FINAL PROJECT EVALUATION

Miles Matter Project

DECEMBER 2025



U.S. Department of Transportation
Federal Highway Administration

North Central Texas Council of Governments

Texas Department of Transportation

carma

Texas A&M Transportation Institute

Miles Matter Project Team

Evaluation Team (Texas A&M Transportation Institute): Nick Wood**,** HyeMin Ju, Mark Burris, Max Steadman, Jacqueline Kuzio, Minh Le, Robert Saylor, and Tina Geiselbrecht.

Project Partners:

Carma Technology Corporation: Katy Linburg, Lawrence Mulligan, Emmett Murphy, Paul Steinberg, and Magda Waskiel

North Central Texas Council of Governments: Natalie Bettger, Dan Lamers, and Vickie Morris

North Texas Tollway Authority: Jeffrey Dailey and James Hancock

Texas Department of Transportation: Brandi Bush, Federico Hernandez, Zeke Reyna, and Marty Stewart

Table of Contents

List of Figures ix

List of Tables ix

Chapter 1. Background 1

Road Usage Charging as a Funding Alternative 1

GoCarma Carpool Verification System 2

Initial Deployment 2

Relevance for RUC Applications 3

Miles Matter Project Overview 3

Geographic Scope and Selected Corridors 4

Project Timeline 5

Project Purpose and Key Goals 5

Chapter 2. Evaluation Approach 7

Participant Recruitment 7

Incentive Design 9

Data Collection 11

Odometer Reporting 12

Transactional Data (App-Recorded Travel) 12

Participant Survey Data 13

Other Data Sources 14

Participant Sample Sizes 15

Data Analysis 16

Comparative Study Design for Behavioral Analysis 16

Longitudinal Survey Analysis 17

Analysis of Open-Ended Responses 17
Integration and Synthesis 17
Chapter 3. Technology Assessment 19
Recording Road Usage Data....19
Odometer Photo Verification....20
Vehicle Telematics 20
Interactive Dashboards....21
Consistency and Reliability....22
Scalability for Large Volumes of Road Users....23
Cloud-Based Back Office....23
Onboarding and Activation....24
Ease of Applying and Adjusting Credits 24
Updating Rules....25
Staff Perspectives....25
Interoperability....25
Applying Credits for Targeted Locations 26
Credits by Corridor 27
Visibility of Credits 28
Accounting of Incentives....28
Summary of Findings 29
Chapter 4. Policy Assessment 32
Cross-Boundary Accounting 32
Safeguarding Privacy 33
User Controls and Transparency 34
Participant Privacy Perceptions 34

Agency Partner Perceptions 35
Supporting a User-Based Revenue Mechanism 36
Rate Setting Simulator 36
Policy Perceptions of Fairness and Acceptability 37
Summary of Findings 40
Chapter 5. Mobility Assessment 42
Applying Incentives for Targeted Behaviors 42
Quantitative Analysis of Behavior Changes 43
Travel Distance 43
Number of Trips 43
Shifting to Off-Peak Trips on I-35W 44
Route Choice on Harry Hines Boulevard 45
Potential to Increase HOV Trips on I-20 and I-30 46
Thursday Travel Avoidance 47
DART Red Line Transit Use 48
Avoidance of Poor Air Quality Days 49
Survey Questions on Behavior Changes 50
Participant-Reported Behavior 50
Participant Attitudes and Perceptions 52
Impact on Overall Mobility 54
Summary of Findings 54
Chapter 6. Public Engagement Assessment 57
Respondent Surveys 57
Initial Enrollment 58
Continual Engagement 59

Frequency of Use 60
Summary of Findings 65
Chapter 7. Administrative Assessment 68
System Costs 68
Mileage Reporting Method 69
Data Storage 70
Security Compliance 70
Customer Support 70
System Maintenance 71
Engagement and Enrollment 71
Administrative Burden 71
User Enrollment and Engagement 72
Customer Support 73
Ease of Administering Policies and Rules 74
Compliance and Enforcement 76
Summary of Findings 76
Chapter 8. Conclusions 78
Summary of Findings 78
Insights for Future Efforts 80
References 82
Appendix A. Survey Responses 83

List of Figures

Figure 1. Location of the Selected Miles Matter Corridors 4

Figure 2. In-App Invitation with Version A (left) and Version B (right) 8

Figure 3. Screenshot of Miles Matter Road Transaction Dashboard 21

Figure 4. Screenshot of the GoCarma Metro Dashboard 22

Figure 5. Number of Awarded Points by Corridor 28

Figure 6. Monthly Vehicle Miles Traveled by County 33

Figure 7. Screenshot of the Rate Setting Simulator 36

Figure 8. Map of I-35E and Harry Hines Corridors in Dallas 46

Figure 9. When Travelers First Began and Stopped Earning Points for Trips (n=1,874) 61

Figure 10. Distribution of Total Point-Earned Distance Per Traveler (n=1,874) 62

Figure 11. Retention Since Earning Points from First Trip 64

List of Tables

Table 1. Phases of Participant Recruitment 8

Table 2. Applied Incentives by Selected Corridor 10

Table 3. Points Earned for Each Incentive 11

Table 4. Number of Trips and Trips Per Participant by Corridor 16

Table 5. Road Usage Key Statistics During Miles Matter Pilot 19

Table 6. Monthly Statistics from Miles Matter Project 24

Table 7. Number of Point-Earning Transactions 29

Table 8. Summary of Findings from the Technology Assessment 31

Table 9. As it relates to your participation in the program, please rate how you feel about security and privacy of my personal data? 35

Table 10. Did you feel the travel choices points system in this project was fair to all people?....37

Table 11. User Preference for Gas Tax vs. Mileage Charge 38

Table 12. Comfort with GPS Tracking for Discounts with an Odometer-Based Mileage Charge 39

Table 13. Perceptions on Combining an Incentive with a Mileage Fee 39

Table 14. Summary of Findings from the Policy Assessment....41

Table 15. Number of Weekday Trips Per Participant 44

Table 16. Proportion of Trips by Weekday Time Period 45

Table 17. Proportion of Trips on Harry Hines Boulevard 45

Table 18. Proportion of HOV Trips on I-20 and I-30 46

Table 19. Number of Weekly Thursday Trips Per Participant....47

Table 20. Proportion of Travelers for DART Red Line Incentive....48

Table 21. Share of DART Red Line Trips for Red Line Travelers 49

Table 22. Number of Daily Trips per Traveler for Days with Air Quality Incentive 50

Table 23. Average Weekly Incentive Earning Frequency by Type per Participant 51

Table 24. Self-Reported Behavior Change vs. Perceived Difficulty (Survey 3)....52

Table 25. How do you like the concept of an incentive to change travel choices? 53

Table 26. If it were expanded, how effective do you think it would be at reducing congestion?..53

Table 27. Were the incentives big enough to cause you to change your travel choices? 53

Table 28. Summary of Findings from the Mobility Assessment 55

Table 29. Survey Response Through August 2025....58

Table 30. How easy or difficult was it to install the GoCarma app and join the travel behavior study? 59

Table 31. Are you able to see the points you have earned by participating in the travel behavior study? 59

Table 32. Have you ever contacted GoCarma support? 60

Table 33. Did GoCarma support resolve your issue to your satisfaction? 60

Table 34. Descriptive Statistics According to Mileage Group (n=1,874) 63

Table 35. Overall, how well did the study work for you? 65

Table 36. Summary of Findings from the Public Engagement Assessment 67

Table 37. Annual Miles Matter Costs 69

Table 38. Administrative Component and Responsibility 75

Table 39. Summary of Findings from the Administrative Assessment 77

Chapter 1. Background

The United States faces a critical challenge in maintaining and funding its surface transportation infrastructure. With traditional revenue streams, such as fuel taxes, steadily declining due to improvements in vehicle fuel efficiency and the growing adoption of electric vehicles, transportation agencies at all levels of government are exploring alternative funding mechanisms to ensure long-term sustainability. Among the most promising approaches is road usage charging (RUC), which shifts the basis of user contributions from fuel consumption to miles traveled. In this context, the Miles Matter project represents an advancement in the exploration of smartphone-based RUC systems. Conducted in the Dallas/Fort Worth metropolitan region, the pilot tested the feasibility, public acceptability, and administrative viability of a mileage-based crediting architecture using existing mobile technology and geofencing tools. This chapter introduces the foundational context for the pilot, including the national evolution of RUC, the underlying verification platform, the structure of the Miles Matter program, and the key goals that guided its evaluation.

Road Usage Charging as a Funding Alternative

Over the past decade, numerous states have launched pilots and programs to test the feasibility of RUC systems. Oregon was the pioneer, creating a Road User Fee Task Force in 2001 to seek alternatives to fuel taxes, which led to the concept of charging drivers for each mile driven. Oregon's efforts culminated in the OReGO program, the nation's first operational RUC program, which began in 2015 and allows volunteer drivers to pay per-mile charges instead of state fuel tax (FHWA, 2019). Following Oregon's lead, other states have actively joined the RUC movement. Utah now operates a mileage-based fee program for electric and hybrid vehicles, making it one of the first states (along with Oregon) to actively charge drivers by the mile on an ongoing basis (NCSL, 2022). Virginia has also implemented a program in recent years that allows owners of fuel-efficient vehicles to opt into a per-mile charging rate rather than a fixed annual fee.

Beyond fully deployed programs, many more states have conducted pilot projects to evaluate RUC. States such as California, Washington, and Hawaii each implemented RUC pilot programs, often with federal support, to test mileage-reporting technologies and gauge public acceptance (GAO, 2022). California conducted a comprehensive, phased demonstration program. The phases examined the potential integration of road usage charging along with other emerging transportation technologies, including pay-at-the-pump (PATP), user-based insurance (UBI), transportation network companies (TNCs), and automated vehicles (AVs). Washington State launched its "Forward Drive" initiative in 2019 to evaluate a wide range of RUC implementation scenarios. The program tested five distinct mileage-reporting methods and developed a revenue-modeling tool that accounts for broader changes in travel behavior, such as increased electrification and remote work. Hawaii's HiRUC program generated mock invoices and individualized "Driving Reports" for several hundred thousand residents using vehicle registration and periodic motor vehicle inspection data (FHWA, 2023).

Recognizing the critical need to explore new funding models, the federal government has played a significant role in supporting state RUC initiatives. In 2015, Congress established the Surface Transportation System Funding Alternatives (STSFA) program under Section 6020 of the Fixing America's Surface Transportation (FAST) Act (FHWA, 2019). The STSFA program's purpose is to provide grants to states to demonstrate user-based alternative revenue mechanisms that could help maintain the long-term solvency of the Highway Trust Fund. Between FY 2016 and FY 2020, the Federal Highway Administration (FHWA) made approximately $90.2 million in STSFA funds available and awarded about $73.9 million across 37 demonstration projects selected from 42 applications. FHWA has provided STSFA grants to more than a dozen state DOTs and two multi-state coalitions (FHWA, 2023).

The STSFA grants supports the ability to test various aspects of RUC, ranging from technical systems and interoperability to public outreach and policy impacts, in a controlled pilot environment. STSFA requires that each pilot address critical issues, including system implementation, public acceptance, privacy protection, interoperability, ease of user compliance, and other potential hurdles to adoption (FHWA, 2019).

GoCarma Carpool Verification System

A cornerstone of the Miles Matter pilot is its use of the existing GoCarma technology, a smartphone-based carpool verification system, initially deployed in the Dallas/Fort Worth region. The GoCarma app was developed to automate the verification of high-occupancy vehicles (HOVs) and facilitate HOV toll discounts on regional managed lanes. In North Texas, the Regional Transportation Council (RTC) established policies granting toll discounts to carpool vehicles during peak periods on specific TEXpress-branded managed lanes. Historically, drivers had to manually declare their carpool status in advance to receive the discount, a cumbersome, error-prone process.

Initial Deployment

To modernize this process, the North Central Texas Council of Governments (NCTCOG) and the Texas Department of Transportation (TxDOT) partnered with Carma Technology Corporation to deploy GoCarma in early 2020, replacing the manual HOV declaration system with a fully automated smartphone solution. Launched on January 24, 2020, GoCarma is a free mobile app that uses Bluetooth signals and smartphone global positioning system (GPS) to automatically detect when two or more registered users are traveling together in a vehicle. Once users have installed the app and completed a one-time setup, the app runs in the background to sense and verify co-travelers whenever the vehicle enters a monitored corridor. No further driver interaction is required. The automated process dramatically reduces the potential for user error, HOV violation, or distracted driving as compared to manual systems. For passengers who may not have a smartphone (e.g., young children, older adults), GoCarma provides an Occupant Pass, a small Bluetooth device or tag that can be carried to be counted as an additional person in the vehicle. The system also incorporates fraud detection analytics to flag anomalous carpool patterns and deter abuse.

One of GoCarma's key features is its integration with the regional toll collection system. Whenever a GoCarma-equipped car passes under a toll gantry on a participating managed lane, the toll system sends an electronic query to GoCarma's back office to retrieve the vehicle's occupancy status in real time. If the system confirms an eligible carpool (e.g., HOV2+ during peak times), the toll charge is automatically discounted in accordance with RTC's policy before being posted to the driver's toll account. This seamless back-end integration means that carpool drivers see the discount applied to their toll bills without needing to self-declare. The process is instant and invisible to the user, yet highly accurate. In short, the smartphone app effectively functioned as a virtual transponder and a passenger-counting device, demonstrating that mobile technology can perform tasks traditionally requiring specialized in-vehicle units or infrastructure.

Relevance for RUC Applications

The GoCarma system's success in Dallas/Fort Worth demonstrates a scalable approach to verifying and rewarding specific travel behaviors (e.g., carpooling, alternative routing) using personal smartphones. This has direct implications for mileage-based charging and broader road usage pricing strategies. First, because GoCarma relies solely on ubiquitous consumer devices and cloud software, it avoids the need for expensive roadside hardware or plug-in car devices. This cost-saving advantage is also a core goal for smartphone-based RUC systems. New locations or policies can be activated via software updates within minutes, rather than the months or years required to install physical tolling equipment.

This flexibility and speed in updating the system were proven by NCTCOG's ability to adjust GoCarma's geofenced corridors and rules through a web-based administration tool, reflecting how a future RUC program could dynamically modify charging rates or zones with minimal effort. Second, GoCarma showcases interoperability with existing toll infrastructure, which is highly relevant for RUC. The fact that GoCarma can communicate with toll authorities and inform accurate billing indicates that a smartphone-based RUC platform could likewise integrate with toll payment systems or other transportation services. For example, if a statewide RUC were implemented, the same data pipeline could prevent drivers from being double-charged. Toll road miles could be recognized and deducted from RUC fees. Finally, GoCarma's use of occupancy verification points yields an enriched RUC model in which charges or credits vary with vehicle occupancy. Traditional mileage fee pilots using OBD-II devices only record distance, but the smartphone approach can also capture how many people are in the car.

Miles Matter Project Overview

The Miles Matter project was conceived as Texas's first comprehensive trial of a mileage-based user fee architecture, using the Dallas/Fort Worth (DFW) region as a test bed. Formally titled "Demonstration of Smartphone-Based Alternative to Current Gas Tax Structure in the Dallas-Fort Worth Region," the project was proposed by TxDOT in 2020 and awarded funding under the FHWA's STSFA grant program. The project was a collaborative effort led by NCTCOG, in partnership with TxDOT, the technology provider Carma, and the Texas A&M Transportation Institute (TTI), serving as the project evaluator, with additional support from the North Texas Tollway Authority (NTTA).

The fundamental concept was to leverage smartphone geolocation technology to log and credit road usage on selected routes, thereby demonstrating an alternative road-funding mechanism to the fuel tax. Using an app-based system built on the existing GoCarma app platform, the pilot could track when, where, and how far participants drove within designated highway corridors. The data collection process would then feed into a simulated charging model in which drivers earn credits based on mileage and behavior, rather than paying tolls or fees, to emulate how a real RUC system might work in practice. No actual money was charged or exchanged during the pilot. Any “fees” were purely notional and offset by credits so that participants did not incur out-of-pocket costs. This approach allowed testing the user experience and the technical feasibility of road usage charging without the complications of financial transactions, a key aspect emphasized in the project design.

Geographic Scope and Selected Corridors

Miles Matter focused on several strategically selected travel corridors. The project team identified a set of highways and major routes that would serve as the geofenced pilot locations (collectively referred to as the “Miles Matter corridors” throughout the evaluation). The roadways included both tolled and non-tolled facilities to capture a variety of facility types. For example, Interstate 35W (I-35W) in Fort Worth was one of the initial pilot corridors, an important north-south highway with a mix of general-purpose and managed toll lanes. Additional corridors were added in phases, such as Interstate 35E (I-35E) in Dallas, along with a roughly parallel arterial route (e.g., Harry Hines Boulevard) to test the incentives for alternative routing. The pilot also incorporated the I-30 and I-20 corridors for specific incentive programs. Figure 1 shows the location of the corridors within the Dallas/Fort Worth region.

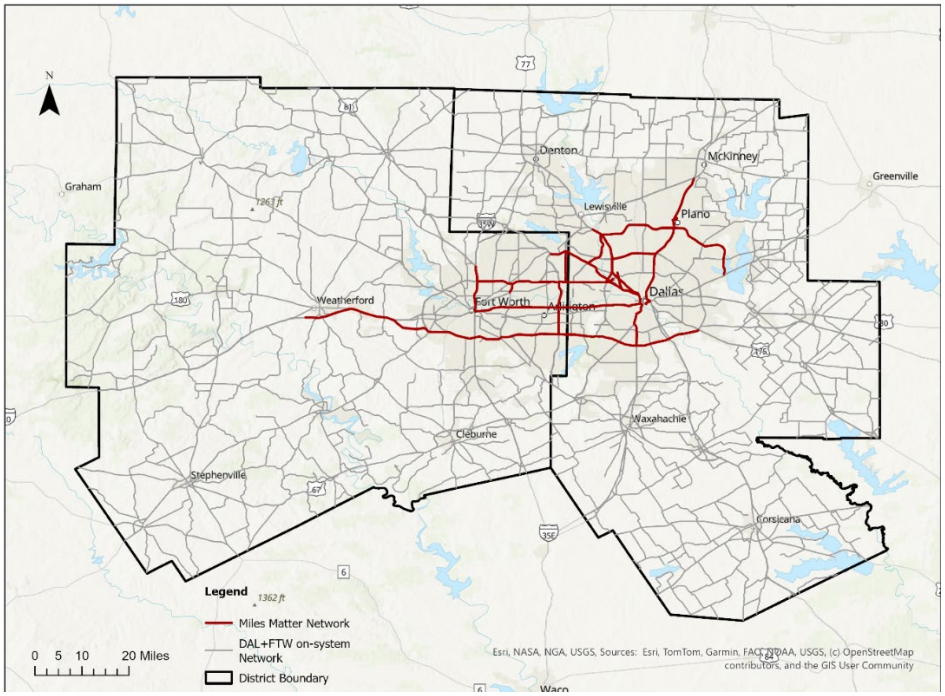


Figure 1. Location of the Selected Miles Matter Corridors

In total, five counties in North Texas (Dallas, Tarrant, Collin, Denton, and Parker Counties) had roads included in the pilot's geofenced network. Whenever a participant's smartphone detected travel within one of these defined corridors, the app automatically recorded a "road usage transaction," logged the distance traveled, time, and location, and applied any relevant point incentives. This virtual geofencing approach meant that data were collected only at the target sites, preserving user privacy outside the corridors and minimizing phone battery use. It also demonstrated that RUC could be implemented in a targeted manner (e.g., on specific congested highways) rather than across all roads, if desired by policy.

Project Timeline

The Miles Matter pilot unfolded in phases over approximately one year from September 2024 to August 2025. The initial phase (late 2024) focused on deploying the technology and recruiting participants, while a second phase (early-to-mid 2025) added additional behavioral incentives to more fully test the points and crediting system. During the recruitment period, the project team invited existing GoCarma users to join the Miles Matter program. Recruitment was done in waves. For example, a first wave in September 2024 targeted I-35W commuters, and subsequent waves in October and November 2024 and January 2025 extended invitations to drivers on I-35E and other corridors as new incentives were introduced.

The pilot formally concluded in August 2025, by which time the GoCarma system had logged over 12.4 million trips, covering 64.1 million vehicle miles on the geofenced corridors. These rich data, along with user survey feedback, were then analyzed by TTI to assess the pilot's performance and derive lessons for future RUC implementations.

Project Purpose and Key Goals

The overarching purpose of the Miles Matter pilot program was to validate the effectiveness of smartphone technology for a mileage-based road-funding mechanism and to gather insights to inform the long-term adoption of such a system. In essence, the project aimed to demonstrate a viable model for future road usage charging by showing how an app-based platform can accurately record travel, dynamically charge or credit for road use, and support policy objectives such as congestion management. The pilot's design and evaluation were structured around five key goals that encapsulate this purpose. These goals were defined in the original grant application and guided both implementation and the metrics used to measure success. Each goal addresses a critical aspect of feasibility or impact for a user-based charging system:

- Goal #1: Demonstrate the capability, reliability, and scalability of a smartphone-based crediting system for targeting geofenced locations in the DFW region. This goal was examined for the Technology Assessment, found in Chapter 3.
- Goal #2: Identify evidence-based policy recommendations regarding revenue allocation, preservation of personal privacy, and equity. This goal was examined for the Policy Assessment, found in Chapter 4.
- Goal #3: Explore the potential for market-based congestion mitigation on targeted locations in the DFW region. This goal was examined for the Mobility Assessment, found in Chapter 5.

- Goal #4: Determine the ease of public acceptance for different users of the system. This goal was examined for the Public Engagement Assessment, found in Chapter 6.
- Goal #5: Confirm the administrative and cost burden of implementing the user-based alternative revenue mechanism. This goal was examined in the Administrative Assessment, as presented in Chapter 7.

Together, the five goals provided a comprehensive evaluation framework for the Miles Matter pilot, ensuring it addressed the technical performance, policy integration, user perspective, and administrative practicality of a road usage charging approach. In the chapters that follow, this report evaluates the extent to which the pilot met each of these goals and provides insights for future RUC efforts.

Chapter 2. Evaluation Approach

This chapter outlines the evaluation approach used to assess the implementation and outcomes of the Miles Matter pilot project. Consistent with the project goals and stated benefits, the evaluation was designed to assess the extent to which the pilot achieved its objectives in technology performance, policy readiness, mobility, public engagement, and administrative feasibility. To support the evaluation, the project team implemented a mixed-methods framework that combined quantitative analysis of travel behavior with qualitative assessments of participant experience and program operations.

The evaluation approach centered on five key components: (1) participant recruitment, (2) incentive design, (3) data collection, (4) sample sizes, and (5) data analysis. Each of these components is detailed in the following sections. Together, they describe the procedures, sources, and methods that underpinned the assessment of pilot effectiveness, providing a foundation for the findings reported in the chapters that follow.

Participant Recruitment

Participant recruitment for the Miles Matter pilot was conducted using the existing GoCarma user base in the DFW region. Rather than opening enrollment to the general public, the team invited a randomly selected subset of active GoCarma users to join the pilot (primarily those already using the tolled express lanes). Invitations were delivered in-app via GoCarma notifications and by email, prompting users to opt in to the Miles Matter program. Upon opting in, each participant was automatically assigned to either a treatment group (approximately 75% of recruits) or a control group (25%) for experimental evaluation. This ensured that only the treatment group received behavior-based incentives, while the control group did not, providing a basis for comparison. All participants, however, were eligible for baseline rewards (points) for initial activities (as described below), regardless of their assigned group.

Recruitment was conducted in multiple phases from fall 2024 through early 2025. The first phase launched in early September 2024 and targeted a small group of GoCarma users who had recently traveled on a chosen pilot corridor (I-35W). Subsequent waves in October 2024, November 2024, and January 2025 expanded the pool by inviting additional users, often targeting those traveling specific corridors of interest (e.g., I-35E for an alternative-route incentive, as described later). Table 1 shows the number of participants recruited and enrolled by specific dates and project phases.

To maximize enrollment, the project team experimented with different invitation messaging strategies during the initial phases. Three versions of the invitation message were A/B tested: a neutral, information-focused message (Version A); a more personalized, enthusiastic message (Version B, e.g., “Congratulations, you have been chosen!”); and an urgency-themed message emphasizing a limited-time opportunity (Version C). These messages were delivered through both email and in-app prompts. Response rates were closely monitored, and Version B, the more engaging version, proved most effective at converting invitations to sign-ups, informing the messaging approach for subsequent recruitment rounds. Regardless of messaging, the opt-in

process was simple. Invitees could tap the in-app notification or email link, review the program terms and conditions, and confirm their enrollment in the Miles Matter pilot. Once enrolled, they were prompted to update and grant the necessary app permissions (e.g., location access for GoCarma) and thereby became eligible to earn points. Figure 2 shows visual representations of the in-app invitations for both Version A and Version B.

Table 1. Phases of Participant Recruitment

Start Date	Number Invited	Cumulative Number of Opt-in Participants
Sept. 3, 2024	560	125
Oct. 1, 2024	598	270
Nov. 18, 2024	1,646	440
Jan. 15, 2025	4,567	808
Mar. 4, 2025	92,052	3,970

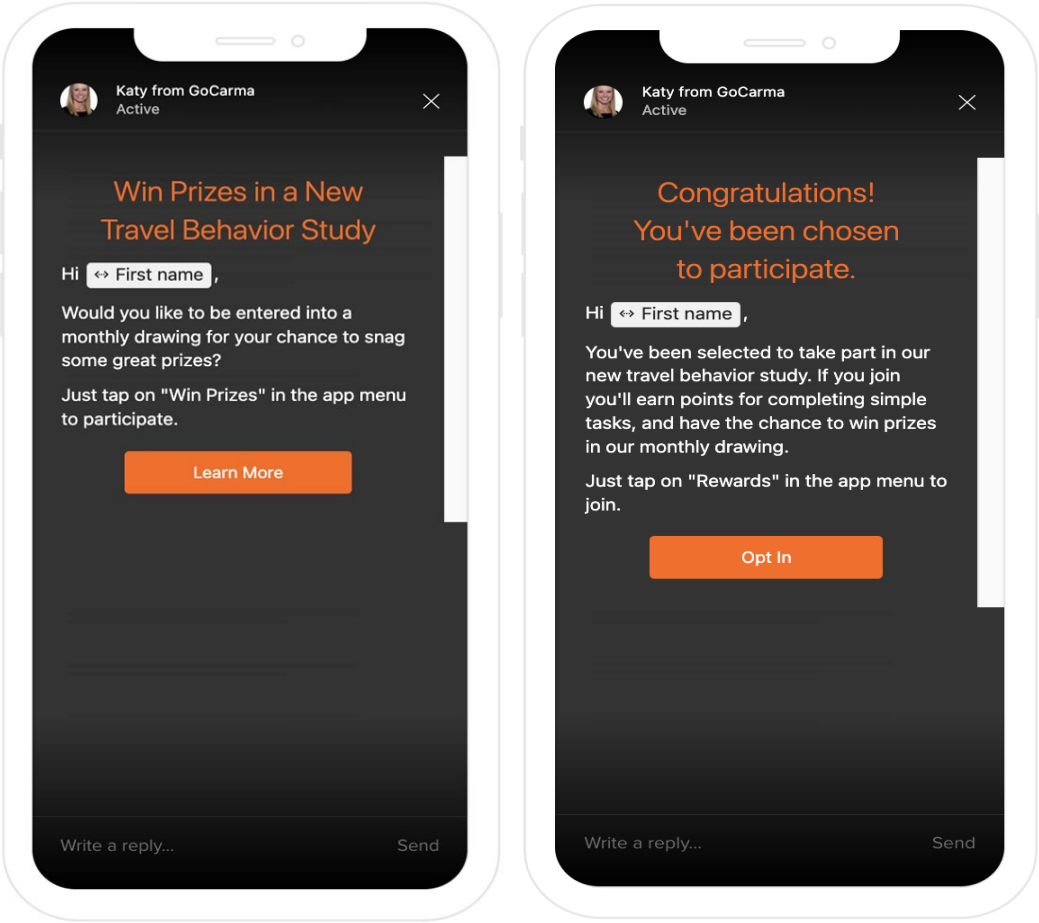


Figure 2. In-App Invitation with Version A (left) and Version B (right)

Notably, the recruitment strategy included immediate incentives for joining to encourage participation. Upon enrollment, users received a 500-point sign-up bonus. They could earn an additional 400 points for completing an initial baseline survey and 200 points for submitting a starting odometer reading (used to validate mileage). These onboarding incentives were provided to all participants (treatment and control alike) and were communicated in advance in the invitation materials to encourage participation. The program offered points that could be used as entries for cash-prize drawings, thereby increasing participation. In short, the participant recruitment process leveraged the existing GoCarma user network through targeted in-app invitations and an opt-in system, coupled with small upfront rewards, to achieve a sizable cohort enrolled in the pilot.

Incentive Design

Once participants were enrolled, the Miles Matter pilot implemented a structured incentive program integrated into the GoCarma app to encourage specific travel behaviors. The incentive design was grounded in two broad objectives: reducing congestion and reducing emissions on targeted highways in the DFW region. To support these objectives, the team defined a set of behavioral incentives, each corresponding to a desirable travel behavior, and assigned a point value to each occurrence of that behavior. The following summary notes the key parts of the incentives framework:

Off-Peak Travel (Travel Timing Shift): Participants were rewarded for avoiding the busiest rush-hour periods. For example, traveling on the heavily congested I-35W corridor during the “shoulder” periods just outside the morning peak earned 75 points per trip. Specifically, trips on I-35W taken in the early morning (5–7 a.m.) or late morning (9–11 a.m.), rather than the 7–9 a.m. peak, qualified for this incentive. This off-peak incentive was the first to launch (in September 2024) and aimed to spread out peak demand by encouraging commuters to shift their travel times.

Alternative Route Use: To reduce congestion on a major freeway, the program incentivized drivers to use a parallel arterial route. For instance, when the project expanded in late 2024, I-35E commuters could earn 75 points for diverting to Harry Hines Boulevard rather than driving on I-35E. This reward for using a less congested route was available at any time of day. It targeted users with a history of frequent I-35E travel (the app identified eligible users based on their past travel patterns). By rewarding the use of Harry Hines Blvd., the incentive encouraged drivers to redistribute traffic away from a congested interstate.

High-Occupancy Vehicle (HOV) Travel: To promote additional carpooling within an existing carpool verification program, the pilot offered point rewards for using high-occupancy modes on select corridors. Beginning in early 2025, participants earned 75 points per carpool trip during peak periods (6:30–9 a.m. or 3–6:30 p.m.) and 40 points per carpool trip at off-peak times on designated facilities. This was implemented on the I-30 TEXpress lanes and the I-20 corridor, both of which benefit from increased HOV use. The GoCarma app’s existing functionality to detect HOV status (via Bluetooth passenger pairing) enabled this incentive. One objective during the pilot was to reduce solo driving by making carpool trips more rewarding.

Trip Avoidance on Targeted Days: Recognizing that not driving at all can be the most effective way to reduce congestion and emissions, Miles Matter included incentives for avoiding travel on specific days. For example, the program periodically designated specific dates or locations (e.g., particularly congested "Do Not Travel Thursdays" on specific corridors) on which participants could earn 200 points for not taking a trip on that route on that date. Similarly, on officially declared Air Quality Action Days (days with poor air quality forecasts in the region), participants received 200 points for avoiding driving on those days. The avoidance incentives were designed to test whether modest rewards could influence people to eliminate or reschedule trips that contribute to congestion and pollution.

Try Transit: In a limited test, the program also tested an incentive to use the Dallas Area Rapid Transit (DART) Red Line, which operates parallel to US 75. For a small subset of users, the app offered a one-time reward (e.g., 200–400 points) for taking the Red Line. This transit incentive was not widely deployed but was used to gauge interest and the feasibility of encouraging mode shift through the app's reward system. It was delivered as a targeted in-app challenge (e.g., "Try a transit trip this week for 200 points") and integrated with GoCarma, allowing users to self-report or have GPS confirm a transit station visit.

A summary of key incentive details for the Miles Matter project, including corridor information, start and end dates, is shown in Table 2.

Table 2. Applied Incentives by Selected Corridor

Travel Behavior	Corridor	Start and End of Incentive
Travel in Shoulder Times	I-35 W	Sept. 3, 2024 to Aug. 31, 2025
Travel on a Less Congested Route	I-35E, Harry Hines Blvd	Nov. 18, 2024 to Aug. 31, 2025
HOV use	I-20, I-30	Jan. 15, 2025 to Aug. 31, 2025
No Trips on Thursday	All selected corridors	Mar. (20, 27) and Apr. (3, 10), 2025
Transit Use	DART Red line	Apr. 18, 2024 to Aug. 31, 2025
Air Quality Bonus	All selected corridors	July (2, 18, 29, 30, 31) and August (1, 5, 6, 12, 13, 20), 2025

In addition to behavior-based incentives, all participants could earn points for basic program participation: 500 points for enrolling, 400 points for completing the initial survey, and 200 points for each odometer photo submission. These served as foundational incentives to encourage engagement and data collection. Odometer readings were used to cross-check reported mileage. However, only the treatment group was eligible for ongoing travel-behavior incentives (e.g., off-peak travel, route choice), whereas the control group accrued only the basic points. The differentiation was intentional because it created an experimental control to evaluate the effects of travel on outcomes with versus without behavioral rewards. Table 3 summarizes the points that could be earned for each incentive, depending on whether the participant was in the treatment or control group.

Table 3. Points Earned for Each Incentive

Participation Type	Incentivized Behavior	**Incentive**
Both control and treatment groups	Opt-in	500 points
	Survey submission	400 points (Survey 1 and 2) 800 points (Survey 3)
	Odometer reading upload	200 points
Treatment group only	Driving during an uncongested time	75 points for each trip
	Using an uncongested route	75 points for each trip
	Using a higher occupancy (carpool)	75 points per carpool (peak) 40 points per carpool (off-peak)
	Not taking a Thursday trip	200 points
	Using transit	75 points per ride (peak) 40 points per ride (off-peak)
	Not taking a trip during bad air quality	200 points

Rather than paying cash per mile or per trip, Miles Matter used a points-based raffle to distribute monetary rewards. Each point a participant earned effectively served as a raffle entry into a monthly prize drawing. At the end of each month, the system randomly selected winners from the pool of entries (e.g., points) and awarded a total of $5,950 in cash prizes. The prize structure was tiered to include a $2,500 Grand Prize (1 winner), $750 Second Prizes (2 winners), $200 Third Prizes (6 winners), plus a $750 bonus prize reserved for one high-participation user (drawn from those earning at least 1,500 points in the month). This lottery-style mechanism was chosen because it could offer a few participants substantial rewards, even with limited funding, thereby making the incentives meaningful without requiring large payouts to every user. The integration of this system into the app meant that users' points automatically translated to drawing entries. Winners were notified and received their prizes outside the app (e.g., via gift cards or checks managed by the program). The incentive design and delivery were fully app-based, from detecting trips and assigning points to tracking entries for the prize lottery. The process attempted to create a seamless experience for participants. This framework established the basis for evaluating whether such incentives could indeed influence travel behavior, as discussed in later chapters.

Data Collection

To support the evaluation of the Miles Matter pilot, the project team employed a variety of data sources and collection methods. Broadly, the project collected automated transactional data on participants' travel via the GoCarma system, administered surveys to assess participants' attitudes and self-reported behavior, and compiled additional data from stakeholders, external sources, and project documentation to supplement the analysis. This section summarizes each of these data collection efforts.

Odometer Reporting

In addition to app-recorded transactional travel data, the Miles Matter pilot also tested odometer-based mileage verification workflows commonly used in road usage charge (RUC) programs to establish an auditable, vehicle-level record of total miles traveled. Odometer reporting is often treated as a “low-tech” option in RUC program design because it can be collected through periodic photo submissions or existing administrative processes (e.g., inspection/registration) and can serve as an independent check on other mileage-reporting channels.

Carma emphasized that this element of the pilot was intentionally designed to demonstrate how a smartphone-based system can verify odometer status without requiring plug-in OBD-II devices, which is highly relevant to evaluating the scalability of alternative mileage-reporting approaches. During the pilot, odometer verification was implemented through two complementary pathways: (1) odometer photo verification and (2) automatic odometer verification via connected-vehicle telematics.

Odometer photo verification (smartphone capture): A total of 372 participants used the monthly odometer photo feature, uploading odometer images 542 times. Participants qualified for 200 points in each month they submitted a verified odometer photo (treatment group incentive). To strengthen integrity and reduce the risk of fraudulent submissions, the app used optical character recognition (OCR) to read the odometer value and applied additional verification checks, including verification of the vehicle's Bluetooth ID and review of image metadata.

Automatic odometer verification (telematics integration): Beginning April 22, 2025, the pilot also offered an alternative method in which participants could submit odometer readings automatically after completing a one-time authentication step, provided they had an active connected-services account for their vehicle. GoCarma integrated with Smartcar (a connected services aggregator) to enable this capability across participating vehicle manufacturers that offered API access. Through this telematics pathway, Carma reported that it automatically retrieved odometer data from 19 vehicles during the pilot.

Transactional Data (App-Recorded Travel)

The primary data backbone of the evaluation was an extensive set of trip transaction records automatically collected by the GoCarma smartphone application and its cloud back office. Whenever a participant drove through one of the geofenced Miles Matter corridors, the app logged a transaction record that captured detailed information about the trip. Each record included fields such as start/end times, GPS coordinates along the route, distance traveled within the corridor, duration, average speed, and whether the trip occurred in a general purpose, tolled or HOV lane. These data were transmitted in real time to the system’s servers.

Over the pilot period from September 2024 to August 2025, the system recorded a substantial volume of transactions. Approximately 12.4 million logged trips occurred during the pilot, accounting for about 64.1 million vehicle miles traveled (VMT) by participants on the tracked corridors. In total, 41,600 unique travelers had their road usage captured in the system’s database, which includes not only the incentivized pilot participants but also other GoCarma

users whose travel fell within the geofenced routes. To demonstrate the technical capability to handle tens of thousands of users, the Miles Matter program evaluated trip records collected passively from travelers using the existing carpool verification program, but did not enroll participants in the behavioral incentives. Considering a larger sample of passive participants helped evaluate the program's other administrative capabilities. Carma noted that the capability to process distance-based transactional data was not a preexisting feature of the HOV verification program and required new development for this project.

All transactional data was stored securely and accessible only to the evaluation team via both direct data exports and interactive dashboards. The project's technology partner (Carma) provided a Road Transaction Dashboard, which summarized key metrics across the corridors. This dashboard (as described further in the Technology Assessment chapter) allowed the team to view total trips, total VMT, average trip length, trip durations, average speeds, and number of travelers for each corridor and time period. It also distinguished between travel on tolled and non-tolled lanes and facilities. Using these tools, the project team could, for example, query how many off-peak trips were taken on I-35W in a given month, or the total VMT on the alternate route (Harry Hines Blvd) versus the parallel I-35E freeway. The data from the dashboards was backed by raw data tables that could be downloaded for more granular analysis outside the platform as needed.

Participant Survey Data

The project team conducted three surveys of pilot participants to collect qualitative and self-reported data, complementing the app's quantitative travel logs. These surveys were administered at key stages of the pilot. They served multiple purposes: (1) capturing participants' demographic profiles and baseline travel behavior, (2) gauging their experience and satisfaction with the program, and (3) recording any changes in their attitudes or behavior over time. The surveys were administered online via a survey platform, with recruitment conducted via the app and email. Key details for each survey are as follows:

Survey 1 – Baseline Intake: The first survey was launched in early September 2024, at the start of the pilot, coinciding with initial enrollment. New participants were prompted to take the survey soon after opting into the program. This questionnaire was the most extensive of the three, with 40 questions, because its primary role was to establish a baseline profile of the participants. It collected demographic information (e.g., age, income) and details about current travel behavior (e.g., commute frequency, ability to flex work schedules). The first survey also asked about the ease of onboarding and installing or updating the GoCarma app. The survey remained open throughout the pilot so that participants who joined slightly later in subsequent recruitment waves could still provide baseline data.

Survey 2 – Mid-Program Follow-Up: The second survey was administered beginning in February 2025, approximately midway through the pilot. Its timing allowed participants to accumulate experience and earn points. The second survey was shorter, with 27 questions, and focused on participant experiences and feedback up to that point. It asked about user satisfaction with specific Miles Matter features within the GoCarma app, any technical issues encountered, and whether participants had noticed changes in their own travel behavior due to the incentives. Many questions from Survey 1 were repeated in Survey 2 to track changes.

Survey 2 also asked users how often they checked the app, whether they understood the rewards process, and their views on the incentive rewards (e.g., “Are the point rewards motivating you to change when or where you drive?”).

Survey 3 – Final Evaluation Survey: The third survey was distributed from July 2025 onward, near the end of the pilot period. By this time, early participants had nearly a full year of exposure to the Miles Matter program. The third survey served as a summative evaluation, asking many of the same questions as the prior surveys to capture end-of-pilot attitudes, along with new questions about specific perceptions and future intentions. In particular, Survey 3 asked participants to reflect on whether the program had affected their long-term travel habits, how they felt about the concept of a road usage fee with incentives after having participated, and their opinions on the fairness and impact of such a program. It also included questions about whether they would continue using an app such as GoCarma for incentives or participate in a similar program again.

All survey responses were collected and stored for later analysis. In total, Survey 1 had 1,413 respondents, Survey 2 had 375, and Survey 3 had 209. The response numbers indicate that not all participants remained active or willing to complete subsequent surveys. The level of response provides a robust sample for understanding participant views. For example, the Survey 1 responses represent approximately 36% of all enrolled participants, a high response rate for an opt-in survey. The survey data are used extensively in the Public Engagement Assessment to evaluate user acceptance and, in parts of the Mobility Assessment, to evaluate self-reported behavior change alongside observed transactional data.

Other Data Sources

Beyond the core participant-generated data, the Miles Matter evaluation drew on several supplementary data sources to enrich the analysis. These data included stakeholder surveys and staff feedback, project administrative data, regional congestion data, and air quality data.

The evaluation team conducted qualitative interviews with key project stakeholders, including Carma program developers and NCTCOG staff who managed the pilot's day-to-day operations. The interviews provided insights into the implementation process, including the technical challenges faced, user feedback, and any policy or administrative considerations that arose. Interview feedback was not formally quantified. However, it was used to contextualize the findings. For example, understanding the process for exchanging data between agency partners (e.g., handling toll charges between Carma and NTTA). The Administrative Assessment chapter leverages this information to discuss the pilot’s operational lessons, with insights provided throughout the other chapters.

The team collected various internal data logs and records generated during Miles Matter operations. For instance, registration and activation timestamps for each participant were obtained, allowing analysis of how quickly users joined after being invited and how long it took them to start logging trips. A detailed rewards ledger was also examined, which recorded every point transaction awarded to participants. The ledger data enabled analysis of which incentives were most frequently used (e.g., how many total points were awarded for off-peak travel versus HOV trips) and validation of the count of active participants (those who earned points).

Additionally, customer support tickets and inquiries were reviewed. During the pilot, participants could contact support through the app or email with issues or questions. Customer service information was fed into the Public Engagement Assessment (to gauge user difficulties) and the Technology Assessment (to identify any system reliability issues). In short, these administrative datasets provided a behind-the-scenes look at user engagement and system performance beyond the trip data alone.

To place the pilot's outcomes in a broader regional context, external data on regional traffic and travel conditions were analyzed alongside the pilot data. The evaluation examined regional traffic volumes and speeds on the targeted corridors, using sources such as TxDOT traffic counts and third-party speed data. Additionally, regional VMT data were used to compare the pilot's tracked miles with broader travel activity. The VMT from the pilot participants was a tiny fraction of regional travel (well under 1%), so these data were not a primary consideration for further analysis. Because one of the incentives was related to air quality, the evaluation also incorporated data on which days were designated as "bad air quality days" for the region. The dates of Air Quality Action Days in the DFW area during the pilot were obtained from environmental agencies, as these are the days when ozone pollution levels were forecasted to be high.

Participant Sample Sizes

The Miles Matter project had multiple objectives and, accordingly, employed different sample sizes to test different hypotheses. The project used credits to mimic fees within a road usage charge architecture, but to examine the technology's scalability to process millions of transactions, the project team analyzed passive data collected from existing GoCarma carpool verification travelers who did not specifically sign up for the credit-based incentives. Additionally, the project team used both a treatment and a control group to assess the impact of various travel behavior incentives within the broader user population. To help keep the context straight, these are the key figures that reflect the scale of participants analyzed across the different user groups:

- 92,052 total active GoCarma users.
- 41,600 users who traveled on the selected Miles Matter corridors.
- 3,970 participants who enrolled for travel behavior incentive and credits (roughly 4.3% opted in from all GoCarma users).
- 2,968 were assigned in the treatment group for the incentive program (roughly 74.8% of enrolled participants).
- 2,679 treatment group participants made trips during the program
- 1,874 treatment group participants earned points from trips that qualified as part of the incentive program (e.g., shifted times, HOV use, alternative route).

The Technology Assessment (Chapter 3) evaluates system performance using data from the complete set of 41,600 travelers whose trips were recorded by the system. In contrast, the Mobility Assessment focuses on the nearly 3,970 individuals who opted into the project's incentive component. The travel behavior component focuses on the 1,874 participants who earned points for traveling through the corridors during the incentive period and compares them with the control group. Lastly, the Public Engagement Assessment draws on the three surveys,

with sample sizes ranging from 1,413 in the initial survey to 209 in the final survey. The survey response rate tapered as the pilot progressed (which is common in longitudinal studies). However, it still yielded a significant sample for capturing user feedback at each stage of the project.

Table 4 summarizes the number of participants with trip records, the total number of trips, and the number of trips per participant for the entire project period, by corridor and in total. Among participants with trip records, the control group averaged 575 trips per participant, whereas the treatment group averaged approximately 598.

Table 4. Number of Trips and Trips Per Participant by Corridor

Corridor	Number of Trips			Number of Trips Per Participant		
	Control	Treatment	Total	Control	Treatment	Total
I-35W	68,274	187,907	256,181	148	141	143
I-35E	12,654	37,363	50,017	74	64	66
HH Blvd	3,318	9,713	13,031	72	93	87
I-30	3,951	12,639	16590	116	104	106
I-20	31,612	104,979	136,591	164	197	188
Total	119,809	352,601	472,410	575	598	590

Note: HH Blvd is Harry Hines Boulevard, the parallel arterial to I-35E in Dallas.

Data Analysis

The Miles Matter evaluation employed a mix of quantitative and qualitative methods to assess the pilot's outcomes against the original goals outlined in the grant application. This section outlines the overarching analytical approach, including how different groups and time periods were compared and how qualitative feedback was handled. The guiding principle was to objectively measure changes attributable to the pilot incentives by using a control group and baseline data, while also interpreting those changes (or lack thereof) through the lens of participant feedback and external context.

Comparative Study Design for Behavioral Analysis

Because the pilot was structured with a treatment group (with incentives) and a control group (without incentives), the evaluation leveraged an experimental design to assess behavioral outcomes. In practice, this meant that, for key outcome measures, the analysis compared the before-and-after changes in the treatment group with those in the control group. Each participant effectively served as their own baseline (pre-pilot travel data were obtained from GoCarma records before the incentives), and the control group provided a baseline trend to account for external factors (e.g., seasonal traffic variations unrelated to the pilot).

By subtracting the control group's changes from the treatment group's changes, the approach isolated the effect of the incentives. For example, if both groups reduced their peak-period travel by similar amounts, that suggests an external cause (not the incentive), whereas a greater

reduction in the treatment group would indicate a likely impact of the incentive. This analytic framework was central to the Mobility Assessment. The evaluation team calculated metrics for the “pre-incentive” and “during-incentive” periods for each participant, then aggregated them within groups to identify statistically significant differences in outcomes. The comparative method was supplemented with visual analyses (e.g., time-series trend charts) to confirm that the treatment and control groups exhibited similar trends prior to the incentives, thereby strengthening the validity of any observed post-incentive divergence.

Longitudinal Survey Analysis

For the survey data, the analysis was primarily descriptive and comparative over time. Since Surveys 1, 2, and 3 included many of the same questions, the evaluators tracked how responses changed from the baseline to the midpoint to the final. This essentially created a before-during-after view of participant attitudes and perceptions. These results were often presented side by side across the three surveys to illustrate trends. For example, the percentage of participants who were “very concerned” about privacy was recorded across Surveys 1, 2, and 3 to examine whether comfort with the app improved over time. The analysis sought notable shifts, such as increased understanding of the program or changes in support for mileage fees following participation. The survey responses were compared with the observed data (i.e., transactions from the app) to ensure consistency and, if needed, add context. All survey findings are primarily integrated into the Public Engagement chapter, with selective use in other chapters to support the assessment of specific objectives.

Analysis of Open-Ended Responses

Qualitative data played an essential role in the evaluation, especially in understanding why specific outcomes occurred. The evaluation team analyzed open-ended survey responses using thematic coding. For each open-ended survey question (e.g., “Do you have any suggestions to improve the Miles Matter program?”), the evaluation team reviewed the comments and categorized them into common themes. The frequency of each theme was recorded to identify the most common issues. In the report, these qualitative insights are used to explain quantitative patterns, such as why some users felt the credit-based system was unfair (e.g., “Incentives need to be continuous because congestion happens all the time, not just during peak periods.”). The Administrative Assessment uses quotes and summarized staff feedback to complement quantitative cost or performance data. The Public Engagement Assessment highlights participant quotes to make the statistics relatable (without revealing any personal identifiers).

Integration and Synthesis

Each assessment area of the evaluation (e.g., Technology, Policy, Mobility, Public Engagement, and Administrative) had specific metrics and analysis techniques. The Technology Assessment primarily involved calculating system performance metrics (e.g., uptime, transaction volume) from transactional data and comparing them with user expectations and administrative requirements. The Policy Assessment combined quantitative data to assess whether miles could be aggregated by specific political boundaries (e.g., VMT by county), and a qualitative review of privacy protections and interoperability processes, using technical documentation and

staff interviews as sources. The Mobility Assessment relied heavily on the travel analysis techniques previously described. The Public Engagement Assessment primarily relied on survey analytics to identify trends in user feedback. Finally, the Administrative Assessment used cost data from Carma and the original grant application to estimate total costs if the program operated with one million participants, and drew on staff interviews to assess overall administrative burden.

Chapter 3. Technology Assessment

The key goal of the Miles Matter project was to demonstrate the capability, reliability, and scalability of a smartphone-based crediting system for targeting geofenced locations in the DFW region. This Technology Assessment evaluates how well the pilot achieved that goal by examining four key areas: (1) Recording Road Usage Data, (2) Scalability for Large Volumes of Road Users, (3) Ease of Applying and Adjusting Credits, and (4) Applying Credits for Targeted Locations. Each section analyzes qualitative and quantitative metrics (e.g., time-to-activation, system uptime, recorded VMT, scaling capacity, rule-update capability, credit distribution, interoperability) derived from system data and stakeholder feedback.

The GoCarma smartphone application and its cloud-based back office form the technical backbone of Miles Matter; therefore, this assessment highlights its performance and adaptability. The results show that the smartphone-based system successfully recorded a large volume of trips and miles, with the potential to scale to a million users with minimal issues, provided flexible administration of incentive rules, and effectively applied credits for travelers. Key findings and metrics are summarized in each section, and a summary of findings is provided at the end.

Recording Road Usage Data

By the end of the pilot in August 2025, the GoCarma app recorded 64.2 VMT across the geofenced project corridors, spanning 12.4 million transactions (or trips) by 41,600 unique users. The app automatically tracked each participant's travel within defined corridor geofences. It captured detailed trip information, including distance, duration, speed, and location coordinates for each road segment and travel mode. Furthermore, more than 90% of participants reported that they could easily view the points and trip records in the app, indicating high transparency and user trust in the data logging. By the final survey, 95% of users reported being able to verify when and where they received rewards in the app.

Table 5. Road Usage Key Statistics During Miles Matter Pilot

Metric	Value Recorded
Unique travelers	41,600 travelers
Road use transactions logged	12.4 million
Vehicle miles traveled	64.2 million miles
Passenger miles traveled	93.2 million miles
Average trip distance	5.2 miles
Average trip duration	6 minutes, 21 seconds

At the trip level, the GoCarma application generates a structured record every time a participant's smartphone is detected within a Miles Matter geofence. For each corridor transaction, the system logs the start and end timestamps, GPS coordinates, and the distance and duration of travel within the geofenced limits. These fields are then used to compute core

performance measures, including VMT, passenger miles traveled (PMT), average trip distance, average time within the corridor, and average speed by facility and time period. For example, the pilot statistics table shows that in August 2025 (the final month of the project), the system logged approximately 5.6 million vehicle miles across roughly 1.09 million transactions, with an average trip distance of approximately 5.1 miles and an average in-geofence duration of approximately 6 minutes 20 seconds. Analysts can access similar month-by-month records for the entire pilot period, demonstrating that the smartphone platform consistently captured detailed distance, duration, and speed information for millions of individual trips.

Odometer Photo Verification

The Miles Matter app enabled participants to verify vehicle mileage by photographing their dashboard odometer. In this approach, users periodically capture an image of the odometer display, and the system uses optical character recognition (OCR) to read and confirm the recorded mileage. This self-report method is straightforward to implement on smartphones and requires no extra hardware beyond the driver's mobile device. It aligns with industry practice of offering "odometer photo" submissions as a mileage reporting option. In the pilot, the feature proved technically feasible: the app successfully extracted mileage readings from submitted photos under typical lighting conditions. Most personal vehicles have digital odometers that are easily legible in photographs, and the OCR algorithm converted the images into accurate mileage readings for billing or incentive purposes.

During the pilot period, 372 unique participants chose to use the odometer-photo option. Collectively, they submitted 542 verified readings of their odometer mileage (on average, about 1.5 submissions per participant). Each monthly submission earned a reward credit under the program. These vehicles were standard passenger cars with digital odometer displays, and no special vehicle features were required.

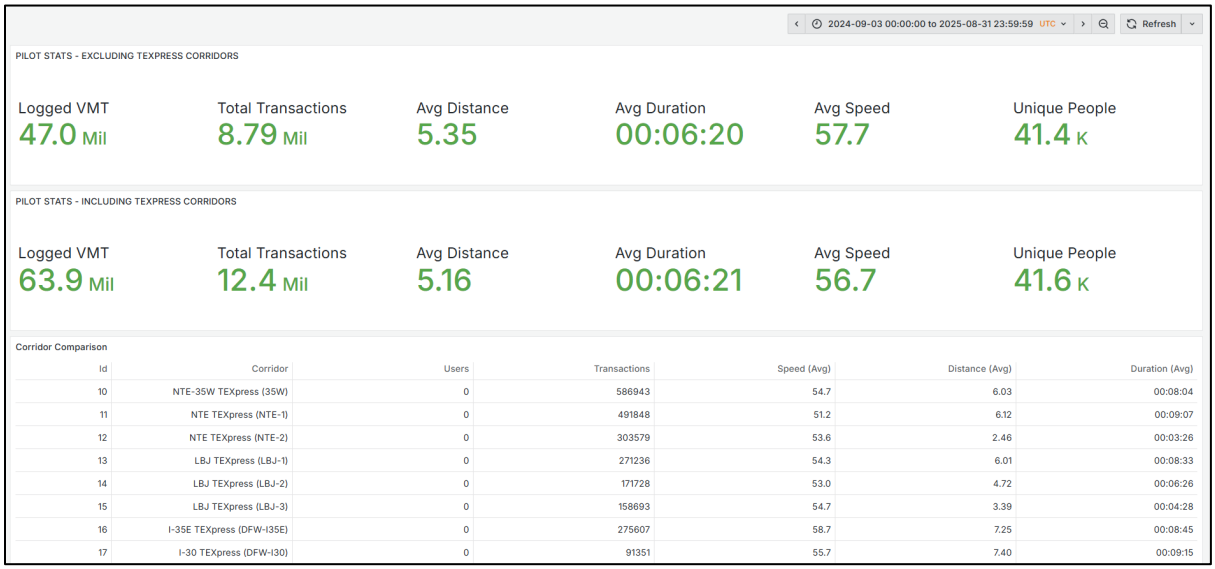
Vehicle Telematics

In parallel with manual photo uploads, the Miles Matter system leveraged built-in vehicle telematics to automatically collect odometer data. Embedded telematics (factory-installed systems in modern vehicles) can continuously report accurate mileage without driver action. In practice, participants with compatible vehicles who opted into this feature linked their vehicle data to the app. The Carma platform then automatically polled the vehicles' on-board computers (via Bluetooth or manufacturer cloud services) to retrieve odometer readings.

This method was technically successful for the subset of users with connected-car capabilities. More than 70% of new vehicles already include telematics as standard, and the pilot confirmed that integration was feasible for many makes. In total, the system automatically retrieved mileage from 19 vehicles owned by participants. These vehicles spanned 13 different makes, including: BMW, Buick, Chevrolet, Ford, GMC, Hyundai, Kia, Lexus, Lincoln, Subaru, Tesla, Toyota, and Volkswagen. Mileage updates were collected automatically each day that the app was active, so there was no need for participants to submit readings manually.

Interactive Dashboards

This level of detail is reflected in the GoCarma dashboards. The road transaction dashboard reports, for both TEXpress and non-TEXpress facilities, total VMT, total transaction counts, average trip distance, average trip time, average trip speed, and the number of unique travelers. At the individual corridor level, the same dashboard provides corridor-specific totals for travelers and transactions, as well as corridor-level averages for speed, distance, and duration. Figure 3 shows a screenshot of the Road Transaction Dashboard.



Id	Corridor	Users	Transactions	Speed (Avg)	Distance (Avg)	Duration (Avg)
10	NTE-35W TEXpress (35W)	0	586943	54.7	6.03	00:08:04
11	NTE TEXpress (NTE-1)	0	491848	51.2	6.12	00:09:07
12	NTE TEXpress (NTE-2)	0	303579	53.6	2.46	00:03:26
13	LBJ TEXpress (LBJ-1)	0	271236	54.3	6.01	00:08:33
14	LBJ TEXpress (LBJ-2)	0	171728	53.0	4.72	00:06:26
15	LBJ TEXpress (LBJ-3)	0	158693	54.7	3.39	00:04:28
16	I-35E TEXpress (DFW-I35E)	0	275607	58.7	7.25	00:08:45
17	I-30 TEXpress (DFW-I30)	0	91351	55.7	7.40	00:09:15

Figure 3. Screenshot of Miles Matter Road Transaction Dashboard

The companion GoCarma Metro dashboard, as seen in Figure 4 extends this further with a map-based view that displays total vehicle miles and passenger miles, hourly and daily volumes, and the share of travel by occupancy category (e.g., SOV vs. HOV2+) for any selected corridor or group of corridors over a user-defined time window. Together, these tools confirm that the system captures and organizes the underlying location coordinates into a set of robust, multidimensional metrics suitable for detailed corridor analysis.

Qualitative feedback from NCTCOG, NTTA, and other project partners reaffirms the relative ease of recording road use. According to NCTCOG staff, the smartphone-based GPS tracking has been effective in identifying specific roadway segments and travel modes with a seemingly high degree of accuracy. In practice, the system distinguishes between TEXpress and adjacent non-tolled lanes, attributes trips to the correct study corridor, and determines whether a vehicle is operating as a single-occupant or HOV trip within a tolled managed lane. NCTCOG staff favorably compared the Miles Matter program with plug-in OBD-based approaches, noting that the smartphone system generated fewer user complaints, was easier to administer, and provided greater flexibility for segmenting and analyzing travel by location and mode. As a result, the GoCarma platform provided a granular view of road usage that is difficult to achieve with traditional data-collection technologies, relying solely on geofenced GPS and passively collected sensor data from participants' smartphones.

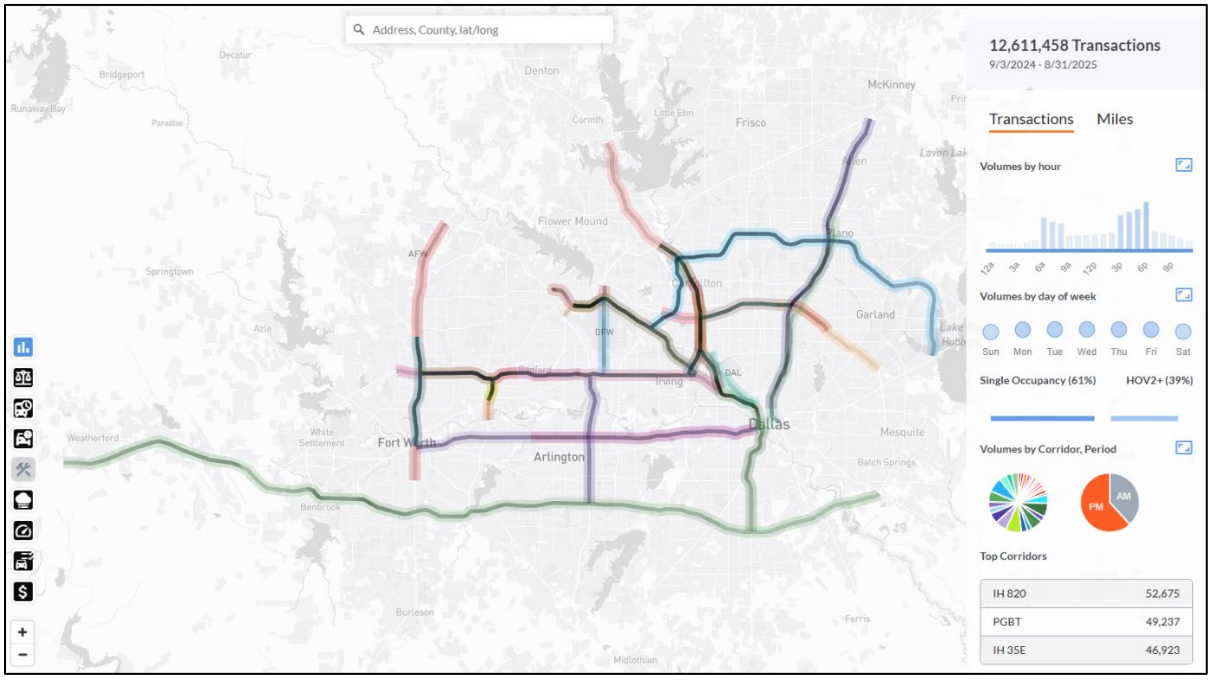


Figure 4. Screenshot of the GoCarma Metro Dashboard

Consistency and Reliability

As shown previously in Table 5, the system successfully recorded a large volume of targeted travel data. Vehicle miles and trip records were tracked on each corridor with no notable data loss. Notably, system logs show consistent monthly active usage of around 25,000–30,000 users throughout the pilot, demonstrating sustained engagement (e.g., an average of 27,763 monthly active users). The data collection process was entirely automated once users installed or updated the app. No additional user action was required to report mileage, unlike odometer-based pilots that required manual readings or device installation.

The GoCarma platform proved reliable for maintaining trip records. During the pilot, no system outages were reported that caused data gaps. The app included an offline caching capability to record trips when the device was out of range of cellular signals, with a process to synchronize the data at a later time. The system uptime was nearly 100% during data collection, owing to cloud servers that ensured continuous availability.

One important caveat is that formal field validation of the GPS data accuracy was not conducted during the pilot. All parties assumed the smartphone location data were accurate, but an independent audit (e.g., comparing app-recorded distances to ground truth or toll tag reads) was beyond the scope of this pilot. Thus, while capability was demonstrated, the next step toward a more full-scale test is to verify the absolute accuracy and integrity of the mileage data.

NCTCOG staff also noted that to fully transition from credit-based points (e.g., giving travelers money) to actual road charges (e.g., charging travelers fees), the system would need to log

monetary transaction data (e.g., dollars charged per facility and time) in addition to points. Currently, GoCarma's data schema is optimized for point incentives, but it would require augmentation (for example, capturing chargeable miles and rates by jurisdiction) to serve as a revenue system. These are next-step challenges rather than current deficiencies. Within the pilot's scope, the system clearly met the objective of accurately recording road usage data on the targeted corridors.

Scalability for Large Volumes of Road Users

The Miles Matter pilot drew on an existing pool of more than 92,000 GoCarma travelers in the DFW region. Over 41,000 travelers made trips on the Miles Matter corridors during the year of the pilot. Although substantial, the number of GoCarma travelers remains a small fraction of the region's drivers. For context, the DFW region has roughly 8.5 million people and about 6.1 million registered vehicles as of 2024. Thus, active GoCarma users represented only 0.6% of the region's travelers. Even the geofenced Miles Matter corridors accounted for only 476 centerline miles, approximately 4% of TxDOT's on-system road mileage in the region. In short, full regional deployment would require scaling up by orders of magnitude in both geographic scope and participant base. A question for this assessment is whether the technology platform could handle such growth.

Cloud-Based Back Office

Despite the pilot penetration of tens of thousands of travelers, all evidence suggests the system is highly scalable for a million or more users. The cloud-based architecture on Amazon Web Services (AWS) allows GoCarma to "elastically" scale to support a greater user base with minimal incremental cost per user. Whenever demand increases, the platform automatically adds computing and storage resources via AWS auto-scaling and load balancing. In practical terms, expanding from 41,600 travelers to hundreds of thousands would not require any new physical infrastructure or significant slowdowns, only an increase in cloud usage costs. GoCarma's developers confirmed that even a 10%, 20%, or 30% share of all DFW vehicles (i.e., hundreds of thousands of users) could be supported by the current app and server design. The only anticipated scaling challenge would be administrative in nature. Handling a larger customer support load and ensuring user onboarding remains smooth at scale. Those aspects can be addressed with automated support tools and efficient enrollment workflows.

During the pilot, the system consistently exhibited high usage, which increased slightly by the project's end. The monthly logged VMT rose slightly from 4.8 million in September 2024 to 5.6 million in August 2025, with a similar trend in total transactions over that period. The system handled the transaction volume without issue, and data latency remained consistent (no slowdowns in recording or processing were observed). The number of active users per month remained between 23,000 and 32,000 throughout, indicating that the system sustained a steady load. No crashes or extended downtime were reported. The system uptime remained extremely high (at 99.9% availability). Additionally, the system has built-in resilience features. The app logs trips offline when cellular data is unavailable (e.g., in tunnels) and syncs them to the network later, ensuring no long-term data loss.

Table 6. Monthly Statistics from Miles Matter Project

Month	VMT	Transactions	Avg. Distance (mi)	Unique Users
September 2024	4,793,050	925,010	5.18	24,028
October 2024	5,630,239	1,081,246	5.21	34,425
November 2024	5,085,413	981,268	5.18	31,959
December 2024	5,056,057	977,837	5.17	34,096
January 2025	4,925,025	958,653	5.14	26,665
February 2025	4,878,781	948,090	5.15	24,491
March 2025	5,433,599	1,061,766	5.12	26,568
April 2025	5,747,132	1,118,820	5.14	26,407
May 2025	6,093,375	1,187,812	5.13	25,955
June 2025	5,447,115	1,056,711	5.15	23,361
July 2025	5,419,765	1,045,630	5.18	29,988
August 2025	5,600,819	1,088,979	5.14	28,058

Onboarding and Activation

Scalability also depends on how easily new users can join and start generating data. In Miles Matter, this process was rapid and efficient. Because recruitment was conducted via in-app invitations to existing GoCarma users, 51% of those who ultimately joined opted in within 24 hours of receiving the invitation. Once a user opted in, their account became active immediately with no waiting period. As a result, 57% of new participants had logged travel data within one day of enrolling. Compared with hardware-based RUC pilots, near-instant activation is a significant improvement: a new enrollee might wait days to receive a device in the mail and install it before any data flows.

Overall, the pilot demonstrated that scalability is a strength of the smartphone-based system. The combination of cloud infrastructure and an app-based deployment means adding users or corridors is essentially a matter of software configuration, not field installation.

Ease of Applying and Adjusting Credits

A key trait of Miles Matter was its use of technology that facilitated the implementation of policy changes. Over the course of the pilot, NCTCOG staff introduced multiple new incentive strategies (e.g., starting with I-35W time shift, then I-20 HOV incentives) and adjusted parameters in real time. The system design enabled policy changes with minimal effort or disruption. The entire program is smartphone-based, with no physical roadside equipment or in-vehicle devices requiring physical interaction. All geofences and business rules live in software. As a result, adding a new monitoring corridor was as simple as drawing a new geofence polygon in the administrative interface. Carma staff reported that a new corridor could be added in about two minutes of staff time. Once defined in the software, the corridor goes “live” immediately, and the app begins logging trips.

Updating Rules

Likewise, updating the incentive rules was straightforward (e.g., the hours during which "off-peak" credits apply and the days on which the air quality incentive is active). Many rule parameters can be changed through a secure web dashboard by authorized staff. During the pilot, NCTCOG staff primarily focused on designing the initial set of incentive rules, which required upfront consideration of their effectiveness given localized travel behaviors and context. However, once those custom rules were created, the system implemented them quickly with the ability to make further adjustments. For example, adding a "no-drive Thursday" incentive mid-pilot, or implementing non-regular single-day incentives for days with poor air quality (starting in July 2025), could be implemented by NCTCOG staff with little difficulty. The ability to instantly adjust pricing or credit policies—whether based on time of day, corridor, or real-time conditions—is a significant benefit of a cloud-connected smartphone service. Additionally, notifying users of forthcoming policy changes is easier through an in-app message than through physical signage, mailed notices, and paid media for fee policy changes on traditional toll roads.

Staff Perspectives

Interviews with NCTCOG staff underscored that the smartphone-based approach was highly flexible and easy to manage. Most staff effort was devoted to conceptualizing the incentive policies. Once NCTCOG decided on a rule, implementing it in GoCarma was "straightforward and quick". Staff appreciated features such as the ability to easily distinguish which road a user was on (facilitating corridor-specific actions) or to detect whether they were in a tolled managed lane versus a general-purpose lane. This level of detail provided by the app enabled the design of targeted credits (i.e., rewarding only carpool trips that use the TEXpress lanes).

The only significant development work consisted of creating entirely new incentive types that the base software did not already support. For example, the behavioral incentives point system was custom-developed as an add-on feature to an existing carpool verification app. Implementing the rules for point allocation initially required 1-2 days of software development. However, once that capability was implemented, subsequent updates or recalibrations of the rules required minimal effort. This suggests that even if new policy ideas require some one-time coding, the platform can then reuse that functionality in the future. From an administrative burden standpoint, the day-to-day operation of updating rules or adding locations was very low.

Interoperability

The ease of adjusting credits can be further enhanced by integrating external data sources to trigger or inform incentive rules. The GoCarma platform is designed with an API architecture that supports the integration of real-time data, including traffic conditions, air quality readings, and vehicle characteristics. In the pilot, some of the potential flexibility was demonstrated conceptually. For example, the "Air Quality Action Day" incentive was triggered by regional pollution alerts with manual oversight from staff. NCTCOG staff expressed interest in linking GoCarma to vehicle registration data (e.g., DMV records) to identify participating vehicles' makes, models, or emissions profiles. These additional data could enable targeted incentives for high-emitting vehicles or verification of fuel type for potential credits. NCTCOG staff also

suggested using real-time speed and congestion data (from either the app itself or third-party sources) to enable dynamic congestion-based pricing on corridors without managed lanes. GoCarma's developers indicated that the platform could integrate external data streams to provide more adaptive incentives (e.g., increasing point rewards on days of unusual traffic or major sporting events).

Interoperability with toll and other billing systems was also a focus. For example, building on the existing process that Carma uses to credit the 50% peak-period toll discount for carpools that travel on the TEXpress managed lane system. This pilot used non-monetary credits in place of tolls. Nevertheless, an incentive system that uses actual dollars for behaviors would require a more robust mechanism for exchanging financial data. Staff from Carma and NCTCOG both highlighted the need for a central account manager or clearinghouse, if the project uses actual funds, to ensure that all financial data exchanges (between GoCarma, toll agencies, state DMVs, etc.) remain consistent and auditable. Without a single entity managing the transactions, there could be a risk of discrepancies or missed communications. For example, if one agency changes its system, others must be informed of the change. This is a policy and administrative consideration more than a technical flaw. Technically, the platform demonstrated its ability to integrate and share data, but governance protocols must be established among agency partners.

Applying Credits for Targeted Locations

The pilot results show that GoCarma effectively delivered location-specific incentives across multiple corridors and strategies, confirming the viability of smartphone GPS for precise road charging and crediting. Participants in the treatment group earned points for a variety of targeted behaviors, each defined by location and time criteria (2,968 enrolled participants were eligible to earn points for the opt-in behavior incentives).

Each type of behavioral incentive required the GoCarma system to geo-locate the user's travel location and apply the appropriate credit when conditions were met. During the pilot, the system recorded 472,195 total corridor transactions for the treatment group, including tens of thousands of incentive-triggering events. In total, 1,874 users (63% of the 2,968 in the incentive group) earned at least one point by engaging in one or more of the targeted travel behaviors. For example, whenever a participant drove on I-35W during the shoulder period, the app recognized their GPS coordinates and timestamp as eligible and automatically awarded 75 points for that activity. If a traveler used a carpool on the I-20 corridor, the system awarded points based on the number of passengers (all with the GoCarma app) and the corridor location.

The targeting accuracy was high. To the evaluation team, no known cases of credits were awarded in error (e.g., someone receiving an off-peak credit when they actually drove at 8 a.m.). Likewise, if a user met the criteria but did not receive points, NCTCOG could investigate via the trip logs. Such instances were rare and typically attributable to minor GPS signal gaps; overall, the credit allocation was reliable.

Credits by Corridor

A central test of the Miles Matter technology was whether it could reliably recognize when users traveled through specific locations under specified conditions and then apply the correct credits to their accounts. Rather than awarding generic rewards for any mileage, the pilot relied on location- and behavior-based incentives tied to individual corridors and time windows. Examples included off-peak shoulder-period travel on IH 35W, diversion from IH 35E to Harry Hines Boulevard, and HOV use on IH 20 and I-30 TEXpress. Each incentive required the system to (1) detect that a trip occurred within a particular geofenced corridor, (2) confirm that the trip met additional criteria (e.g., time of day, occupancy), and (3) award points in real time and record them in both the user's in-app ledger and the back-office database.

Figure 5 shows the cumulative points awarded (i.e., incentives) by corridor over the course of the Miles Matter pilot for select locations on I-35W, I-30, I-20, and Harry Hines Boulevard. Only two corridors received points before January 2025: I-35W and Harry Hines Boulevard, because they were associated with the two initial travel behavior incentives: off-peak travel on I-35W and the alternative-route incentive on Harry Hines Boulevard for I-35E commuters. These incentives, launched in September 2024, began generating credits immediately for travelers who shifted trips out of the 7–9 a.m. peak on IH 35W or diverted from IH 35E onto Harry Hines Blvd.

The incentive for HOV Use on I-20 became effective after January 2025 and is reflected in the sharp change in slope of the I-20 corridor beginning that month. Evaluation results show that about one-third of participants earned carpool credits on I-20, and that carpooling was already common among this user base. The I-20 incentive peaked at 337,350 points by the end of the pilot in August 2025. Furthermore, I-20 was exposed to many more travelers beyond the managed lanes on I-30 and I-35W. All I-20 freeway lanes were treated as a "virtual" managed lane that did not require physical separation, with operational rules and incentives communicated via a smartphone.

Other corridors exhibited relatively modest earning potential relative to I-20. The I-30 TEXpress Lanes also began to increase in early 2025, but at a much slower rate, ending the pilot with a more modest cumulative total of 65,210 points, indicating that some HOV behavior occurred on that corridor compared with I-20. The I-35W TEXpress Lanes have shown a steady accumulation of points since the incentive launched in September 2024. By the end of the pilot, I-35W had accrued roughly 219,525 total points. Harry Hines Blvd shows a different pattern, likely the result of the arterial being shorter than the other corridors. Points begin accruing in November 2024, reflecting the alternative route incentive that rewarded drivers for diverting from I-35E to Harry Hines at any time of day. Use increases slightly and remains relatively stable through 2025, peaking at 39,975 points in August 2025.

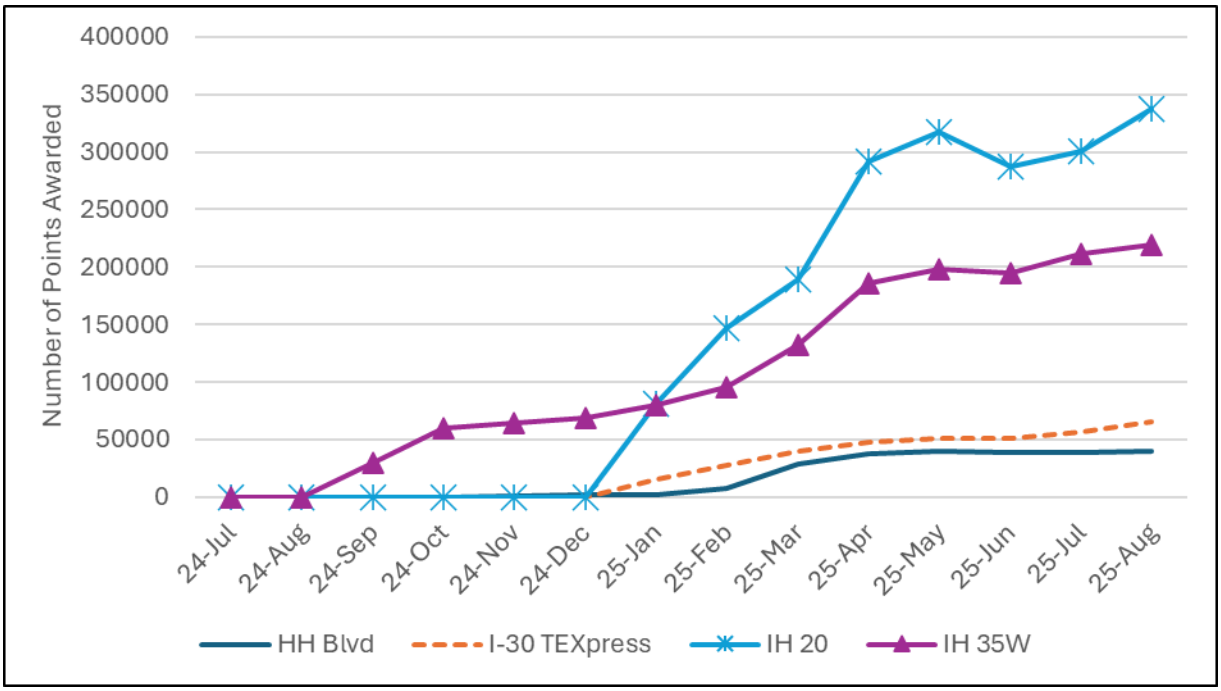


Figure 5. Number of Awarded Points by Corridor

Visibility of Credits

Participants had full access to their reward information through the GoCarma app. The app interface displayed point balances and a transaction history of points earned for various activities. According to survey feedback, over 90% of users reported being able to see the points they earned and review their “travel choices” statements in the app, indicating a high level of transparency and user awareness of credits. For example, in the first survey, 93% of respondents reported being able to view accumulated points, whereas only about 7% reported being unable to do so. The share increased to 95% by the time Survey 3 was administered. The high satisfaction rate suggests the credit accounting was clearly communicated to participants, allowing them to verify when and where they received rewards. More information on the traveler perceptions can be found in the Public Engagement Assessment in Chapter 6.

Accounting of Incentives

On the administrative side, the Miles Matter program maintained a detailed rewards ledger tracking every credit issued. This ledger included timestamps, user IDs, and trigger codes for each point allocation (e.g., distinguishing whether a given credit was for off-peak travel, route diversion, or survey completion). Program stakeholders could monitor incentive distributions in detail and provide partnering agencies (e.g., NCTCOG) with an easy ability to audit and evaluate specific incentives. Overall, the system awarded over 10.8 million points to participants during the pilot. As mentioned earlier, the points only had notional value. Still, they could be used as entries into prize drawings and as a proxy currency for potential future credit or debit-

based road usage charging systems. Table 7 shows the breakdown of all incentive credits awarded by type.

Notably, the HOV travel incentive on I-20 was the most utilized, with over 37,000 HOV trip transactions, reflecting the popularity of carpooling rewards among travelers on that corridor. Morning off-peak travel on I-35W was also widely used, accounting for approximately 20,775 transactions. In comparison, the alternative route incentive on Harry Hines Blvd was more targeted, generating 3,173 transactions. The special air quality day and travel avoidance bonuses each had hundreds of transactions (e.g., 336 for Thursday avoidance). The number of earned points demonstrates that the system not only could apply targeted incentives but did so thousands of times, reliably crediting user accounts when qualifying behaviors were detected.

Table 7. Number of Point-Earning Transactions

Incentive	Number of Transactions
HOV travel on I-20	37,068
Off-peak travel on I-35W	20,775
Avoid travel on AQ days	18,382
HOV on I-30 TEXpress	4,845
Travel on Harry Hines Blvd	3,173
Avoid travel on Thursdays	336
Try DART Red Line	13
Total	84,592

Overall, the Miles Matter platform proved fully capable of applying incentives for targeted behaviors. Every eligible action by a treatment-group participant resulted in an appropriate credit to their account, and these transactions were visible to the user and recorded for analysis by partner agencies (e.g., NCTCOG). The accounting system confirms that the technical backbone for an underlying wallet-based accounting system that functioned as intended. Participants could easily track their earned credits (enhancing motivation and trust in the system), and stakeholders could view the number of points issued, thereby satisfying the objective of transparent and targeted incentive delivery.

Summary of Findings

Overall, the Miles Matter pilot demonstrated that a smartphone-based platform can reliably perform the core technical functions needed for a user-based road charging or crediting system. The GoCarma app and its back-office systems successfully recorded detailed road-use data across the targeted corridors, capturing millions of trips and more than 60 million vehicle miles during the pilot. For each transaction, the system logged distance, duration, speed, and location within defined geofences, and that data could be aggregated by corridor, time of day, and user group. Participants could view their own trip histories and point balances in the app, while project staff could monitor program-level performance through dashboards. Although formal, independent field validation of GPS accuracy was not conducted, the volume, consistency, and usability of the data indicate that the system can serve as a primary source of information.

The pilot also confirmed that the technology can scale well beyond the relatively modest share of the region's drivers who participated. Cloud hosting on a commercial platform allowed the system to support tens of thousands of active users and millions of monthly transactions without any noticeable performance issues or significant downtime. Onboarding was rapid: most new enrollees began generating usable travel data within a day of opting in, without requiring hardware installation or specialized equipment. Technical discussions with the vendor indicate that the same architecture could support an order-of-magnitude increase in participants with minimal changes, suggesting that technological capacity is unlikely to be a limiting factor in a future regional or statewide deployment. Scaling the program would instead hinge more on policy design, outreach, and customer support than on core system performance.

Another key finding is the platform's flexibility in applying and adjusting credits. New corridors and incentive rules were added via configuration rather than field deployment, often within minutes, and changes to time windows or eligibility criteria took effect immediately. This allowed NCTCOG and its partners to test multiple incentive types without requiring changes to roadside infrastructure. The system's design also supports integration with external data sources and systems, such as toll collection, traffic condition, and vehicle registration databases, which would allow future programs to implement more sophisticated, data-driven crediting or charging policies.

Finally, the pilot demonstrated that the system can apply credits accurately to targeted locations and behaviors. The app consistently identified when users traveled on specific corridors during defined time periods, and could distinguish between single-occupant and carpool trips on express lanes. Thousands of location-based credits were applied across multiple corridors, and a majority of treatment-group participants (1,897 out of 41,600 travelers tracked as part of the program) earned at least one incentive. Participants reported that the points and rewards displayed in the app aligned with their expectations, supporting the conclusion that credits were applied transparently and reliably.

Taken together, these results indicate that the Miles Matter technology platform met the project's overarching goal of demonstrating the capability, reliability, and scalability of a smartphone-based crediting system for targeted geofenced locations in the Dallas–Fort Worth region. The pilot did not attempt to operate as a complete revenue-collection system, and critical next steps would include formal validation of GPS accuracy, integration of secure payment and invoicing functions, and the establishment of clear governance arrangements for multi-agency use of the data. Nonetheless, the evidence from this pilot suggests that a smartphone-centric approach is technically viable and operationally robust as a foundation for future user-based revenue and incentive programs. A summary of the findings can be found in Table 8.

Table 8. Summary of Findings from the Technology Assessment

Objective	Metrics	Finding
The system is technologically capable of recording road usage data at target locations along the corridor.	• 41,600 tracked and recorded travelers • 12.4 million trip transaction records with 64.1 million VMT logged • Zero major data outages.	**Supported:** The system recorded road usage data without issues.
The system is technologically capable of integrating odometer photo verification and vehicle telematics.	• 372 unique participants chose to use the odometer-photo option and recorded 542 verified readings during the pilot. • 19 vehicles were observed to have used the embedded vehicle telematic option to submit trip records.	**Supported:** The system implemented odometer photo verification and used embedded vehicle telematics.
The system can efficiently scale to accommodate large volumes of road users who enroll and participate.	• Monitored travelers represented 0.6% of the average daily volume in the region. • Cloud-based architecture can scale to millions of users • Slight increase in VMT observed during pilot with no performance issues. • For the incentive sub-study: 51% of users activated within 24 hours. 57% of users had logged trips after activation.	**Supported:** The system proved scalable and stable. Cloud architecture and app-based deployment handled pilot volumes efficiently, and analysis indicates it can grow for millions of users without infrastructure bottlenecks.
The system ensures the ease of applying and adjusting credit rules and policies.	• New corridor setup can occur in 2 minutes. • Rule changes live instantly via the administrative user interface. • Staff report high flexibility and minimal admin burden.	**Supported:** The platform was highly flexible and administrator-friendly. Agencies could rapidly modify crediting systems.
The system can award points for travel through designated roadway segments.	• 1,874 users earned points (representing 63% of enrolled participants in the incentive sub-study). • Over 472,195 location-based transactions processed. • Over 90% of users who earned credits could easily see it in the app.	**Supported:** The system successfully geo-fenced specific routes, times, and traveler groups to award incentives.

Chapter 4. Policy Assessment

This chapter evaluates how the Miles Matter pilot addressed key policy-related objectives: (1) enabling cross-boundary accounting of road use, (2) safeguarding user privacy, and (3) supporting a user-based revenue mechanism. Each section examines specific qualitative and quantitative metrics tied to these objectives and discusses the pilot's outcomes. Overall, the Miles Matter project tested a smartphone-based framework that could log miles driven and the conditions under which they were driven, allocate usage across jurisdictions, protect personal data, and inform future mileage-based charging policies. The following sections detail the findings for each policy topic.

Cross-Boundary Accounting

One core policy goal was to demonstrate a non-monetary, point-based framework for tracking road usage by jurisdiction. Rather than charging in real dollars, the Miles Matter pilot awarded points for specific incentive behaviors while recording where those miles were earned. The GoCarma app automatically geofenced every trip, associating each mile with the county and road type where it was driven. This allowed the system to simulate how a road usage fee might be allocated across different jurisdictions. In essence, every trip log recorded the distance traveled, enabling a detailed jurisdictional road-use ledger based on points rather than cash. Importantly, the system could also flag special road-use categories. For example, identifying if miles were driven on toll roads, private roads, HOV lanes, or outside the defined region. Under this classification system, miles on different roads and in different jurisdictions could be treated differently depending on specific policies.

In practice, the pilot collected detailed VMT data across five North Texas counties (Tarrant, Dallas, Collin, Parker, and Denton) in which the incentive corridors were located. Participants logged millions of miles within these geofenced routes during the pilot. Figure 6 below provides the distribution of VMT by county, demonstrating that the majority of pilot travel was concentrated in Tarrant and Dallas Counties. Tarrant County accounted for approximately 54% of the miles, with Dallas County accounting for about 36%, and the remaining 10% split among Collin (6%), Parker (3%), and Denton (1%). This skew indicates that the selected corridors were primarily located in Tarrant and Dallas counties. For real-world road-use charging programs, such data could be used to allocate revenue to the jurisdictions where the travel occurred. The pilot results indicate that a smartphone-based system can accurately disaggregate mileage by county.

Beyond aggregate totals, the GoCarma app's location capabilities proved adept at assigning each mile to the correct jurisdiction and road category. The system logged 64.1 million total VMT during the pilot, all of which were tagged with location metadata. Through integrations with external data sources, the system could detect when a trip entered a tolled express lane or a private facility, enabling those miles to be identified for distinct policies when applicable. For instance, toll road miles could hypothetically be deducted from a road usage fee (to avoid double-charging someone who already pays tolls), and the pilot showed that such deductions are technically feasible using app data. The existing GoCarma system is already interoperable

with regional toll transaction systems through the established carpool verification program. This interoperability implies that a future deployment could merge smartphone-collected mileage data with other sources to ensure accuracy and proper revenue sharing across boundaries when actual dollars are used (not credits). As a result of these capabilities, the Miles Matter platform functioned as a comprehensive road-use accounting system. It not only tracked how far each participant drove, but also where they drove and under what conditions, all within a point-based ledger architecture.

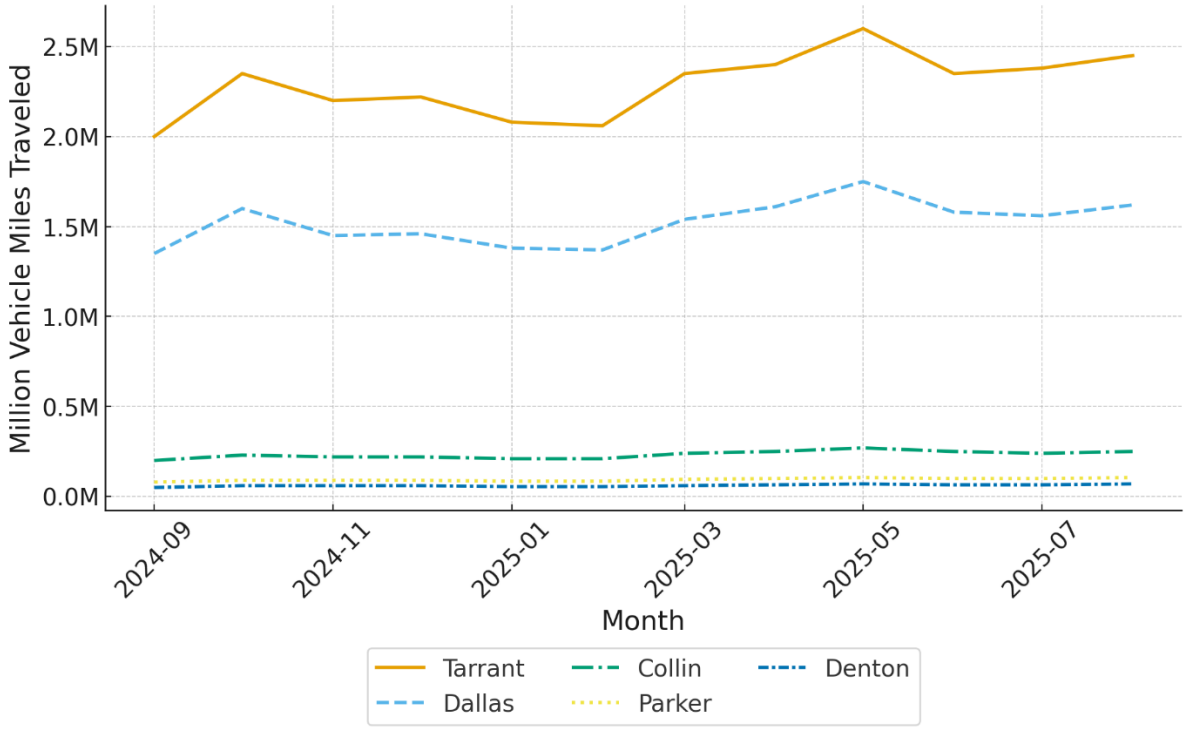


Figure 6. Monthly Vehicle Miles Traveled by County

Safeguarding Privacy

Another critical policy objective was to ensure that the system protected user privacy and data security, a common challenge for GPS-based road charging programs. The Miles Matter pilot approached this proactively by minimizing data collection and giving users transparency and control. To ensure data protection, Carma implemented strong safeguards aligned with industry best practices. The GoCarma app recorded location data only within the designated corridor geofences and automatically went dormant (i.e., “went to sleep”) when the user was outside those areas. The targeted data collection process meant that participants were not continuously tracked everywhere; only trips on the pre-selected Miles Mater routes were tracked, reducing exposure of personal travel information. Additionally, all personal data were stored securely on U.S.-based servers (e.g., Amazon Web Services), with encryption and strict access controls. Carma underwent an independent SOC 2 audit and achieved certification during the project,

demonstrating that its data-handling practices met rigorous security and privacy standards. No data breaches or system downtime occurred during the pilot (i.e., 0% downtime was reported). To further safeguard privacy, Carma did not share any personally identifiable data with external partners. Any data provided to the research team or agencies was aggregated and anonymized. This was explicitly stated as “No sharing of personal data” in the Terms and Conditions provided to users during the app registration process. In short, the technical and organizational measures (e.g., encryption, secure hosting, audit logs) were in place to ensure that users’ information remained protected and private.

User Controls and Transparency

The pilot also recognized that perceived privacy protection is as important as actual security. Carma’s data retention policy automatically deletes data after 60 days or immediately upon user request. To build user trust, GoCarma included an in-app Privacy Center that provides participants with visibility and control over their data. Users could easily see which locations the app had saved (via a “Your Location Data Saved by GoCarma” screen) and adjust permissions or delete their data if desired. The app’s Privacy menu allowed users to revoke location access and offered a one-click “Delete Account” option that would remove all their personal data from the system. These features empowered participants to actively manage their privacy, an approach intended to maintain comfort with the technology.

Participant Privacy Perceptions

Despite these measures, privacy remained a sensitive issue for some users. Survey results and qualitative feedback indicated a mix of opinions. In the initial onboarding survey, nearly half of the respondents reported being highly concerned about the privacy of their travel data. This reflected a common skepticism about GPS tracking in mobility programs. Over the course of the pilot, slightly more participants became comfortable with the idea as they experienced the app.

Across all three surveys, participants were asked to rate their level of concern about the security and privacy of their personal data, as shown in Table 9. The response trends reveal a consistent and meaningful pattern. A significant portion of participants expressed strong concern, while others remained neutral or only moderately concerned. In Survey 1 (n=1,413), conducted at the start of the program, 44.9% of respondents rated their privacy concern as “5 (Very concerned),” while another 22.0% selected “4 (some concern).” Only 9.1% said they were “not concerned at all” (rating of 1). For Survey 2 (n=375), conducted mid-program, the share of “very concerned” respondents dropped to 34.9%, and the average concern level decreased slightly to from 3.86 to 3.40 out of 5. Although still notable, this shift suggests a moderate easing of concern as participants gained experience with the system and saw that data collection was limited to specific travel corridors. For Survey 3 (n=209), which was conducted after program completion, the trend held steady: 35.9% of respondents rated their concern as “very concerned,” and the average score remained at 3.34. These results suggest that while a core group of users remained concerned about privacy throughout the pilot, others grew more comfortable with the limited, transparent data-use model.

Table 9. As it relates to your participation in the program, please rate how you feel about security and privacy of my personal data?

Scale of Concern	Survey 1	Survey 2	Survey 3
1 (not concerned)	129 (9.1%)	68 (18.1%)	44 (21.1%)
2	105 (7.4%)	38 (10.1%)	21 (10.0%)
3	233 (16.5%)	75 (20.0%)	39 (18.7%)
4	311 (22.0%)	63 (16.8%)	30 (14.4%)
5 (very concerned)	635 (44.9%)	131 (34.9%)	75 (35.9%)
Total	1,413 (100%)	375 (100%)	209 (100%)
Avg. Score	3.86	3.40	3.34

To address privacy in a future RUC system, Carma's staff advocated a hybrid approach, as demonstrated in Miles Matter. In correspondence with the evaluation team, Carma explained that a full RUC deployment "does not propose to use GPS tracking to log every mile traveled." Instead, the idea is to report most mileage via periodic odometer readings (to ensure an audit-proof record) and use GPS only for targeted mileage exemptions. During the pilot, 372 participants tested a monthly odometer photo feature (submitting a photo of their odometer reading), and 15 vehicles were directly connected via telematics; these were used to verify total miles without relying on GPS. This odometer-based method provides a "verifiable audit trail of each vehicle's odometer value" to resolve any billing disputes while maintaining user privacy.

At the same time, Carma showed that drivers could opt in to GPS tracking for certain benefits. For example, if a driver wanted to get credit for driving on a toll road or out of state (miles that should be exempt from state charges), they could allow the app to log those specific miles. In Carma's words, "it is now possible to offer drivers the option to have miles traveled at certain locations (e.g., on a toll road, out-of-state) automatically verified via GPS with drivers' permission." Those miles could then be deducted from the RUC calculation. Crucially, this optional tracking would come with "real-time transparency of charges" and complete user control over location permissions.

Agency Partner Perceptions

It is worth noting that local agency staff (e.g., NCTCOG) observed relatively few privacy complaints during the pilot's operation. Still, staff acknowledge that privacy is a primary public concern in any RUC program. In an interview, NCTCOG staff noted they "specifically designed this program to try to avoid and minimize any potential privacy issues" by using limited geofences. The targeted nature of Miles Matter likely helped assuage fears because data were not collected for every road in the region. However, NCTCOG staff cautioned that if the geofenced areas were greatly expanded for a true statewide RUC, public concern would increase accordingly. The underlying question is how to balance data needs with privacy at scale. The NCTCOG team drew parallels to usage-based auto insurance programs: "As long as people see a benefit to them in the data collection, they are generally willing to accept it." In other words, the value exchanged for data is key. If drivers receive tangible benefits (such as lower fees or rewards) for sharing their mileage data, they may be more comfortable with it.

Supporting a User-Based Revenue Mechanism

The third focus of the policy assessment evaluated how the pilot supported a user-based revenue mechanism. Essentially, the concept of replacing or augmenting the gas tax with a road usage charge. While Miles Matter itself did not levy any fees (it provided only point-based incentives), it served as a testbed for the technologies and policies that a road usage charge (RUC) would entail. Two aspects are considered in this subsection: (a) the development of analytical tools for mileage-based policy decisions, and (b) participant perceptions of the fairness and acceptability of a mileage fee approach.

Rate Setting Simulator

One feature of the project was the creation of a Rate Setting Simulator, a web-based tool developed by Carma to model various RUC policy scenarios using the pilot's data, as shown in Figure 7. This simulator was accessible to project partners via the GoCarma Metro dashboard, which enabled potential decision-makers to configure hypothetical per-mile pricing scenarios and view projected outcomes. According to Carma's team, "the pricing simulator is of central importance to demonstrating an accounting framework" based on the pilot's smartphone-generated travel data. The tool leverages millions of collected trip records to provide an evidence-based analysis of alternative pricing models. Users of the simulator can adjust dozens of input variables that a future RUC might incorporate. These inputs include vehicle attributes (e.g., fuel efficiency, electric), occupancy, time of day, traffic conditions, and even external factors such as air quality. The tool can also apply dynamic pricing rules. For example, an analyst could simulate a lower per-mile rate for electric vehicles, or a higher charge during peak periods. The simulator then computes the revenue that would be generated under those rules, drawing on the actual travel data observed from the Miles Matter project.

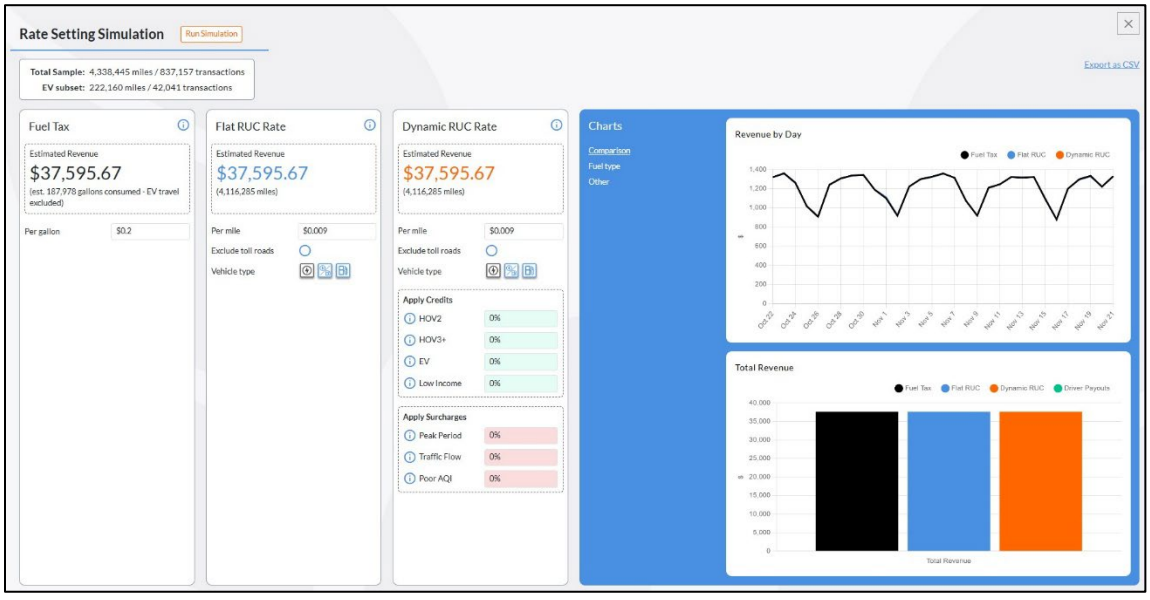


Figure 7. Screenshot of the Rate Setting Simulator

The Rate Setting Simulator also includes benchmarking and visualization features. For example, an analyst could determine whether a $0.01-per-mile charge would generate the same revenue as the current 20¢-per-gallon fuel tax or yield a different revenue distribution. According to Carma, the pricing simulator was "always developed as a policy-making and analytical tool, not a public-facing feature". Its purpose is to provide agencies such as TxDOT, NCTCOG, and others with a sandbox to test dynamic models using real-world trip data from the pilot. This tool is a clear link between the pilot and real-world implementation considerations of a usage-based charging architecture.

Policy Perceptions of Fairness and Acceptability

Alongside the technical architecture, the pilot also examined public attitudes toward policies for implementing road usage charges. Any policies to implement a RUC should be considered fair and acceptable to the public. Therefore, the evaluation collected feedback on these topics through Survey 3, near the end of the pilot project. Since the project did not involve actual tolls and the key public-facing feature was the ability to earn credit for behaviors, the project team did not want to overburden participants with too much information at enrollment.

First, participants were asked about the fairness of the Miles Matter points system itself, as a proxy for how a road usage charging program might be perceived. As shown in Table 10, the responses were generally positive or neutral. About one-third of participants (33.5%) rated the points incentive system "extremely fair," another 19.5% rated it "moderately fair," and 34.0% were neutral. Only a small minority (6.2%) considered it unfair, and about 7% said they needed more information. In short, the majority of respondents viewed the system as fair or at least not unfair. This finding indicates that the pilot's use of credits was not viewed as unduly biased. Some skepticism about the fairness of incentives was expressed qualitatively in the open-ended responses, with select quotes as:

- *"Not everyone can modify their travel behaviors."*
- *"Well, sometimes we really have no options for our commute."*
- *"Not all employers allow flexibility."*
- *"There were not as many incentives offered for everyone [only on select corridors]."*

Table 10. Did you feel the travel choices points system in this project was fair to all people?

Response	Number of Responses	Percentage
Extremely Fair	70	33.5%
Moderately Fair	40	19.1%
Neutral	71	34.0%
Moderately Unfair	10	4.8%
Extremely Unfair	3	1.4%
I don't know. I need more information.	15	7.2%
Total	209	100%

When it came to replacing the gas tax with a road usage charge, participants were more divided. Survey 3 introduced a hypothetical scenario: “Instead of the gas tax, drivers could pay for each mile they drive. Which system do you think is better for Texas?” The results revealed significant hesitancy about a per-mile charge, as shown in Table 11. About 56% of respondents rated the mileage fee as a “bad” or “terrible” idea compared to the gas tax, whereas only 23% thought it was a “good” or “great” idea. The remaining 21% said it would be approximately the same as, or neutral relative to, the gas tax. In short, a slight majority preferred maintaining the current gas tax or seeking an alternative, and only one in four viewed the road usage charge approach favorably. This finding suggests considerable initial resistance to a RUC, even among this pilot’s participants, who might be more informed than the general public (who skew more negative than engaged Miles Matter participants).

Table 11. User Preference for Gas Tax vs. Mileage Charge

Response	Number of Responses	Percentage
Paying per mile seems like a great way to fund transportation improvements in Texas	30	14.4%
Paying per mile seems like a good way to fund transportation improvements in Texas	18	8.6%
Paying per mile seems to be about the same as the current gas tax system	44	21.1%
Paying per mile seems like a bad way to fund transportation improvements in Texas. The state should look at other funding options	47	22.5%
Paying per mile is a terrible way to fund transportation improvements in Texas. The state should look at other funding options	70	33.5%
Total	209	100%

The whole question asked: “The average Texas household pays about $200 per year in state gas taxes. Instead of this gas tax, drivers could pay per mile driven. Which tax system do you think is better for Texas?”

As a follow-up, Survey 3 asked whether participants would be comfortable using a GPS-based app to record their travel as part of a RUC program (in exchange for discounts or benefits). Results from that question are shown in Table 12. Here, privacy remained an issue, with approximately 51.2% reporting they would be “very uncomfortable” or “somewhat uncomfortable” with using a smartphone GPS solely for select segments of trips in an odometer-based pay-by-mile system. This finding does not indicate a significant shift in opinion compared with the previous question on mileage charges. Furthermore, the share of negative feelings aligns with the earlier finding that roughly a third remained very concerned about tracking. It highlights that any RUC system that relies on GPS—even for a fraction of travel—must overcome a trust barrier.

Table 12. Comfort with GPS Tracking for Discounts with an Odometer-Based Mileage Charge

Response	Number of Responses	Percentage
Very comfortable	38	18.2%
Somewhat comfortable	27	12.9%
Neither comfortable nor uncomfortable	37	17.7%
Somewhat uncomfortable	38	18.2%
Very uncomfortable	69	33.0%
Total	209	100%

The whole question asked: "To pay by the mile, your vehicle mileage would likely be measured by an odometer reading. You may receive a discount by opting in to have your travel recorded within specific locations through GPS on a smartphone app like GoCarma. The technology then goes to sleep outside those areas, safeguarding your privacy. How comfortable are you with having your travel recorded through a smartphone GPS app to get the pay by the mile discounts?"

Building on the previous question, Survey 3 also examined whether combining a mileage fee with an incentive-and-reward program (similar to Miles Matter) would affect public opinion. Table 13 shows the results from the survey question on a combined system. Participants were asked if introducing a points system alongside a per-mile fee would be better or worse for them and for Texas's transportation system. The response to this combined scenario was mixed: 42.6% of respondents believed this option was worse than a straight mileage fee. Compared to using a mileage fee alone (see Table 11), adding incentives only marginally improved the acceptability for some, and many remained opposed.

Table 13. Perceptions on Combining an Incentive with a Mileage Fee

Response	Number of Responses	Percentage
Much better than the gas tax	25	12.0%
A little better than the gas tax	40	19.1%
The same as the current gas tax	55	26.3%
Worse than the gas tax	41	19.6%
Much worse than the gas tax	48	23.0%
Total	209	100%

The whole question asked: "If the travel choices study incentive system and the pay-per-mile fee were introduced in Texas together, do you think it would be better for you and the Texas transportation system?"

Summary of Findings

Overall, the Policy Assessment found that the Miles Matter pilot made notable progress in addressing key policy challenges for a road usage charge system. Cross-boundary accounting was effectively demonstrated. The GoCarma platform reliably tagged each mile traveled across different political jurisdictions, enabling precise mileage tracking for potential revenue allocation at the county and state levels. The system could also filter out ineligible miles from preselected roads (e.g., tolled facilities already covered by a transponder system) from the total odometer count, demonstrating that nonchargeable mileage can be deducted in a real-world user-charge scenario. These results indicate that a mobile application can meet the multi-jurisdictional accounting requirements of a user-based fee program by both partitioning miles by area and excluding miles that are not subject to charges.

Safeguarding privacy remained a central focus and a mixed challenge for the Miles Matter project. The pilot employed targeted privacy measures. Data collection was limited to geofenced corridors (e.g., the app went dormant outside of designated areas) to minimize exposure of personal location data. All location and user data were encrypted and stored securely, and the system operated in compliance with stringent state data privacy laws (e.g., the Texas Data Privacy and Security Act). No security breaches or data misuse incidents were reported during the pilot. The user experience also emphasized transparency and control, as participants could review their trip logs and the app that shows their earned points, helping reassure travelers about how their data is used. Despite these safeguards, many participants still expressed significant concern about the privacy and security of their data in the program. This finding underscores that maintaining public trust is still as critical as adopting technical privacy measures.

To support a user-based revenue mechanism, the pilot demonstrated that the system can both model alternative user-based crediting policies and elicit travelers' perceptions of them. On the technical side, Carma's rate-setting simulator used millions of smartphone-recorded transactions to enable agency staff to test different user-based crediting and charging structures (e.g., varying rates by vehicle type, occupancy, EV status, time of day, or air quality alerts) and to immediately observe the revenue and distributional impacts. This functionality provided stakeholders with a practical tool to assess how alternative RUC or crediting designs might perform prior to implementation.

Survey results indicate cautious yet nuanced attitudes toward user reactions to various policies. When asked whether the travel choice points system was fair to all people, most participants responded positively or neutrally. Roughly half felt the system was at least somewhat fair, and about one-third were neutral, while only a relatively small share viewed it as outright unfair (e.g., could not change travel behavior).

Opinions became skeptical when the focus shifted from incentives to road usage charging policies. A clear majority preferred other options to a per-mile fee (56%), and only about one in four respondents (23%) viewed a mileage fee as an improvement. Comfort with GPS tracking for pay-by-mile discounts was similarly mixed. A sizable share (51%) reported being uncomfortable with their travel being recorded via a smartphone app (yet, they regularly participate in an HOV verification program that monitors personal location data), even with

geofences to exclude selected roads (e.g., local streets near homes). When participants were asked to consider a combined system that paired the Miles Matter incentive structure with a per-mile fee, some became more receptive. However, many still felt it would be no better (disapproval fell to about 43%). Taken together, these results indicate that while the platform clearly enables policymakers to design and model user-based crediting and charging mechanisms, broad public acceptance will depend on how effectively future programs address concerns about fairness and privacy, and on how the system is communicated and implemented. Table 14 presents the Policy Assessment findings for each objective, along with supporting metrics.

Table 14. Summary of Findings from the Policy Assessment

Objective	Metrics	Finding
The system supports cross-boundary accounting.	• Over 64 million miles logged. • Location-based could tell the difference between tolled and non-tolled facilities. • VMT allocation by county: Tarrant County 54%, Dallas 36%, Collin 6%, Parker 3%, and Denton 1%.	**Supported:** The system can attribute miles to specific jurisdictions and facilities with sufficient precision.
The system should safeguard the privacy of its users and their data.	• No major data breaches during pilot. • In-app Privacy Center to manage or revoke location permissions. • Trip data were automatically deleted after 60 days or immediately upon account deletion. • Survey data show persistent but slightly easing concern about data privacy, dropping from a score of 3.86 (out of 5) in the beginning to 3.34 at the end.	**Supported:** The system effectively safeguarded user privacy. Privacy remained a significant user concern, though it lessened slightly during the pilot.
The system can improve the performance and impact of alternative user-based crediting mechanisms.	• The rate-setting simulator can model a wide variety of RUC policies. • The crediting system was seen as being unfair by 6% of users. • 56% felt that using a mileage fee instead of a gas tax was either terrible or bad. • 51% felt uncomfortable with relying on odometer readings that only used GPS for select roads. • 43% felt that a combined system that used credits with a mileage fee was worse than the gas tax.	**Mixed:** The rate-setting simulator allows agencies to model detailed RUC and incentive scenarios. The points framework itself was generally viewed as fair, but attitudes toward a mileage-based road charge remained cautious among a significant share of users.

Chapter 5. Mobility Assessment

The Miles Matter pilot project established an overarching mobility goal: “Explore the potential for market-based congestion mitigation on targeted locations in the DFW region.” This chapter evaluates the pilot’s effectiveness in achieving that goal by examining two key areas: (1) changes in participant travel behavior before versus after incentives and (2) the impact of the program on overall mobility and congestion outcomes. The following sections detail each evaluation area, drawing on quantitative travel data (from the GoCarma platform and vehicle transactional data) and qualitative insights from participant surveys.

Applying Incentives for Targeted Behaviors

The Miles Matter system successfully implemented a structured incentive program targeting specific congestion-mitigation behaviors. Participants were randomly assigned to a 75% treatment group (receiving behavior-based incentives) and a 25% control group (no behavior-based incentives) among the total of 3,970 enrolled participants. All participants earned some base credits (e.g., 500 points for opting in, 400 points for completing the initial survey, and 200 points per odometer submission). Travelers within the treatment group earned additional credits for designated travel behaviors, including:

- **Off-Peak Travel on I-35W:** 75 points for trips during shoulder periods (weekday early morning 5–7 a.m. or late morning 9–11 a.m.), incentivizing avoidance of the 7–9 a.m. peak on this congested corridor. This was the first incentive introduced at program launch in September 2024.
- **Alternative Route Use (I-35E to Harry Hines Blvd):** 75 points for traveling on Harry Hines Boulevard instead of the parallel I-35E freeway, offered at any time of day. This detour incentive targeted I-35E commuters by rewarding the use of a less-congested arterial route.
- **Carpool (HOV) Travel on the I-30 TEXpress Lanes and I-20 Corridor:** 75 points for HOV trips during peak periods (6:30–9 a.m. or 3–6:30 p.m.), or 40 points for HOV trips at off-peak times. This reward encouraged HOV use on two major corridors (I-30 and I-20) to reduce solo driving.
- **Avoiding Travel on Targeted Days and Locations:** For example, 200 points were awarded for avoiding travel on specific Thursdays on specific congested corridors (as a special incentive to skip or shift trips on a high-traffic day), and a 200-point Air Quality Action Day bonus was offered for not driving on days with poor air quality forecasts. These incentives were intended to encourage trip skipping or rescheduling to reduce peak demand and emissions.
- **Public Transit:** A limited incentive (e.g., “Try DART Red Line” for 200 or 400 points) was offered to a small subset of users to encourage taking transit instead of driving for a trip, though uptake of this option was minimal. Only 13 instances of the transit reward were logged during the pilot.

Whenever a participant completed one of these target behaviors, the GoCarma system automatically credited the appropriate points to their account. The incentives were delivered in real time via geofenced trip detection. For example, a treatment group member traveling on I-35W at 5:30 a.m. would immediately earn 75 points for off-peak travel, and a carpool going through the IH-30 TEXpress Lane at 8 a.m. would earn 75 points for HOV use.

Quantitative Analysis of Behavior Changes

Part of the Miles Matter project examined whether participants altered their travel patterns in response to the incentives, focusing on four aspects: (a) total travel distance, (b) number of trips, (c) timing of trips, (d) route choice, (e) mode choice, and (f) travel avoidance. The Mobility Assessment used a combination of GoCarma trip data, which compared pre- and during-incentive behavior with a control-group benchmark, and survey responses from the Travel Behavior Study to assess changes in these metrics.

To isolate the effects of the Miles Matter incentives, the analysis used a control-versus-treatment comparison. Participants' travel on targeted corridors was recorded before the rewards were introduced and then throughout the incentive period. Statistical data were used to compare changes in the treatment group (i.e., those who received behavior-based credits) with those in the control group (i.e., those who did not receive behavior-based credits). This helped account for background trends (e.g., seasonal changes or external factors) and identify any statistically significant shifts attributable to the incentives. In addition, self-reported behavior from surveys (conducted at baseline, mid-point, and at the end of the pilot) provided qualitative context. For instance, participants indicated whether they consciously changed their commuting habits to earn points and, if so, which barriers or motivations influenced their ability to do so.

Travel Distance

No significant reduction in overall driving distance was observed as a result of the incentives. The assessment did not find a measurable significant difference in total mileage per participant between the pre-incentive and incentive periods when comparing the treatment group to the control group. Overall, VMT did decrease with additional travelers carpooling, avoiding travel on specific Thursdays, and avoiding travel on poor air quality days. However, the control group travel decreased as much or more than the treatment group and thus the reduction in VMT cannot be attributed to the Miles Matter incentives.

Number of Trips

Participants did not significantly change their trip frequency. The average number of trips per participant per weekday remained nearly the same before and after the incentives, with no statistically significant difference between the treatment and control groups. On average, participants made approximately the same number of trips per week, indicating that the program neither induced additional trips nor substantially suppressed them. Receiving point rewards did not lead people to take more or fewer trips. This makes intuitive sense – the incentives were neutral with respect to trip frequency (no reward for making fewer trips, and no reason to make additional "unnecessary" trips either, since points could not be earned unless one was traveling

in specific ways). The survey data corroborates this steady trip rate: at baseline, about 69% of participants reported making 6–15 trips per week, and by the final survey, this distribution remained similar (most still fell in the mid-range of weekly trips). Participants generally maintained their usual travel routines, including the number of trips per week.

Shifting to Off-Peak Trips on I-35W

Only minimal shifts in travel timing were achieved, despite the off-peak incentive on I-35W and related efforts. Before the program, a large majority of participants regularly traveled during peak congestion—73% reported traveling in peak hours daily or most days—the incentives aimed to spread out some of this travel by encouraging shoulder-period trips.

On the I-35W corridor, the Miles Matter program offered an incentive to avoid the morning peak period. Participants could earn 75 points if they traveled during the shoulder periods: either 5–7 a.m. (early shoulder) or 9–11 a.m. (late shoulder), instead of the 7–9 a.m. peak. To assess how effective this incentive was, the analysis focused on two indicators: (1) the number of weekday trips per participant in each time period, and (2) the share of weekday trips occurring during the peak period. Results for the early and late shoulder periods are summarized in Table 15 and Table 16. The analysis compared three time windows: early shoulder (5–7 a.m.), late shoulder (9–11 a.m.), when incentives were offered, and the morning peak (7–9 a.m.), when no incentives were offered.

For the peak period, weekday trips per participant decreased by 0.02 in the control group and increased by 0.01 in the treatment group (Table 15). During the early shoulder, the control group's trip rate increased by 0.03, while the treatment group's trip rate decreased by 0.01. In the late shoulder, the control group's trips fell by 0.001, and the treatment group's trips rose by 0.001. These changes are minimal.

Table 15. Number of Weekday Trips Per Participant

Time of Day (Window)	Study Period	Control Group	Treatment Group	Total	Difference
Peak (7–9 a.m.)	Pre-study	0.28	0.26	0.26	−0.02
	During study	0.26	0.27	0.26	0.00
	Change	−0.02	0.01	0.002	0.02
Early shoulder (5–7 a.m.)	Pre-study	0.27	0.31	0.30	0.04
	During study	0.30	0.30	0.30	0.00
	Change	0.03	−0.01	0.004	−0.04
Late shoulder (9–11 a.m.)	Pre-study	0.10	0.11	0.11	0.01
	During study	0.10	0.11	0.11	0.01
	Change	−0.001	0.001	0.000	0.002

As shown in Table 16, both the control and treatment groups reduced the share of their trips during the peak period. Peak-hour trip share fell by 1.9 percentage points in the control group and by 0.4 percentage points in the treatment group. During the late shoulder period, both groups moved slightly in the opposite direction, with trip shares increasing by 0.2 and 0.3

percentage points, respectively. For the early shoulder period, the control group's trip share increased by 0.6 percentage points, while the treatment group's share declined by 1.1 percentage points.

Comparing the two groups after incentives were introduced, the treatment group's trip share changed relative to the control group by +1.4 percentage points in the peak, −1.7 points in the early shoulder, and +0.1 points in the late shoulder. These shifts are all relatively small, but it is notable that the control group actually reduced its peak-period travel more than the treatment group.

Table 16. Proportion of Trips by Weekday Time Period

Time of Day (Window)	Study Period	Control Group	Treatment Group	Total	Difference
Peak (7–9 a.m.)	Pre-study	20.1%	19.2%	19.5%	-0.9%
	During study	18.3%	18.8%	18.7%	0.6%
	Change	-1.9%	-0.4%	-0.8%	1.4%
Early shoulder (5–7 a.m.)	Pre-study	12.4%	14.6%	14.0%	2.1%
	During study	13.0%	13.5%	13.4%	0.5%
	Change	0.6%	-1.1%	-0.6%	-1.7%
Late shoulder (9–11 a.m.)	Pre-study	6.5%	7.0%	6.8%	0.4%
	During study	6.8%	7.3%	7.2%	0.5%
	Change	0.2%	0.3%	0.3%	0.1%

Route Choice on Harry Hines Boulevard

On the I-35E and Harry Hines Boulevard corridors (see Figure 8), an incentive was offered to encourage travelers to shift from I-35E to the less-congested Harry Hines route. This incentive applied to trips at all times of day, on both weekdays and weekends. The key performance measure was the share of trips taken on Harry Hines Boulevard, with results summarized in Table 17. In the control group, the proportion of trips on Harry Hines increased by 2.6 percentage points, while in the treatment group it increased by 1.4 percentage points. Once again, this is a somewhat unexpected finding, as the control group showed a larger increase than the treatment group.

Table 17. Proportion of Trips on Harry Hines Boulevard

Study Period	Control Group	Treatment Group	Total	Difference
Pre-study	20.3%	22.1%	21.7%	1.8%
During study	22.9%	23.6%	23.4%	0.7%
Change	2.6%	1.4%	1.7%	-1.2%

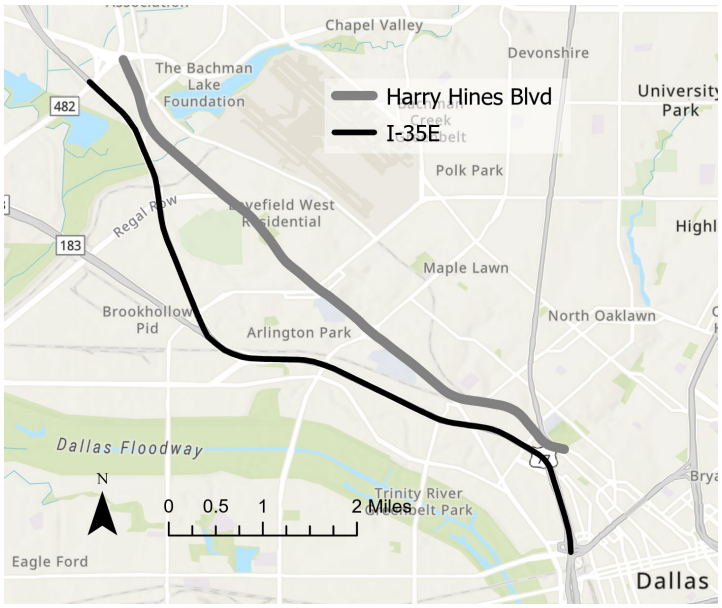


Figure 8. Map of I-35E and Harry Hines Corridors in Dallas

Potential to Increase HOV Trips on I-20 and I-30

On I-20 and I-30, Miles Matter awarded points for weekday HOV trips. During the designated peak periods (6:30–9:00 a.m. and 3:00–6:30 p.m.), participants received 75 points for HOV travel; HOV trips outside these periods earned 40 points. The results of this analysis are shown in Table 11. In the morning and afternoon peaks, and when both are combined, the share of HOV trips increased in both the control and treatment groups. However, across these time-of-day windows, the increase was consistently larger in the control group than in the treatment group. Once again, this is a somewhat unexpected finding, as the control group showed a larger increase than the treatment group.

Table 18. Proportion of HOV Trips on I-20 and I-30

Time of Day (Window)	Study Period	Control Group	Treatment Group	Total	Difference
Peak (7–9 a.m.)	Pre-study	50.5%	56.8%	55.6%	6.2%
	During study	59.1%	61.4%	60.9%	2.3%
	Change	8.5%	4.6%	5.3%	-3.9%
Early shoulder (5–7 a.m.)	Pre-study	53.3%	55.4%	54.9%	2.1%
	During study	55.8%	56.6%	56.5%	0.8%
	Change	2.6%	1.3%	1.5%	-1.3%
Late shoulder (9–11 a.m..)	Pre-study	52.2%	56.0%	55.2%	3.8%
	During study	57.1%	58.7%	58.4%	1.6%
	Change	5.0%	2.7%	3.2%	-2.2%

Thursday Travel Avoidance

The “No Trips on Thursday” incentive was applied across all selected corridors beginning March 17, 2025. During this period, participants in the treatment group who avoided traveling on Thursdays could earn 200 points. A total of 448 participants in the treatment group met the eligibility criteria for this incentive (regularly travel on the most recent four Thursdays). The control group for this analysis consisted of users who registered in GoCarma before February 13, 2025, and opted into the Miles Matter project by March 12, 2025, which served as the cutoff date for the treatment group.

To assess the effectiveness of the Thursday incentive, the analysis focused on two indicators: (1) the number of weekly Thursday trips per participant, and (2) the share of Thursday trips out of all weekday trips. Both indicators were evaluated over a 12-week observation window, consisting of four weeks before, four weeks during, and four weeks after the incentive period. Calculations were performed separately for the control and treatment groups, and the results are summarized in Table 19. For the weekly measures, each indicator was calculated by dividing the total number of Thursday trips in that week by the total number of eligible participants. For the four-week measures, the total number of Thursday trips over the four consecutive weeks was divided by the total number of eligible participants during the same four-week interval.

Table 19 summarizes the weekly and 4-week averages of Thursday trips per participant. Before the incentive was introduced, participants in both groups averaged more than one Thursday trip per week, with the treatment group making about 0.65 more Thursday trips per week than the control group. During the incentive period, Thursday travel declined in both groups: average Thursday trips fell from 1.05 to 0.80 in the control group and from 1.70 to 1.39 in the treatment group. After the incentive ended, Thursday trip frequencies in both groups stayed close to these reduced levels rather than returning to pre-incentive rates.

Table 19. Number of Weekly Thursday Trips Per Participant

Period	Control (share of total trips)	Treatment (share of total trips)	Difference (share of total trips)
Previous four weeks (Feb 17 – Mar 14, 2025)	1.05 (20.7%)	1.70 (22.0%)	0.65 (1.3%)
During four weeks (Mar 17 – Apr 11, 2025)	0.80 (19.8%)	1.39 (20.6%)	0.59 (0.8%)
After four weeks (Apr 14 – May 9, 2025)	0.78 (20.8%)	1.45 (21.3%)	0.67 (0.6%)

Table 19 also shows Thursday trips as a share of all weekday trips. Before the incentive, roughly 20–22% of weekly trips occurred on Thursdays in both groups. During the incentive weeks, this share dropped slightly, by 1.4 percentage points in the treatment group and 0.9 percentage points in the control group. After the program concluded, the Thursday share remained generally stable, with no strong rebound or further decline. Overall, the treatment

group exhibited a slightly greater reduction in Thursday travel than the control group, indicating that the incentive prompted some behavioral change, although the overall effect was modest.

DART Red Line Transit Use

The transit-use incentive for the DART Red Line was offered between April 15 and August 31, 2025. From April 15 to May 20, eligible participants in the treatment group could earn 200 points per DART Red Line trip. Beginning May 21, the reward increased to 400 points per trip. DART Red Line activity was monitored in both the control and treatment groups, beginning approximately 1.5 months before the incentive and continuing through the incentive period and afterward. Across the entire observation window, six DART Red Line users were identified in the control group and 15 in the treatment group, corresponding to 13 and 31 Red Line trips, respectively. Of the 15 treatment-group users, nine were actually eligible for the transit incentive and together made 19 Red Line trips.

To evaluate the effect of the incentive, four performance indicators were examined:

- **Proportion of DART Red Line users** – the share of participants in each group who rode the Red Line at least once.
- **DART Red Line trip share** – Red Line trips as a share of all trips (Red Line and passenger-car trips).
- **Passenger-car trip share** – passenger-car trips as a share of all trips (Red Line and passenger-car trips).
- **DART Red Line trip share among Red Line users** – the share of Red Line trips out of all trips made by participants who used the Red Line at least once.

These indicators were calculated for the control and treatment groups before and after the incentive started, using monthly data. The analysis covers roughly 1.5 months before the incentive (March 1–April 14, 2025) and 4.5 months during the incentive period for the treatment group (April 15–August 31, 2025). Table 20 shows the share of participants who used the DART Red Line at least once. Before the incentive, usage was extremely low in both groups, with fewer than 1% of participants taking any Red Line trips. After the incentive began, the treatment group's share of Red Line users increased from 0.49% to 1.14%, while the control group remained at 0.59%, indicating a positive, however small, response among treatment participants. Overall participation on the Red Line remained low in both groups, but consistent use over time was observed only in the treatment group, particularly in July and August.

Table 20. Proportion of Travelers for DART Red Line Incentive

Period	Control (share of all trips)	Treatment (share of all trips)	Difference (share of all trips)
Before (Mar 1 – Mar 14, 2025)	0.59% (0.03%)	0.49% (0.03%)	-0.10% (0.00%)
After (Apr 14 – Aug 31, 2025)	0.59% (0.02%)	1.14% (0.03%)	0.56% (0.01%)

Table 20 also summarizes the share of DART Red Line trips out of all trips. Before the incentive, both groups made almost no Red Line trips, with the mode accounting for only about 0.03% of total travel. After the program started, the treatment group's Red Line trip share increased slightly relative to the control group, especially in July and August, when no Red Line trips were recorded in the control group.

Table 21 reports the share of trips made on the DART Red Line only among participants who used the Red Line at least once between March and August 2025. Because this metric focuses solely on Red Line users, the percentages are naturally higher than those in the previous tables, which included all participants. Before the incentive, Red Line users in the control group made 15.15% of their trips on the DART Red Line, compared with 3.25% for those in the treatment group. After the incentive was introduced, the treatment group's Red Line trip share among these users increased to 5.53%, while the control group's share declined to 7.77%. This pattern suggests that the incentive encouraged existing Red Line users in the treatment group to ride the DART Red Line more often, and that its effect was stronger among current users than among non-users.

Table 21. Share of DART Red Line Trips for Red Line Travelers

Period	Control	Treatment	Difference
Before (Mar 1 – Mar 14, 2025)	15.15%	3.25%	-11.90%
After (Apr 14 – Aug 31, 2025)	7.77%	5.53%	-2.24%

Avoidance of Poor Air Quality Days

The Air Quality Incentive (AQI) was offered on designated Ozone Action Days on weekdays between July 2 and August 21, 2025. The Texas Commission on Environmental Quality (TCEQ) identified these days. Participants in the treatment group who did not travel on the selected corridors on an Ozone Action Day earned 200 points. The specific air quality incentive days consisted of the following (all during 2025):

- Wednesday, July 2
- Friday, July 18
- Tuesday, July 29
- Wednesday, July 30
- Thursday, July 31
- Friday, August 1
- Tuesday, August 5
- Wednesday, August 6
- Tuesday, August 12
- Wednesday, August 13
- Wednesday, August 20

To evaluate the effect of this incentive, the assessment examined four indicators: (1) average daily trips per traveler on AQI days, (2) average daily trips per traveler on non-AQI days, (3) daily vehicle miles traveled (VMT) per traveler on AQI days, and (4) daily VMT per traveler on non-AQI days.

The project team also assessed VMT, using only travel recorded on the geofenced project corridors (and therefore not capturing participants' total daily VMT). As shown in Table 22, on AQI days, average VMT was 248 miles lower in the treatment group than in the control group. During non-AQI days, the difference was 64 miles in favor of the treatment group. Although the effect direction during AQI days was desirable, with slightly fewer miles traveled by the treatment group, the magnitude is small relative to total VMT. It excludes any travel outside the geofenced network.

Table 22. Number of Daily Trips per Traveler for Days with Air Quality Incentive

Period	Control (VMT)	Treatment (VMT)	Difference (VMT)
AQI Days	0.56 (5,099)	0.56 (4,851)	-0.01 (-248)
Non-AQI Days	0.55 (4,814)	0.55 (4,750)	0.00 (-64)

Overall, the impact of the incentives was negligible. For the various incentives designed to encourage off-peak travel, use of less congested routes, HOV travel, and reduced travel on poor-air-quality days, changes in travel behavior in the treatment group were generally similar to or smaller than those observed in the control group. This pattern suggests that factors other than the incentives themselves likely drove the observed changes. The research team could not identify a clear explanation for why the control group showed changes at least as significant as those in the treatment group.

Survey Questions on Behavior Changes

The transaction-based quantitative analyses show that, at the pilot scale, Miles Matter produced negligible changes in aggregate travel patterns. To understand why behavior changed for some participants but not for others, it is essential to pair the objective data with self-reported information from the project surveys. The survey results provide critical context for interpreting the mobility findings, revealing participants' constraints, attitudes toward congestion and incentives, and their comfort level with GPS-based, road usage charge concepts (or in this case, credits-per-trip).

This section synthesizes responses from all three Travel Behavior Study surveys and links them directly to observed incentive activity. The analysis focuses primarily on the 209 participants who completed the final survey (Survey 3), of whom 23 percent were in the control group, and 77 percent were in the treatment group. For these respondents, the research team merged survey responses with detailed incentive records to examine how often each person actually earned rewards for specific behaviors (e.g., shoulder-time travel, carpooling, using less-congested routes, avoiding travel on Thursdays, or skipping trips on days with poor air quality).

Participant-Reported Behavior

Survey feedback indicates that many participants attempted to modify their travel behavior for points, but sustained behavior change was limited. By the final survey, only about 18% of participants reported changing their travel behavior "often" (at least once a week) to earn points. In contrast, approximately 24% reported that they never changed their travel despite the

incentives. The remainder fell in between, making occasional adjustments a few times per month. Notably, more than half of the participants felt that the incentives offered were insufficient to significantly change their habits. In Survey 2, when asked whether the incentives were “big enough” to prompt changes, a majority responded “No” or reported that they changed only rarely, indicating that the reward levels were insufficient to prompt substantial behavioral change in many cases.

Nevertheless, a solid majority of participants did engage with at least one of the target behaviors during the pilot. According to system logs, 63% of those enrolled in the incentive program ultimately earned points from one or more of the defined incentive categories. Table 23 summarizes the average frequency of earning each type of incentive reward, per participant per week. The carpool incentives were utilized most frequently. On average, participants earned an HOV reward about 0.65 times per week (roughly once every 1.5 weeks). Off-peak trip incentives on the I-35W corridor were the next most common (0.32 per user per week), followed closely by the air-quality “no-drive” bonus (0.29 per user per week). In contrast, incentives for taking an alternate arterial route or avoiding travel on a specific weekday were rarely used, and transit incentives were virtually unused (reflecting just a handful of transit trial trips during the pilot).

These figures align with the participation rates observed for each incentive. The high uptake for avoiding travel on poor air quality days was likely due to having all participants eligible for this incentive—even those who rarely drove. Roughly one-third of participants used off-peak driving incentives on I-35W (35.5%), and a similar share received carpool points on the I-20 corridor (36.4%). Other incentives saw lower activity: fewer than 15% of users earned I-30 HOV rewards, fewer than 9% used the alternate-route diversion, and about 7% participated in the Thursday no-travel incentive. Almost no participants received the transit incentive (only four individuals, or 0.1%, tried the DART Red Line offer). This distribution suggests that incentives aligned with participants’ existing patterns or available options (such as carpooling for those already using HOV lanes or shifting a trip out of peak hours) generated decent interest. In contrast, those requiring more significant changes (new transit use or major route changes) faced far more reluctance.

Table 23. Average Weekly Incentive Earning Frequency by Type per Participant

Incentive Category	Specific Behavior	Average Weekly Events per Participant
Carpool travel	HOV trip on I-20 or I-30 TEXpress	0.65
Off-peak travel	Off-peak trip on I-35W	0.32
Air quality avoidance	No trip on designated bad-air day	0.29
Alternate route	Use of Harry Hines Blvd	0.05
Transit use	Try the DART Red Line train	negligible

Note: The averages in Table 8 are calculated for treatment-group respondents only (n = 169), including those who earned zero incentives in a given category.

Examining the survey data and reward ledger together indicates that the ability to change behavior played a significant role in the observed outcomes. Participants who reported having the means or flexibility to alter their travel were far more likely to do so. Table 24 compares participants' self-reported frequency of behavior change with their perceived difficulty in making such changes (using the example of avoiding peak-period travel). Those who found it easy to shift their travel were significantly more likely to report making frequent changes. The "easy" group of 37% of Survey 3 respondents changed their travel at least once per week, versus only about 5% of those who felt it was tough, as they were much less likely to make no changes (only 17% of the easy group never changed, compared to one-third of those who rated it hard).

Table 24. Self-Reported Behavior Change vs. Perceived Difficulty (Survey 3)

Perceived Difficulty (Avoiding Peak Travel)	Changed Behavior Weekly or More	Never Changed Behavior
Easy (rating 4-5)	37%	17%
Hard (rating (1-2)	5%	33%

Participant Attitudes and Perceptions

Key attitudinal findings from the final survey (Survey 3) include:

- 74% "liked the concept" of the Miles Matter program (with a majority indicating they liked it "a lot").
- 83% of participants believed an incentive system like Miles Matter could help reduce congestion and air pollution in D/FW.
- 52.5% felt that the incentives in this pilot were not large enough to change their travel behavior regularly, or at least once a week.

Despite modest behavioral changes among many individuals, overall attitudes toward the Miles Matter concept were largely positive, as shown in Table 25. The likability of the concept remained relatively stable before (Survey 1), during (Survey 2), and toward the end of the project (Survey 3). The general belief in effectiveness, as shown in Table 26, declined slightly by the end of the project, from 89% to 82%. The vast majority of participants appreciated the idea of earning rewards for wise travel choices. About three-quarters liked the program concept, and over four-fifths believed that such an incentive system could have a beneficial impact on regional congestion and air quality. Participants recognized the potential public benefit of the strategy. In open-ended feedback, some noted that even if they personally did not change much, "incentives are a good way to encourage others" and could be effective if appropriately designed.

Table 25. How do you like the concept of an incentive to change travel choices?

Answer	Survey 1	Survey 2	Survey 3
Like the concept a lot	501 (35.5%)	166 (44.3%)	93 (44.5%)
Like the concept	547 (38.7%)	120 (32.0%)	60 (28.7%)
Neither like nor dislike the concept	258 (18.3%)	71 (18.9%)	44 (21.1%)
Don't like the concept	23 (1.6%)	5 (1.3%)	3 (1.4%)
Don't like the concept a lot	14 (1.0%)	6 (1.6%)	3 (1.4%)
I don't know. I need more information	70 (5.0%)	7 (1.9%)	6 (2.9%)
Total	1,413 (100%)	375 (100%)	209 (100%)

Table 26. If it were expanded, how effective do you think it would be at reducing congestion?

Answer	Survey 1	Survey 2	Survey 3
Very effective	421 (29.8%)	93 (24.8%)	53 (25.4%)
Somewhat effective	842 (59.6%)	219 (58.4%)	119 (56.9%)
Not effective at all	150 (10.6%)	63 (16.8%)	37 (17.7%)
Total	1,413 (100%)	375 (100%)	209 (100%)

At the same time, the surveys revealed some skepticism about the sufficiency and fairness of the incentives. As shown in Table 27, more than half the respondents did not find the reward amounts compelling enough to overcome the inconvenience of altering their routine at least once per week (the "not very often" group noted as a non-changer). Many felt the points or dollars on the table were simply too small to make a significant change. A common suggestion was that only larger incentives (or more frequent rewards) would meaningfully motivate change. This implies that while the concept was appealing, the magnitude of incentives is crucial to success. Participants were essentially calculating their own cost–benefit analysis, and for many, the benefits did not outweigh the personal "cost" of altering travel decisions, given the pilot's reward levels.

Table 27. Were the incentives big enough to cause you to change your travel choices?

Answer	Survey 2	Survey 3
No. I did not change my travel due to the incentives	116 (30.9%)	59 (28.2%)
Yes, but not very often	101 (26.9%)	50 (23.9%)
Yes, but only once or twice	41 (10.9%)	26 (12.4%)
Yes. I changed my travel 1–3 times/week	75 (20.0%)	43 (20.6%)
Yes. I changed my travel every day/almost every day	42 (11.2%)	31 (14.8%)
Total	375 (100%)	209 (100%)

Impact on Overall Mobility

To assess whether the Miles Matter incentives produced detectable congestion relief, the project team compared participants' recorded trips with independent traffic counts in the study corridors. Using TxDOT traffic data for 2024 as a baseline, it became clear that Miles Matter accounted for only a small fraction of overall traffic on these facilities.

On heavily traveled freeways such as I-35W, I-35E, I-30, and I-20, typical weekday peak-period volumes can exceed 100,000 vehicles. A typical weekday on I-30 may see 38,000 vehicles during the afternoon peak of 3:00 – 6:30 p.m. By contrast, Miles Matter participants contributed on the order of dozens of trips per period rather than thousands. For example, during the morning peak (6:30 – 9:00 a.m.) on I-35W, the program averaged fewer than 100 participant trips per weekday, while more than 20,000 total vehicles traveled during the same period. That translates to well under 1% of all traffic volume, even on days with the highest observed Miles Matter activity. Similar patterns appeared for other corridors and time periods. Across the board, the Miles Matter trips accounted for a minimal share of total corridor volumes and rarely approached that level on the busiest days.

Because the participant footprint was so small relative to total demand, even meaningful behavior changes within the Miles Matter group were not sufficient to be detected by corridor-level congestion metrics. In other words, the incentives may have influenced some individual decisions. Still, the number of affected travelers was too limited to influence aggregate measures such as traffic volume, average speed, or travel time reliability on the regional network.

The key takeaway is that the pilot realistically could not produce observable congestion relief at the scale of the Dallas/Fort Worth freeway system, given its modest enrollment and the size of regional traffic volumes. Instead, the value of the pilot lies in demonstrating that a smartphone-based incentive system can be implemented, that travelers will engage with it, and that some will adjust their behavior in response to rewards. For such a program to have a measurable impact on DFW traffic conditions, it would need to reach a much larger share of drivers (or be applied in a more targeted, high-participation corridor) and likely offer more substantial or more sustained incentives (i.e., not a raffle).

Summary of Findings

The Mobility Assessment for Miles Matter reveals that, although the pilot successfully implemented a smartphone-based incentive system to target travel behaviors, the resulting changes in participants' travel patterns were minimal. The GoCarma app and back-office system proved capable of applying point rewards for specific behaviors, such as avoiding peak periods, carpooling, taking alternate routes, or not traveling on certain days. Participants did engage with the incentives to some extent. In total, 63% of participants in the treatment group (i.e., 1,874 out of 2,968 travelers) earned points for at least one targeted trip or action, demonstrating the system's ability to credit thousands of travel behavior events. Table 28 provides a summary of the findings from the Mobility Assessment, aligned with the specific objective and measurable results.

Specific incentive strategies saw strong uptake: roughly one-third of participants earned rewards for shifting to off-peak travel on I-35W or carpooling on I-20. By contrast, far fewer users took advantage of incentives requiring more disruptive changes. Only 8.8% used an alternative route (e.g., Harry Hines Blvd) instead of a congested freeway, and a small number (0.1%) used the offered transit incentive (e.g., DART rail).

Despite the successful issuance of point incentives, the changes in travel behavior of the treatment group relative to the control group were generally minimal and very few were statistically significant. A rigorous analysis compared the treatment group (with incentives) to a control group (without incentives) before and after the program. The analysis found no significant differences in key metrics, such as the number of trips and the share of travel during peak versus off-peak hours. For example, the peak-period trip percentage in the treatment group decreased by only about 0.9%, which was actually smaller than the 2.1% reduction observed in the control group over the same period (without any incentives). In other words, peak-spreading trends were evident, but they appeared to be driven more by broader regional or seasonal factors than by the incentive program itself.

Table 28. Summary of Findings from the Mobility Assessment

Objective	Metrics	Finding
The system can apply incentives and credits to targeted travel behavior.	• 1,874 users (63% of those eligible) earned points at least once. • More than one-third earned points for shifting off-peak travel on I-35W. • More than one-third earned points for making carpool trips on I-20.	**Supported:** The system demonstrated the ability to target behaviors with incentives.
Road user behavior changes before and after the application of credits.	• No significant change in the number of trips and VMT per participant was observed. • The number of observed trips with shifted travel times, new carpool, altered routes, or different modes was not statistically different between the treatment and control groups. • In follow-up surveys, less than half indicated the amount of the incentive was big enough to make a weekly change.	**Not Supported:** Almost no significant behavioral changes were observed. Some change in travel was observed, but with control group travelers often making more change than treatment group travelers. Therefore, the incentives could not be assumed to cause these travel behavior changes.
The system should help to improve overall congestion on regional roadways.	• No measurable improvement in peak-hour travel times or speeds. • The incentive program did not worsen congestion or shift problems elsewhere (e.g., Harry Hines Blvd.) • I-35W only had 100 incentivized trips out of 20,000 vehicles on a typical morning peak, less than 1% of total volume.	**Not Demonstrated (neutral):** The pilot did not produce any significant change (positive or negative) in overall traffic congestion. Substantially greater number of participants or incentive magnitudes would likely be required.

Consistent with these findings, participant surveys indicated that, although users found the program easy to use, it was generally “convenient and non-intrusive, if not transformative,” in its impact on their day-to-day travel. In mid- and late-program surveys (Surveys 2 and 3), approximately 60% of active users reported that the pilot was working well for them. However, those who dropped out or stopped earning points likely did so because the incentives were not sufficiently compelling to sustain long-term behavior change, a challenge noted in similar incentive-based mobility programs (Papayannoulis et al., 2024).

At the broader mobility level, the Miles Matter project had no impact on overall traffic congestion, as expected given the limited scale. The number of participants was too small produce any measurable improvement in corridor travel speeds, traffic volumes, or travel time reliability. Notably, the program did not cause any adverse effects on congestion. Even where participants diverted to alternative routes or changed their travel times, these shifts were limited in number and had no observable negative impact on other travelers. However, achieving a noticeable congestion-mitigation effect would likely require either a larger number of travelers in the program or larger incentive levels.

The Miles Matter pilot underscores that point-based incentives alone (for use in a monthly raffle), at the modest scale and values offered, were insufficient to alter regional traffic outcomes. Future efforts may build on these insights by refining incentive designs and combining them with complementary policies to achieve more substantial changes in travel behavior.

Chapter 6. Public Engagement Assessment

This chapter presents an assessment of how well the Miles Matter project interacted with and engaged users, including the timing of participant invitations, ongoing interactions with the GoCarma app platform and various support channels, and participation in the incentive program. The assessment synthesizes findings from three participant surveys: Survey 1 given at enrollment, and Surveys 2 and 3 administered after participants had experience with the program. Other data sources for consideration in this assessment included registration activation timestamps, the rewards ledger for participants, customer support tickets, GoCarma dashboard summaries, and interviews with NCTCOG and Carma staff.

Respondent Surveys

The Miles Matter team conducted three surveys to understand participants' perspectives before and during their experience with the program's incentives and points. These surveys collected feedback on several key aspects: the user experience with the Miles Matter program function in the GoCarma app; the acceptability and comprehensiveness of the point-based accounting framework; existing travel behaviors; the potential to alter trip activities; and interest in continuing or expanding such a program.

The questionnaire included a mix of multiple-choice questions, scale-rated items (e.g., 1-to-5 scores), and open-ended prompts. Key topics covered by the survey were:

- App Utilization and Experience: frequency of app use, ease of use, satisfaction with app features, and any technical issues encountered
- Perceptions of Point-Based Accounting Framework: opinions on the fairness and acceptability of incentives and the incentive/reward structure experienced in the program.
- Existing Behaviors and Likelihood for Change: current activities for driving frequency, routes, timing, and mode of travel, as well as thoughts and hurdles to altering behaviors.
- Future Possibilities: willingness to continue using the app or participate in a similar program again, and thoughts about overall transportation programs in the D/FW region

Most quantitative questions were closed-ended with predefined options or rating scales. The surveys also included an open-ended comments section, allowing participants to elaborate on their experiences or suggest improvements in their own words. The combination of quantitative and qualitative data provided both measurable metrics and contextual explanations for participants' perceptions.

The three surveys provided a comprehensive perspective, from the initial baseline (Survey 1) to the participants' experience and outcomes (Surveys 2 and 3). Survey 1 served as a comprehensive intake, helping establish participants' demographic traits, how they typically

travel, and the practical constraints that shape their choices. Survey 1 also asked about the ease of joining Miles Matter and installing or updating the GoCarma app, as well as reasons for enrollment. To encourage participation, the project offered respondents 400 points for completing the first survey.

Surveys 2 and 3 delved deeper into operations of and opinions about the Miles Matter program. Many questions from Surveys 2 and 3 were similar to provide a consistent means to compare performance over the course of the pilot project. Later surveys included focused on overall satisfaction with the project and on the app's technical capability. The later surveys also asked directly about behavior change attributable to Miles Matter incentives, including whether the incentives encouraged shifting the time of day, increasing carpool or transit trips, working remotely, or avoiding travel on poor-air-quality days. Toward the end of the project, the Miles Matter team added questions to Survey 3 that allowed participants to reflect on the concepts of fairness and regional impact.

Of the 3,970 participants, at least 1,413 completed the first survey, which was distributed upon project kickoff in September 2024, yielding a response rate of 35.7%. Subsequent surveys had smaller subsets of completers and were distributed in February and July 2025, respectively. Survey 1 had the most questions, 40, due to the need to establish a demographic and traveler-behavior profile for baseline conditions. Table 29 provides a summary of key statistics from the administration of the three surveys. All three surveys remained open through August 2025, the remainder of the pilot, as participants joined the program at different times.

Table 29. Survey Response Through August 2025

Survey	Total Questions	First Distribution	Responses
Survey 1 – Initial Intake	40	9/3/2024	1,413
Survey 2 – Middle	27	2/3/2025	375
Survey 3 – Final	32	7/8/2025	209

Survey responses were compiled and analyzed using statistical software. For scale-rated and multiple-choice questions, the team calculated response frequencies and percentages across all the respondents. Key results are presented in charts and tables in the latter parts of this section. For open-ended questions, responses were coded into thematic categories (i.e., Top Issues Reported in Region). The research team identified recurring themes and notable comments to help enrich the quantitative findings. Throughout this analysis, common themes are highlighted to deepen understanding of the rationale for participants' perceptions.

Initial Enrollment

Participants were generally pleased with the Miles Matter app experience. When asked to rate their overall satisfaction with the app's performance and usability, the vast majority responded positively. A large majority (about 75%) found it "very easy" to install the GoCarma app and join the travel behavior study (see Table 30), with an additional 20% finding it "somewhat easy." Only a small portion of respondents reported any difficulty. This ease was also reflected in roughly half of the invitees (51%) formally signing up after receiving an invitation.

The smooth onboarding process is a noticeable improvement over traditional road usage charge (RUC) programs that rely on distributed OBD-II plug-in devices, which can take days to deliver and install. In Miles Matter, registration was instant for existing GoCarma users who opted in on a smartphone, eliminating any hardware setup delay. As a result, new users began logging mileage quickly. Nearly half recorded their first trip within 24 hours of enrollment, and about 68% did so within the first week.

Table 30. How easy or difficult was it to install the GoCarma app and join the travel behavior study?

Survey 1 Answer	Count	Proportion
Very easy	1,055	74.7%
Somewhat easy	278	19.7%
Neither easy nor difficult	43	3.0%
Somewhat difficult	31	2.2%
Very difficult	6	0.4%
Total	1,413	100%

Participants also appreciated the intuitive account setup and points system. Upon sign-up, every user received a 500-point bonus, and 93% reported that they could clearly see their earned points in the app after enrolling. Subsequent surveys showed that the ability to see points remained high at 88% and 96% in Surveys 2 and 3, respectively (see Table 31). Qualitative comments from early surveys highlighted the “ease of enrollment” as a motivation for joining, alongside the chance to win prizes and the appeal of the program’s goals. Many users found the interface intuitive and easy to navigate, and they valued features such as the clear display of their current balance, reward points, and trip logs.

Table 31. Are you able to see the points you have earned by participating in the travel behavior study?

Answer	Survey 1	Survey 2	Survey 3
Yes	1,308 (92.6%)	329 (87.7%)	200 (95.7%)
No	105 (7.4%)	46 (12.3%)	9 (4.3%)
Total	1,413 (100%)	375 (100%)	209 (100%)

Continual Engagement

Beyond onboarding, the Miles Matter app was designed to keep users continually engaged and informed, with an emphasis on customer service and transparency. In-app support features included a help center, support ticketing, and live chat capability. In practice, relatively few participants needed one-on-one support, suggesting the app’s usability and self-help resources were effective. Roughly one in five respondents contacted GoCarma support in the initial wave, rising to about one in three by Survey 3 (Table 32).

Table 32. Have you ever contacted GoCarma support?

Answer	Survey 1	Survey 2	Survey 3
Yes	300 (21.2%)	100 (26.7%)	73 (34.9%)
No	1,113 (78.8%)	275 (73.3%)	136 (65.1%)
Total	1,413 (100%)	375 (100%)	209 (100%)

Among users who interacted with GoCarma support, satisfaction was consistently high across all surveys. Roughly 75–85% rated their experience as satisfactory or very satisfactory. Only a small minority (6% or fewer) were dissatisfied in any wave. These findings reinforce that user support was effective and well-received, with slightly higher satisfaction during the mid-program phase (Survey 2). In all surveys, only a portion of negative responses focused on errors in app functionality, the ability to detect carpools, and the accuracy of point scoring. Most dissatisfied respondents appeared to report general transportation grievances (e.g., high toll rates) rather than direct customer-support issues through the Miles Matter Program.

Table 33. Did GoCarma support resolve your issue to your satisfaction?

Answer	Survey 1	Survey 2	Survey 3
Very satisfactory	183 (61.0%)	65 (65.0%)	41 (56.2%)
Somewhat satisfactory	67 (22.3%)	22 (22.0%)	16 (21.9%)
Neither satisfactory nor unsatisfactory	28 (9.3%)	5 (5.0%)	9 (12.3%)
Somewhat unsatisfactory	13 (4.3%)	2 (2.0%)	3 (4.1%)
Very unsatisfactory	9 (3.0%)	6 (6.0%)	4 (5.5%)
Total excluding (blank)	300 (100%)	100 (100%)	73 (100%)

Transparency of the point and travel logs also contributed to positive engagement, as eight customer service sessions (i.e., online chats between GoCarma support and participants) were logged during the pilot—a relatively small number. Nearly all users could view their trip data and point totals in real time, building trust in the system. Participants could review a transaction history of their miles and rewards for the past 60 days in the app (as envisioned in the project design), thereby increasing their understanding of how their behaviors translated into points. The low number of customer service sessions implies many users found what they needed through self-service. The app also pushed out announcements to gather feedback, keeping users involved in program. Overall, the pilot's engagement data suggest that the smartphone platform effectively supported continuous user interaction, with quick support resolution and clear information helping maintain user trust throughout the program.

Frequency of Use

Point-earning activity from trips tended to mirror active participation in the program. Figure 9 illustrates when users began and ended point-earning trip activity during the Miles Matter Travel Behavior Study, measured by the first and last month in which each unique participant recorded point-qualifying trips. Participant enrollment increased gradually through early 2025, with the most considerable growth occurring between March and May 2025. The number of users who

received their first points for trip-making activity peaked in April 2025 at 367, coinciding with the broad public outreach and incentive communications released during that period. Participation continued to expand modestly in May with 293 first-time point earners, before tapering in subsequent months.

By contrast, the “last trip” distribution indicates that most participants remained active through the end of the pilot in the summer of 2025, with 1,178 users recording their final qualifying trips in August. The lower counts of last trips in earlier months (e.g., 8–9 users ending participation in January and February) indicate that most participants remained engaged for several months after joining, even if they did not take frequent trips during the week.

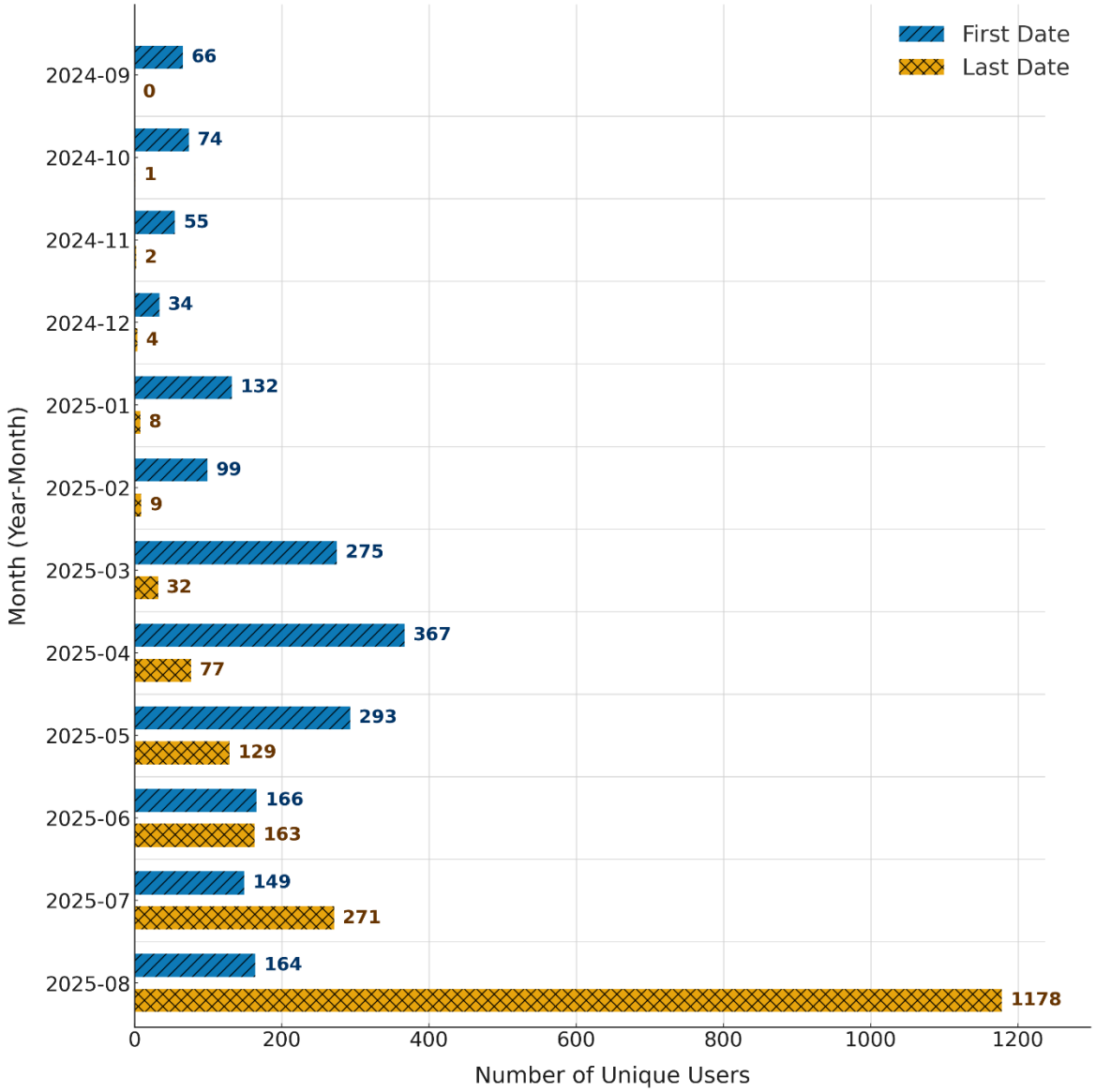


Figure 9. When Travelers First Began and Stopped Earning Points for Trips (n=1,874)

The distribution of mileage among all trip-earning participants was skewed toward a majority of travelers who made a small number of infrequent trips. Figure 10 summarizes the total distance traveled by each participant for point-earning trips on the selected corridors (e.g., I-30, I-35W, SH183) during the Miles Matter study period. These data show a highly skewed distribution, with most travelers recording relatively short total travel distances, whereas a smaller subset accumulates higher mileage. A total of 961 users (about 55 percent of 1,874 point-earning travelers) had fewer than 50 total miles for point-earning trips. In comparison, another 279 users (16 percent of point-earning travelers) recorded between 50 and 99 miles. Roughly 22 percent of point-earners traveled between 100 and 399 miles, and only about 7 percent of participants exceeded 400 miles of logged travel. Fewer than 2 percent of users (about 16 participants) recorded more than 2,000 miles for point-earning travel during the study period.

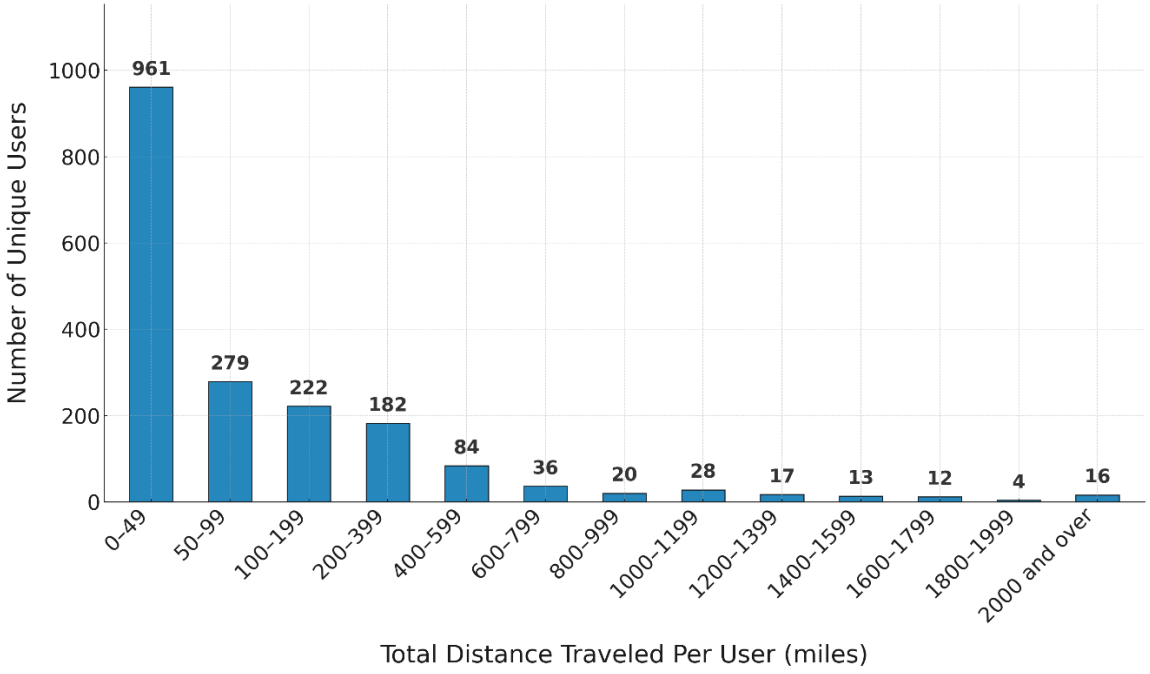


Figure 10. Distribution of Total Point-Earned Distance Per Traveler (n=1,874)

A majority of users logged relatively short travel during the pilot. The low-mileage group of 961 users who traveled fewer than 50 miles collectively accounted for just 4.4 percent of total program mileage and 7.4 percent of all recorded point-earning trips. These travelers completed an average of 5 trips per person with an average trip length of 3.3 miles. However, low-mileage travelers were less frequent in their point-earning trip activity. The low-mile group was active for 55 days (roughly 8 weeks) on average, measured from the first to the last point-earning trip. Out of 1,874 total point-earning users, a total of 265 users (14.1%) recorded only one trip, and 174 users (9.3%) recorded two trips.

The group with a moderate level of activity accounted for 731 participants (39 percent of the 1,874-person subgroup), defined as travelers who logged between 50 and 500 total point-earning miles during the project. Moderate-mileage travelers averaged 171 miles per person across 37 trips, with an average trip length of 4.6 miles. Their engagement duration averaged

151 days (about 22 weeks) between their first and last recorded trips, indicating sustained participation across much of the pilot.

A relatively small but highly active segment of participants logged more than 500 total miles during the pilot. The high-mileage group comprised 182 travelers (10 percent of the subgroup's 1,874 participants), yet they contributed disproportionately to overall activity. Point-earning travelers with more than 500 miles recorded accounted for 60.8 percent of all miles recorded and 51.4 percent of all trips. On average, each high-mileage participant recorded 1,203 total miles across 185 trips, with an average trip length of 6.5 miles. High-mileage travelers remained active for approximately 207 days (about 30 weeks) between their first and last trips. The traveler who took the most trips accumulated more than 7,600 miles of point-awarded activity across 544 trips (541 as a two-person carpool). The most active traveler enrolled in Miles Matter in January 2025 and continued through the end of August, averaging 68 trips that earned points.

Table 34 provides a summary of descriptive statistics for the low (fewer than 50 miles), medium (between 50 and 500), and high mileage (more than 500 miles) groups. For data on the average mileage per user, average trips per person, and average active days (measured between the first point-earning trip and the last), data on the median are also provided because the overall total mileage does not follow a normal distribution, as the mean and median values do not predictably align with one another.

Table 34. Descriptive Statistics According to Mileage Group (n=1,874)

Mileage Group	Total Users (Share)	Total Miles (Share)	Avg Total Mileage Per User (Median)	Avg Trips Per User (Median)	Avg Active Days (Median)
<50 miles	961 (51.3%)	15,898 (4.4%)	17 (22)	5 (4)	55 (21)
50–499 miles	731 (39.0%)	125,338 (34.8%)	174 (165)	37 (31)	151 (133)
≥500 miles	182 (9.8%)	218,954 (60.8%)	1,203 (865)	185 (143)	207 (196)
All groups	1,874 (100%)	360,190 (100%)	192 (108)	35 (19)	117 (69)

The ability to maintain a consistent pattern of earning points by performing specific trip behaviors varied significantly, with some travelers taking earning points on just 1-2 trips and others earning points almost every day. Figure 11 presents user retention trends for the treatment and control groups, measured as the share of unique users who recorded at least one trip each week after their first trip.

This tapering pattern is consistent with behavioral trends documented in previous incentive- and credit-based travel behavior programs, as shown in FHWA's Smartphone Travel Incentives Study (Papayannoulis et al., 2024). Historically, participant activity typically declines once the novelty of data collection diminishes or initial rewards are earned.

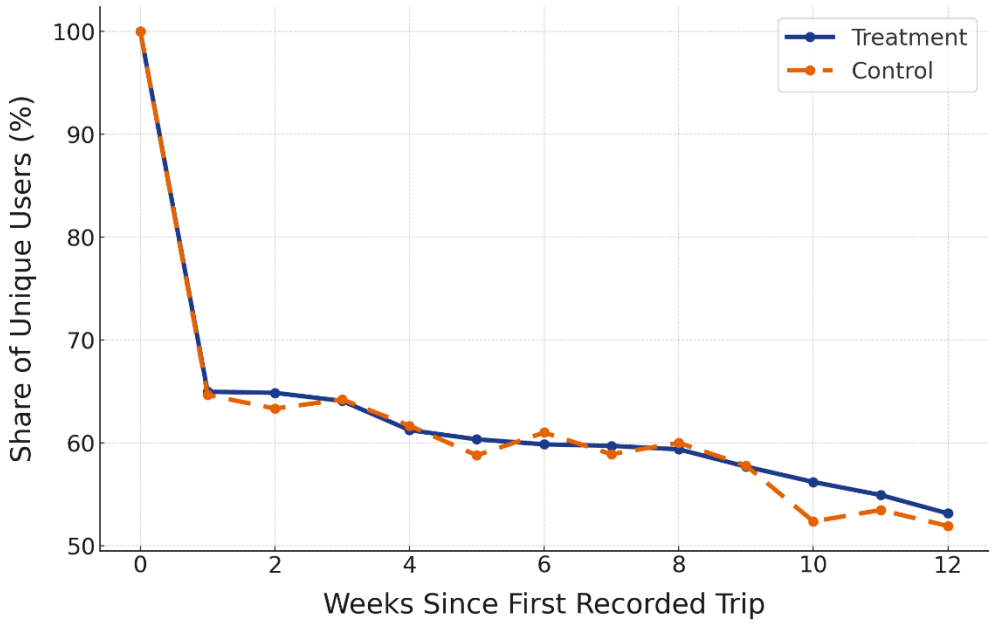


Figure 11. Retention Since Earning Points from First Trip

Toward the middle and end of the Miles Matter project, participants' feelings about the program tended to be positive or neutral, based on their experiences. Across all responses, 320 participants (60%) from both Survey 2 and Survey 3 reported a positive experience, selecting either “working well” or “working very well.” Of these, 217 participants (41%) said the study was “working well,” while another 103 participants (19%) felt it was “working very well.” Another 214 participants (40%) selected the neutral category, “not working well but not working poorly,” suggesting that, although the study was not burdensome, many participants may have viewed the experience as adequate but not particularly impactful. A much smaller fraction of respondents reported adverse experiences. Only 29 participants (5%) selected “working poorly,” and 21 participants (4%) indicated “working very poorly,” totaling just 9% of all responses from both Survey 2 and 3.

Results were consistent across Survey 2 and Survey 3. Survey 2 included 201 participants (54%) who selected a positive option and 145 participants (39%) who selected the neutral option. Survey 3 had 119 participants (57%) who chose a positive rating and 69 participants (33%) who selected the neutral option. Table 35 shows the number of responses from Surveys 2 and 3 regarding the program's overall effectiveness. However, a caveat of the survey is that it does not capture individuals who left early or stopped earning points from various incentives but continued to travel.

Table 35. Overall, how well did the study work for you?

Answer	Survey 2	Survey 3
Working very well	53 (14.1%)	50 (23.9%)
Working well	148 (39.5%)	69 (33.0%)
Not working well, but not working poorly	145 (38.7%)	69 (33.0%)
Working poorly	19 (5.1%)	10 (4.8%)
Working very poorly	10 (2.7%)	11 (5.3%)
Total	375 (100%)	209 (100%)

Summary of Findings

Overall, the public engagement assessment indicated that Miles Matter successfully leveraged an existing smartphone platform to recruit, onboard, and support a large number of travelers, while revealing predictable challenges in sustaining long-term participation in an incentive-based program. Three in-app surveys (1,413 baseline respondents and smaller follow-up panels of 375 and 209) provided a strong quantitative and qualitative foundation for understanding the user experience from enrollment through the end of the pilot, supplemented by transaction logs, registration timestamps, support records, and staff interviews. Together, these sources show that the project met its core engagement objectives around ease of entry, transparency, and customer support, and achieved moderate success in encouraging targeted behaviors among a subset of users.

The first key finding is that the app-based enrollment and onboarding process worked exceptionally well for participants. Roughly half (51 percent) of those who received an invitation joined on the first day, and about two-thirds (68 percent) took at least one point-earning trip within the first week after registering. Survey 1 results indicate that approximately 95 percent of respondents rated joining as “very easy” or “somewhat easy,” and more than 90 percent reported being able to view their earned points in the app. The high level of clarity remained strong in the mid- and late-program surveys. Compared with legacy road usage charge pilots that required shipping and installing OBD-II devices, Miles Matter’s integration into the existing GoCarma platform minimized friction and allowed users to start earning points almost immediately after enrollment.

Ongoing engagement with customer support was similarly positive. Across all three surveys, only about one-quarter to one-third of respondents reported ever contacting GoCarma support. However, among those who did, roughly 75–85 percent rated the experience as satisfactory or very satisfactory. System logs recorded only eight formal support sessions over the entire year, indicating that most needs were addressed through in-app information, self-service tools, or one-time assistance.

Participation in the incentive program and progress toward target behavior goals were more mixed. Of the 3,970 participants who opted into the incentive program, approximately 2,697 made trips on Miles Matter corridors and were eligible to earn points; 1,874 ultimately earned at least some points, representing roughly 63 percent of eligible users. Specific incentives

resonated particularly well. More than half (52 percent) of all enrolled participants in the treatment group earned points for avoiding travel on selected days with poor air quality, and roughly one-third earned points for carpooling on I-20 or shifting to off-peak periods on I-35W. By contrast, fewer participants engaged with incentives that required larger changes, such as diverting to Harry Hines Boulevard (8.8 percent of eligibles) or trying the DART Red Line (0.1 percent).

The engagement data also highlight substantial variation in the extent to which participants used the app over time. Among participants who earned at least some points (1,874 of 2,968 in the treatment group), one-third (650 travelers) stopped earning points after the first week, and retention declined steadily thereafter. By Week 8, only about 59 percent of users recorded at least one trip that week, and by Week 12, that share had fallen to roughly 53 percent (~1,000 travelers), with no significant difference between the treatment and control groups. Mileage distributions were highly skewed: just under 10 percent of users (the high-mileage group) accounted for roughly 61 percent of all point-earning miles, while more than half of users recorded fewer than 50 total miles during the pilot. This pattern is consistent with other smartphone-based incentive programs, where a smaller core of highly engaged participants drives a large share of activity, and novelty effects wear off for many users over time (Papayannoulis et al., 2024).

Despite a decline in point-earning activity, mid- and late-program surveys indicate that most respondents—at least those still actively earning points—viewed the study favorably or neutrally. Combining Survey 2 and Survey 3 responses, about 60 percent of participants reported that the study was “working well” or “working very well” for them, 40 percent selected a neutral option (“not working well but not working poorly”), and only 9 percent reported negative experiences. These results indicate that for those who remained engaged, Miles Matter was generally seen as convenient and non-intrusive, if not transformative, in their regular behavior. At the same time, the surveys do not fully capture the perceptions of participants who disengaged early, and some of those users likely found the ongoing value of participation to be limited.

Overall, the public engagement assessment indicates that the Miles Matter program achieved strong early recruitment and delivered a mostly positive user experience, demonstrating that a smartphone-based platform can support large-scale, low-friction participation in a system that supports road usage charging (without charging actual monetary fees). The program successfully communicated points and rewards, resolved a small number of concerns with minimal staff intervention, and motivated meaningful behavioral responses among a subset of travelers. At the same time, the findings underscore the difficulty of sustaining engagement over many months and of motivating larger changes in traveler behavior. These insights underscore the importance of refining incentive design, communication strategies, and program value propositions in future efforts to sustain broad, long-term participation. Table 36 provides a summary of the findings from the Public Engagement Assessment, aligned with the specific objective and supported by measurable results.

Table 36. Summary of Findings from the Public Engagement Assessment

Objective	Metrics	Finding
The mobile app should facilitate user enrollment and participation.	• Roughly half (51%) of those who received an invitation joined on the first day. • Two-thirds (68%) of enrollees took their first trip one week after registration. • 94% of participants felt that it was easy to join.	**Supported:** Adopting the Miles Matter Program was straightforward for existing GoCarma users, and many were eager to participate.
The mobile app should make it easy and transparent for users to engage with customer service agents	• Only logged eight customer support sessions during the year. • 25-30% of respondents contacted customer support. • 75–85% rated customer service as satisfactory or very satisfactory.	**Supported:** Users who continued with Miles Matter found it easy, with few customer service issues.
The mobile app should encourage participation in the incentive program and achieve target behavior goals.	• 63% of those who could earn points did so as part of the program. • More than one-third either took HOV trips on I-20 (36%) or shifted travel to off-peak periods on I-35W (35%). • One-third stopped earning points after the first week. • Toward the end, 60% felt that it was working well for them, with 9% feeling a poor experience.	**Mixed:** Initially, users were very excited about the program, and many earned points within the first week. However, the ability to get travelers to earn points waned as the project progressed.

Chapter 7. Administrative Assessment

The administrative assessment focuses on the two objectives related to costs and administrative burdens. The assessment uses data from the pilot to document system costs and burdens, and information from a literature review to estimate costs and burdens associated with a full-scale deployment that could not be analyzed under the Miles Matter pilot. When possible, quantitative data were used; when costs and burdens were unknown or difficult to quantify, the research team conducted a qualitative analysis of the relevant factors.

Transitioning to a RUC-based revenue mechanism requires a more resource-intensive collection system. The Miles Matter project used a smartphone app to help reduce the cost and administrative burden associated with other RUC data-collection methods. However, based on past research (U.S. Government Accountability Office, 2022), a user-based revenue mechanism inherently incurs greater costs and burdens than traditional transportation revenue mechanisms, such as the fuel tax. As the Miles Matter project focused on technological feasibility, the actual costs and administrative burdens associated with a full deployment warrant further research.

System Costs

The Miles Matter Pilot used an existing smartphone app, but incurred costs for both staff time and ongoing system maintenance. Carma stated that the capability to process distance-based transactional data was newly explicitly developed for the Miles Matter Project and described this functionality as foundational to the broader project architecture and evaluation context. Table 37 shows the major cost components of the Miles Matter pilot for 41,600 active GoCarma users who traveled on the designated corridors (but did not necessarily sign up for the behavioral incentives), as well as estimated costs for a larger deployment. The Miles Matter pilot total cost column is based on actual expenditures during the pilot program that are relevant to the actual deployment. Other costs that are not relevant, such as behavioral incentive costs, were excluded. Table 37 also shows the estimated program costs if scaled to one million total participants.

Total costs are not provided, as the Miles Matter Pilot did not mirror a traditional RUC pilot. Several costs remain unknown; however, discussions with Carma and NTTA suggest that operational costs would likely amount to approximately 6.5 percent of revenue collected. For the Miles Matter Project, Carma explained that its pricing approach includes two primary components, beginning with a flat Software-as-a-Service (SaaS) licensing fee. Carma also indicated that, within its transaction-based pricing component, approximately 4 percent is intended to cover operational needs, including overhead, hosting, storage, maintenance, and security compliance (including SOC 2). An additional 2-3 percent covers banking and payment processing.

The remainder of the section provides a breakdown of each cost component, except for account management and compliance, which are discussed under the administrative burden objective.

Table 37. Annual Miles Matter Costs

Item	Total Project Cost	Cost Per User	Est. Cost for One Million Participants	Est. Cost Per User for One Million Participants
Mileage Reporting Method	$0	$0	$0	$0
Data Storage	$60,000	$1.44	$1,440,000	$1.44
Security Compliance	$75,000	$1.80	$75,000	$0.08
Customer Support	$30.90	$0	Unknown	Unknown
System Maintenance	$774,000	$18.62	$774,000	$0.77
Engagement and Enrollment	Unknown	Unknown	Unknown	Unknown
Account Management	Unknown	Unknown	Unknown	Unknown
Compliance	Unknown	Unknown	Unknown	Unknown

Mileage Reporting Method

A substantial portion of the cost of any RUC program is attributable to the data-reporting method employed. Standard methods include OBD devices, telematics, and odometer checks. Costs for these options range from $1 to $5 per vehicle per year for odometer readings, $60 to $120 per vehicle per year for OBD devices, and $12 to $102 per vehicle for technology support (e.g., OBD, telematics) per year, depending on the scale of the program (Hawaii Department of Transportation, 2022; Utah Department of Transportation, 2024; Washington State Transportation Commission, 2024). The Miles Matter pilot avoided this cost entirely by using a smartphone-based method.

In all cases, these costs are expected to decrease as more vehicles are enrolled in the program; however, the OBD method's potential cost reduction at scale is limited by the equipment required. Telematics incurs no upfront cost to the state, as the technology is already integrated into the vehicle. The cost is purely data-related and decreases as more vehicles are enrolled, due to economies of scale in data handling. OBD costs are primarily comprised of the unit cost of the physical device, rather than data costs, which means that as more vehicles are enrolled, the cost can only be reduced to a certain level, since each vehicle still requires its own OBD device.

A smartphone-based RUC avoids most of these costs in the same way a telematics option does, since each participant brings their own device, resulting in an upfront cost of $0. This cost would remain $0 at any scale, as participants bring their own smartphones. A significant advantage of a smartphone-based system is the ability to avoid these costs; however, both smartphone-based and telematics systems incur data management costs.

Carma reported that the submission of odometer photos was used as a verification mechanism in the pilot, with 372 participants submitting odometer photos to demonstrate smartphone-enabled verification workflows. Carma also noted that, although many newer vehicles are equipped with telematics hardware, continued participation in connected services subscriptions is limited. Carma staff cited research indicating that only 25 to 35 percent of connected-car

owners maintain their subscriptions beyond the initial period. Based on the current state of telematics subscription uptake, Carma concluded that telematics may not yet serve as a viable primary channel for large-scale RUC data collection, even though it can be technically functional for some users.

Data Storage

Data storage costs are a significant component of the total cost for any RUC program with a large number of participants. Carma's data retention policy deletes user trip data after 60 days, or immediately if the user selects the "delete" option in the Privacy menu. Aggregate data is maintained for reporting purposes, but it does not include personally identifiable information (PII). In many pilot and program accounts, these costs are included in the account manager contract and, therefore, difficult to quantify independently. NTTA currently retains approximately 40 petabytes of data, including seven years of user data, in accordance with its data retention policy. The Miles Matter pilot collects much more detailed data than NTTA's tolling data. This, along with data retention requirements, would necessitate storing very large volumes of data in a statewide program.

The estimated data storage costs for the Miles Matter pilot are approximately $5,000 per month, totaling $60,000 per year. This would likely scale in a stepwise manner with the number of program users. This currently amounts to approximately $1.44 per user per year. In the one-million-user scenario, the per-user cost is held constant at $1.44, and the total cost increases to $1,440,000. For a statewide deployment with 26 million users, this cost would scale to $37.44 million per year. As with other cost elements, additional economies of scale may be realized as a program matures.

Security Compliance

Another cost of the current pilot was the SOC 2 audit, also known as a System and Organization Controls audit. A certified CPA firm conducts this audit to evaluate the firm's adherence to five categories, including data security, availability, confidentiality, processing integrity, and privacy. For the Miles Matter Project, the cost of the SOC 2 audit was covered by other sources of funding from NCTCOG, and the security compliance costs were not covered by the STSFA grant.

However, the security compliance costs were approximately $75,000, plus $15,000 annually in ongoing expenses. This included a base cost of $20,000 for the audit and $55,000 for labor. In subsequent years, an additional $15,000 in labor costs will be incurred to comply with the audit. This annual cost may increase as the program evolves (and could increase if the project charged actual tolls and exchanged money), but the per-user cost would fall substantially. It was assumed that the total audit cost would remain constant in the one-million-user scenario, reducing the per-user cost to $0.08.

Customer Support

Customer service support, marketing, education, and compliance are likely to be high costs in any full-scale deployment; however, the nature of this pilot provided little insight into these costs.

Customer service costs were estimated at $31 for the entire pilot, with only eight support tickets being submitted. On the per-user level, this is essentially $0 per participant. This low number of tickets is attributable to the pilot's incentives and non-billing of participants, which limited customer support to users experiencing app-related problems. Billing participants for their travel would likely substantially increase the volume of customer support tickets. Nonetheless, this low number of tickets shows that the app functions well and is easy for participants to use.

System Maintenance

GoCarma currently charges NCTCOG a $774,000 Software-as-a-Service (SaaS) fee as part of the Miles Matter pilot. This covers the management, updates, and maintenance of the software. The current cost is approximately $18 per user and is likely to decrease as the program scales. It was assumed that the current effort would work for up to several million users. Thus, it was assumed that for 1 million users, the cost would fall to $0.77 per user. A statewide program would require greater effort and a higher SaaS fee, resulting in a higher total cost; however, the per-user cost would likely be lower than $0.77.

Carma emphasized that SaaS licensing is based on the scope of deployment (e.g., roads and geography) rather than on the number of enrolled users. Carma also stated that scaling a program by adding roads or expanding into new regions (including statewide) may require a separate licensing arrangement, even if the underlying app platform remains the same.

Engagement and Enrollment

Marketing and engagement costs were minimal for this pilot, as users were recruited from the app's existing user base, which was already familiar with the app. In a full-scale deployment, these costs would be substantial, as large numbers of people unfamiliar with the app would need to be trained to use it, which would likely increase customer support costs as well. Compliance costs may also be high. Fee evasion may necessitate odometer checks or other methods, thereby reducing total revenue collected.

Likewise, enrollment costs were very low, since the only cost was labor for crafting the in-app messages. In a standalone RUC program, recruitment costs would be higher, as users would presumably not already be participating in a similar program and would therefore not have the app downloaded, nor would they be familiar with the interface. A new RUC program entails additional advertising costs that were not incurred by the Miles Matter program. Data costs also increase in a stepwise fashion as more users join the program. Adding one additional user may not incur any increase in cost, whereas adding 10,000 or 100,000 users would require additional data storage and maintenance capacity.

Administrative Burden

The administrative burden objective focuses on the day-to-day effort required for an agency and its partners to operate a smartphone-based RUC system at scale. Rather than asking whether the technology can record and credit road usage, this subsection examines the requirements for recruiting users, keeping them engaged, responding to questions, configuring and monitoring

rules, and coordinating among institutional partners. Overall, the pilot suggests that the incremental burden of running a smartphone-based program can be low when it is built on an existing platform and framed as an incentive program.

Some of the most resource-intensive elements of a full road usage charge (e.g., enforcing compliance, resolving billing disputes, and managing multi-party financial clearing) were not part of the Miles Matter system's design. Therefore, because of that limitation, this subsection distinguishes between the observed administrative burden in the pilot and the expected burdens that would emerge in a full deployment, focusing on user enrollment and engagement, customer support, rule configuration and monitoring, and institutional roles and responsibilities.

User Enrollment and Engagement

At the end of the project in August 2025, the Miles Matter program had 41,600 unique users, totaling 12.4 million transactions, and logged 64.1 million vehicle miles traveled. This is more users than most other RUC pilots, which typically involve a few hundred to a few thousand participants. Notable exceptions include the Virginia program, with over 10,000 users enrolled, and the Hawaii pilot, which included 360,000 participants in the odometer-reading phase.

A primary pillar of the Miles Matter pilot was the premise that a large cohort of participants could be readily recruited from the existing GoCarma HOV Incentive user base in the D/FW region. This avoided the majority of recruitment and education costs typically required for other RUC pilots. This was a benefit to the pilot, as it kept costs and complexity down, but reduced the ability to capture the true administrative cost burdens associated with a full-scale deployment.

Initial Enrollment

The high number of participants can be attributed to the program's ease of enrollment. All recruitment for the Miles Matter pilot was done using in-app messaging. Participants were recruited from the DFW user base of the existing GoCarma app, which comprises approximately 90,000 users. To enroll, participants had to opt in after receiving an in-app message about the optional Miles Matter program. Since users already had GoCarma accounts, no additional action was required after opting in, resulting in low-effort enrollment.

Time to user activation was also very short in the Miles Matter program. Among participants who opted into the program, 51 percent did so within 24 hours of receiving an invitation. Once they opted in, the person became immediately active in the program. Travel data was logged for 57 percent of newly registered participants within 24 hours of registration. This contrasts with other RUC programs, which require a physical device. In other pilots, participants must opt in, wait at least several days to receive a device, and then install it in their vehicle. In contrast, in the Miles Matter pilot, activation is immediate.

Ongoing Engagement

Three types of messages were used throughout the program: recruitment notices, incentive updates, and survey reminders. All three were developed in-house and issued through the existing app messaging platform. The total number of messages developed was 2-3 recruitment messages per corridor, 30-40 incentive messages per corridor, and six incentive-requirement

messages. In total, only 10 to 15 hours of staff time were devoted to messaging efforts over the one-year life of the pilot. As a result, the administrative burdens associated with recruitment for this pilot were negligible.

Using an existing app interface reduced education costs and simplified enrollment. Under Miles Matter, the user interacted with a familiar app interface and opted in to an additional program with surveys and additional messaging. In a full-scale deployment, recruitment and education are likely to incur substantial costs as users adapt to an unfamiliar smartphone app and a new revenue-collection system.

NCTCOG staff noted that data collected through this approach could benefit public outreach, communication with policymakers, and planners' understanding of travel behavior. Data could be summarized in a public-facing dashboard to educate the public and policymakers about the program and how travel patterns behave in the area. Each user could be provided with an individualized breakdown of their own travel behavior. When paired with an incentive program or dynamic pricing, this could be used to show individuals how to minimize their own costs and to influence the public's travel behavior more broadly. This data would also be invaluable to transportation planners, helping them better understand individual travel behaviors (NCTCOG, 2025).

Customer Support

Because participants had opted into an additional program in the GoCarma app, they were already familiar with its use. This familiarity is reflected by the very low number of customer support tickets generated. Only eight customer support tickets were generated for the 3,970 users who participated in the behavioral incentives—and were not passively recorded for their travel behavior.

In describing potential customer support efficiencies, Carma provided a real-world example in which app-based workflows and automated tools reduced a client's support staffing needs to a dedicated agent. The Miles Matter Project used a small fraction of one person's time. Carma argued that, even while acknowledging that complete billing programs may introduce additional complexity, the app-based approach could still yield substantial reductions in customer service costs for users who participate through the app. Even users who do not rely on in-app mileage tracking can still use customer service features via the web or a customer-facing app interface, thereby reducing demand for phone-based support channels.

This pilot was also unique in that it offered participants rewards rather than charging them for travel expenses. In a program in which participants are billed rather than rewarded, customer support issues are likely to be much more frequent. In a full-scale deployment, these customer support tickets would likely be split between the app developer and the account manager, with technical questions about app use directed to the app developer and billing issues to the account manager. The OReGO program currently uses NextMove and GeoToll as its vendor options, while Utah uses ETAN, and Virginia uses Emovis.

Ease of Administering Policies and Rules

An essential feature of the Miles Matter pilot is its flexibility in updating rules, policies, and procedures. Project partner time was required to determine rules, policies, and procedures for the pilot and would be required under a full-scale deployment. In the pilot, this meant that the corridors included and the conditions for the incentive could change easily. In a RUC deployment, this feature can be used to quickly adjust charges and modify dynamic pricing conditions, including corridors, time-of-day, and air quality. Under this objective, the assessment considers the ease of use of the proposed system in Miles Matter as well as ease of administration and agency perceptions.

The Miles Matter pilot can add new corridors to the program with minimal effort. A new corridor can be added with approximately two minutes of staff labor. Since the entire program is smartphone-based, no physical infrastructure is required. Once the corridor is defined in the software, it is live immediately, and data collection can begin. Because adding new corridors is straightforward, even a statewide deployment would incur minimal costs in this category.

Updating Rules

Rules related to RUC administration, or in this pilot, the incentive disbursement, can also be updated with minimal effort. Many of the rules, including which users are affected and the operational hours, can be updated through a web-based administrator interface, making any changes effective immediately. In a larger deployment, this would enable the agency to update pricing rules so that they take effect immediately. This would entail an ongoing cost, as staff time would be required to determine the rules; however, this would likely represent a small share of overall program costs. NCTCOG staff found that the smartphone-based approach was flexible and could be easily updated. Most of their effort went into developing the initial rules, while the application implemented them straightforwardly and quickly (NCTCOG, 2025).

For the pilot, custom rulesets were developed for the behavioral incentive program. These were more complex rule sets that required custom software development. Creating these more complex rules initially required one to two days of developer effort, but once created, they could be quickly updated. In a larger deployment, creating specific rules is likely to require some developer effort; once developed, updating them would require minimal effort and cost.
Any major costs associated with updating rules would likely come from the effort associated with maintaining user awareness and support related to a policy change. Any change to policy would challenge existing user expectations, especially in a toll or RUC-based system.

Account Management Needs

As currently configured, the Miles Matter pilot does not accept user payments. Instead, the goal of this program was to demonstrate the feasibility of using a smartphone-based method for RUC collection and to administer points for the behavioral incentive program; thus, in any full-scale deployment, a significant cost component would be the account manager and associated payment system.

The Eastern Transportation Coalition estimated that administrative costs for a RUC would be approximately 19 percent of total revenue, with the account manager's portion accounting for 10 percent (I-95 Coalition, 2019). This implies that the account manager accounts for

approximately 53 percent of total program administrative costs. The account manager in this case would handle data processing, user payments, and the majority of customer service issues. The state would handle recruitment, outreach, public education, and performance monitoring of the account manager.

For a Miles Matter-based program, the account management costs would likely have a different structure. The app developer currently manages smartphone app development and updates, as well as data. The third-party account manager would then be responsible only for managing user payments and addressing the associated customer support issues. This means that, for this type of program, the account manager would account for less than 53 percent of total costs, since the app developer already performs many of those functions. There would also be an upfront cost to develop an oversight policy for this vendor, as well as a small ongoing oversight cost. Carma noted that administrative cost savings may be achievable in supporting functions (e.g., Department of Motor Vehicles lookups) that can become expensive at scale depending on the data access structure. Carma also reported that existing agreements with agencies can enable access to certain lookup information without additional per-transaction or per-record charges, which could reduce back-office administrative expenses at higher volumes.

Table 38 lays out the functions each entity would perform. In a hypothetical deployment with multiple entities involved, the app developer would retain control of the smartphone app, including development, maintenance, and updates, and would continue to manage the data and associated dashboards. In an RUC deployment, an outside account manager would be required to handle payment processing and address associated customer service issues. The state agency would then be responsible for performance monitoring and vendor oversight of the app developer and the outside vendor, as well as RUC enforcement, education and outreach, and system audits. This differs from past RUC deployments in that it involves three parties.

Table 38. Administrative Component and Responsibility

Component	Either Vendor or State	Carma	Exclusively State
Mileage Reporting Method		X	
Data Collection		X	
Payment Processing	X		
Account Management (inc. customer service)	X		
Performance Monitoring/Vendor Oversight			X
Enforcement			X
Education and Outreach			X
Audits			X

Furthermore, some RUC deployments may rely on a single provider for payment processing, account management, mileage reporting, and data collection. The private partner for this project, Carma, prefers to have a single vendor to do all those functions. Carma believes that using a single entity provides an easier customer experience and reduces potential issues associated with transferring sensitive location data between entities (e.g., fewer data breaches).

Compliance and Enforcement

Another burden associated with a smartphone-based RUC is the compliance and enforcement requirements. An OBD-based RUC may encounter issues if users remove or turn off the devices; however, these issues can be detected and reconciled through annual odometer inspections. In-vehicle telematics could avoid many of these issues because it cannot be easily disabled.

A smartphone-based RUC, however, would likely have unique enforcement issues. Since the RUC would be calculated via the smartphone app, malicious actors could avoid the fee by simply turning off their phones while driving. Users could install the app on a second device that remains at home, thereby bypassing the RUC entirely. An annual odometer check, as demonstrated by this pilot, could be completed through the app and would mitigate this issue. Still, because the smartphone app is based on an individual's travel behavior rather than on a vehicle, it would be difficult to prove that the user is evading the fee.

NCTCOG staff believed that these issues could generally be mitigated by verifying odometer readings and that a smartphone-based solution would be most effective when used in conjunction with other collection methods. Annual odometer inspections, more frequent uploads of odometer photographs, and possibly software solutions could address this concern; however, each would increase the program's overall administrative costs. A full-scale deployment in Texas would require reconciling mileage data for over 18 million drivers, which would incur a substantial yet unknown cost. Even with this effort, compliance is unlikely to reach 100%, resulting in additional lost revenue.

Carma summarized that odometer photo verification was repeatedly used during the pilot, with 372 participants uploading verified photos a total of 542 times, indicating that recurring verification via smartphone can be operationally feasible for at least a subset of participants. Carma also suggested that pairing odometer photo verification with periodic reminders could offer a broadly applicable and relatively tamper-resistant compliance mechanism, supporting enforcement discussions for a future program design.

Summary of Findings

This assessment identified the total administrative burden and system costs associated with a hypothetical RUC using the Miles Matter smartphone app, to the extent possible. Table 39 provides a summary of findings from the Administrative Assessment, aligned with specific objectives and supported by metrics. Where costs could not be quantified, a qualitative discussion of the administrative burden required was used instead. The analysis estimated costs, where possible, for both the current user base and a program with one million users. It is expected that the value based on the Miles Matter program participants represents the maximum possible cost per user. As the number of participants increases, most of these costs will exhibit economies of scale. This analysis estimates that at an enrollment of one million users, the per-user cost would be approximately $2.30, excluding many unknown costs. This would likely decrease further at higher enrollment levels.

Table 39. Summary of Findings from the Administrative Assessment

Objective	Metrics	Finding
The potential for the proposed system to reduce the costs of scaling alternative user-based revenue mechanisms.	• At $0 per device, no physical device cost is attributed explicitly to the program. • $2.30 or lower per user data cost at scale, with at least a million enrolled • Unknown account management, engagement, and compliance costs. • NTTA retains 40 petabytes of data for its system. • NTTA estimates a full deployment at 6.5% of the actual total revenue collected.	**Supported:** Did not deploy a true RUC program with actual fees, so information on handling real dollars was incomplete (e.g., more user complaints with actual bills). However, based on estimates from NTTA, a fully deployed RUC with actual dollars would be 6.5% of total revenue collected, as compared to 10-11% of total revenue for a traditional toll system.
The potential for the proposed system to ease the administrative burden associated with user-based revenue mechanisms.	• Only logged eight customer support sessions during the year. • About 15 hours of staff time in total were spent during the year messaging individual users. • Two minutes to add new corridors within the system. • 1-2 days for a developer to code complex rule changes	**Supported:** The low number of support tickets indicated the app's ease of use. NCTCOG staff enjoyed the procedural flexibility of the application and the quality of the travel data it generated. Travel data could inform changes in user travel behavior and the development of educational materials.

The nature of this pilot precluded the collection of data on several cost categories, including enforcement, customer service, public engagement, and account management. These represent substantial costs that would be incurred in a full RUC program deployment. This analysis attempted to estimate these costs to the extent possible; however, limited data exist on the cost components of an RUC, especially at scale. Evidence from future RUC deployments will be necessary to fully understand these cost elements.

Regarding administrative burden, the Miles Matter pilot highlighted the flexibility and accessibility of a smartphone app. While the understanding of ease of enrollment is constrained by the use of the existing customer base, time to activation, and limited customer support, it still highlights ease of use. The pilot emphasized the minimal staff time required to establish rules and policies when using an existing system. Finally, the agency, in this case NCTCOG, viewed the pilot positively. At the same time, administrative burdens for compliance and education present a challenge. NCTCOG found that the pilot provided an adaptable system that met their needs despite limited staff support.

Chapter 8. Conclusions

The Miles Matter pilot has provided valuable insights into the feasibility and impact of a smartphone-based RUC system with behavioral incentives. This chapter synthesizes the evaluation results across the five goals and offers insights to guide future RUC initiatives at the national level. The findings indicate that the pilot successfully demonstrated key technological capabilities and innovative policy approaches, while also highlighting challenges in public acceptance and program administration that future efforts should address.

Summary of Findings

The evaluation was structured around five primary goals: Technology, Policy, Mobility, Public Engagement, and Administrative. The following section summarizes the key findings from each of these evaluation areas, drawing from the detailed results presented in the respective chapters.

Goal #1: Demonstrate the capability, reliability, and scalability of a smartphone-based crediting system for targeting geofenced locations in the DFW region. The Miles Matter pilot demonstrated that a smartphone-based platform can reliably record and process large volumes of geofenced road usage data without additional in-vehicle hardware. Over the project period, the GoCarma system recorded approximately 12.4 million road-use transactions and 64.1 million VMT among 41,600 unique travelers. Monthly active usage remained stable, averaging 23,000 to 32,000 users per month, and the system operated with an effective recorded uptime of approximately 100%. Time-to-activation was also short, with about 51 percent of invited participants opting in within 24 hours, and travel data were logged for 57 percent of newly registered users within a day of registration. A total of 372 participants used a monthly odometer photo feature, uploading odometer images 542 times in total. Additionally, a total of 19 travelers utilized their vehicle telematics system to record and submit trip records. A small minority of users experienced technical issues (e.g., GPS signal dropouts or application errors), which were resolved primarily through customer support. Overall, the pilot confirmed that modern smartphone apps are a feasible and scalable approach for RUC data collection, provided that technical support is available to address user issues.

Goal #2: Identify evidence-based policy recommendations regarding revenue allocation, preservation of personal privacy, and fairness. The pilot found that the smartphone-based platform is technically capable of supporting key RUC policy needs, but that public acceptance of those policies remains a significant constraint. The system successfully processed millions of logged miles. It allocated VMT across counties (e.g., 54% in Tarrant, 36% in Dallas, 6% in Collin, 3% in Parker, and 1% in Denton), demonstrating precise cross-boundary accounting and the ability to distinguish tolled from non-tolled facilities. Privacy protections also performed well from a technical perspective. There were no major data breaches, an in-app Privacy Center allowed users to manage or revoke location permissions, and trip data was automatically deleted after 60 days or when an account was removed. Average reported concern about data privacy declined from 3.86 to 3.34 on a 5-point scale during the pilot, indicating that concerns eased slightly but did not disappear. The system's rate-setting simulator could model a wide

variety of RUC and crediting policies. The points framework (that did not use actual tolls) was generally viewed as fair (only about 6% of users rated it unfair).

However, attitudes toward a policy on road usage charging were much more skeptical: 56% of respondents felt replacing the gas tax with a per-mile charge would be a “bad” or “terrible” way to fund transportation, 51% were uncomfortable with an odometer-based system that used GPS on select roads, and 43% felt that even a combined credits-plus-mileage-fee system would be worse than the current gas tax.

Goal #3: Explore the potential for market-based congestion mitigation at targeted locations in the DFW region. The Miles Matter project compared road-user behavior before and after the application of credits using a treatment–control framework. No significant change in the number of trips or VMT per participant was observed between the pre-incentive and post-incentive periods. Similarly, the number of trips with shifted travel times, newly formed carpools, altered routes, or different modes did not differ statistically between the treatment and control groups. Follow-up surveys aligned with these quantitative results. Fewer than half of respondents indicated that the incentive amounts were sufficient to motivate a weekly change in their travel choices. Taken together, these findings indicate that using credits (or points) in a monthly raffle did not achieve the desired shift in travel behavior that could influence overall congestion. The limited incentive levels yielded little significant behavioral change toward market-based congestion mitigation.

Goal #4: Determine the ease of public acceptance among different users of the system. The Miles Matter pilot underscored the importance of proactive public engagement and education for the success of new funding mechanisms. The program’s outreach and incentive structure garnered interest from 3,970 travelers in the Dallas/Fort Worth region. Participant feedback was largely positive about the ability to earn credits for prizes. More than 70% of surveyed participants indicated a preference for receiving rewards to change travel behavior, and a substantial majority felt that such an incentive system could at least somewhat help reduce congestion and improve air quality.

The project also met its objectives for easy enrollment and customer support, but had mixed results in sustaining long-term participation. Roughly half (51%) of invited users joined on the first day; two-thirds (68%) took their first trip within a week of registration; and 94% reported that joining was easy, indicating that onboarding through the existing GoCarma app was effective for participants. Customer service demands were minimal. Only eight support sessions were formally logged over the year; approximately a quarter of respondents ever contacted support, and roughly 80% of those who did rated their experience as satisfactory or very satisfactory, indicating that ongoing interactions were generally smooth and low-burden for both users and staff. However, engagement tapered over time. Approximately one-third of participants who earned points stopped earning points after the first week. Toward the end of the pilot, approximately 60% of respondents reported that the study was working well for them, whereas roughly 9% reported a poor experience. Overall, many users participated in incentives, but maintaining active participation and enthusiasm over many months proved more challenging.

Goal #5: Confirm the administrative and cost burden of implementing the user-based alternative revenue mechanism: The administrative assessment examined both system costs and day-to-day administrative burdens associated with a smartphone-based RUC platform. On the cost side, the Miles Matter pilot documented major system cost components for approximately 41,600 passively recorded travelers and developed scalable estimates, indicating per-user data and system costs on the order of $2.30 or less at an enrollment of one million users, excluding unknown categories. Several important cost elements, such as comprehensive account management, compliance, and large-scale customer engagement and dispute handling, are measured in actual dollars rather than using credits for various TDM-type initiatives. However, in discussions with NTTA, they estimated that a fully deployed RUC system, including actual dollars, dispute resolution, and revenue leakage, would account for 6.5 percent of total revenue collection. NTTA's estimation was less than the 10-11 percent that NTTA currently uses for traditional toll collection with roadside gantries. Costs associated with staff overhead, data hosting, storage, and maintenance are likely to remain with a smartphone service. Furthermore, 2-3 percent of total revenue collection is attributed to credit card, banking, and processing fees. In short, a smartphone-based system has the potential to reduce costs by as much as 40-50 percent compared to traditional toll systems.

Insights for Future Efforts

Building on the lessons learned from the Miles Matter pilot, this section presents insights for future RUC deployments. These recommendations are intended to inform other states and federal policymakers as they explore mileage-based user fee programs and seek to build on the pilot's successes and address its challenges. The focus is on broad, national-level guidance that can be adapted to different contexts to ensure that emerging RUC systems are effective, fair, and publicly acceptable.

Leverage Proven Technology as an Alternative: Future RUC programs should build on the success of smartphone-based mileage tracking, as demonstrated by the Miles Matter pilot, to ensure accuracy and user-friendliness. Mobile apps with GPS and geofencing can notably reduce costs associated with additional hardware and the administrative staff burden. However, it is important to offer alternative reporting options for those who cannot or prefer not to use smartphones to ensure inclusivity. States should also invest in ongoing technical support and app improvements, as a reliable and easy-to-use system is critical for user retention and trust.

Prioritize Privacy and Data Security: Privacy concerns were a transparent barrier for many pilot participants, so addressing this issue is paramount in any future RUC rollout. States and RUC providers should implement strong privacy safeguards. For example, limiting location tracking to select corridors and employing techniques such as data anonymization or encryption to protect personal information. Importantly, agencies must communicate these safeguards clearly to the public. Users are more likely to accept technology when they understand how their data is handled and why. Offering choices (such as a flat-rate option or an odometer-only plan for those uncomfortable with GPS tracking) can also help alleviate privacy concerns. In short, building a reputation for data security and respecting user privacy will be critical for gaining public trust in RUC systems.

Develop Scalable and Interoperable Administrative Systems: As RUC programs transitions from pilot to full-scale implementation, administrative demands will increase. States should plan for scalable systems for account management, billing, enforcement, and customer service. One recommendation is to build on existing systems. For example, motor vehicle agencies or toll authorities (which already handle millions of user accounts and payments) could serve as models or partners for RUC account management to streamline operations. Interoperability is another key consideration, as the Miles Matter pilot benefited from a coalition of stakeholders. Future efforts should continue in this collaborative spirit, pooling expertise to handle technical integration and back-office complexities. Additionally, controlling administrative costs is crucial for the sustainability of RUC as a funding source. Efficiencies gained through automation, shared services, and effective use of technology will help keep overhead low relative to revenue.

Adopt a Phased Implementation Approach with Continuous Evaluation: Finally, it is recommended that states view RUC deployment as a gradual, learning-oriented process. The Miles Matter pilot is an example of how a phased approach can yield important insights and enable adjustments before wider deployment. Each phase should be accompanied by independent evaluation and data collection to measure outcomes against goals. By continuously evaluating and sharing results, the broader community of practice can learn what works best. An iterative approach will reduce risks and build public confidence over time.

In conclusion, the Miles Matter pilot made notable contributions to the understanding of next-generation road funding mechanisms. The results confirm that an app-based RUC with targeted incentives is technically feasible and that users generally preferred earning credits for specific trip-making behaviors—even if they did not significantly adjust their behavior. Nevertheless, a significant limitation of the study was the use of non-monetary credits instead of actual fees.

Based on literature, the project team believes that an incentive system with monetary rewards for each trip, even if very small, would have yielded different results. However, the use of actual monetary rewards makes the overall budget larger and beyond the scope of the Miles Matter project. Yet, the concept of adding additional features to a RUC system beyond the collection of fees does hold some promise toward making road usage charging at least marginally more palatable to the general public.

References

Federal Highway Administration. Fixing America's Surface Transportation (FAST) Act – Surface Transportation System Funding Alternatives Program Description. U.S. Department of Transportation, Washington, DC, 2019.

Federal Highway Administration. *Surface Transportation System Funding Alternatives (STSFA) Program: 2021 Biennial Report.* Report No. FHWA-HOP-22-090, U.S. Department of Transportation, Washington, DC, April 2023.

Hawaii Department of Transportation HiRUC. Costs of Odometer Reading Analysis. March 2022. https://hiruc.org/wp-content/uploads/2022/08/E-4-HiRUC-Cost-of-Odometer-Mileage-Collection.pdf. Accessed September 22, 2025.

I-95 Corridor Coalition. I-95 Corridor Coalition Mileage-Based User Fee Study. 2019.

Interview with Utah Department of Transportation, RUC Program Manager, 2024.

National Conference of State Legislatures. Road Usage Charge Fact Sheet: RUC America. Washington, DC, 2022.

North Central Texas Council of Governments Staff Interviews, 2025.

Papayannoulis, V., et al. Smartphone Travel Incentives Study: Final Report. Federal Highway Administration. Report FHWA-HOP-24-078. September 2024. Report available at: https://ops.fhwa.dot.gov/publications/fhwahop24078/fhwahop24078.pdf.

U.S. Government Accountability Office. Highway Trust Fund: Pilot Projects Could Help Determine the Viability of Mileage Fees for Certain Vehicles. GAO-22-104299, Washington, DC, 2022.

Washington State Transportation Commission. Forward Drive: Sustaining Washington State's Transportation System into the Future. January 2024. https://waroadusagecharge.org/media/final-report/DIGITAL_WA%20RUC%20Final%20Report%20January%202024_v2.pdf. Accessed September 22, 2025.

Appendix A. Survey Responses

Appendix A. 1. How easy or difficult was it to install the GoCarma app and join the travel behavior study? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Very easy	1073	74.6
Somewhat easy	284	19.7
Neither easy nor difficult	44	3.1
Somewhat difficult	31	2.2
Very difficult	6	0.4

Appendix A. 2. Are you able to see the points you have earned by participating in the travel behavior study? (Survey 1, 2, and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
Yes	1329	92.4	344	87.8	211	95.5
No	109	7.6	48	12.2	10	4.5

Appendix A. 3. Have you ever contacted GoCarma support? (Survey 1, 2, and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
Yes	307	21.3	101	25.8	75	33.9
No	1131	78.7	291	74.2	146	66.1

Appendix A. 4. Did GoCarma support resolve your issue to your satisfaction? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Very satisfactory	189	13.1	66	16.8	43	19.5
Somewhat satisfactory	68	4.7	22	5.6	16	7.2
Neither satisfactory nor unsatisfactory	28	1.9	5	1.3	9	4.1
Somewhat unsatisfactory	13	0.9	2	0.5	3	1.4
Very unsatisfactory	9	0.6	6	1.5	4	1.8
Not Answered	1131	78.7	291	74.2	146	66.1

Appendix A. 5. How many people live in your household? (Survey1)

Answer	Number of respondents	Share of respondents (%)
1 person	54	3.8
2 people	466	32.4
3 people	331	23
4 people	348	24.2
5 people	140	9.7
More than 5 people	99	6.9

Appendix A. 6. What is your annual household income? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Less than $50,000	79	5.5
$50,000-$99,999	284	19.7
$100,000-$149,999	338	23.5
$150,000-$199,999	288	20
More than $200,000	266	18.5
Prefer not to answer	183	12.7

Appendix A. 7. Which of the following best describes your gender? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Male	724	50.3
Female	672	46.7
Other	5	0.3
Prefer not to answer	37	2.6

Appendix A. 8. What is the highest level of education you accomplished? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Have not finished High School	21	1.5
High School or GED	118	8.2
Associate, Vocational, or Technical Degree	168	11.7
Some College	263	18.3
Bachelor's Degree	513	35.7
Master's or Ph. D.	355	24.7

Appendix A. 9. What is your age? (Survey1)

Answer	Number of respondents	Share of respondents (%)
16-25	51	3.5
26-35	267	18.6
36-45	428	29.8
46-55	347	24.1
56-65	216	15
66-75	106	7.4
76 or Older	23	1.6

Appendix A. 10. Which of the following best describes your race? (Survey1)

Answer	Number of respondents	Share of respondents (%)
White or Caucasian	887	61.7
Hispanic or Latino	238	16.6
Asian or Pacific Islander	117	8.1
Black or African American	67	4.7
Multiracial or Biracial	37	2.6
Native American or Alaskan Native	17	1.2
Prefer not to answer	71	4.9
Other	4	0.3

Appendix A. 11. Employment status (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Employed full-time	1050	73.0	286	73.0	152	68.8
Retired	158	11.0	45	11.5	29	13.1
Employed part-time	58	4.0	15	3.8	7	3.2
Homemaker	56	3.9	18	4.6	13	5.9
Unemployed	30	2.1	9	2.3	6	2.7
Student	25	1.7	4	1.0	2	0.9
Employed full-time & Student	15	1.0	2	0.5	4	1.8
Employed full-time & Employed part-time	5	0.3	2	0.5	0	0.0
Employed full-time & Homemaker	5	0.3	1	0.3	1	0.5
Employed full-time & Retired	4	0.3	2	0.5	0	0.0
Employed full-time & Unemployed	2	0.1	0	0.0	0	0.0
Employed full-time & Student & Retired	1	0.1	1	0.3	1	0.5
Employed full-time & Employed part-time & Unemployed	0	0.0	1	0.3	0	0.0
Employed part-time & Homemaker	7	0.5	0	0.0	2	0.9
Employed part-time & Retired	6	0.4	1	0.3	0	0.0
Employed part-time & Student	6	0.4	1	0.3	0	0.0
Employed part-time & Student & Homemaker	1	0.1	0	0.0	0	0.0
Student & Homemaker	1	0.1	1	0.3	1	0.5
Student & Retired	2	0.1	0	0.0	0	0.0
Student & Unemployed	2	0.1	1	0.3	0	0.0
Retired & Homemaker	2	0.1	1	0.3	1	0.5
Retired & Unemployed	1	0.1	1	0.3	1	0.5
Retired & Homemaker & Unemployed	0	0.0	0	0.0	1	0.5
Homemaker & Unemployed	1	0.1	0	0.0	0	0.0

Appendix A. 12. How often do you use flextime? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Daily	148	10.3	34	8.7	20	9
Weekly	163	11.3	54	13.8	38	17.2
Monthly	83	5.8	28	7.1	12	5.4
Rarely	225	15.6	59	15.1	21	9.5
I don't use flextime although my work allows it	95	6.6	21	5.4	9	4.1
My work does not allow flextime	446	31	116	29.6	67	30.3
Not Answered	278	19.3	80	20.4	54	24.4

Appendix A. 13. How many days in a week, do you currently work from home or an alternative work location? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
3 or more days per week	345	24	84	21.4	40	18.1
2 days per week	120	8.3	36	9.2	23	10.4
1 day per week	106	7.4	26	6.6	13	5.9
I don't work remotely although my work allows it	127	8.8	32	8.2	8	3.6
My work does not allow me to work remotely	462	32.1	134	34.2	83	37.6
Not Answered	278	19.3	80	20.4	54	24.4

Appendix A. 14. Does your employer allow you to work remotely due to bad air quality in your region? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Yes	94	6.5	2	26	6.6	3
No	918	63.8	2	247	63	3
I don't know	148	10.3	2	39	9.9	3
Not Answered	278	19.3	2	80	20.4	3

Appendix A. 15. What type of vehicle do you use most often? (Survey1)

Answer	Number of respondents	Share of respondents (%)
SUV	717	49.9
Passenger car	463	32.2
Pickup truck	223	15.5
Motorcycle	4	0.3
Others	31	2.2

Appendix A. 16. Thinking about the car you use most often, how many miles have you driven in the past year? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Less than 5,000 miles in a year	95	6.6
Between 5,000 and 10,000 miles in a year	402	28
Between 10,000 and 15,000 miles in a year	411	28.6
Between 15,000 and 20,000 miles in a year	247	17.2
More than 20,000 miles in a year	233	16.2
I don't know	48	3.3
Not Answered	2	0.1

Appendix A. 17. How many trips do you make in a typical week? Please include all types of trips, such as commuting to work, grocery shopping, visiting the doctor, etc. (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
0-5 trips per week	194	13.5	72	18.4	36	16.3
6-10 trips per week	415	28.9	117	29.8	66	29.9
11-15 trips per week	342	23.8	88	22.4	48	21.7
16-20 trips per week	230	16	53	13.5	34	15.4
More than 20 trips per week	257	17.9	62	15.8	37	16.7

Appendix A. 18. How often do you travel during the peak period in a week? (6:30 am-9:00 am / 3:00 pm – 6:30 pm) (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
I don't travel during the peak period	65	4.5	30	7.7	18	8.1
1-5 trips per week	580	40.3	168	42.9	72	32.6
6-10 trips per week	494	34.4	110	28.1	75	33.9
11-15 trips per week	177	12.3	51	13	29	13.1
16-20 trips per week	73	5.1	18	4.6	14	6.3
More than 20 trips per week	49	3.4	15	3.8	13	5.9

Appendix A. 19. Do you know how much longer it takes to travel during the peak period than the off-peak period? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Yes	975	67.8	275	70.2	178	80.5
No	398	27.7	87	22.2	43	19.5
Not Answered	65	4.5	30	7.7	0	0

Appendix A. 20. For trips you often make, do you check travel information (such as Google Maps) before deciding your route? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
I always check travel information when deciding my route	899	62.5	248	63.3	147	66.5
I usually check travel information when deciding my route	271	18.8	74	18.9	37	16.7
I check travel information around half the time when deciding my route	139	9.7	37	9.4	23	10.4
I usually do not check travel information when deciding my route	96	6.7	21	5.4	8	3.6
I never check travel information when deciding my route	33	2.3	12	3.1	6	2.7

Appendix A. 21. What is the most important piece of information that you use to decide your route? - This question was shown to people who selected other than "I never check travel information when deciding my route" (n=1,405) (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Travel time	1263	89.9	332	87.4	184	85.6
Avoid construction	96	6.8	35	9.2	20	9.3
Use less gas	32	2.3	11	2.9	6	2.8
Others	14	1.0	2	0.5	5	2.3

Appendix A. 22. Why not? - This question was shown to people who selected "I never check travel information when deciding my route" (n=33) (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
My usual route takes the least travel time	19	1.3	6	1.5	2	0.9
I don't want to bother looking for a better route	12	0.8	3	0.8	1	0.5
My usual route is the most fuel-efficient	2	0.1	1	0.3	2	0.9

Appendix A. 23. How often do you use transit (Bus, Rail, Trolly/Streetcar, but not Uber or Lyft)? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Daily	11	0.8	6	1.5	4	1.8
Weekly	12	0.8	7	1.8	5	2.3
Monthly	50	3.5	12	3.1	10	4.5
Rarely	440	30.6	118	30.1	59	26.7
Never	925	64.3	249	63.5	143	64.7

Appendix A. 24. What are the main reasons why you use transit? - This question was shown to people who answered they use transit "Daily ", "Weekly", or "Monthly" (n=73). Also, respondents could select multiple answers in this question (Survey1)

Answer	Number of respondents	Share of respondents (%)
It is convenient to use	36	49.3
Less expensive than driving a personal vehicle	26	35.6
Eco-friendly option	18	24.7
Reliable travel time	18	24.7
Parking is expensive	18	24.7
Shorter travel time	13	17.8
Shortage of parking at my destination	11	15.1
My employer offers a transit subsidy	2	2.7
Others	5	6.8

Appendix A. 25. What are the main reasons why you don't use transit? - This question was shown to people who answered they use transit "Rarely" or "Never" (n=1365). Also, respondents could select multiple answers in this question (Survey1)

Answer	Number of respondents	Share of respondents (%)
No available transit service	592	43.4
Longer travel time	391	28.6
Inconvenient to get to the transit station	359	26.3
My schedule is erratic	273	20.0
I have children to transport	272	19.9
Inconvenience of transfers	204	14.9
Personal safety on transit	197	14.4
Not frequent service	135	9.9
The transit service is not served at the scheduled time	107	7.8
Inconvenient parking for using transit	105	7.7
Expensive fare	101	7.4
I don't know how to find a good transit route	96	7.0
Transit facilities are not clean	79	5.8
Others	69	5.1

Appendix A. 26. How many minutes does it take you to get to the closest transit station *by walking*? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Less than 10 mins	76	5.3
10-30 mins	169	11.8
Greater than 30 mins	292	20.3
Cannot get there by walking	572	39.8
I don't know	329	22.9

Appendix A. 27. How many minutes does it take you to get to the closest transit station *by driving*? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Less than 10 mins	307	21.3
10-30 mins	528	36.7
Greater than 30 mins	239	16.6
I don't know	364	25.3

Appendix A. 28. How often do you carpool? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Daily	522	36.3	136	34.7	78	35.3
Weekly	326	22.7	81	20.7	49	22.2
Monthly	64	4.5	19	4.8	10	4.5
Rarely	154	10.7	49	12.5	24	10.9
Never	372	25.9	107	27.3	60	27.1

Appendix A. 29. When you do carpool, are you usually a driver or passenger? - This question was shown to people who answered they carpool "Daily", "Weekly", or "Monthly" (n=912) (Survey1)

Answer	Number of respondents	Share of respondents (%)
Driver	744	81.6
Passenger	168	18.4

Appendix A. 30. Please indicate who you typically carpool with - This question was shown to people who answered they carpool "Daily", "Weekly", or "Monthly" (n=912) (Survey1)

Answer	Number of respondents	Share of respondents (%)
Adult family member	689	75.5
Child(ren)	475	52.1
Friend	194	21.3
Co-worker	189	20.7
Other	19	2.1

Appendix A. 31. What are the main reasons why you carpool? - This question was shown to people who answered they carpool "Daily", "Weekly", or "Monthly" (n=912). Also, respondents could select multiple answers in this question (Survey1)

Answer	Number of respondents	Share of respondents (%)
Convenient to use	432	47.4
Cheaper toll lane	394	43.2
Lower cost	299	32.8
Eco-friendly option	237	26.0
Shorter travel time	101	11.1
Shortage of parking when I bring my vehicle	64	7.0
Lack of parking	48	5.3
Expensive parking fee	42	4.6
Other	123	13.5

Appendix A. 32. What are the main reasons why you don't carpool? - This question was shown to people who answered they carpool "Daily", "Weekly", or "Monthly" (n=526). Also, respondents could select multiple answers in this question (Survey1)

Answer	Number of respondents	Share of respondents (%)
My schedule is erratic	208	39.5
Hard to find someone to carpool with	165	31.4
Shortage of carpool opportunities	89	16.9
I am responsible for transporting others	82	15.6
Longer travel time	60	11.4
I don't know how to find carpool opportunities	39	7.4
Inconvenience to get to the carpooling location	34	6.5
Inconvenience of transfers	28	5.3
Lack of parking	7	1.3
Other	55	10.5

Appendix A. 33. How often do you reduce or change your travel to reduce emissions? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Daily	180	12.5	33	8.4	19	8.6
Weekly	160	11.1	56	14.3	36	16.3
Monthly	79	5.5	23	5.9	17	7.7
Rarely	405	28.2	134	34.2	65	29.4
Never	614	42.7	146	37.2	84	38

Appendix A. 34. How hard or easy is it to do the following for your everyday trips? – Changing departure time to avoid congestion (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
1 (Extremely hard)	323	22.5	94	24	59	26.7
2	308	21.4	79	20.2	39	17.6
3	366	25.5	94	24	54	24.4
4	264	18.4	83	21.2	33	14.9
5 (Extremely easy)	177	12.3	42	10.7	36	16.3

Appendix A. 35. How hard or easy is it to do the following for your everyday trips? – Taking an alternative uncongested route (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
1 (Extremely hard)	164	11.4	43	11	22	10
2	258	17.9	54	13.8	28	12.7
3	388	27	122	31.1	74	33.5
4	399	27.7	101	25.8	54	24.4
5 (Extremely easy)	229	15.9	72	18.4	43	19.5

Appendix A. 36. How hard or easy is it to do the following for your everyday trips? – Taking transit (Survey1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
1 (Extremely hard)	1084	75.4	298	76	163	73.8
2	167	11.6	42	10.7	26	11.8
3	120	8.3	29	7.4	23	10.4
4	42	2.9	14	3.6	4	1.8
5 (Extremely easy)	25	1.7	9	2.3	5	2.3

Appendix A. 37. How hard or easy is it to do the following for your everyday trips? – Carpooling (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
1 (Extremely hard)	452	31.4	133	33.9	68	30.8
2	215	15	64	16.3	34	15.4
3	313	21.8	65	16.6	50	22.6
4	231	16.1	63	16.1	28	12.7
5 (Extremely easy)	227	15.8	67	17.1	41	18.6

Appendix A. 38. How hard or easy is it to do the following for your everyday trips? – Reducing travels to improve air quality in your area (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
1 (Extremely hard)	532	37	144	36.7	71	32.1
2	304	21.1	80	20.4	42	19
3	378	26.3	107	27.3	68	30.8
4	132	9.2	36	9.2	20	9
5 (Extremely easy)	92	6.4	25	6.4	20	9

Appendix A. 39. One of the primary purposes of the travel choices study is to examine the incentive system to create a better traffic environment in the Dallas-Fort Worth area. If the travel choices study is expanded to all travelers, do you think it would be effective at improving travel? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Very effective	430	29.9	98	25	57	25.8
Somewhat effective	857	59.6	227	57.9	126	57
Not effective at all	151	10.5	67	17.1	38	17.2

Appendix A. 40. Why did you join the travel choices study? Respondents could select multiple answers in this question (Survey1)

Answer	Number of respondents	Share of respondents (%)
I wanted to win prizes	950	66.1
It seemed like a worthwhile program	712	49.5
Ease of enrollment	431	30.0
It helps the environment	338	23.5
I was already carpooling/taking transit	310	21.6
My employer encouraged it	17	1.2
Other	28	1.9

Appendix A. 41. Are the incentives big enough to change your travel choices? (Survey1)

Answer	Number of respondents	Share of respondents (%)
Yes	462	32.1
Probably yes	496	34.5
Neither yes nor no	315	21.9
Probably no	114	7.9
No	51	3.5

Appendix A. 42. Were the incentives big enough to cause you to change your travel choices? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
Yes. I changed my travel everyday/almost everyday	43	11	32	14.5
Yes. I changed my travel 1-3 times/week	76	19.4	46	20.8
Yes, but only once or twice	41	10.5	27	12.2
Yes, but not very often	106	27	52	23.5
No. I did not change my travel due to the incentives	126	32.1	64	29

Appendix A. 43. How do you like the concept of an incentive to change travel choices? (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
Like the concept a lot	511	35.5	170	43.4	96	43.4
Like the concept	556	38.7	130	33.2	67	30.3
Neither like nor dislike the concept	263	18.3	74	18.9	46	20.8
Don't like the concept	24	1.7	5	1.3	3	1.4
Don't like the concept a lot	14	1	6	1.5	3	1.4
I don't know. I need more information	70	4.9	7	1.8	6	2.7

Appendix A. 44. As it relates to your participation in the program, please rate how you feel about each of the following – Accuracy of how many miles I drive (Survey 1)

Answer	Number of respondents	Share of respondents (%)
1 (Not concerned at all)	385	26.8
2	239	16.6
3	433	30.1
4	234	16.3
5 (Very concerned)	147	10.2

Appendix A. 45. As it relates to your participation in the program, please rate how you feel about each of the following – Accuracy of points awarded (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
1 (Not concerned at all)	302	21.0	109	27.8	69	31.2
2	183	12.7	37	9.4	18	8.1
3	447	31.1	110	28.1	57	25.8
4	297	20.7	74	18.9	37	16.7
5 (Very concerned)	209	14.5	62	15.8	40	18.1

Appendix A. 46. As it relates to your participation in the program, please rate how you feel about each of the following – Security and privacy of my personal data (Survey 1, 2, and 3)

Answer	Number (S1)	Share (%, S1)	Number (S2)	Share (%, S2)	Number (S3)	Share (%, S3)
1 (Not concerned at all)	134	9.3	70	17.9	46	20.8
2	105	7.3	38	9.7	21	9.5
3	237	16.5	78	19.9	42	19
4	320	22.3	69	17.6	31	14
5 (Very concerned)	642	44.6	137	34.9	81	36.7
1 (Not concerned at all)	134	9.3	70	17.9	46	20.8

Appendix A. 47. How important are the following factors for you in driving for daily travel? – Shorter travel time (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	1031	71.7	114	51.6
Very important	223	15.5	56	25.3
Moderately important	105	7.3	36	16.3
Slightly important	30	2.1	11	5
Not at all	49	3.4	4	1.8

Appendix A. 48. How important are the following factors for you in driving for daily travel? – Shorter distance (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	630	43.8	68	30.8
Very important	358	24.9	58	26.2
Moderately important	303	21.1	66	29.9
Slightly important	87	6.1	20	9
Not at all	60	4.2	9	4.1

Appendix A. 49. How important are the following factors for you in driving for daily travel? – Environmentally friendly (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	295	20.5	38	17.2
Very important	294	20.4	43	19.5
Moderately important	501	34.8	69	31.2
Slightly important	175	12.2	43	19.5
Not at all	173	12	28	12.7

Appendix A. 50. How important are the following factors for you in driving for daily travel? – Less fuel consumption (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	557	38.7	73	33
Very important	399	27.7	58	26.2
Moderately important	306	21.3	53	24
Slightly important	80	5.6	22	10
Not at all	96	6.7	15	6.8

Appendix A. 51. How important are the following factors for you in driving for daily travel? – Less parking cost (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	526	36.6	81	36.7
Very important	260	18.1	42	19
Moderately important	278	19.3	29	13.1
Slightly important	125	8.7	33	14.9
Not at all	249	17.3	36	16.3

Appendix A. 52. How important are the following factors for you in driving for daily travel? – Closeness of the parking lot to the final destination (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	554	38.5	69	31.2
Very important	297	20.7	47	21.3
Moderately important	280	19.5	46	20.8
Slightly important	122	8.5	28	12.7
Not at all	185	12.9	31	14

Appendix A. 53. How problematic are the following transportation issues in your region? – Traffic congestion in peak period(Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	1023	71.1	114	51.6
Very important	234	16.3	42	19
Moderately important	106	7.4	32	14.5
Slightly important	43	3	25	11.3
Not at all	32	2.2	8	3.6

Appendix A. 54. How problematic are the following transportation issues in your region? – Overall traffic congestion(Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	878	61.1	105	47.5
Very important	312	21.7	53	24
Moderately important	178	12.4	29	13.1
Slightly important	41	2.9	26	11.8
Not at all	29	2	8	3.6

Appendix A. 55. How problematic are the following transportation issues in your region? – Car crashes (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	583	40.5	66	29.9
Very important	366	25.5	57	25.8
Moderately important	373	25.9	50	22.6
Slightly important	78	5.4	36	16.3
Not at all	38	2.6	12	5.4

Appendix A. 56. How problematic are the following transportation issues in your region? – Road construction work (Survey 1 and 3)

Answer	Number of respondents (S1)	Share of respondents (%, S1)	Number of respondents (S3)	Share of respondents (%, S3)
Extremely important	773	53.8	94	42.5
Very important	342	23.8	54	24.4
Moderately important	232	16.1	38	17.2
Slightly important	58	4	30	13.6
Not at all	33	2.3	5	2.3

Appendix A. 57. Overall, how well is the travel choices study working for you? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
Working very well	53	13.5	51	23.1
Working well	155	39.5	73	33
Not working well but not working poorly	153	39	73	33
Working poorly	20	5.1	11	5
Working very poorly	11	2.8	13	5.9

Appendix A. 58. How effect is the travel choices study at Changing travel behavior? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
1 (Not effective)	89	22.7	54	24.4
2	74	18.9	36	16.3
3	153	39.0	73	33.0
4	47	12.0	29	13.1
5 (Extremely effective)	29	7.4	29	13.1

Appendix A. 59. How effective is the travel choices study at Encouraging change from driving alone to taking transit, carpooling, or walking? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
1 (Not effective)	102	26.0	77	34.8
2	79	20.2	43	19.5
3	114	29.1	49	22.2
4	57	14.5	26	11.8
5 (Extremely effective)	40	10.2	26	11.8

Appendix A. 60. How effective is the travel choices study at Encouraging off-peak travel? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
1 (Not effective)	80	20.4	52	23.5
2	70	17.9	37	16.7
3	108	27.6	64	29.0
4	88	22.4	33	14.9
5 (Extremely effective)	46	11.7	35	15.8

Appendix A. 61. How effective is the travel choices study at Encouraging remote work? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
1 (Not effective)	130	33.2	85	38.5
2	64	16.3	30	13.6
3	108	27.6	44	19.9
4	45	11.5	29	13.1
5 (Extremely effective)	45	11.5	33	14.9

Appendix A. 62. How effective is the travel choices study at Encouraging avoiding travel on days with bad air quality? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
1 (Not effective)	129	32.9	69	31.2
2	62	15.8	38	17.2
3	118	30.1	56	25.3
4	51	13.0	30	13.6
5 (Extremely effective)	32	8.2	28	12.7

Appendix A. 63. How effective is the travel choices study at Encouraging you to take a less congested alternative route? (Survey 2 and 3)

Answer	Number of respondents (S2)	Share of respondents (%, S2)	Number of respondents (S3)	Share of respondents (%, S3)
1 (Not effective)	59	15.1	43	19.5
2	46	11.7	29	13.1
3	119	30.4	58	26.2
4	89	22.7	39	17.6
5 (Extremely effective)	79	20.2	52	23.5

Appendix A. 64. How much did you change your travel behavior to earn points in the project? (Survey 3)

Answer	Number of respondents	Share of respondents (%)
Often (once a week or more)	39	17.6
Occasionally (1 to 4 times a month)	72	32.6
Rarely (less than once per month)	56	25.3
Never	54	24.4

Appendix A. 65. How important were the following factors in allowing you to change your travel? – Available carpool opportunities - This question was shown to people who answered they "Often" or "Occasionally" change their travel behavior to earn points in the project (n=111). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	34	30.6
2	10	9.0
3	27	24.3
4	22	19.8
5 (Extremely important)	18	16.2

Appendix A. 66. How important were the following factors in allowing you to change your travel? – Available transit option - This question was shown to people who answered they "Often" or "Occasionally" change their travel behavior to earn points in the project (n=111). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	47	42.3
2	18	16.2
3	16	14.4
4	17	15.3
5 (Extremely important)	13	11.7

Appendix A. 67. How important were the following factors in allowing you to change your travel? – Flextime availability - This question was shown to people who answered they "Often" or "Occasionally" change their travel behavior to earn points in the project (n=111). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	19	17.1
2	16	14.4
3	21	18.9
4	22	19.8
5 (Extremely important)	33	29.7

Appendix A. 68. How important were the following factors in allowing you to change your travel? – Working remotely - This question was shown to people who answered they "Often" or "Occasionally" change their travel behavior to earn points in the project (n=111). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	26	23.4
2	11	9.9
3	16	14.4
4	20	18.0
5 (Extremely important)	38	34.2

Appendix A. 69. How important were the following factors in allowing you to change your travel? – Self-motivation - This question was shown to people who answered they "Often" or "Occasionally" change their travel behavior to earn points in the project (n=111). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	9	8.1
2	6	5.4
3	31	27.9
4	27	24.3
5 (Extremely important)	38	34.2

Appendix A. 70. How important were the following factors in allowing you to change your travel? – Incentives provided in this project - This question was shown to people who answered they "Often" or "Occasionally" change their travel behavior to earn points in the project (n=111). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	6	5.4
2	7	6.3
3	28	25.2
4	29	26.1
5 (Extremely important)	41	36.9

Appendix A. 71. How important were the following factors in preventing you from changing your travel? – Lack of good transit option - This question was shown to people who answered they "Never" or "Rarely" change their travel behavior to earn points in the project (n=110). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	33	30.0
2	10	9.1
3	15	13.6
4	15	13.6
5 (Extremely important)	37	33.6

Appendix A. 72. How important were the following factors in preventing you from changing your travel? – Flextime not available - This question was shown to people who answered they "Never" or "Rarely" change their travel behavior to earn points in the project (n=110). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	36	32.7
2	5	4.5
3	20	18.2
4	14	12.7
5 (Extremely important)	35	31.8

Appendix A. 73. How important were the following factors in preventing you from changing your travel? – Working remotely was not available - This question was shown to people who answered they "Never" or "Rarely" change their travel behavior to earn points in the project (n=110). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	45	40.9
2	4	3.6
3	18	16.4
4	9	8.2
5 (Extremely important)	34	30.9

Appendix A. 74. How important were the following factors in preventing you from changing your travel? – Shortage of self-motivation - This question was shown to people who answered they "Never" or "Rarely" change their travel behavior to earn points in the project (n=110). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	54	49.1
2	12	10.9
3	28	25.5
4	8	7.3
5 (Extremely important)	8	7.3

Appendix A. 75. How important were the following factors in preventing you from changing your travel? – Not enough incentives provided in this project - This question was shown to people who answered they "Never" or "Rarely" change their travel behavior to earn points in the project (n=110). (Survey 3)

Answer	Number of respondents	Share of respondents (%)
1 (Not important)	45	40.9
2	16	14.5
3	27	24.5
4	7	6.4
5 (Extremely important)	15	13.6

Appendix A. 76. Did you feel the travel choices points system in this project was fair to all people? (Survey 3)

Answer	Number of respondents	Share of respondents (%)
Extremely fair	72	32.6
Moderately fair	46	20.8
Neutral	74	33.5
Moderately unfair	10	4.5
Extremely unfair	3	1.4
I don't know. I need more information	16	7.2

Appendix A. 77. Do you think an incentive system (such as the travel choices study points system) could help mitigate traffic congestion and air pollution in the Dallas-Fort Worth area? (Survey 3)

Answer	Number of respondents	Share of respondents (%)
Strongly helpful	48	21.7
Somewhat helpful	105	47.5
Not helpful at all	42	19
Not sure, need more information	21	9.5
Not Answered	5	2.3

Appendix A. 78. The average Texas household pays about $200 per year in state gas taxes. Instead of this gas tax, drivers could pay for each mile they drive. Which tax system do you think is better for Texas? (Survey 3)

Answer	Number of respondents	Share of respondents (%)
Paying per mile seems like a great way to fund transportation improvements in Texas	32	14.5
Paying per mile seems like a good way to fund transportation improvements in Texas	20	9.0
Paying per mile seems to be about the same as the current gas tax system	48	21.7
Paying per mile seems like a bad way to fund transportation improvements in Texas. The state should look at other funding options	49	22.2
Paying per mile is a terrible way to fund transportation improvements in Texas. The state should look at other funding options	72	32.6

Appendix A. 79. To pay by the mile, your vehicle mileage would likely be measured by an odometer reading. You may receive a discount by opting in to have your travel recorded within specific locations through GPS on a smartphone app like GoCarma. The technology then goes to sleep outside those areas, safeguarding your privacy. How comfortable are you with having your travel recorded through a smartphone GPS app to get the pay by the mile discounts? (Survey 3)

Answer	Number of respondents	Share of respondents (%)
Very comfortable	40	18.1
Somewhat comfortable	29	13.1
Neither comfortable nor uncomfortable	39	17.6
Somewhat uncomfortable	40	18.1
Very uncomfortable	73	33
Very comfortable	40	18.1

Appendix A. 80. If the travel choices study incentive system and the pay-per-mile fee were introduced in Texas together, do you think it would be better for you and the Texas transportation system? (Survey 3)

Answer	Number of respondents	Share of respondents (%)
Much better than the gas tax	28	12.7
A little better than the gas tax	42	19.0
The same as the current gas tax	60	27.1
Worse than the gas tax	41	18.6
Much worse than the gas tax	50	22.6