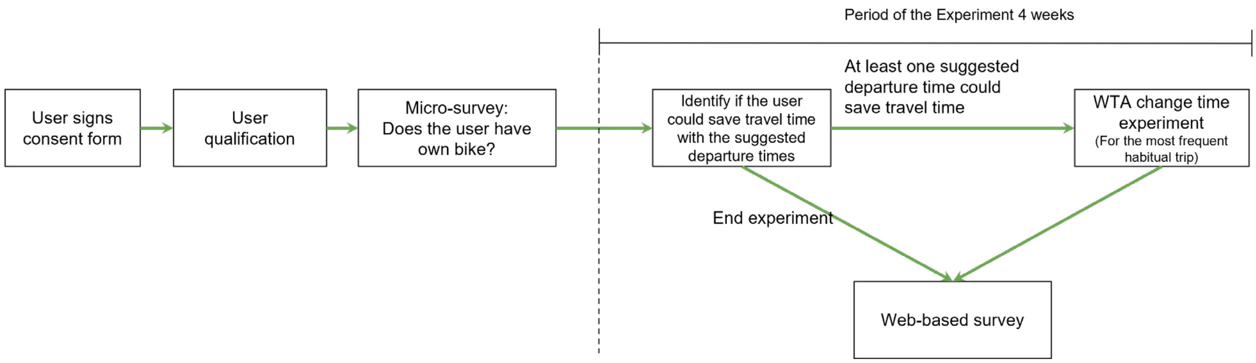

Figure 4. Graphic. Departure time experiment flow

Source: FHWA

Exhibit 3: Departure time change details

- The MOD module calculated probabilities for the second-choice mode as less than 5% probability of user acceptance.
- Identify if the user could save travel time for the most frequent habitual trip if the user left:
  - 30 minutes earlier
  - 15 minutes earlier
  - 15 minutes later.
- If the participant could save travel time changing to a proposed departure time, direct them to the WTA website.

Carpool Experiment

The decline in transit ridership caused by COVID-19 closings spurred the need for a new mode, carpooling, to be added to the study. Developing a carpooling program for each market in the experiment was beyond the scope and budget of the study, but the study attempted to provide a carpooling option in one or two markets only, using the app's existing social carpool feature. In the end, the study could not achieve the numbers needed for reliable carpooling, and this travel mode was not offered to participants. Nevertheless, a discussion of the social carpooling feature and the planning and work that went into preparing the carpooling experiment could prove instructive for future initiatives.

Social carpooling allows people to find carpooling partners in groups that they choose to join. In this way, the app user is not matched with a stranger. Research has found that people are more willing to carpool with someone with whom they have some form of social relationship, such as coworkers, members of a recreational or professional club, or people attending the same event.

The social carpooling feature in the app was for a simple journey. The user, either driver or passenger, could browse the details of a potential trip—pickup and drop-off locations and time—and accept or reject a carpool pairing. When both passenger and driver accepted the pairing, both users would be notified of the pairing, and communication tools would be provided in the app to facilitate logistics between the passenger and driver *(31)*.

For the Smartphone Travel Incentive Study, employers were engaged to initiate a carpool program for employees and ask for employees' study participation. Involving employers would provide two benefits: (1) it fixes one end of a trip, thus making carpool matching easier, and (2) it creates trust among users. Because employees may or may not participate in a carpool, the experiment process flow for carpooling is a hybrid of the flow of previous experiments, as illustrated in figure 5. Employees who participate in a carpool follow the upper level of the flow, while employees not participating in a carpool follow the lower level of the flow.

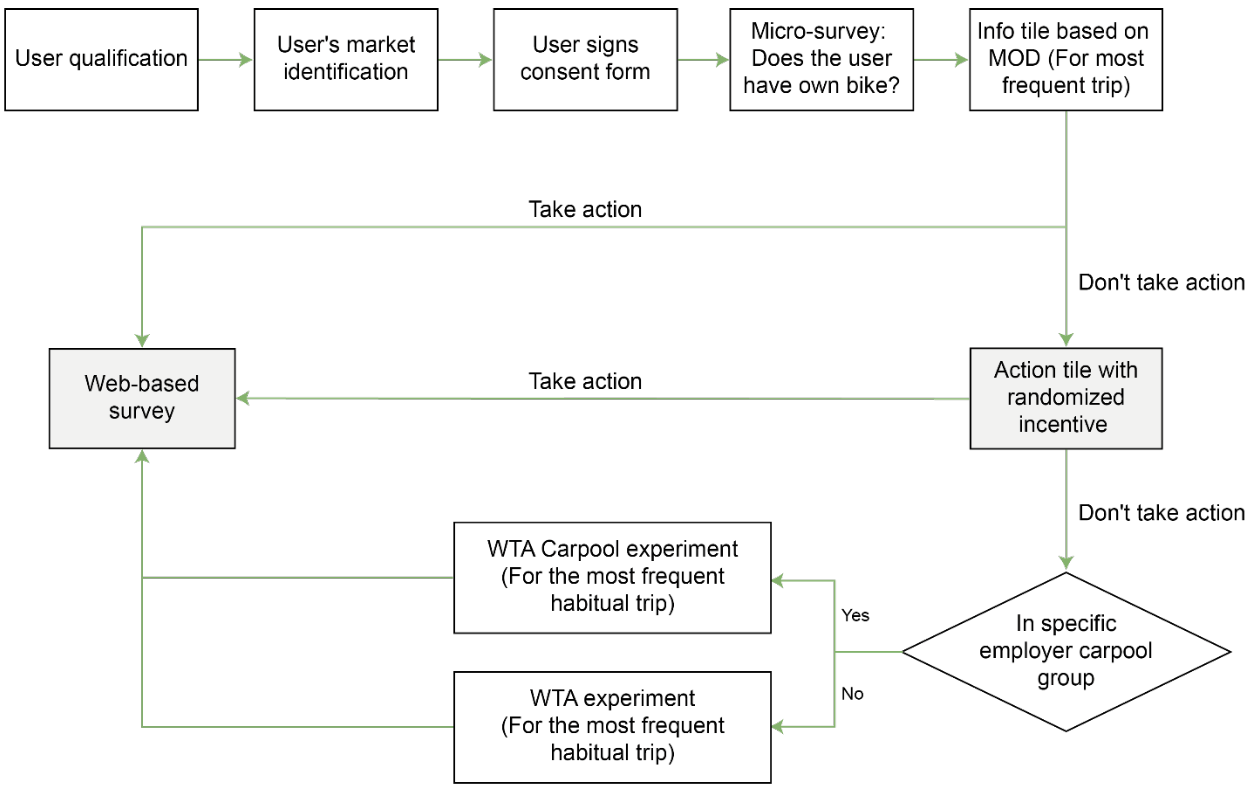

Figure 5. Graphic. Carpool participant flow
Source: FHWA

Unlike participants recruited from the public, participants recruited through an employer would be excluded from experiments involving adjusted travel times but would be eligible to participate in carpooling experiments through the WTA experiment website. At the WTA website, participants joining through an employer would be presented with up to five commute options for an upcoming trip, including walking, biking, taking transit, and participating in a carpool as a driver or passenger. The bidding processes would occur as described earlier.

For participants with a winning bid to serve as a carpool driver, the next step would be to schedule in the app the winning trip as a carpool. When entering the carpool trip, drivers would indicate a per mile "chip-in" that they would require the passenger to pay them (much like a bus passenger would be required to pay a fare). For the Smartphone Travel Incentives Study, the default chip-in was 30 cents per mile (roughly half of the Internal Revenue Service allowable reimbursement rate of 62.5 cents per mile in 2022), although drivers had discretion to lower the amount all the way to zero (but were barred from raising it beyond 30 cents per mile). The sum of the chip-in (rate per mile times the distance of the trip) and of the winning bid from the WTA website would be the driver's WTA value to take a passenger.

When scheduling a carpool with a driver, passengers would have to accept the chip-in fee of no more than 30 cents per mile (and would know that they are required to accept this in advance of placing their WTA bid). The passenger could also choose the optional trip protection fee ($2.75), as described below. All these fees, minus the WTA bid, would make up the passenger's WTP for the trip (with or without trip protection).

The app system would search for other participants signed up through the employer for a trip matching the origin, destination, and the acceptable range of departure times of the driver. The app would match the parties and the driver would extend an invitation to share a ride. After trip completion, the reward for both driver and passenger would be issued through the app wallet in coins, to be exchanged for gift cards in the app.

Carpooling carries one risk that other modes of transportation do not—being stranded if the driver does not meet the pickup obligation. Drivers' and riders' ability to rate each other in the app was intended to create reputational consequences for both good and bad behavior and thus somewhat mitigate this particular risk. To further mitigate it, the app would offer passengers the option to buy Emergency Ride Home protection for $2.75 if the driver canceled the trip and the app could not secure a replacement carpool. The protection would entitle carpool passengers to a refund of as much as $50 in fares for alternative modes of transportation—ridehail, taxi, or transit, or a combination of these.

Automations in the app would trigger the trip protection feature if a driver canceled a carpool ride or did not show up as planned. The app would notify passengers of the cancellation and of their options for another ride. If a driver canceled more than four hours before the scheduled departure time, a passenger could form another carpool with another driver matched in the app. Passengers could also report a no-show driver in the app.

But if the app could not find another carpool ride and the passenger had bought trip protection, the trip protection would be activated, and the passenger would be eligible for reimbursement for taking another mode. Passengers with trip protection could submit a receipt in the help desk feature in the app to receive reimbursement.

WEB-BASED SURVEY

Users who either partially or fully completed the experiment were directed to a web-based survey for the collection of socio-demographic data to strengthen the experiment analysis (see Appendix: Smartphone Travel Incentives Survey).

DATA COLLECTION PROTOCOLS

The data collected from the website and the smartphone app was stored in a secure, cloud-based database that was accessible only by project personnel who completed a course in social and behavior research from the Collaborative Institutional Training Institute. The researchers who handled participants' personally identifiable information (PII) were required to take Institutional Review Board training on handling PII and confidential information. Project staff had extensive experience in conducting federally funded projects. FHWA did not have access to the PII but only to the aggregate data relevant to the project objective of reporting on the behavioral impacts of incentives combined with other information strategies on travel choices.

CHAPTER 3. MARKET SELECTION AND USER RECRUITMENT

MARKET SELECTION

The selection of markets in which to conduct the Smartphone Travel Incentives Study was made during the time of experiment design and was based on the following criteria:

- **Population size and population density:** Behavior trends and experiment impacts can be more clearly established among larger cohorts of participants, and so target markets would be large and densely populated enough to provide the size of cohort necessary.
- **Robust transit system:** Because the experiments sought to shift drivers to alternative modes of travel, a robust transit system was needed to provide viable transit alternatives to driving.
- **Agency support:** Participation by local agencies was very helpful in lending legitimacy to the experiment, assisting in user acquisition, and improving experiment effectiveness.
- **Traveler pain points:** The likelihood of adopting a new behavior depends largely on a person's satisfaction or dissatisfaction with their current situation. Travelers in a region with significant congestion may be more interested in trying an alternative mobility option than travelers in less congested markets.

The study requested the help of the Association of Metropolitan Planning Organizations and the National Association of City Transportation Officials. The study team provided an outline of the study and a request for participation that the two associations sent to their members. The following agencies responded by agreeing to participate in the study and WTA experiment and to promote the study in public-facing communications:

- Broward Metropolitan Planning Organization (Broward County, Florida)
- Capital District Transportation Committee (Albany, New York)
- Region 1 Planning Council (Rockford, Illinois)
- City of Providence, Rhode Island
- Des Moines Area Metropolitan Planning Organization (Iowa)
- City of Alexandria (Virginia)
- West Contra Costa Transportation Advisory Committee (California)
- Richmond, California
- Chicago Metropolitan Agency for Planning (Illinois)
- Northern Virginia Regional Commission.

INSTITUTIONAL SUPPORT AND COORINDATED OUTREACH

Selecting the markets in which to conduct the study from among those that expressed interest depended in large part on the support that local agencies could provide. The support provided by participating agencies included providing geographic information system shapefiles of their operating areas to define experiment boundaries, identifying the most heavily traveled corridors, and refining communications to create a “local feel.” They also spread and amplified recruitment messages and promoted participation through their own communication channels.

Operating through established agencies validated the legitimacy of the study, alleviated potential user concerns about the trustworthiness of the study, and encouraged adoption; the increase in earned media coverage in markets with greater agency outreach resulted in higher participation rates. The study also asked participating agencies to identify employers in their areas that might be interested in piloting an employee carpooling program. Although not all agencies used the same information channels, most used some combination of social media sites, their own website, email blasts, press releases, newsletters, and blogs.

Because potential audiences had the potential to be exposed to more than one communication channel, such as watching the news on TV and scrolling through social media sites, study organizers sought integrated marketing campaigns on several communication channels at once to increase the likelihood of repeat exposure to messaging. Repeat exposure to a message increases the chance that a potential user will respond to it.

Some agencies requested a dedicated page on the study website for their agency noting their participation and providing additional program information and a portal for a user survey. In response, the program created a custom webpage for each participating agency that requested it, referencing the agency, the local market, and local transit lines and roads. As with the social media ads and most other outreach, these webpages were revised throughout the program to increase the likelihood that readers would download the app and participate in the program.

The study also published ads on social media sites throughout the user recruitment process, testing ad response to reduce costs and increase the number of users downloading the app and participating in the program. To reach potential users directly at low cost, the study also identified relevant social media group sites in the target markets. The Smartphone Travel Incentives Study team members asked group moderators for permission to join their groups and post information about the program. Team members, aiming to connect with and appeal to the audience on a personal level, posted multiple times in 17 groups, using a more familiar tone than the tone used in traditional advertisements.

HELPING PARTICIPANTS UNDERSTAND THE BIDDING MECHANISM

The research team at the outset understood that, given the novelty of the game and related bidding strategy, along with various complexities, some users could be expected to have difficulty understanding how best to play the game and the reason to place a bid that reflects their WTA accurately instead of some other bid value.

Four approaches for explaining the bidding game to users were considered:

- A short and simple description of the game
- A more detailed description of the game

- A detailed description of the game with explanatory graphics
- A more detailed description of the game with accompanying video.

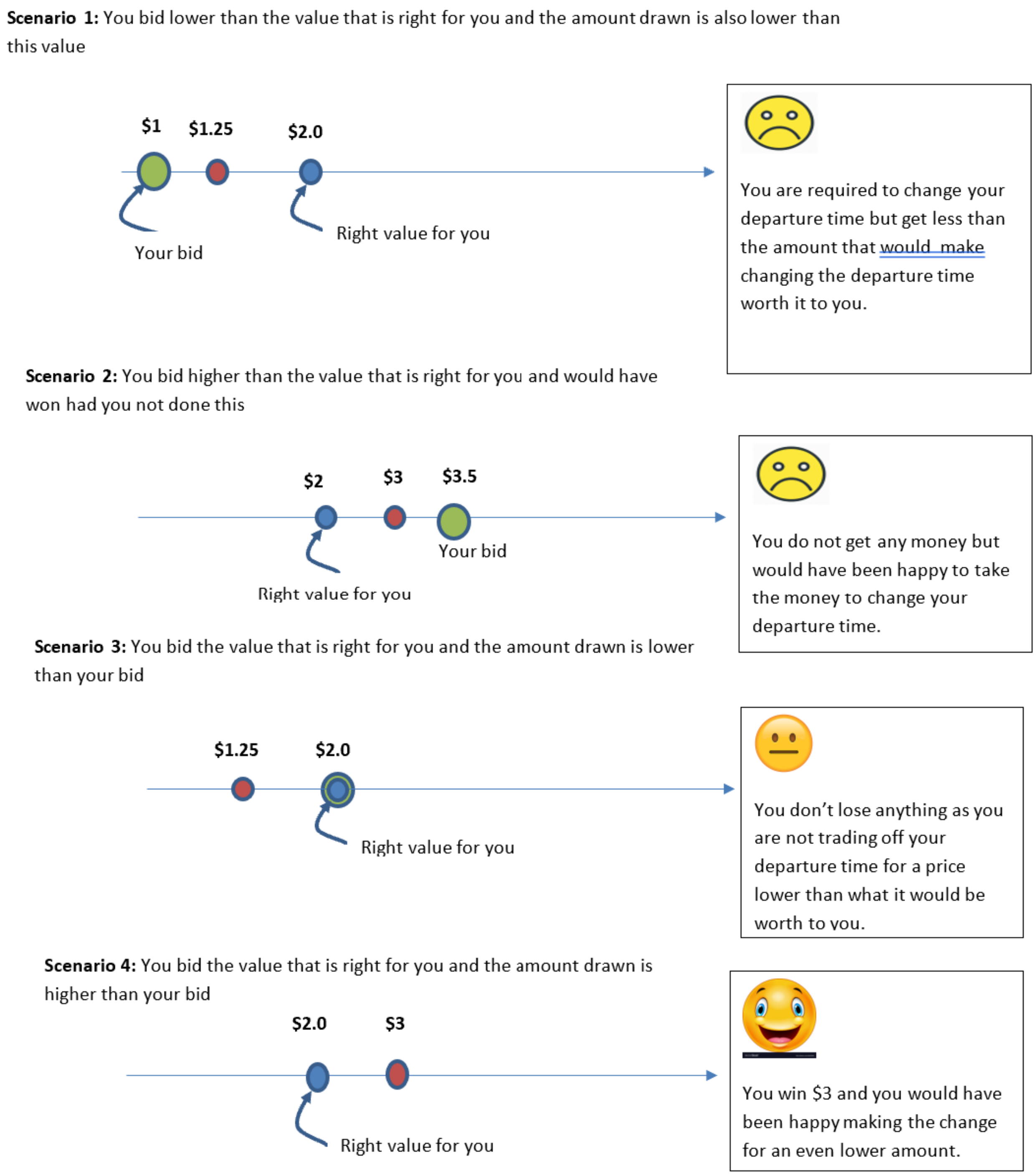

Figure 6. Screenshot. Graphics in app explaining how to place a bid that would maximize user utility

Source: FHWA

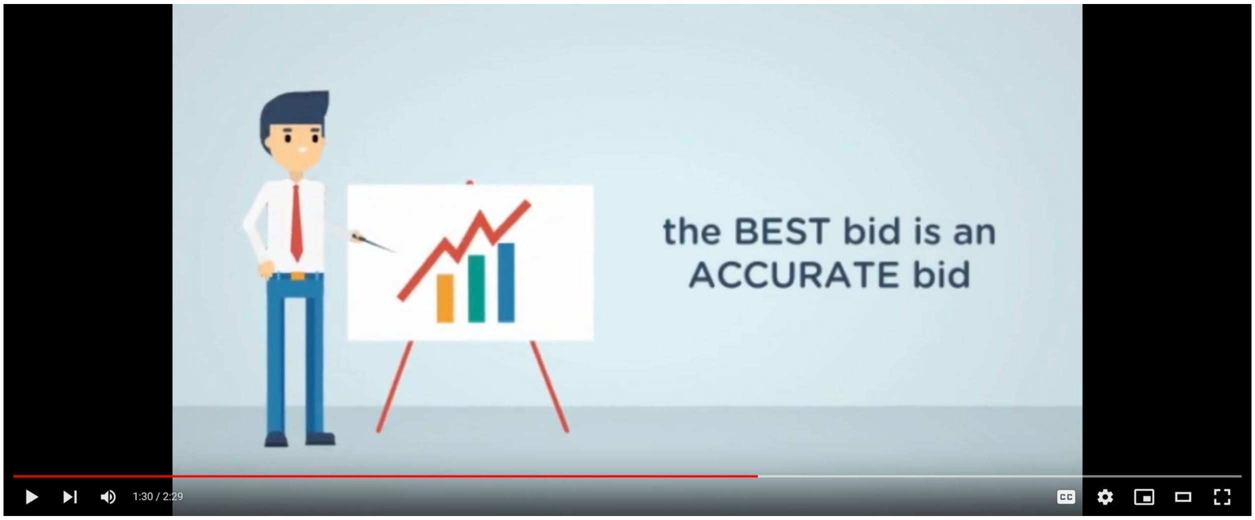

Figure 7. Screenshot. A video explained the game and bidding strategies.
Source: FHWA

An experiment was set up using a common testing platform in which testers would receive one of the four types of communication, then play the game as expected. After they completed the game, testers were asked to gauge how well they recalled the bid they entered and the value appearing on the prize wheel, if they won the game, and if they understood the strategy they should use to participate. The results were conclusive in favor of presenting the video to users before they played the game (see table 1), and the experiment website was redesigned with the video placed prominently at the top. Results revealed that participants had a better understanding of the game and their performance in it after watching the video than after reading descriptive text and, also, that their understanding of the game and game strategy, along with recollection of their bids and game results, was high after watching the video.

Table 1. Results of testing platform experiment on finding best explanatory strategy

Strategy	Participant Recalled Bid	Participant Recalled Prize Wheel	Participant Knew If They Won	Participant Knew the Amount Won	Participant Understood Game Strategy
Simple description	67.40%	79.20%	71.00%	33.20%	35.00%
With more description	61.60%	66.50%	65.90%	25.10%	43.00%
With video	85.00%	89.00%	73.00%	56.00%	64.00%
With graphics added	81%%	86.00%	61.00%	35.00%	38.00%

Source: FHWA

USER RECRUITMENT

Before the study could even approach the WTA value experiment, it had to recruit users, who had to download an app, create an account, sign a consent form required by the Institutional Review Board, and use the app while traveling to establish a baseline for habitual trips. The Smartphone Travel Incentives Study attempted to reduce the journey from ad or media contact to app download, simplify sign-up, and reduce the time before the user started using the app—in other words, to move users to the WTA experiments with as little friction as possible.

Even in optimal conditions for a smartphone app, an app might lose nearly 80% of its users on the same day the users create the account *(32)*—and conditions for recruiting users to the Smartphone Travel Incentives Study were not optimal. For example, user recruitment for the study necessitated steps that most smartphone apps do not require—such as confirming users target market to ensure that they qualified for study experiments and rewards and obtaining signed consent forms—each of which was an obstacle to recruitment. The team went through several iterations of the user recruitment process to gain traction in recruitment.

Seeking Representativeness of Users

Typically, an app targets an audience on the basis of demographics, such as age, travel behavior, and interests. Demographic filters allow app marketers to target groups that have proven to be more likely to want and to adopt their product—thus lowering recruitment costs. But for the Smartphone Travel Incentives Study, such targeting could skew the experiment's results. Favoring audiences more likely to take the bus, for example, could provide results and statistics that do not represent the traveling public at large. To avoid injecting bias into the study, a wide net was cast—one that was inclusive of diverse demographics and viewpoints. Although the decision prevented maximum user acquisition and retention, it was necessary to ensure a degree of universality in the results of the program's experiments.

User Onboarding Flow

The original user onboarding flow was designed to minimize onboarding friction. Flow A, illustrated in figure 8, started with a click-to-install ad on a social media site, which took users directly to the smartphone's app store to download the app. After users downloaded the app, they were sent a welcome email encouraging them to use the app routinely so that they could qualify for the WTA experiment. To qualify for the WTA experiment, participants had to use the app for transportation often enough that the app could identify at least one habitual trip—defined as a trip taken at least once per week for three weeks. When they qualified, users were sent an email with a link to sign the consent form. By delaying the request for the signing of the consent form until after users had qualified for the experiments by establishing travel patterns in the app, users were expected to be more invested in the program and on the cusp of earning rewards and thus more motivated to sign the consent form. After signing, the app then assigned participants to the experiment most relevant to their habitual trip and then, at the appropriate time, invited them to participate in the WTA experiment.

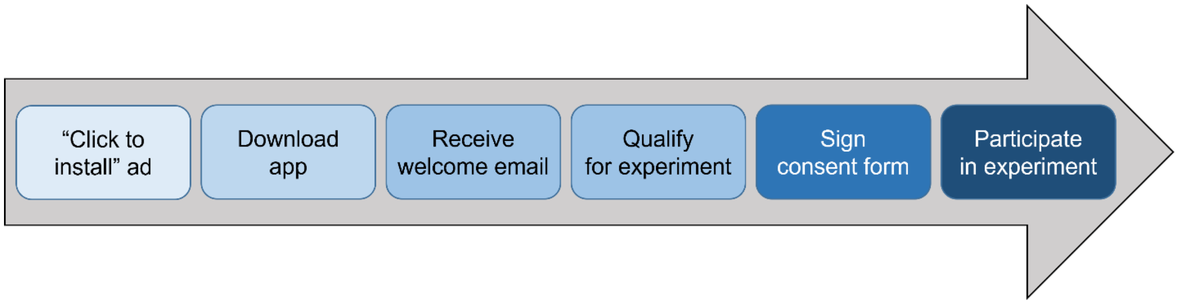

Figure 8. Graphic. User onboarding flow A
Source: FHWA

In recognition that users could be brought in through various channels, and also in response to low rates of signing of the consent form after users had qualified, Flow B, illustrated in figure 9, was initiated at any source, either from agency-based outreach or a social media site ad, and took the viewer to the agency-specific webpage, where they were directed to sign the consent form, download the app, and then continue along the same steps as in flow A.

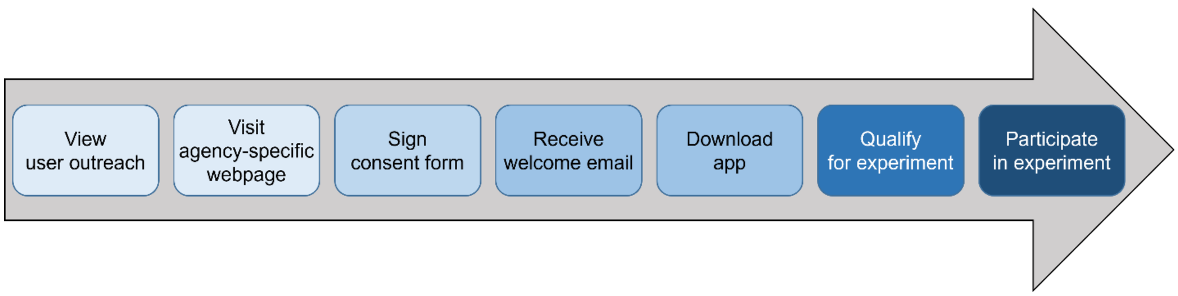

Figure 9. Graphic. User onboarding flow B
Source: FHWA

Initially, a link to the consent form was placed on the program webpage, but later the form was embedded directly into the webpage so viewers would not have to leave the site to complete the form. These adjustments increased participant numbers greatly, and obtaining the signed consent form no longer created much of a barrier to program participation. This shift in the user onboarding flow increased the conversion rate—that is, the rate of people clicking the ad and then actually creating an account in the app—from 27.8% to 54% and overcame the consent barrier, because now 100% of participants signed the form before downloading the app.

USER RETENTION

Retaining app users can be a greater challenge than recruiting them. According to industry metrics *(32)*, one week after downloading an app, an average of 94% of users have already abandoned the app. But for the Smartphone Travel Incentives Study, to qualify for experiments, users would need to take and record trips in the app with sufficient regularity, typically over the course of a number of weeks, for the system to recognize a habitual trip (one that recurs at the same approximate time from the same origin to the same destination) to qualify the user for the experiments. To be labeled habitual, such a trip had to be observed multiple times, which could take as long as three weeks, depending on the user's frequency of travel and app use. So, for the experiments, beating the probabilities in retaining users was necessary.

It was expected that by telling users up front that travel patterns had to be established before rewards could be won, users would eagerly use the app to progress to the experiments and subsequent rewards. In practice, few users showed interest in using the app consistently for the time needed to qualify to participate in the experiments. Reasons could have been that users often worked from home, had flexible and changing work schedules, or just forgot to use the new app, or that normal app retention challenges surfaced. Regardless, few users recorded a habitual trip using the app. In response to this lack of participation, the study took a multiprong approach to prompt users to open the app, to take a trip for the first time, and to reengage after prolonged inactivity.

Incorporating automated motivational reminders into the app was successful in increasing retention. Messages were sent on a schedule based on user inactivity—when a user failed to take a trip after three days, a push notification to their phones prompted them to take a trip. The push reminder was sent again if the user did not take a trip in six days. To increase participation in the experiment, a new reward offer for opening the app and taking trips was instituted and promoted by email, until the user had qualified for experiments. This offer would no longer require participants to use the app for prolonged periods with delayed gratification. The value of these reward offers was random, which took advantage of the intrigue of variable rewards while allowing lower average payouts than if using deterministic awards and thus the preservation of program funds. On average, users earned 12 cents for opening the app (up to once per day) and $1.55 per trip taken with the app. The new offer greatly increased trip counts and propelled more users through to the experiment phase.

FINAL MARKETS AND PARTICIPANT SIGN-UP

The study recruited 589 travelers from 13 markets who created user accounts in the app. Table 2 shows the numbers of registered accounts and trips generated by regional market.

Table 2. Registered accounts and trips by market

Market	No. of Registered Accounts	No. of Trips
Providence, RI	194	1,706
Albany, NY	94	1,309
Chicago, IL	73	2,116
New York City, NY	60	216
Los Angeles, CA	54	310
West Contra Costa	30	202
Rockford, IL	28	785
Des Moines, IA	13	438
Northern Virginia	12	105
Alexandria, VA	10	11

Market	No. of Registered Accounts	No. of Trips
Broward County, FL	10	321
Washington, DC	9	6
Boston, MA	2	1
Total	589	7,526

Source: FHWA

All participants were required to sign the consent form prior to their inclusion in the experiments. Of the users brought on through "User onboarding flow A," shown in Figure 8, 152 of the 589 participants did not sign the consent form and thus were ineligible to proceed in the study. Thus, the remaining pool of participants was narrowed to 437. Following the creation of an account and the signing of the consent form, the next barrier to entering the experiment phase was the recording of a habitual trip, which required the user to use the app for navigation from the same origin to the same destination by the same mode at approximately the same time on multiple occasions. Of the 437 remaining participants, 382 never took a trip, thus making them ineligible to move along to the experiments. Out of the remaining 55 participants who had both signed the consent and taken trips, only 38 were recorded in the system as having taken a habitual trip.

Figure 10. Graph. Number of participants by market

Source: FHWA

The mode options presented to participants were based on a contextual and relevant choice set that was developed using the MOD process, in which transportation alternative options were explored and evaluated for habitual trips detected by the system.

Participants who had mode options with relative attractiveness above the threshold of 5% (meaning that the system estimated a probability of user acceptance of at least 5%) were introduced to the mode change experiment, while participants who had mode options with relative attractiveness below the threshold were introduced to the departure time experiment.

The mode change experiment included a microsurvey about bicycle ownership, information tiles, and action tiles with variable rewards. If the user did not change behavior, they were taken to a website, customized to the local metropolitan planning organization (MPO) or transit agency, where the user could identify through a bidding mechanism their minimum WTA value for changing mode for the most frequent habitual trip.

Participants where none of the mode alternatives reached the 5% probability threshold of acceptance were directed into the departure time experiment. They were sent directly to a website, also customized to the local MPO or transit agency, where the user could identify though a bidding mechanism the minimum WTA value for changing departure time for the most frequent habitual trip.

Among the 38 participants, 24 participated in the departure change experiment and 14 participated in the mode change experiment. None of the mode experiment participants changed behavior in response to the info and action tiles, so all 14 users were directed to the WTA website, with only four of them providing bids of their WTA values. Of the 24 participants in the departure time change experiment, only seven participants provided a WTA value through bids—again well below expectations.

CHAPTER 4. EXPERIMENTAL RESULTS

This chapter discusses the outcomes of the bidding games on the WTA website. The small sample made only qualitative observations possible.

WTA VALUES FOR DEPARTURE TIME

The WTA departure time bidding game was used to learn how much individuals are willing to accept to change their departure time for a habitual trip. In this case, seven participants from different cities played the game and submitted their WTA values for each of the following: leaving earlier by 30 minutes and 15 minutes, and leaving later by 15 minutes.

Table 3 shows the WTA values entered by each participant and the system's randomly generated award value for each suggested departure time interval. When a user's WTA bid value is lower than the system's randomly generated award value for a suggested interval, the user wins, meaning that if they change their habitual departure time to the suggested interval, they will be awarded the system's randomly generated reward, regardless of how much lower their WTA bid was.

Table 3. WTA and system bidding value for departure time changes

User	Traveler's WTA			System Bidding Value			Won or Lost	Selection	Took the winning trip?
	Leave 30 min. earlier	Leave 15 min. earlier	Leave 15 min. later	Leave 30 min. earlier	Leave 15 min. earlier	Leave 15 min. later			
1	$7	$5	$6	$12*	$20*	$11*	Won	Leave 15 min. earlier	Yes
2	$10	$10	$10	$15*	$15*	$12*	Won	Leave 15 min. earlier	Yes
3	$2	$2	$2	$18*	$9*	$7*	Won	None	No
4	$3	$10	$35	$20	$17*	$14	Won	None	No
5	$15	$10	$60	$12	$17*	$6	Won	None	No
6	$4	$4	$5	$17*	$9*	$10*	Won	None	No
7	$40	$32	$42	$16	$12	$7	Lost	NA	NA

*—Options for which the user had a winning bid.

Source: FHWA

The limited sample size did not allow for any inference about behavior to be drawn through the experiments, and the bidding behavior of the users was such that it was doubtful that true WTA values were bid. One participant, User 4, required significantly less money to leave 30 minutes earlier than usual versus only 15 minutes earlier than usual, which seems very illogical. An additional three participants–Users 2, 3, and 6—provided identical bids to shift their trips to 30 minutes earlier as to shift them to 15 minutes earlier, where the latter would generally be less personally burdensome than the former. Four of the six bidders who won the WTA game contingent on taking the trip they won (one bidder lost the game) did not take the trip even though the payment offered (the randomly generated amount) was in all cases significantly higher than the WTA bid—ranging from 70% to 450% higher. Setting aside how few participants got to the stage in the experiment where they were asked to place bids and did place such bids, and, also, that a number of bids appear not to reflect actual WTA, the WTA bids for leaving later were generally higher than the WTA bids for leaving earlier. This WTA value pattern suggests that a delayed departure (likely coupled with a delayed arrival) was more problematic or disruptive to users than a departure a bit earlier than what is normal for them.

WTA VALUES FOR MODE CHANGE

Four participants from different cities participated in the bidding game for changing to transit, bicycling, and walking. Their WTA bids are shown in table 5. The characteristics of participants' habitual trips indicate variations in travel time, distance, and departure time (see table 5 table 4).

Table 4. WTA mode change habitual trip characteristics

User	Market	Departure Time	Driving Travel Time (min)	Travel Distance (miles)
1	Providence, RI	16:15	2	0.5
2	Albany, NY	17:45	7	1.5
3	Albany, NY	12:00	5	0.8
4	Providence, RI	10:00	10	1.2

Source: FHWA

Table 5. WTA and system bidding value for mode change

User	Traveler's WTA			System Bidding Value			Won or Lost	Selection	Took a Winning Trip?
	Transit	Biking	Walking	Transit	Biking	Walking			
1	$2	$5	$5	$9*	$7*	$7*	Won	Walking	Yes
2	$2	$4	$6	$8*	$15*	$9*	Won	None	No
3	-	$2	$2	-	$10*	$7*	Won	None	No
4	-	$20	$60	-	$13	$9	Lost	-	-

*—Options for which the user had a winning bid.

Source: FHWA

Because users did not take the required trip to redeem the reward in two of the three cases where they won the auction, their bids cannot be trusted as representing their true WTA value. This is especially true because sometimes the two users in the mode choice experiments were offered significantly higher amounts than they bid (e.g., User 2 bid $4 for bicycling, while the randomly generated award was $15, or $11 higher) and, similarly to users in the departure time experiments, they still chose not to take the reward redeeming trip. Even the single participant who took a trip to redeem an award, User 1 (who bid $5 to walk and redeemed a $7 award for walking), did not choose their asserted utility-maximizing option (for transit, User 1 bid only $2 and was offered $9). Since no user acted entirely logically, we cannot draw general findings from the mode choice experiments.

CHAPTER 5. CONCLUSIONS

The methodological and experimental framework used for this project appears to be the first of its kind in the transportation field and was designed to contribute to knowledge in transportation and behavioral economics—specifically, in applying incentives to trigger and sustain travel behavior change. While, by all measures, the experiments were not successful, they nonetheless could provide insights that might be useful for future research. Thus, researchers interested in pursuing related work could benefit from understanding the experiences described in this report.

Lessons about how to onboard participants, partner with local governments, and engage communities of interest through social media could be useful for a wide variety of research endeavors. For example, among the many adjustments made to user onboarding messaging and user flow throughout the study, none had as meaningful an impact on the study as changing the timing of when the consent form was presented to the user (from later into the participant experience to the start of participant onboarding) and making signing it easier (by embedding it in the webpage, rather than requiring users to leave one webpage and go to another).

Regarding agency partnerships, an eager and willing agency was shown to amplify the message, through press releases in particular, and provide important feedback in tailoring messaging to the region. The research found how to do all these things well and efficiently, and if this project had begun with the knowledge that it ended with—documented in this short report—it certainly would have performed better than it did.

COVID-19 presented particular challenges and results fell short of expectations. A similar research project without such challenges would no doubt have had different results. Nevertheless, results from this project fell so short of expectations that researchers considering pursuing similar work would be well advised to take a more fundamental look at what may have gone wrong.

The first lesson is to appreciate the difficulty of getting people to engage deeply in exercises related to travel choices. Although people use apps all the time—and transportation apps in particular—they are not necessarily likely to accept using one more app. Indeed, the project's experience showed that people use such apps almost entirely on their own terms, which is different from using them in social experiments in ways desired by researchers or to advance public policy goals.

In retrospect, requiring participants to engage in complex tasks was asking too much of casual app users (even if the researchers did not consider the tasks complex). Researchers tested different ways of communicating how to take part in the WTA experiments and believed they had found a way to effectively communicate how to play the game and why it is best to bid one's true WTA value. But of the few people who made it to the end of the experiment where they were to finally play the WTA game, most chose not to play, and the majority of those who did play demonstrated—by their logically inconsistent bids, failure to redeem prizes, or both—that they did not understand the game or considered the game removed from the reality of their travel needs and desires.

The more common and simpler research approach is to apply a charge or offer a rebate based on a pricing or incentive level that has a public policy justification and/or could potentially be sustained after a pilot has been completed. Such a research approach requires trial-and-error pricing tests and would yield less data at higher cost than the WTA bidding approach used by the Smartphone Travel Incentives Study—if the WTA bidding approach had worked. But it did not work. Thus, absent some new discovery outside this research, the only likely choice is between gathering some good data versus gathering little or no good data.

This project did not find a new option to gather a significant amount of good data at a relatively low cost. Large, research projects that followed the more traditional approach and had at least some success include the Puget Sound Traffic Choices Study in Washington State *(33)*, MOBIS in Switzerland *(34)*, and a 10,000-participant congestion pricing pilot in Israel (data forthcoming).

One thing missing from the Smartphone Travel Incentives Study was recognition of the power of loss aversion to gain and keep participant engagement. (Only at the very end of the Smartphone Travel Incentives Study did a user receive a reward for changing a trip that would be lost if they did not make the change.) The concept of loss aversion has been demonstrated in many experiments, where consumers have been shown to value the ability to save money, including or especially in the form of an avoided or reduced payment that would otherwise be required, more than getting paid an equal amount. This general finding has been shown to apply to transportation in tests of incentive strategies under FHWA's Value Pricing Pilot Program (VPPP). VPPP and other research suggests that when incentives are applied directly to consumers' transportation expenses, consumers pay more attention than if incentives are not linked directly to their travel expenses, as with the Smartphone Travel Incentives Study.

For example, VPPP funded tests of incentives for single-trip or dynamic carpooling (where expenses are shared but the driver does not receive a wage). One test included a toll discount of only 70 cents for picking up a passenger to travel on Texas Hwy 183A, yet more than 25% of app users regularly accepted the incentive and engaged in carpooling. This is a much higher engagement rate than in other pilots where incentives were not connected to tolls. Incentives designed around parking payments were also found to be effective. The Minneapolis PayGo Flex-Pass, which gave employees a $7 rebate off monthly parking charges on days they did not park and a $2 rebate on days they used transit instead of parking, reduced driving days from 78.5% with traditional paid monthly parking to 59.8% with Flex-Pass.

Loss aversion framing has been shown to work at bolstering participant engagement, even when the advertised loss pushes the boundaries of credibility. In another VPPP project, the University of California, Berkeley, converted a monthly parking fee to a relatively high daily price, charged until the monthly cap was reached (typically in fewer than 10 parking days). This led to a substantial reduction in parking despite most users continuing to pay the same total price per month.

Outside the VPPP, in an example highlighted in *Mixed Signals: How Incentives Really Work (35)*, taxi drivers in Singapore who were rewarded for engaging in physical activity measured in step count recorded more steps when their potential reward was framed as deferring a single day's taxi rental fee than when the reward was framed as the same amount in cash. What is more, the difference in step count was sustained seven months after award payments ended.

Another lesson learned from the Smartphone Travel Incentives Study is to partner with entities with already-popular transportation apps and pursue projects that do not deviate much from how such apps are already used. When testing incentives and payments, projects will obtain the best results by working with agencies or companies with apps that already provide transportation services and products and limiting to the degree feasible (given research objectives) the changes that consumers experience in using their trusted apps. This approach also offers a clearer path to achieving scalable benefits of pricing and incentive strategies than if starting from scratch.

More fruitful WTA and WTP experiments might entail testing incentive strategies for carpooling with a ridehail provider, testing strategies to lower risk exposure in exchange for insurance premium relief with an insurance company, or testing with a transit provider or toll operator strategies to encourage peak spreading by enabling cost reduction or payment credit for shifting travel time. Such partnership approaches might find a more receptive audience than would an entirely fresh exercise with an app that is new to users, as occurred with this project.

A future program that takes advantage of lessons learned from the Smartphone Travel Incentives Study may still require multiple steps or less-than-ideal user flows, iteration, A/B testing, and trial and error to succeed. Marketing and experiment design teams may need to test a wide range of alternative content through each stage of the user journey—marginal returns at each stage can add up to significant results. But the key to any success is an appreciation of what it takes to bring about and sustain user engagement and an understanding of potential partnerships that may offer scalable deployment opportunities if a pilot is successful.

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APPENDIX: FHWA SMARTPHONE TRAVEL INCENTIVES SURVEY

Smartphone Travel Incentives Survey

Approximate completion time: 5 minutes

Sign in to Google to save your progress. Learn more

* Required

Thanks for taking the time to complete this brief survey. By answering these questions you will play a major role in helping us better understand the wants and needs that motivate drivers to make their travel decisions, and ultimately help shape future strategies to reduce traffic congestion for everyone!

How many vehicles does your household own? *

- ○ None
- ○ 1
- ○ 2
- ○ 3
- ○ 4 or more

How long have you been driving? *

- ○ I don't drive
- ○ Less than one year
- ○ 1 - 3 years
- ○ 4 - 5 years
- ○ 6 or more years

How many times per week on average do you need to pick up/drop off another person (count each pick-up and drop-off trip separately)? *

- ○ Never
- ○ 1 - 2 times/week
- ○ 3 - 4 times/week
- ○ 5 or more times/week

How would you describe your typical commute? *

- Traveling to or from school
- Traveling to or from work
- Traveling to or from work and school
- I'm not a commuter

For a typical trip NOT heading to work or school, how much flexibility do you have to leave earlier or later than normal? *

- I have no or extremely little flexibility
- Up to 15 minutes
- Up to 30 minutes
- Up to 45 minutes

How many days per week do you typically work or attend school from home (telework or take online classes)? *

- 0
- 1
- 2
- 3
- 4
- 5 or more

Does your employer subsidize your parking expenses? *

- No
- Yes, partially
- Yes, in full
- I'm not currently employed

The following question is for non-work or non-school related trips: In the past two years, I have: (check all that apply) *

- [ ] changed my departure time to avoid traffic
- [ ] taken transit
- [ ] carpooled with someone other than a family member
- [ ] bicycled
- [ ] none of the above

Would you ever consider changing your departure time to avoid traffic instead of driving alone during rush hour for any non-work or non-school related trip? *

- ○ I would never consider doing that.
- ○ I normally wouldn't consider it, but I could be persuaded to under the right circumstances.
- ○ I'm willing to consider it.
- ○ I am curious about it and would like to give it a try.
- ○ I already do this at times.

Which of the following best reflects why you wouldn't want to shift your departure time for an upcoming trip? *

- ○ I always wait until the last minute
- ○ I have a very tight schedule
- ○ I need to consider other people's schedules
- ○ My schedule is too hectic to pre-plan
- ○ It's difficult to change my habits
- ○ Other

Next

Clear form

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