



**CENTER FOR
TRANSPORTATION
STUDIES**



 UNIVERSITY OF MINNESOTA

**Parking FlexPass at ABC Ramps:
Integrating Parking and Transit
Options for Sustainable Mobility**

Final Report

Yingling Fan

Humphrey School of Public Affairs
University of Minnesota

CTS 22-11

Technical Report Documentation Page

1. Report No. CTS 22-11	2.	3. Recipients Accession No.	
4. Title and Subtitle Parking FlexPass at ABC Ramps: Integrating Parking and Transit Options for Sustainable Mobility		5. Report Date December 2022	
		6.	
7. Author(s) Galen Ryan; Yingling Fan; Andy Becker; Frank Douma		8. Performing Organization Report No.	
9. Performing Organization Name and Address Humphrey School of Public Affairs University of Minnesota 310 19th Avenue South, Minneapolis, MN 55455		10. Project/Task/Work Unit No. CTS #2020027	
		11. Contract (C) or Grant (G) No. MnDOT (c) 1003325 (wo) 134	
12. Sponsoring Organization Name and Address Center for Transportation Studies University of Minnesota 440 University Office Plaza 2221 University Avenue SE Minneapolis, MN 55414		13. Type of Report and Period Covered Final Report	
		14. Sponsoring Agency Code	
15. Supplementary Notes https://www.cts.umn.edu/publications/researchreports/			
16. Abstract (Limit: 250 words) Previous research has found that ABC Ramps contract holders were interested in taking transit more frequently; however, Minneapolis lacked a flexible commuter program for these commuters. The current project aimed to develop and implement a commuter program named FlexPass to manage parking demand, promote public transit, and provide a cost scenario that incentivized commuters to drive less. Multiple data collection efforts were conducted over the course of the FlexPass study to assess the viability of this alternative parking contract design, including: (1) Two Phase 1 program evaluation efforts, including the first one in September–December 2020 and the second one in August–December 2021; and (2) Phase 2 program evaluation in February–August 2022. Due to the COVID impacts, this study did not yield sufficient data to generate conclusive findings. Nonetheless, the data provided rich insights into the viability of alternative parking contracts designed to limit the amount of driving. Participants indicated that FlexPass made positive impacts on their travel decisions for more than two third of their work-related trips. Seventy percent of the participants were very satisfied with the FlexPass contracts, and the remaining third percent were somewhat satisfied.			
17. Document Analysis/Descriptors Commuting, Parking, Public transit, Travel behavior, Travel demand management, Modal shift		18. Availability Statement No restrictions. Document available from: National Technical Information Services, Alexandria, Virginia 22312	
19. Security Class (this report) Unclassified	20. Security Class (this page) Unclassified	21. No. of Pages 83	22. Price

PARKING FLEXPASS AT ABC RAMPS: INTEGRATING PARKING AND TRANSIT OPTIONS FOR SUSTAINABLE MOBILITY

FINAL REPORT

Prepared by:

Galen Ryan
Yingling Fan*
Andy Becker
Frank Douma

Humphrey School of Public Affairs
University of Minnesota

*Corresponding author; email: yingling@umn.edu.

DECEMBER 2022

Published by:

Center for Transportation Studies
University of Minnesota
University Office Plaza, Suite 440
2221 University Avenue SE
Minneapolis, MN 55414

This report represents the results of research conducted by the authors and does not necessarily represent the views or policies of the Minnesota Department of Transportation, the Metropolitan Council, and/or the University of Minnesota. This report does not contain a standard or specified technique.

The authors, the Minnesota Department of Transportation, the Metropolitan Council, and the University of Minnesota do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to this report.

ACKNOWLEDGMENTS

We would like to thank several others that advised and contributed to the study procedures laid out in this report. Thank you to the Center for Transportation studies for providing administrative support early in the project and editorial assistance in drafting this report. Thank to University of Minnesota researchers Chen-Fu Liao and Julian Wolfson for helping to guide survey design and implementation of the smartphone-based travel behavior survey. Thank you to staff at the City of Minneapolis Parking Services (MPLS Parking), Metro Transit, Move Minneapolis, and ABM Industries Inc. for your project guidance and your instrumental work to implement and record us of the FlexPass program. Thank you to MnDOT Office of Transit and Active Transportation staff Lisa Austin, Elliott McFadden, Nicole Campbell for each acting as Technical Advisor throughout various stages throughout the life of the FlexPass project. Your support and vision for the FlexPass program made this research possible. Thank you to all others not directly mentioned here who engaged with the study to provide feedback and support, your input provided important context for the development and implementation of the FlexPass program.

TABLE OF CONTENTS

CHAPTER 1: Introduction	1
CHAPTER 2: Literature Review	4
CHAPTER 3: FlexPass Contracts.....	5
CHAPTER 4: Study Design and Data Collection Methods	7
4.1 Interest survey 2020 among ABC Ramps contract holders.....	7
4.2 Focus Groups conducted by Move Minneapolis	8
4.3 1 st Program Evaluation, Phase 1	8
4.4 Interest survey 2021 among downtown Minneapolis commuters	11
4.5 2 nd Program Evaluation, Phase 1	11
4.6 Phase 2 Program Evaluation	12
CHAPTER 5: Interest Survey 2020 Among ABC Ramps Contract Holders	14
CHAPTER 6: Interest survey 2021 among downtown commuters	17
CHAPTER 7: Phase 1 FlexPass Use and Travel Behavior	20
7.1 Participant Characteristics	20
7.2 FlexPass Parking Activity.....	22
7.3 Travel and Activity Patterns	23
Transit User	24
Frequent Driver.....	25
Occasional Driver	26
Activity Density	27
In-App Survey Questions	28
7.4 Exit Survey.....	29
Participant feedback and mode use:	29
Contract Cost Analysis.....	30

Mobility-As-A-Service.....	31
Open Feedback	32
CHAPTER 8: Phase 2 FlexPass Use	33
8.1 Participant Characteristics	33
8.2 FlexPass Parking and Transit Activity.....	37
8.3 Exit Survey.....	39
Participant feedback and mode use:	39
Contract Cost Analysis.....	40
Mobility-As-A-Service.....	41
Open Feedback	41
CHAPTER 9: Conclusion.....	43
9.1 Primary takeaways from Phase 1 Program Evaluation.....	43
9.2 Primary Takeaways from Phase 2 Program Evaluation	43
9.3 Opportunities To Explore	44
9.3.1 Implement Go-To card media for all new ABC Ramps parking contracts	44
9.3.2 Institutionalize the FlexPass program across downtown	44
9.3.3 Simplify, better tailor, or eliminate federal commuter tax benefits	45
REFERENCES	47
APPENDIX A Interest Survey 2020 among ABC Ramps contract holders	
APPENDIX B Daynamica In-App Surveys	
APPENDIX C Interest Survey 2021 among Downtown Minneapolis Commuters	
APPENDIX D Phase 2 Enrollment Survey	
APPENDIX E FlexPass Exit Survey	

LIST OF FIGURES

Figure 1.1 View of ABC Ramps and downtown Minneapolis, facing south (Source: Google Earth)	1
Figure 1.2 Graph of average mid-week occupancy rates at ABC Ramps and the total COVID-19 cases in Minnesota (Source: Minnesota Department of Transportation and Minnesota Department of Health) ...	3
Figure 3.1 Appearance of FlexPlus card.....	5
Figure 4.1 Daynamica app main interface	10
Figure 4.2 Enrollment activity during the Phase 2 evaluation, comparing the number of participants that completed the enrollment survey (Enrolled), were making payments for their FlexPass card (Card Holders), and were using their card (Active)	13
Figure 6.1 Interest in alternative monthly contract with reduced parking; respondents not interested in parking at ABC Ramps were not asked about the reduced parking contract (N=86)	17
Figure 7.1 Example 14-day trip and activity pattern for the Transit User archetype.....	24
Figure 7.2 Example 14-day trip and activity pattern for the Frequent Driver archetype.....	25
Figure 7.3 Example 14-day trip and activity pattern for the Occasional Driver archetype	27
Figure 7.4 Activity patterns of Daynamica users within the Twin Cities metro over the 14-day observation period with minimum bounding of participant activities by archetype	28
Figure 7.5 Willingness to pay for respondent designed contracts that either have no transit (limited parking only), limited transit (with limited parking), or unlimited transit (with limited parking; the figure includes two trend lines for the cost of the parking only contract and the unlimited transit contract depending on the amount of parking selected.....	31
Figure 8.1 Distribution of Phase 2 FlexPass participants by zip code (N = 42)	34
Figure 8.2 Histogram of parking activity per participant months (i.e., the number of participant months with a given number of parking days)	38
Figure 8.3 Mean comparisons among four categorical characteristics including FlexPass type, ramp location, existing ramp customers, and gender.....	39
Figure 8.4 Willingness to pay for respondent designed contracts that either have no transit (limited parking only), limited transit (with limited parking), or unlimited transit (with limited parking; the figure includes two trend lines for the cost of the parking only contract and the unlimited transit contract depending on the amount of parking selected.....	40

LIST OF TABLES

Table 4.1 Summary of data collection efforts during the project period	7
Table 5.1 Descriptive statistics for the dependent variable and the four explanatory variables investigated in the assessment of interest in FlexPass (N=385)	14
Table 5.2 Coefficients (log odds) for the ordered logistic regression of interest in FlexPass	15
Table 5.3 Commute Mode preferences for a non-driving commute among respondents interested in FlexPass, separated by the preferred Weekly Frequency of that mode; respondents could select multiple modes	16
Table 6.1 Interest in all the surveyed contracts side-by-side	17
Table 6.2 Interest in pairing Public Transit or Lyft with a parking contract at ABC Ramps	18
Table 6.3 Current Commute Frequency (rows) versus Future Commute Frequency (columns) showing the number of respondents decreasing, maintaining, or increasing their commute frequency.....	19
Table 7.1 Key parking, employment, commuting, demographic, and household characteristics of FlexPass User and Daynamica Users	21
Table 7.2 Number of days parked at ABC Ramps among FlexPass users; users with FlexPlus (parking and transit) are marked with “+”	22
Table 7.3 Breakdown of activities recorded from the nine FlexPass participants who completed Daynamica data collection (We recorded 626 total activities) (Duration Minutes; Distance Miles).....	23
Table 7.4 Breakdown of trip segments by mode recorded from the nine FlexPass participants who completed Daynamica data collection (We recorded 534 total trip segments in 490 total trips)	23
Table 7.5 Descriptive statistics of car trips, comparing days commuting downtown with days not commuting downtown among the Frequent Drivers.....	26
Table 7.6 Descriptive statistics of car trips, comparing days commuting downtown with days not commuting downtown among the Occasional Drivers	27
Table 7.7 Summary of preferred mode when participants indicated they did not use their preferred mode.....	28
Table 7.8 Summary of participant answers to how a work-related trip was influenced by FlexPass (N= 89)	29
Table 8.1 Characteristics of FlexPass participants including FlexPass contract type, Ramp location, recruitment method, contract ownership, transit use, and commuting costs.....	33

Table 8.2 Study averages from the Enrollment Survey including study duration, commuting costs, work schedule, distance to ABC Ramps, and household characteristics	35
Table 8.3 Participant characteristics from the Enrollment Survey including working hours per week, work schedule, commute mode, and commute satisfaction	35
Table 8.4 Participant choice of displayed commute preference and context statements.....	36
Table 8.5 Participant demographics collected with the Enrollment Survey, including age, gender, race/ethnicity, disability, nativity, and household income.....	37
Table 8.6 FlexPass use monthly averages per participant; parking use includes all 42 participants, while transit use includes the 7 FlexPlus users only.....	37

EXECUTIVE SUMMARY

Previous research has found that ABC Ramps contract holders were interested in taking transit more frequently; however, Minneapolis lacked a flexible commuter program for these commuters. The current project aimed to develop and implement a commuter program named FlexPass to manage parking demand, promote public transit, and provide a cost scenario that incentivized commuters to drive less.

Monthly parking contract models typically available downtown today provide little incentive for commuters to shift commute mode from day to day. FlexPass aimed to guarantee downtown parking while changing the cost scenario, particularly so that contract holders would not be penalized (i.e., pay extra out-of-pocket expenses) when using public transit or telecommuting. Implementation and evaluation of the FlexPass program was led by The University of Minnesota, in collaboration with project sponsors, the Twin Cities Metropolitan Council and the Minnesota Department of Transportation, and project stakeholders, Metro Transit and ABC Ramps managers.

Although commuting remained low through 2020 and 2021, the FlexPass project went forward to complete the work within the budgeted time frame. Multiple data collection efforts were conducted over the course of the FlexPass study to assess the viability of this alternative parking contract design, including:

- Two Phase 1 program evaluation efforts, including the first one in September–December 2020 and the second one in August–December 2021
- Phase 2 program evaluation in February–August 2022

The first Phase 1 evaluation efforts examined two contracts named FlexPass 10 and FlexPass14. Both contracts offered unlimited transit use and in-and-out privileges at the ramps; they differed in the amount of guaranteed parking. FlexPass10 offered 10 days of parking for \$110 per month; FlexPass14 offered 14 days of parking for \$125 per month. Guaranteed parking is reset each month, unused days are lost. Despite the implementation, the first Phase 1 evaluation efforts failed due to the lack of interest and low commuting rates overall. Based upon the online interest survey in June 2021, the study team revised the FlexPass contracts to create the FlexPark and the FlexPlus contracts and relaunched the second Phase 1 evaluation efforts in August–December 2021. Specifically:

- The FlexPark contract only offered 14 days of guaranteed parking for \$90 per month.
- The FlexPlus contract was a rebranding of the FlexPass14, with the same cost (\$125), 14 days of parking benefit, and unlimited transit use.

The following considerations were used to create this second iteration of FlexPass contracts:

- Potential participants would be working from home more than using public transit.
- A parking only product and a parking plus transit product can better evaluate the interest in using public transit in combination with guaranteed parking.
- The FlexPass contracts could be meeting current commute behavior rather than influencing it through new limitations.

In the 2nd program evaluation of Phase 1, the study team implemented study recruitment from late August through October 2021. Nineteen people completed the Enrollment Survey, and 13 picked up their FlexPass cards and paid for their first month. Of these 13 FlexPass users, 9 completed the 14-day smartphone-based travel behavior data collection. Of these users, we observed three travel patterns, including transit user, frequent driver, and occasional driver. The data indicate that the Flexpass contracts (including FlexPark and FlexPlus) were able to accommodate the travel needs of these three types of users. Participants indicated that they were using their preferred modes for 96.5% of their trips. Participants also indicated that FlexPass made positive impacts on their travel decisions for more than two third of their work-related trips. Seventy percent of the participants were very satisfied with the FlexPass contracts, and the remaining third percent were somewhat satisfied.

We also asked FlexPass participants about Mobility-As-A-Service, a new framing of connected and flexible mobility options. Respondents were asked “How interested are you in a future FlexPass program that could provide an integrated payment platform that includes additional mobility options, such as shared mobility or vehicle options (including Nice Ride, HOURCar, Lyft, Uber, Zipcar, etc.)?” The majority of the participants were at least somewhat interested. The respondents were especially interested in combining Uber, Lyft, and parking options. They were split in preference of whether they would prefer a pay-as-you-go model or a subscription model. If using a subscription model, most preferred to be able to adjust their use quota from month to month. Respondents were also split in preference for using a mobile app or a physical card. We last asked about using pre-tax income for the MAAS platform, most indicated pre-tax benefits as an important feature.

The Phase 2 program evaluation in February–August 2022 resulted 42 participants who had signed up before July 2022 and made at least one monthly payment for their FlexPass contracts. The highest number of card holders at one time was 37 in March; the highest number of active card users was 32 in June. These numbers show that the overall interest in the program was much greater than the first phase. This provided some hint of the potential role that the COVID-19 pandemic, commuting restrictions, or study procedures played in Phase 1. Interest in the FlexPass program was still well below overall interest in monthly parking contracts at ABC Ramps. FlexPass participants parked much more frequently in Phase 2, demonstrating that most people interested in the program were parking between 2 and 3 times per week. Interest in the FlexPlus program was still wanting, and overall transit use was much less than expected. These observations certainly call into question the viability of a combined transit and parking program in the current commuting context (e.g., cost and availability). However, Phase 2 suggests that the FlexPark contract is worth continued evaluation at ABC Ramps without associated study procedures.

The goal of the FlexPass study was to investigate the ability of commuter programs to shape commuting behavior and test the viability of a combined parking and transit program. Overall, we were unable to examine the former amid a large shift in metro-wide commuting habits. Many employers now only require in-office work a few days per week. We were also unable to develop definitive findings for the viability of FlexPass even though we now know the difference in interest for the parking only pass versus the parking and transit pass. As commuters and employers look for more commute flexibility, FlexPass can help them establish this pattern for the long term.

Due to the COVID impacts, this study did not yield sufficient data to generate conclusive findings. Nonetheless, the data provided rich insights into the viability of alternative parking contracts designed to limit the amount of driving. We make three recommendations based upon the study insights:

- The FlexPass study has confirmed that one card product can be used in both ABC Ramps and on Metro Transit. The ABC Ramps may implement Go-To card media for all new ABC Ramps parking contracts. These commuters would be reminded of the option of using public transit each time they parked. They could then add stored value or pass products as they become more interested in using public transit. This mode flexibility could also incentivize more transit use for travel to downtown Minneapolis; for example, they could take the C Line from and to Ramp A.
- The City of Minneapolis may institutionalize the FlexPass program across all publicly-owned downtown ramps to improve commute mode flexibility. Human resource departments, transportation management organizations, and commuter benefits providers are best suited to advertise this program to commuters.
- It is important to simplify, better tailor, or eliminate federal commuter tax benefit. The commuter tax benefit today offers a \$280 per month exclusion for qualified parking or high-occupancy transit (including commuter highway vehicles) jointly to the employee and employer. The employee can deduct the \$280 from their monthly paycheck or the employer can deduct it from their payroll taxes. To meet current Internal Revenue Service (IRS) tax benefit regulations, the split between transit and parking needs to be visible on the front end, such as the human resources department cutting two checks. The separation creates an unnecessary hurdle to providing flexible commute benefits. Revising commuter tax benefits as suggested here could be an action required by federal or state legislative bodies or could be a discretionary policy change by the IRS or state revenue departments. We suggest that the IRS review its policies regarding commuting benefits to allow more flexibility with new technologies.

CHAPTER 1: INTRODUCTION

The transportation sector is now the largest source of greenhouse gas emissions, both nationally and locally (Popovich & Lu, 2019; Minnesota Pollution Control Agency, 2019). More than 50 percent of the emissions in this sector come from passenger and light-duty trucks and are concentrated in metropolitan centers. Commuting trips are a major contributor to transportation emissions. The state of Minnesota needs strategies to reduce car trips, especially single-occupancy vehicle (SOV) travel, to meet legislative emission reduction mandates in the Next Generation Energy Act of 2007 (Minn. Stat. § 216H.02).

Of the many strategies to reduce car trips, encouraging multimodal integration is a promising direction as a single transportation mode. This project aims to leverage existing transportation infrastructure and systems to provide more flexible, multimodal transportation options for parking contract holders of ABC Ramps who tend to be SOV drivers.

ABC Ramps were built on top of the Interstate 394 and Interstate 94 access points on the west side of downtown Minneapolis in 1992. Ramp A, the largest, holds more than 3,500 parking stalls. Ramp B and Ramp C each contain about 1,500 stalls. As the owner of the ABC Ramps, the Minnesota Department of Transportation (MnDOT) is required by initial federal funding agreements to invest in congestion reduction strategies for downtown Minneapolis.

At the start of 2020, there were about 3,000 Monthly contract holders (for SOV commuting) and 900 holders of Carpool contracts across ABC Ramps. At that time, parking demand was increasing while supply was decreasing due to new development on surface lots throughout downtown; the ABC Ramps were reaching capacity on a daily basis. MnDOT has primarily focused on carpooling programs to reduce SOV trips, but these programs have not significantly increased in popularity since the strategy was first implemented more than 20 years ago. MnDOT has since started to investigate additional strategies for reducing SOV trips and the daily demand of parking at ABC Ramps.



Figure 1.1 View of ABC Ramps and downtown Minneapolis, facing south (Source: Google Earth)

The ABC Ramps Transportation Options project, completed in 2019, identified present and emerging challenges with parking and transportation in downtown Minneapolis and potential next steps for ABC Ramps (Douma et al., 2019). The project found that many contract holders were interested in taking transit more frequently; however, Minneapolis lacked a flexible transit and parking commuter program that was institutionally supported.

The current project aimed to develop and implement a flexible commuter program named FlexPass to manage parking demand and promote public transit options. The FlexPass program was expected to create a cost scenario that incentivized commuters to drive less. The ubiquitous monthly parking contract model available downtown today provides little incentive for commuters to avoid driving from one day to the next because they face additional out-of-pocket expenses to use transit and receive no cost savings for working from home. FlexPass aimed to guarantee downtown parking while changing the cost scenario such that contract holders would not be penalized (i.e., pay extra out-of-pocket expenses) when replacing driving with transit or telecommuting.

To carry out the work, the University of Minnesota (UMN) team collaborated with the project sponsors, including the Twin Cities Metropolitan Council and MnDOT. With help from the project sponsors, the team created a study advisory group consisting of various public and private agencies relevant to the Twin Cities commuting landscape during the development phase of the study, including Minneapolis Traffic and Parking Services, Metro Transit, Move Minneapolis, and ABM Industries Inc., the contracted manager of ABC Ramps and other downtown parking ramps.

Implementation of the FlexPass program was severely impacted by the COVID-19 pandemic. Specifically, social distancing restrictions drastically changed commute patterns in Minneapolis. ABC Ramps had an average daily parking rate of 5 to 10 percent for much of 2020. Ridership on Metro Transit fell by more than 70 percent, even more on commuter specific routes. Many downtown businesses implemented a work-from-home only policy, turning telecommuting from a niche “commute” strategy into the predominant work routine among office workers. Telecommuting has long been considered an effective transportation demand management tactic, but employers have been hesitant to adopt it for fear of decreased productivity. Emergency executive orders by Governor Tim Walz provided employers with little room for hesitation.

As shown in Figure 1.2, in fall 2001, ABC Ramps filled between 20 and 30 percent of total capacity on any given weekday (based on overall occupancy Tuesday through Thursday). According to Metro Transit, overall ridership on Metro Transit in December 2021 was 50 percent below pre-pandemic levels (December 2019), and ridership on commuter and express routes was almost 90 percent below pre-pandemic levels.

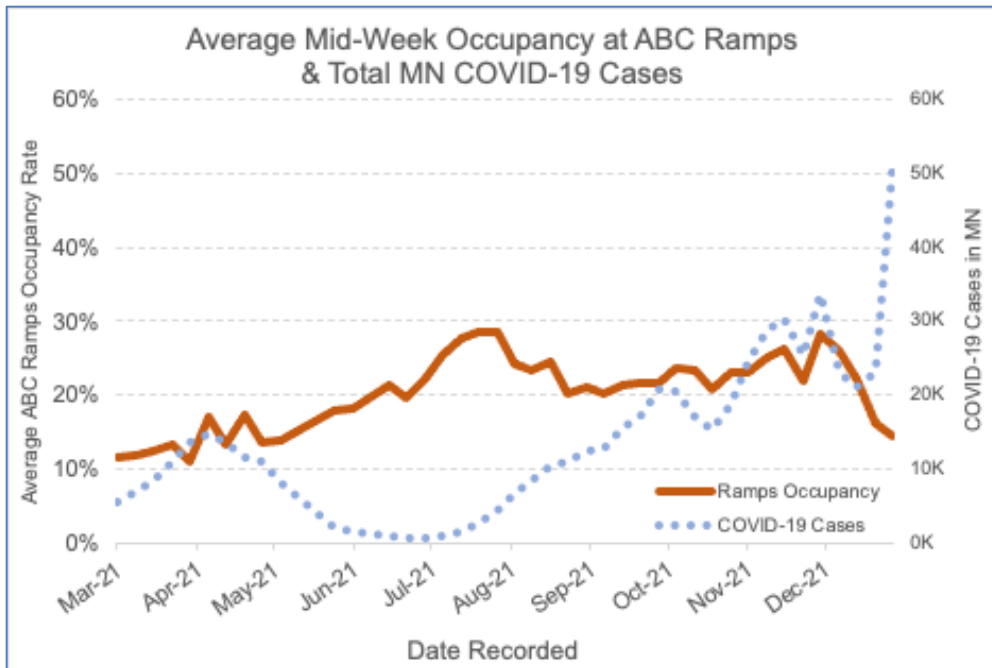


Figure 1.2 Graph of average mid-week occupancy rates at ABC Ramps and the total COVID-19 cases in Minnesota (Data Source: Minnesota Department of Transportation and Minnesota Department of Health)

Although commuting remained low through 2020 and 2021, the FlexPass project went forward to complete the work within the budgeted time frame. Multiple data collection efforts were conducted over the course of the FlexPass study to assess the viability of this alternative parking contract design, including:

- An online interest survey in February 2020
- An online interest survey in June 2021
- Two Phase 1 program evaluation efforts, including the first one in September–December 2020 and the second one in August–December 2021
- Phase 2 program evaluation in February–August 2022

Due to the COVID impacts, these data collection efforts did not yield sufficient data to generate conclusive findings. Nonetheless, the data provided rich insights into the viability of alternative parking contracts designed to limit the amount of driving.

The structure of this report is as follows. Chapter 2 summarizes the existing literature that informs this project. Chapter 3 lays out the design of the FlexPass program. Chapter 4 describes the data collection efforts throughout the course of the project. Chapter 5 details the findings from the online interest survey taken in February 2020. Chapter 6 details the findings from the online interest survey taken in June 2021. Chapter 7 details the FlexPass use and travel behavior patterns from Phase 1. Chapter 8 details the FlexPass use patterns from Phase 2. And finally, Chapter 9 concludes the report with a discussion of the results and future opportunities.

CHAPTER 2: LITERATURE REVIEW

The supply and pricing of parking has been demonstrated to be one of the most important factors for effective Transportation Demand Management. Khordagui (2019) demonstrates that a marginal increase (about 10%) in parking cost for commuters in California can lead to a small reduction in the likelihood of driving. Liu et al. (2014) illustrate how the proportion of reserved and unreserved parking spaces can affect how commuters time their own commute to avoid predictable delays. Hamre and Buehler (2014) demonstrate how free car parking severely limits the effectiveness of other commuter benefit incentives.

Studies investigating the effects of new parking contract models have focused on the cost scenarios of parking, typically increasing the cost salience for each use of parking. Few studies have investigated combining transit and parking contracts in order deliver flexible commute options to consumers.

Researchers at the University of Minnesota investigated flexible commute pricing models at ABC Ramps in 2010 and 2011. The study tested three contract models. The “Buying Flexibility” contract offered an unlimited transit pass to parking contract holders for an additional \$20 per month; the “Marginal Rebate Model” offered a free unlimited transit pass and provided a \$2.00 rebate each time the participant used transit instead of parking (the approximate cost difference between parking and using transit per day); the “PayGo” contract offered a free unlimited transit pass, a \$2.00 rebate when the participant used transit instead of parking, and a \$7.00 rebate when the participant did not use parking or transit (the full daily cost of parking); and lastly, the “Disincentive Removal” contract offered participants a free unlimited transit pass. The study found that the Marginal Rebate and the PayGo contract were the most effective at influencing commute mode switching, by about 2 weekdays per month and 4.5 weekdays per month. The Disincentive Removal contract did demonstrate an effect on commute mode choice; simply giving our free transit passes may not be enough to influence mode choice (Lari et al., 2014).

Another examination of a flexible parking and transit use conducted by Move Minneapolis in 2019 resulted in a similar conclusion. Move Minneapolis, the transportation management organization for downtown Minneapolis, delivered free unlimited transit passes to 48 ABC ramps contract holders interested in using transit more. However, during the 3-month observation period, just one third of the study participants used their transit pass more than 3 days. Among this group of transit users, the median frequency was 5 days per month. While several participants did take advantage of the transit pass, the examination also demonstrates the disconnect between expressed interest in using transit and someone’s actual usage. Participants that did not use transit indicated that they valued taking advantage the parking contract they paid for and that transit trips were too long (Move Minneapolis, 2020).

Besides these examples, there is little else available documenting an evaluation of combined parking and transit contract. The FlexPass project sought to broaden the evaluation of combined commuter programs while also developing a viable commuter product that can deliver flexible parking and transit use.

CHAPTER 3: FLEXPASS CONTRACTS

The study advisory group collaborated to design and implement the FlexPass contracts evaluated during the study. Through 2020, the study implemented two contracts named FlexPass 10 and FlexPass14. Both contracts offered unlimited transit use and in-and-out privileges at the ramps; they differed in the amount of guaranteed parking. FlexPass10 offered 10 days of parking for \$110 per month; FlexPass14 offered 14 days of parking for \$125 per month. Guaranteed parking is reset each month, unused days are lost.

The following considerations and limitations were used to design these FlexPass contracts:

- Both the ABC Ramps and Metro Transit software systems are best suited for prepaid contracts using cards.
- Prepaid products are better suited for accommodating commuter tax benefits. The parking benefit and the transit benefit must be tracked separately.
- There are about 22 workdays per month for a typical Monday through Friday commuter. The participant would use transit on days they do not park downtown.
- The total cost of the contracts should be discounted from simply combining transit and parking products available today, rewarding commuters for embracing limitations and mode flexibility.
 - The cost of parking was calculated based on a 10 percent discount of the daily early-bird rate (available on weekdays, 6–9 AM) and the days of guaranteed parking.
 - The cost of transit was based on daily rate of the Metropass offered to commuters (a product already discounted from typical user costs) and the anticipated number of days using transit.
- These contracts are suited for commuters parking 2 to 3 days per week.

Although efforts were made to evaluate this first iteration of the FlexPass contracts, the efforts failed due to the lack of interest and low commuting rates overall. In summer 2021, the study team conducted an updated market survey and revised the FlexPass contracts to create the FlexPark and the FlexPlus contracts and relaunched the evaluation efforts. Figure 3.1 illustrates the physical appearance of the redesigned FlexPlus products. FlexPark cards were the regular card media used for ABC Ramps.



Figure 3.1 Appearance of FlexPlus card

In response to the market survey, the FlexPark contract only offered 14 days of guaranteed parking for \$90 per month. The FlexPlus contract was a rebranding of the FlexPass14, with the same cost (\$125), 14 days of parking benefit, and unlimited transit use. The following considerations were used to create this second iteration of FlexPass contracts:

- Potential participants would be working from home more than using public transit.
- A parking only product and a parking plus transit product can better evaluate the interest in using public transit in combination with guaranteed parking.
- The FlexPass contracts could be meeting current commute behavior rather than influencing it through new limitations.

This second iteration of the FlexPass contracts was evaluated in the last four months of 2021 during the 2nd Program Evaluation of Phase 1 and from February through August of 2022 during the Phase 2 Program Evaluation. Study design and data collection methods are described in the following chapter, **Chapter 4.**

CHAPTER 4: STUDY DESIGN AND DATA COLLECTION METHODS

The study team conducted multiple data collection efforts over the course of the FlexPass study to assess the viability of this alternative parking contract design. These efforts are briefly summarized in the table below.

Table 4.1 Summary of data collection efforts during the project period

Name	Date	Instrument	Participants	Results Chapter
1. Interest survey 2020 among ABC Ramps contract holders	Feb 2020	Online Survey	385	Chapter 5
2. Focus Groups conducted by Move Minneapolis	Mar 2020	Virtual Meeting	25	Not reported
3. 1 st Program Evaluation, Phase 1	Sept–Nov 2020	Online Survey and Daynamica	2	Failed effort, results not reported
4. Interest survey 2021 among downtown Minneapolis commuters	June 2021	Online Survey	86	Chapter 6
5. 2 nd Program Evaluation, Phase 1	Aug–Dec 2021	Online Survey and Daynamica	13	Chapter 7
6. Phase 2 Program Evaluation	Feb–Aug 2022	Online Survey	42	Chapter 8

4.1 INTEREST SURVEY 2020 AMONG ABC RAMPS CONTRACT HOLDERS

The study team conducted the first interest survey among ABC Ramps contract holders in March 2020 to gather preliminary interest in the FlexPass contract and to recruit people for a focus group to collect more in-depth feedback. We reached 385 ABC Ramps monthly contract customers across the three ramps; the 2-minute survey included questions on the topics listed below:

- Employer
- Subsidized parking
- Parking frequency
- Home city

- Transit proximity
- Interest in FlexPass
- Interest in non-SOV modes
- Interest in focus group

FlexPass was described as “a commuter pass that provides cost savings as you park less at the ABC Ramps and commute more using other options.” Just over 70 percent indicated they were somewhat or very interested in the pass, with about 25 percent selecting “very interested.” Results from the survey are discussed in the next chapter. See Appendix A for a copy of the interest survey questionnaire.

4.2 FOCUS GROUPS CONDUCTED BY MOVE MINNEAPOLIS

Of the 385 respondents to the Interest Survey 2020, 163 (42%) indicated an interest in a follow-up focus group discussion session over video conference (Zoom). A total of 25 participants were selected and invited to participate in one of two focus group discussions, the study team invited an equal number of men and women. Each participant was compensated with a \$20 Target gift card. Each focus group session was 1-hour long. During the focus group, participants were asked about their commute, how they learned about their commuting options, their thoughts on the first iteration of the FlexPass contracts, and their preference for payment models of commuter programs.

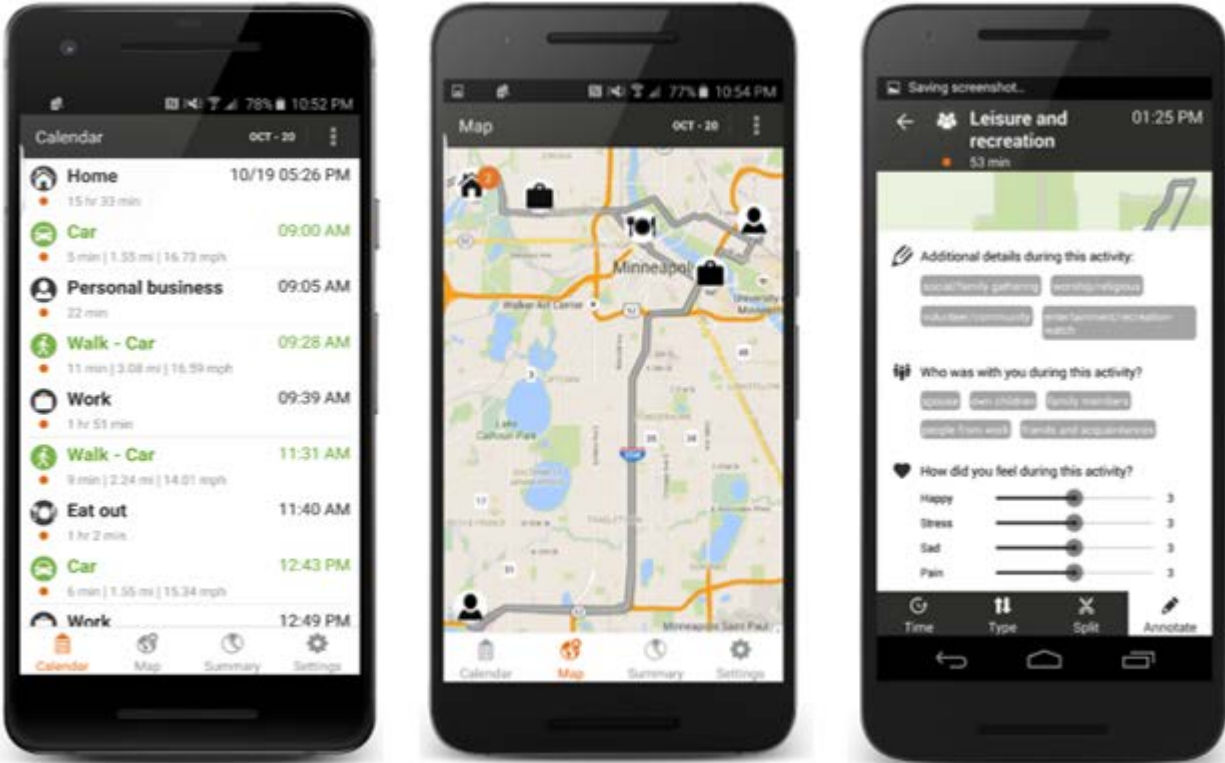
It was found that most participants heard about their options through their employer, typically on that first day or through periodic announcements. Participants were supportive of the FlexPass10 and FlexPass14 designs with slightly more interest in the contract with more guaranteed parking. The design of the contract would grant flexibility with minimum complexity. We presented the alternative of using pre-tax debit accounts with a per-use cost scenario versus the monthly model of the FlexPass contracts. Some participants expressed interest in this option but was consider too complex in the end. The Focus Group meeting supported the decision to first explore the use of the monthly design before navigating a more complex variable pricing system. Unfortunately, the perspectives measured from the interest survey and focus groups during February and March 2020 became obsolete shortly after as the majority of ABC Ramps contract holders adjusted a new work-from-home lifestyle.

4.3 1ST PROGRAM EVALUATION, PHASE 1

Following the interest survey and focus group discussion, the study team began recruiting participants to sign-up for and use the FlexPass program in September of 2020. In the beginning, eligibility for the study was limited to existing or recent contract holders of ABC Ramps. The pilot was communicated through email to contract holders and to Move Minneapolis subscribers. Interested participants were directed to a webpage hosted by Move Minneapolis to learn more about the study and complete the 10-minute enrollment survey.

The enrollment survey verified eligibility, confirmed consent to participate, and collected commuting and demographic characteristics. After completing the enrollment survey, study participants were directed to visit the ABC Ramps front office to pick up their FlexPass card. Once participants had their card, they were asked to record 14-days of travel behavior with a mobile app named Daynamica.

As shown in Figure 4.1, the mobile app automatically records trips and stationary activities, then prompts participants to complete survey questions about their day. This smartphone-based data collection method is more advantageous than the traditional recall- and diary-based methods when it comes to measuring travel behavior. The traditional methods rely heavily on recall memory, requiring participants to remember their past week or past day. Using GPS technology on the participant's smartphone, Daynamica automatically tracks when the participant is traveling (making a Trip) and when they are stationary (during an Activity). The app uses speed and acceleration from the phone's motion sensors to predict the mode the participant is using. Daynamica allows users to view and annotate that data at their convenience. In addition, participants are asked to label their activities which are automatically populated when the participant returns to that same location, for example, to their home. The app takes away the burden of memory recall for travel behavior studies, allowing the study to further investigate the attitudes and decisions that are involved in trips. Each recorded trip is associated with a short survey to gather this additional information about trip characteristics and the potential influence of the FlexPass. The Daynamica survey is included in Appendix B.



(a) Daynamica constructs the activity-trip sequence in real time from mobile sensing data, inferring activity/trip start/end time, activity type, and trip mode.

(b) Daynamica captures and displays detailed spatial information of each activity/trip, including activity locations and trip trajectories.

(c) User can interact with Daynamica to confirm or correct activity/trip inferences, and provide additional info (e.g., subjective experience, attitudes) about each activity/trip.

Figure 4.1 Daynamica app main interface

Initially, participants were offered \$40 for completing the 14-day data collection. After email recruitment over the month of September, just 5 people had completed the enrollment survey; of those, just two had picked up their new FlexPass card. The study team expanded eligibility to all downtown commuters except those with existing contracts at other City of Minneapolis parking ramps, to prevent competition. The study team also increased compensation for Daynamica data collection to \$60. The study team continue to recruit study participants through emails sent by ABC Ramps and Move Minneapolis; we also implemented social media advertising over the course of two weeks.

The renewed effort to increase enrollment did not obtain any new participants. The two participants that had picked up their card did not complete the Daynamica data collection portion over a 6-month period. These two participants were allowed to use their FlexPass cards through March 2021; though, both participants parked well below their monthly limit. After March 2021, the first pilot was paused for reassessment by the study advisory group. The data collected during the first pilot was not included in data analysis due to the small amount and future changes in the study design.

4.4 INTEREST SURVEY 2021 AMONG DOWNTOWN MINNEAPOLIS COMMUTERS

After the end of the first pilot, the study team implemented a second interest survey (Appendix C) to collect more feedback on the design of FlexPass and to understand future commuting behavior. We distributed the survey during June and July 2021 through ABC Ramps and Move Minneapolis email lists. We received 86 responses, 55 percent of which were ABC Ramps contract holders.

List of Topics asked about in the Interest Survey 2021

- Current summer 2021 vs future fall 2021 commute frequency
- Interest in parking at ABC Ramps
- Interest in FlexPass
 - Defined as: “alternative monthly contract models that allow you to pay less than the standard monthly contract price (less than \$145–165) for reduced parking use”
- Interest in three types of parking contracts that vary by cost scenario.
 - Set Contract: A monthly contract with a limited number of days of guaranteed parking each month at a fixed price. Once you park up to your limit, you are no longer guaranteed entry into the ramps. Example: 14 days of parking for \$96; after you reach your limit, you could utilize the early bird rate for \$8 per day if the ramp is not full.
 - Set-Flex Contract: A monthly contract with a limited number of days of guaranteed parking each month at a fixed price plus guaranteed access for additional days of parking paid for upon your exit after each use at a discounted rate. Example: 14 days of parking for \$100, with additional parking for \$7.50 per day.
 - Flex Contract: A monthly contract for a small “membership” fee with guaranteed parking each day paid for upon exit after each use at a discounted rate. Example: A \$20 monthly fee with guaranteed parking for \$6.40 per day.
- Interest in pairing Public Transit services with a parking contract
- Interest in pairing Lyft on-demand mobility services with a parking contract
- Use of commuting cost subsidies and commuting tax benefits.
- Interest in participating in the FlexPass study in the fall 2021.

The results of the survey, detailed in more depth in **Chapter 6**, supported continuing to evaluate the monthly contract type reflective of the Set Contract description and the first FlexPass iteration. In addition, the results indicated a minority interest in additional mobility options with the parking contract. With this mind, we evaluated a parking only contract, FlexPark, in the relaunched 2nd smartphone-based data collection effort described below.

4.5 2ND PROGRAM EVALUATION, PHASE 1

The second evaluation effort was conducted very similar to the first. We distributed emails through ABC Ramps and Move Minneapolis; implemented paid advertising on Facebook and LinkedIn targeting likely downtown commuters; created digital posters for the skyways around ABC Ramps; and we also conducted some in-person outreach during Car-free MSP hosted by Move Minneapolis and in the skyway between Ramp A and Ramp B during two weekday rush-hour periods. We conducted

recruitment from the last two weeks of August through October, typically during the last and first week of the month.

Interested participants were directed to flexpass.umn.edu. To sign-up for the study, participants completed the 10-minute enrollment survey to collect initial commuting and demographic characteristics. After completing the enrollment survey, participants were directed to visit the ABC Ramps front office to pick-up their card. After they picked up their FlexPass card, participants were asked to record 14 days of travel behavior data with the Daynamica mobile app. Participants were compensated \$100 via an amazon electronic gift card for completing this data collection component. After Daynamica data collection, participants could go about their week, using their FlexPass card as needed, without interaction with the study team for the remainder of the study period. Participants were also asked to complete a 5-minute exit survey at the end of the study period.

After the recruitment period:

- 19 people completed the enrollment survey
 - 13 people picked up their FlexPass card
 - 9 people completed Daynamica Data collection
 - 10 people completed the exit survey

The data collected from the 13 people active FlexPass users is detailed in **Chapter 7**.

4.6 PHASE 2 PROGRAM EVALUATION

The Minnesota Department of Transportation, ABC Ramps, and Metro Transit continued to offer FlexPass in 2022 to extend the evaluation of FlexPass and take advantage of remaining research funding. During Phase 2, Move Minneapolis and ABC Ramps conducted outreach, the UMN study team monitored enrollment and data collection; ABC Ramps coordinated with participants during the study to pick-up their pass and resolve potential pass issues. These roles better reflected what program responsibilities would be if the University were not involved, providing an evaluation of organizational viability.

The FlexPark and FlexPlus contracts were offered to downtown commuters beginning in February 2022 through July 2022. Outreach included online ads via social media and search engines, electronic advertising in the skyways adjacent to ABC Ramps, direct conversation with employers and commuters conducted by Move Minneapolis, and other information channels managed by Move Minneapolis and ABC Ramps targeted toward downtown commuters.

Study procedures were scaled back due to limited funding; plus, this scaling back could address potential barriers to entry created by study activities. To participate in Phase 2, participants completed a short enrollment survey, maintained up-to-date payments on their FlexPass contract, and completed a short exit survey at the end of the study. The study team no longer asked participants to record travel behavior with the smartphone application Daynamica. All study procedures ceased at the end of August 2022 while active FlexPass contracts were terminated at the end of September 2022.

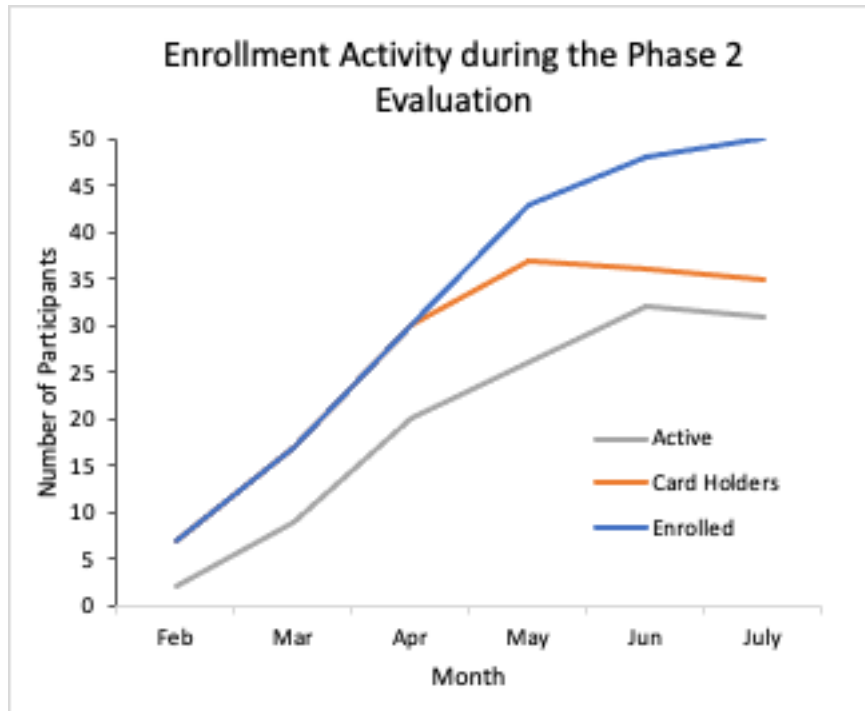


Figure 4.2 Enrollment activity during the Phase 2 evaluation, comparing the number of participants that completed the enrollment survey (Enrolled), were making payments for their FlexPass card (Card Holders), and were using their card (Active)

Figure 4.2 (above) illustrates the number of participants that signed up for the study, were making monthly payments, and were using their card. The rate of enrollment was greatest March through May. By the end July, the last full month of observation, 50 people had completed the enrollment survey; however, they were only 35 card holders and 31 active users. The difference between enrolled participants and card holders is accounted for by participants that cancelled their contract before the end of the study or never picked up their card after enrollment. Most of the enrollments were for the FlexPark contract. Over the course of the evaluation, there were 9 sign-ups for the FlexPlus contract, 7 participants that picked up their card, and 4 used their card. Three of the active FlexPlus users had used their card on public transit. The data collected from the Phase 2 program evaluation is detailed in **Chapter 8**.

CHAPTER 5: INTEREST SURVEY 2020 AMONG ABC RAMPS CONTRACT HOLDERS

The online interest survey that we conducted in February 2020 collected 386 responses from ABC Ramps contract holders. Survey respondents represented over 150 different employers, the topmost common employers include Target, Wells Fargo, Jack Link’s, U.S. Bank, and Colle and McVoy. Survey respondents also represented over 90 different cities in the region, the topmost common cities include Minneapolis, Plymouth, St. Louis Park, Maple Grove, and Edina—primarily west metro cities.

We asked these contract holders about their interest in a FlexPass type product that we described as “a commuter pass that provides cost savings as you park less at the ABC Ramps and commute more using other options.” Just over 70 percent indicated that they were somewhat or very interested (Table 5.1).

Table 5.1 Descriptive statistics for the dependent variable and the four explanatory variables investigated in the assessment of interest in FlexPass (N=385)

Explanatory Variable	Category (Code)	Observations	Percent
FlexPass Interest	Not (0)	111	28.8 %
FlexPass Interest	Somewhat (1)	172	44.6 %
FlexPass Interest	Very (2)	102	26.4 %
Parking Frequency	Less than one day a week (1)	7	1.8 %
Parking Frequency	1–2 days a week (2)	15	3.9 %
Parking Frequency	3–4 days a week (3)	118	30.6 %
Parking Frequency	At least five days a week (4)	246	63.7 %
Parking Subsidy	Yes (1)	149	38.6 %
Nearby Public Transit	Yes (1)	250	64.8 %
Distance*	Average	11 mi	
Distance*	Median	10 mi	
Distance*	Range	1–46 mi	
Distance*	Standard Deviation	8 mi	

*Distance (in miles) is measured between ABC Ramps and the geometric center of the respondent’s home city rounded to the nearest single place.

We investigate four potential explanatory variables that could account for variation in the interest of the FlexPass contract among survey respondents. The descriptive statistics of these variables are described in Table 2. Parking frequency is a categorical measure of how many days per week a respondent parks at ABC Ramps. Parking subsidy is a binary measure of whether the respondent’s employer subsidizes their parking costs. Nearby public transit is a binary measure determined by whether respondents answered yes in response to if there are “a transit stop or Park-and-Ride station near your home that you can use to commute to downtown Minneapolis via transit.” This variable is indication of general proximity with knowledge of availability. Distance is a discrete variable determined by the distance (in miles) between

ABC Ramps and the geometric center of the respondent’s home city rounded to the nearest single place. For example, the center of Minneapolis is 1 mile away from ABC Ramps (in downtown); anyone who lives in Minneapolis has a distance of 1 mile from ABC Ramps.¹ We examine distance in a logarithmic relationship with base e (Euler’s number), using the assumption that the marginal effect of increasing the distance by one-mile decreases as the total distance increases; an increase from 1 to 10 may be more impactful than an increase from 30 to 40.

We conducted an ordered logistic regression of the indicated interest in FlexPass (three categories) to examine how these explanatory variables may account for the variation in interest. Understanding this variation can help inform the design and advertisement strategy for FlexPass. Table 5.2 shows the regression output.

Table 5.2 Coefficients (log odds) for the ordered logistic regression of interest in FlexPass

Explanatory Variable	Coefficient	Odds Ratio	Likelihood
Parking Frequency	-0.740***	.447	-55 %
Parking Subsidy	-0.111	.895	-11 %
Nearby Public Transit	0.771***	2.161	+ 116 %
Log _e (Distance)	-0.270***	.763	- 24 %
Pseudo R ²	0.057	-	-
N	386	-	-

Legend: * p<.05; ** p<.01; *** p<.005

Three explanatory variables were found to have a significant effect on the probability of a respondent being interested in FlexPass: parking frequency, nearby public transit, and distance. Respondents parking more are less likely to be interested in FlexPass. Respondents that are aware of nearby transit options are more likely to be interested in FlexPass. Lastly, respondents living farther away are less likely to be interested in FlexPass.

We also calculated marginal effects of each variable, interpreted as a proportional odds ratio. As the frequency of parking increases by one category, the respondent is about 50 percent less likely to be interested in FlexPass, while other variables remain constant. As nearby transit options changes from 0 to 1 (No to Yes), the respondent is about twice as likely to be interested in FlexPass compared to not

¹ We wanted to keep the survey as anonymous as possible, and we did not need a more disaggregated statistic at the time of conducting the survey. If conducting the survey again, we would use zip code to account for more variation in distance.

interested, while other variables remain constant. As the natural log of distance from ABC Ramps increases by 1, the respondent is about 25 percent less likely to be interest in FlexPass.

These results align with expectations. Commuters that are driving more and live farther from downtown could be less interested in FlexPass because of the greater convenience of parking. Transit options could also be less attractive for those farther from downtown, reducing the feasibility of alternative commuting options.

The remainder of the first interest survey collected information on what commute modes beside driving respondents were interested in and how often they think they would use these alternative commute modes. Only respondents interested in FlexPass were asked these questions (N = 275). Respondents were able to select more than one commute mode. Table 5.3 indicates that most respondents were interested in transit or working from home at about 1 to 2 days per week. Almost half of the respondents (43 percent) selected transit and working from home together.

Table 5.4 Commute Mode preferences for a non-driving commute among respondents interested in FlexPass, separated by the preferred Weekly Frequency of that mode; respondents could select multiple modes

Commute Mode	Less than once	1–2 days	3–4 days	At least 5 days	Total (%)
Carpooling	8 (3 %)	21 (8 %)	7 (3 %)	2 (1 %)	38 (14 %)
Taking Transit	18 (7 %)	133 (48 %)	32 (12 %)	5 (2 %)	188 (68 %)
Biking or Walking	7 (3 %)	40 (15 %)	9 (3 %)	3 (1 %)	59 (21 %)
Working from Home	23 (8 %)	143 (52%)	29 (11 %)	2 (1 %)	197 (72 %)

The results from the first interest survey informed the development of the FlexPass10 and FlexPass14 contracts. These contract types were geared toward respondents interested in using public transit or working from home 2 to 3 days per week. However, the study team was unable to effectively evaluate these contracts due to poor interest and low parking demand during the 1st program evaluation of Phase 1. The study team paused program evaluation to conduct another interest survey.

CHAPTER 6: INTEREST SURVEY 2021 AMONG DOWNTOWN COMMUTERS

Before the project team resumed the FlexPass program evaluation in the second half of 2021, we took the opportunity to conduct another short survey on the design of the FlexPass contracts. We distributed the survey during June and July 2021 through ABC Ramps email lists and Move Minneapolis email lists. We received 86 responses downtown commuters, 55 percent of which were ABC Ramps contract holders. We were primarily investigating the design of the FlexPass pertaining to the payment model and contract amenities. We only asked these questions of respondents that were current ABC Ramps contract holders or interested in parking at ABC Ramps and were interested in “alternative monthly contract models that allow you to pay less than the standard monthly contract price (less than \$145–165) for reduced parking use.” After this eligibility filter, we collected surveys from 62 respondents about payment models and amenities.

We asked about three different contract types that varied by payment model and amount of guaranteed parking, including:

- **Set Contract** gives contract holders a guaranteed maximum of parking each month for an upfront monthly cost, similar to the initial design of the FlexPass contract. If contract holders want to park more, they’ll have to pay the daily or hourly rate if space is available. Example: 14 days of parking for \$96; after you reach your limit, you could utilize the early bird rate for \$8 per day if the ramp is not full.”
- **Set-Flex Contract** gives contract holders a guaranteed amount of parking each month for an upfront monthly cost plus a discount on any extra parking the contract holder may need beyond their limit. Example: 14 days of parking for \$100, with additional parking for \$7.50 per day
- **Flex Contract** allows contract holders to have guaranteed parking for a small monthly fee but charges contract holders per use of parking at a discounted daily rate. Example: A \$20 monthly fee with guaranteed parking for \$6.40 per day.

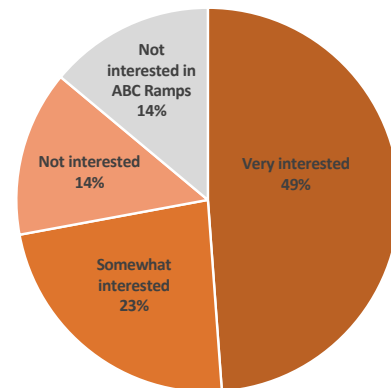


Figure 6.1 Interest in alternative monthly contract with reduced parking; respondents not interested in parking at ABC Ramps were not asked about the reduced parking contract (N=86)

Table 6.1 Interest in all the surveyed contracts side-by-side

Contract Type	Not Interested	Somewhat Interested	Very Interested	Total
Set Contract	15 (24 %)	27 (44 %)	20 (32 %)	62 (100 %)
Set-Flex Contract	14 (23 %)	29 (47 %)	19 (31 %)	62 (100 %)
Flex Contract	18 (29 %)	21 (34 %)	23 (37 %)	62 (100 %)
All Contracts	7 (11 %)	8 (13 %)	7 (11 %)	22 (35 %)

The pricing in the contract examples were normalized such that each contract holder would pay about \$160 per month if they parked 22 days in the month but this was not made explicit to the respondent. A quick glance at the interest across the contracts shows little variation between them, especially between the Set Contract and the Set-Flex Contract. The Flex Contract had the greatest number of respondents that were “Very interested” and also “Not interested” demonstrating greater polarization. There was response variation in just two thirds of the sample, one third of the sample had the same level of interest across all three contracts. Overall, the observed variation in the interest among the contract types was not enough for the project team to deviate from the existing, Set Contract, design of the FlexPass; there were also unaddressed technical barriers to implementing the Flex type contract options.

In addition to surveying about the payment models, we asked respondents about additional amenities they would like included with the parking contract. We surveyed respondents about how much parking they would use with the parking contract. Responses ranged from 4 to 30 days per month. the mean, median, and mode were 15 days per month. We also surveyed respondents if they would like public transit or Lyft on-demand mode services included with their parking contract and how much they would use it. About 60 percent of respondents were “Not interested” in using transit and 70 percent of respondents were “Not interested” in using Lyft. Of those interested in using transit, the average and median amount of transit they would use is 5 days. Of those interested in using Lyft, they would use ride hailing services for an average of 3 days while using bike share services an average of 1 or 2 days.

Table 6.2 Interest in pairing Public Transit or Lyft with a parking contract at ABC Ramps

Selection	Public Transit	Lyft
Not Interested	38 (61 %)	44 (71 %)
Somewhat Interested	11 (18 %)	14 (23 %)
Very Interested	13 (21 %)	4 (6 %)
Total	62	62

These results indicate that driving and parking will remain the primary mode for commuting. In addition, these results gave the project team reason to create a stand-alone, parking only, FlexPass contract that would have a maximum amount of parking.

We also surveyed respondents about their use of pre-tax income to pay for commuting expenses or the use of an employer subsidy. About 50 percent of respondents use pre-tax income while 30 percent have an employer subsidy (similar to the 38% measured in the first interest survey). Just 17 percent have both a subsidy and use pre-tax income. The number of pre-tax respondents and the complexity of aligning FlexPass payments with pre-tax regulations motivated the project team to continue to test FlexPass without a pre-tax component.

Another primary purpose of the second interest survey was to determine current and future commute patterns among potential study participants in order to plan a second pilot of Phase 1. We asked respondents how often they were currently commuting to downtown Minneapolis (July/June 2021) and

how often they expected to be commuting come August or September 2021. Table 6.3 lays out a cross tabulation of current commute frequency (rows) and future commute frequency (columns). These results pointed toward a strong return-to-work trend for the fall, making it a good time to relaunch FlexPass; however, the rise of the delta variant at the end of the summer changed course for many downtown employers.

Table 6.4 Current Commute Frequency (rows) versus Future Commute Frequency (columns) showing the number of respondents decreasing, maintaining, or increasing their commute frequency

	Not Commuting	Less than once	1–2 days	3–4 days	5 days or more	Total
Not commuting	4 (5 %)	5 (6 %)	5 (6%)	14 (16 %)	2 (2 %)	30 (35 %)
Less than once	-	-	4 (5 %)	3 (3 %)	-	7 (8 %)
1–2 days	-	-	10 (12 %)	8 (9 %)	2 (2 %)	20 (23 %)
3–4 days	-	-	-	14 (16 %)	4 (5 %)	18 (21 %)
5 days or more	-	-	-	-	11 (13 %)	11 (13%)
Total	4 (5 %)	5 (6 %)	19 (22 %)	39 (45 %)	19 (22 %)	86 (100 %)

CHAPTER 7: PHASE 1 FLEXPASS USE AND TRAVEL BEHAVIOR

7.1 PARTICIPANT CHARACTERISTICS

In the 2nd program evaluation of Phase 1, the study team implemented study recruitment from late August through October 2021. Recruitment efforts are detailed in **Chapter 3**. At the end of enrollment, 19 people completed the Enrollment Survey. Of the 19 that expressed interest in the study, 13 picked up their FlexPass card and paid for their first month. Of these 13 FlexPass users, 9 completed the 14-day smartphone-based travel behavior data collection.

Table 7.1 on the next page shows key characteristics of the FlexPass users and the Daynamica users; all Daynamica users are also FlexPass users. These characteristics include FlexPass type, parking, employment, commuting, demographic and household information. All together, these characteristics depict a preliminary picture of commuters interested in FlexPass. There are unquantifiable effects of how pandemic commuting patterns, and the research study activities are affecting the measured interest in the FlexPass products.

Key Takeaways:

- The parking-only option was more popular than the parking and transit option.
- Most participants did not have a monthly parking contract in the months preceding enrollment but were regularly driving downtown.
- The monthly cost of FlexPass was less than what most participants were currently paying for parking.
- Most participants were working for companies that accommodate working from home 3 or 4 days per week.
- Only one participant was using transit before enrolling in the study.
- Driving alone is most preferred commute mode compared to public transit, telecommuting, and carpooling.
- Messaging about productivity, carbon footprint, or telecommuting alone would not be enough to entice potential FlexPass users.
- All participants fall in the standard 18 to 65 working age population; however, no one between age 35–44 signed up.
- Just over half of participants (7) were white, not latinx, men. There were 3 white women and 3 men of color.
- There are a variety of household compositions
- Households typically have a 1-to-1 ratio of cars to drivers.
- FlexPass participants fall across the income spectrum with some participants earning less than \$25k and other earning more than \$200k.

Table 7.1 Key parking, employment, commuting, demographic, and household characteristics of FlexPass User and Daynamica Users

Variable Description	FlexPass Users	Daynamica Users
Total (N)	13	9
FlexPark contract user	10 (77%)	7 (78%)
Existing contract owner	3 (23%)	3 (33%)
Median monthly parking cost	\$150	\$150
Parking subsidy	4 (31%)	3 (33%)
Transit card holder (at any time)	6 (46%)	4 (44%)
Employed by company	11 (85%)	8 (89%)
Work ≥ 40 hours per week	12 (92%)	8 (89%)
Works 9 to 5	6 (46%)	4 (44%)
Works from home	9 (69%)	8 (89%)
Drives alone	12 (92%)	8 (89%)
Uses transit	1 (8.0%)	1 (11%)
Average telecommute user per week	3 or 4 days	3 or 4 days
Average drive alone use per week	3 or 4 days	1 or 2 days
Average transit use per week	1 or 2 days	1 or 2 days
Ideal mode is driving alone	7 (54%)	6 (67%)
Ideal mode is using transit	2 (15%)	1 (11%)
Average ideal commute time	23 min	20 min
Use commute time productively	4 (31%)	3 (33%)
Drive less to reduce carbon footprint	5 (38%)	3 (33%)
Telecommute more.	4 (31%)	3 (33%)
Age 18–34 years old	8 (62%)	6 (67%)
Age 45-64 years old	5 (38%)	3 (33%)
Gender: man	10 (77%)	8 (89%)
Race: white Alone	10 (77%)	7 (78%)
Average level of education	Associate's / Bachelor's	Associate's / Bachelor's
Lives with children under 17	6 (46%)	4 (44%)
Lives alone	2 (15%)	2 (22%)
Lives with spouse/partner	5 (38%)	4 (44%)
Average cars per HH	2	2
Average drivers per HH	2	2
Average HH income	\$75,000 - \$99,999	\$75,000 - \$99,999

7.2 FLEXPASS PARKING ACTIVITY

The study team observed the parking behavior through use of FlexPass cards at ABC Ramps. Table 7.2 below details the parking activity of each participant (anonymized as streets in downtown Minneapolis) and monthly summaries.

Most users did not come close to the 14-day monthly parking limit. One user, Chicago+, was using FlexPass outside of the intended scope; they were parking overnight and for consecutive days at a time. This user lived in downtown Minneapolis. They had to pay an additional cost to exit the ramps after staying more than 24 hours.

Most other participants entered their parking ramp in the morning and exited their ramp in the evening. Just a few participants took advantage of the in-and-out guarantee which provided unlimited re-entries in a 12-hour period. Only one of the three FlexPlus users took public transit in addition to parking at ABC Ramps. Three participants, including two FlexPlus users, stopped paying for their FlexPass contracts prior to the end of the study period.

Table 7.2 Number of days parked at ABC Ramps among FlexPass users; users with FlexPlus (parking and transit) are marked with “+”

User	Sept-21	Oct-21	Nov-21	Dec-21	User Average
Chicago+*	20	14	-	-	11.5
Elliot	14	14	12	13	13.25
Grant	12	7	2	6	6.75
Harmon	9	7	11	5	8.0
Hawthorne+	7	4	8	8	6.75
Hennepin	7	6	4	3	5.0
Lasalle		5	13	13	7.75
Laurel		5	13	5	7.67
Marquette		3	6	11	6.67
Park		1	0	-	0.5
Portland			3	1	2.0
Washington			2	0	1.0
Yale+			1	-	1.0
Monthly Average	11	5.8	6.25	6.5	6.0
Monthly Median	10.5	5.5	5	5.5	6.75

The pandemic’s effect on commuting patterns is likely influencing the parking activity we observed. Generally, these participants are self-selecting to purchase a parking contract so we anticipate a reasonable expectation to be commuting regularly; however, variable factors such as personal life

events, waves of COVID-19 severity, and individual employer return-to-the-office determinations can drastically change commuting behavior from month to month.

7.3 TRAVEL AND ACTIVITY PATTERNS

We collected daily travel and activity behavior over a period of 14-days from nine of the 13 FlexPass users. The group of nine participants is approximately representative of the 13. Table 7.3 and 7.4 provide a summary of the total number of activities and trip segments recorded with by participants. Each table also includes pertinent descriptive averages: events per day, duration per day, distance per day.

Table 7.3 Breakdown of activities recorded from the nine FlexPass participants who completed Daynamica data collection (We recorded 626 total activities) (Duration Minutes; Distance Miles)

Activity Type	Total Events	Events per day	Duration per day
Eat Out	53	0.42	21.45
Education	1	0.01	0.69
Home	243	1.93	945.20
Leisure & Recreation	87	0.69	85.54
Other	31	0.25	5.93
Personal Business	60	0.48	76.18
Shop	51	0.40	6.77
Work	100	0.79	165.25

Table 7.4 Breakdown of trip segments by mode recorded from the nine FlexPass participants who completed Daynamica data collection (We recorded 534 total trip segments in 490 total trips)

Mode	Total Segments	Segments per day	Duration per day	Distance per day
Bike	3	0.02	0.08	0.00
Bus	15	0.12	4.01	1.41
Car	367	2.91	74.50	30.48
Other	2	0.02	0.56	0.05
Walk	147	1.17	13.02	1.41

We observed three travel patterns, among the nine Daynamica users, that depict potential patterns of commuters interested in FlexPass and how they use it. These three patterns represent seven of the Daynamica users. The other two users had unique travel behavior not applicable for refining the FlexPass program for its target audience—downtown Minneapolis commuters. The three patterns we created are a transit user, a frequent driver, and an occasional driver. A 14-day, trip-and-activity plot is provided for each pattern.

Transit User

The Transit User is supported by one FlexPlus contract holder who used transit most of the time when commuting downtown. The user lives about 13 miles from downtown, close to an express route Park-&-Ride, and they work downtown along the Marq-2 transit hub. Guaranteed parking at ABC Ramps allows the participant to easily park downtown when they need a car for an activity immediately following work but they are typically commuting directly from and back to home. The commute time using public transit or driving are similar, neither has a significant time advantage.

This participant was only enrolled in FlexPass for one month. It appears that they switched to a different transit pass in the middle of the month. The transit use later in the 14-day observation period was not associated with a tag of their FlexPass card. The Transit User was not using enough parking to capitalize on the investment of a FlexPlus card. The monthly cost of FlexPlus (\$125) is slightly more than the 31-day pass on express routes (\$120) and much more than the Metropass (\$83) which covers the same routes as the 31-day pass on express routes.

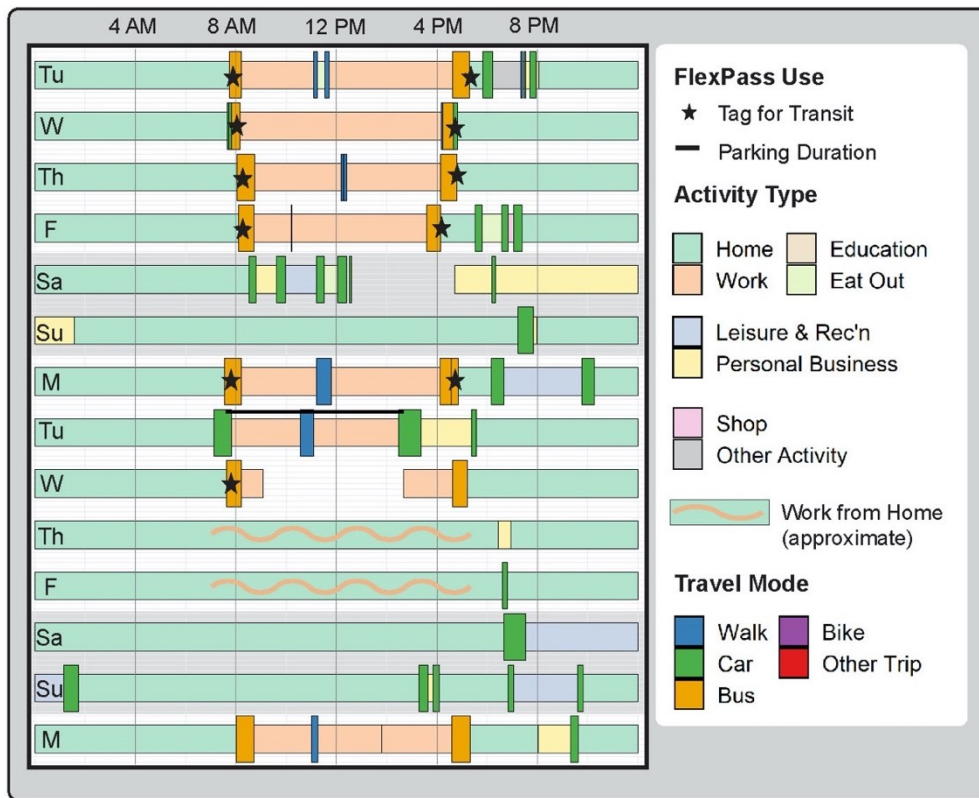


Figure 7.1 Example 14-day trip and activity pattern for the Transit User archetype

Frequent Driver

The pattern of Frequent Driver is supported by 4 FlexPark contract holders. The Frequent Driver commutes downtown, primarily by driving alone, about half of the time—2 to 4 times in any given week. When not driving downtown, they will telecommute to work. They will make a car trip almost every day—11 to 14 days out of the 14-day observation period. Table 7.5 below compares the car trip statistics on days when the participant commutes downtown compared to when they don't. There is not much difference between these categories, just slightly less driving on commute days. This could be explained by the frequency of car trips made in addition to commuting when they drive downtown. The average time per day on non-commute days is skewed by some holiday travel around Thanksgiving. Just one

The Frequent parker lives about 1.5 to 5 miles from ABC Ramps, in Minneapolis or Saint Paul. The typical commute time is 20 to 40 minutes, which includes both a car segment (between home and ABC Ramps) and a walk segment (from ABC Ramps and work). The car segment is typically less than 20 minutes.

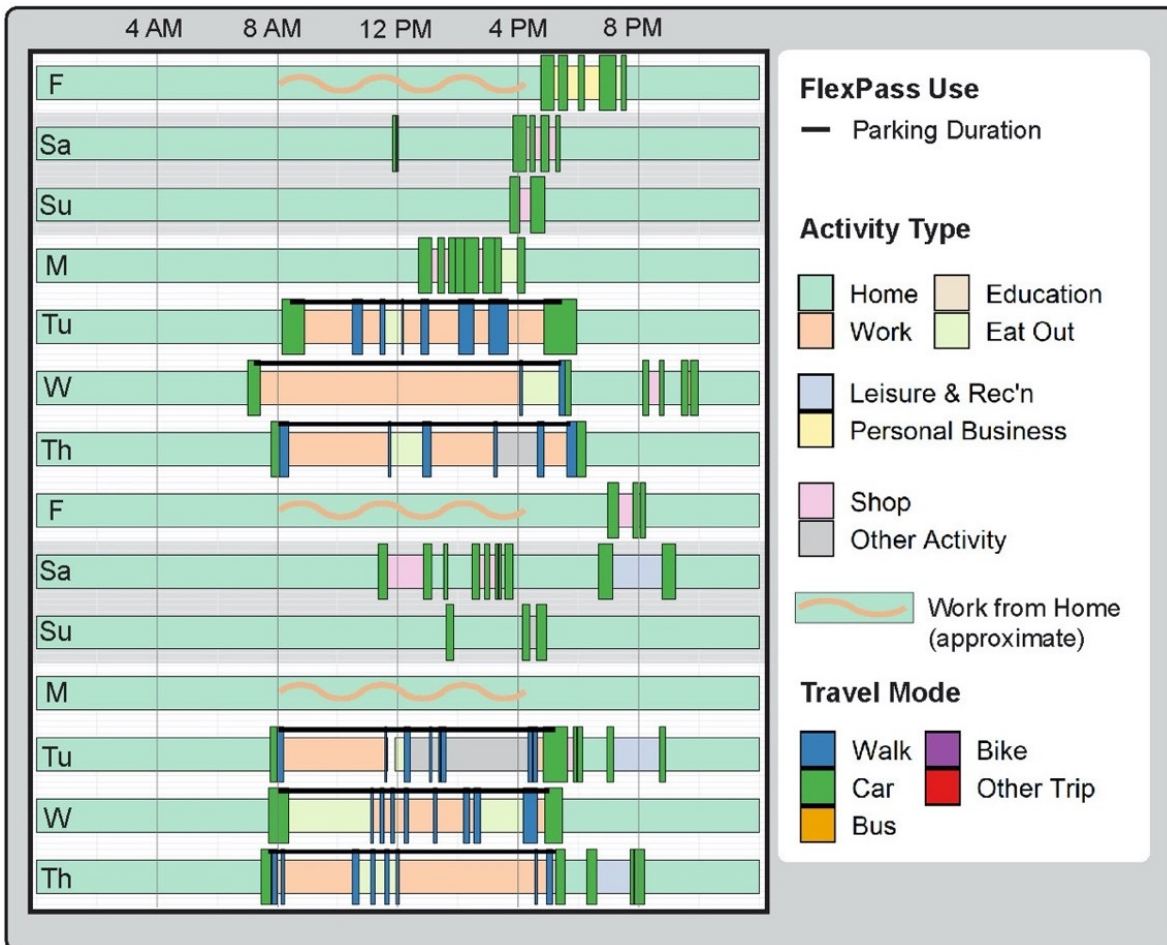


Figure 7.2 Example 14-day trip and activity pattern for the Frequent Driver archetype

Table 7.5 Descriptive statistics of car trips, comparing days commuting downtown with days not commuting downtown among the Frequent Drivers

Statistic	Commute	Non-Commute
Median Time per Day	61.5	51
Median Trips per Day	4	3
Average Time per Day	63	129.9
Average Trips per Day	3.67	2.8

Occasional Driver

The Occasional Driver pattern is supported by 2 FlexPark contract holders. They are distinguished from the Frequent Drivers by the lower commuting frequency and their overall weekday frequency of driving. The Occasional Driver commutes downtown much less than the Frequent Driver, just about 30 percent of weekdays. They are also more likely to have days without any car trips, over 25 percent of the 14-day observation period. They live 10 to 20 miles from ABC Ramps. The commute time is about 25 to 50 minutes.

Table 7.6 below compares the car trip statistics on days when the participant commutes downtown compared to when they don't. There is a much larger difference between the amount of driving on commute days compared to non-commute days. The Occasional Drivers are driving slightly more on commute days but are driving much less on non-commute days than Frequent Drivers. This can be explained by a longer commute and shorter trips made on non-commute days.

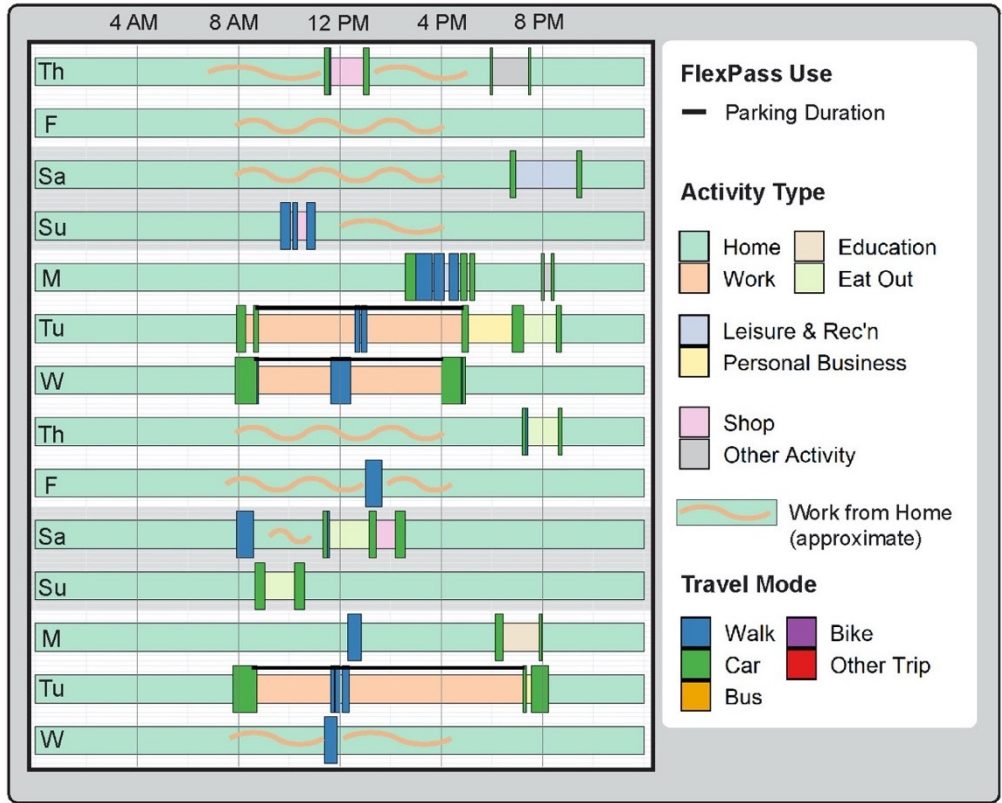


Figure 7.3 Example 14-day trip and activity pattern for the Occasional Driver archetype

Table 7.6 Descriptive statistics of car trips, comparing days commuting downtown with days not commuting downtown among the Occasional Drivers

Statistic	Commute	Non-Commute
Median Time per Day	85	10.75
Median Trips per Day	3	2
Average Time per Day	79.75	15.25
Average Trips per Day	3.3	1.6

Activity Density

Figure 7.4 below illustrates the pattern of activities for the 7 participants included in the archetype analysis. The activity density was calculated using the point density tool in ArcGIS, accounting for the duration of each activity. A few participants travelled outside the Twin Cities metro during the 14-day observation period but we've restricted displayed activity to the metro 7-county metro for relevance. The activity density includes all participants without differentiation of activity types for increase anonymity. We've included a bounding box of activity by archetypes for generalized activity of each archetype.

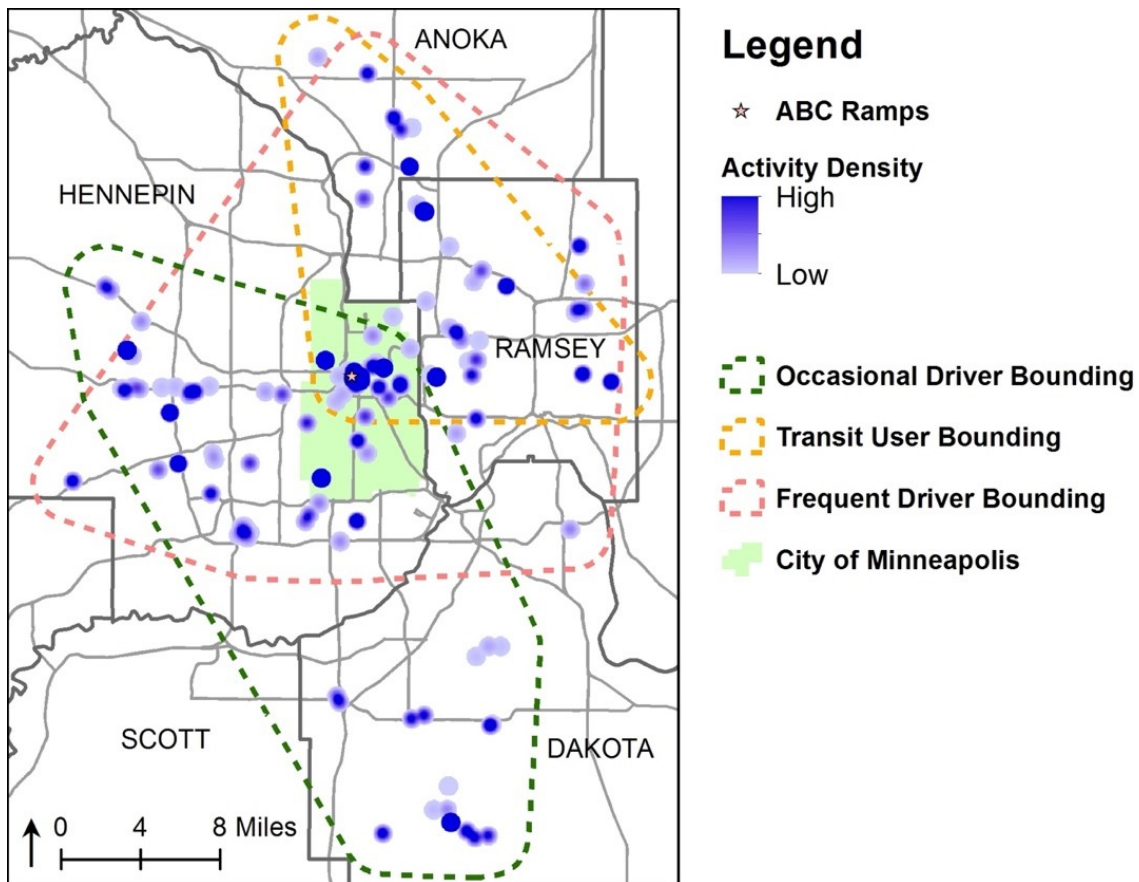


Figure 7.5 Activity patterns of Daynamica users within the Twin Cities metro over the 14-day observation period with minimum bounding of participant activities by archetype

In-App Survey Questions

The study team asked additional questions with Daynamica about each trip a participant recorded. Questions primarily pertained to mode preference and the influence of FlexPass.

In just 17 trips (3.5 percent) did a participant indicate they were not using their preferred travel mode. Just two of the nine participants that used Daynamica made this indication, one Frequent Driver and one Occasional Driver. Table 7.7 below provides more detail what mode these participants preferred instead. Participants could also have preferred to not make the trip at all. Unpreferred trips include short car trips close to home and walk or car trips near downtown.

Table 7.7 Summary of preferred mode when participants indicated they did not use their preferred mode

Mode	Count (%)
Preferred No Trip	4 (23 %)
Transit	11 (65 %)
Walk	2 (12 %)

We also asked respondents to indicate if a trip was related to work-activities (e.g., commuting to work) and if so, how it was influenced by FlexPass. Only 89 trips (18 percent) were self-described as work-related. Participants were asked to choose from 5 choices to describe how FlexPass may have influenced this trip.

- Different Mode:** I would have used a different transportation mode without the FlexPass.
- Paid More:** I would have paid more for this trip without the FlexPass.
- No Trip:** I would not have made this trip without the FlexPass.
- Different Time:** I would have made this trip at a different time without the FlexPass.
- Not Influenced:** This trip was not influenced by the FlexPass at all.

Table 7.8 below details how participants answered this question, given that the trip was work-related. Participants indicated that FlexPass influence the cost of over half of these work-related trips. Over a quarter of these trips were not influenced at all by FlexPass; however, when looking at just work-related trips from Home to Work, the percentage of trips not influenced at all drops to 14 percent (4 out of 28).

Table 7.8 Summary of participant answers to how a work-related trip was influenced by FlexPass (N= 89)

Choice	Count (%)
Different Mode	4 (4 %)
Paid More	58 (65 %)
No Trip	1 (1 %)
Different Time	1 (1 %)
Not Influenced	25 (28 %)

7.4 EXIT SURVEY

In the last month of the study period, we asked all 13 active FlexPass users to complete a 5-minute exit survey. The survey asks about satisfaction, parking use, transit use, ideal parking contract design, Mobility-As-A-Service (MAAS) platforms, and general feedback. We received responses from 10 of the 13 FlexPass participants: 9 FlexPark users and 1 FlexPlus user.

Participant feedback and mode use:

- 7 of 10 participants were very satisfied with their FlexPass contract. The other 3 participants were somewhat satisfied; they either exceeded the parking limit or parked elsewhere downtown during the study. Most respondents reported that avoiding their parking limit was “no burden at all.” The FlexPass contract matched the existing commute patterns for 8 of the 10 respondents. Two participants parked elsewhere downtown at least once during the study, highlighting that ABC Ramps did not capture all of the parking demand of the FlexPass participants
- None of the FlexPark participants used public transit at any point during the study period. The one FlexPlus respondent used transit more than expected.

- All but one respondent telecommuted during the study, between 1 and 4 days per week. Respondents indicated that they were primarily telecommuting because they like it rather than because of their employer or to manage their FlexPass parking limit.
- Initial designs of FlexPass focused on integrating parking and transit to cover the 5-day work week; however, the design going forward needs to integrate parking, transit, and telecommuting; not necessarily all three at once.
- In open feedback, respondents wrote that they liked the price of their FlexPass contract, they liked the parking flexibility, and they liked that it aligned with their work from home schedule. Few participants had general dislikes of their contract; those that did, wished the contract were available at more ramp location downtown and wanted more parking.

Contract Cost Analysis

We asked respondents to design their ideal parking contract; they could choose the amount of parking and transit they would like in a single contract. Potential transit benefits included no transit, limited transit, or unlimited transit. These results are discussed with the Exit Survey results from Phase 2.

- Parking Only = Amount of Parking × \$6.40
- Limited Transit = Amount of Parking × \$6.40 + Amount of Transit × \$4.375
- Unlimited Transit = Amount of Parking × \$6.40 + (22 days – Amount of Transit) × \$4.375

Figure 7.6 below shows the respondents' willingness to pay for their designed contract. All but two respondents designed a parking only contract. One respondent designed an unlimited transit contract, and one respondent designed a limited transit contract. Trend lines are displayed showing the anticipated cost of the parking only contract and the unlimited transit contract depending on the amount of parking selected. The anticipated cost of a limited transit contract cannot be displayed due to the variable, correlated amount of both parking and transit.

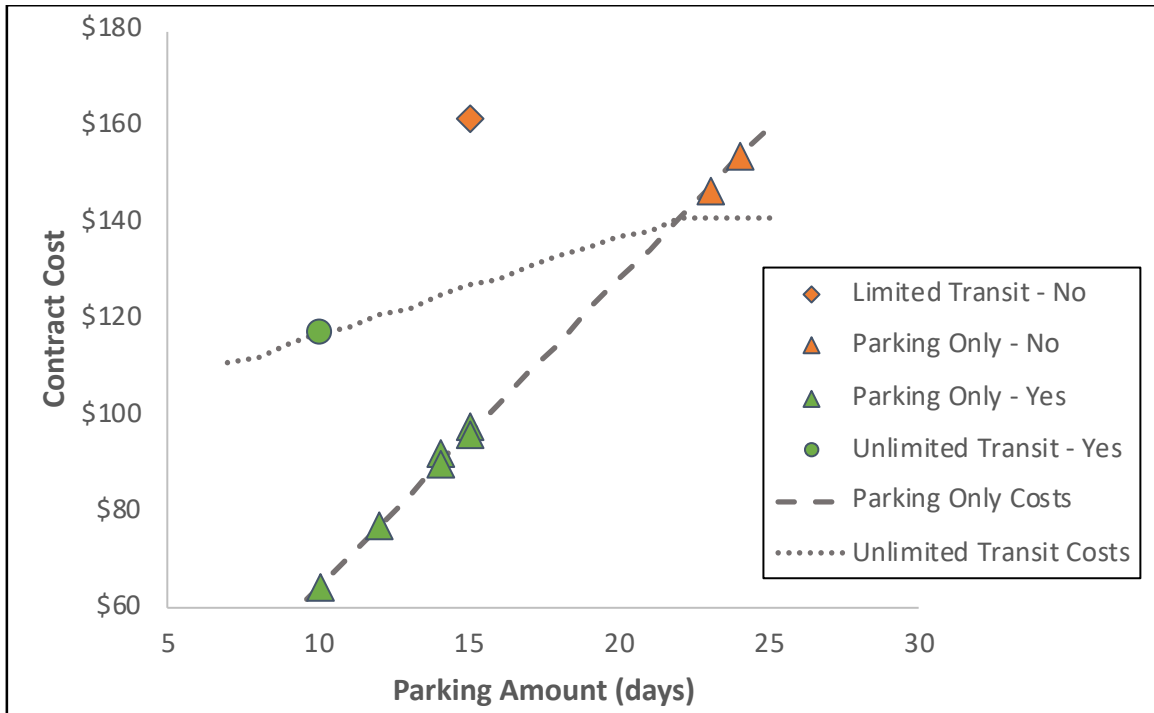


Figure 7.7 Willingness to pay for respondent designed contracts that either have no transit (limited parking only), limited transit (with limited parking), or unlimited transit (with limited parking; the figure includes two trend lines for the cost of the parking only contract and the unlimited transit contract depending on the amount of parking selected

Most respondents were willing to pay the calculated cost of the selected contract. Those with contracts over \$140 per month were not willing to pay, notably above the anticipated cost of the unlimited transit contract. Two of these respondents selected parking only contracts with 23 and 24 days of parking; these respondents may be better off with a standard monthly contract. The price calculation for these contracts and standard monthly contract at ABC Ramps assumes 22 commute days per month.

The other respondent who was not willing to pay selected 15 days of parking and 15 days of limited transit. Assuming they will be commuting for 30 days each month, this respondent would be better off with a 15-day parking contract with unlimited transit. This contract option would cost about \$127, \$35 less than their designed contract.

Mobility-As-A-Service

We also used the exit survey to ask FlexPass participants about Mobility-As-A-Service, a new framing of connected and flexible mobility options. Respondents were asked “How interested are you in a future FlexPass program that could provide an integrated payment platform that includes additional mobility options, such as shared mobility or vehicle options (including Nice Ride, HOURCar, Lyft, Uber, Zipcar, etc.)?” Five were somewhat interested and one was very interested. The respondents were most

interested in combining Uber, Lyft, and parking options. They were split in preference of whether they would prefer a pay-as-you-go model or a subscription model. If using a subscription model, most preferred to be able to adjust their use quota from month to month. Respondents were also split in preference for using a mobile app or a physical card, they were split between a physical card or no preference. We last asked about using pre-tax income for the MAAS platform, most indicated pre-tax benefits as an important feature.

Open Feedback

Several respondents submitted general comments about likes and dislikes of the FlexPass program during the exit survey. Several participants like the low cost of FlexPark Contract with guaranteed parking.

- “It saved me money but still gave me the flexibility to go in and out to the office as needed”
- “I liked not paying the full \$145/month for Ramp A knowing I wasn’t going downtown every day, or even every other day, for work.”

Several respondents commented on how FlexPass fit their commuting patterns well.

- “I liked that the cost & number of days aligned at the time with my WFH & being present at the office.”
- “The plan fit my current parking needs really well.”

Just a few respondents mentioned dislikes. They wished the FlexPass contracts were available at more ramps downtown or expressed some frustration with picking up their card.

CHAPTER 8: PHASE 2 FLEXPASS USE

In the Phase 2 program evaluation, the study was open for enrollment between February and July 2022. Recruitment efforts are detailed in **Chapter 3**. At the end of enrollment, 50 people completed the Enrollment Survey. Of the 50 people that enrolled, we include 42 in our analysis. These 42 participants had signed up before July 2022 and made at least one monthly payment for their FlexPass contract. The highest number of card holders at one time was 37 in March; the highest number of active card users was 32 in June. This chapter details the characteristics, parking activity, and perceptions of the FlexPass program from these 42 study participants.

8.1 PARTICIPANT CHARACTERISTICS

The Enrollment Survey collected baseline sociodemographic information and key information relevant to commuting. The questions asked in the Enrollment Survey are detailed in Appendix D. Table 8.1 below presents the first set of key information. Participants were overwhelmingly interested in the FlexPark contract with 14 days of parking only (over 80%). Just over half the participants requested a contract for Ramp C while under one fifth requested a contract for Ramp A.

Table 8.1 Characteristics of FlexPass participants including FlexPass contract type, Ramp location, recruitment method, contract ownership, transit use, and commuting costs

Characteristic	Count (Percent)
Total (N)	42
FlexPark contract user	35 (83%)
FlexPlus contract user	7 (17%)
Ramp A	7 (17%)
Ramp B	13 (31%)
Ramp C	22 (52%)
Ad in ABC Ramps	11 (26%)
Employer	6 (14%)
Google Search Ad	6 (14%)
Word of Mouth	5 (12%)
Existing ABC Ramps Customer	16 (38%)
No Existing Contract	25 (60%)
Transit User	6 (14%)
Commute Subsidy from Employer	20 (48%)
Use Pre-Tax Income for Commute Expenses	21 (50%)
Both Subsidy and Pre-Tax Income	12 (29%)

The most effective recruitment method was electronic advertisements in the skyways connected to ABC Ramps. Over one third of participants were existing contract holders at ABC Ramps but a majority of participants (60%) did not have any parking contract downtown at the time of signing up. Six participants have used public transit by the time of enrollment, with just 3 of those signing up for the FlexPlus contract. Most of the participants (70%) receive a commute subsidy from their employer or use pre-tax income for commuting expenses; about 30 percent have both.

Figure 8.1 illustrates the geographic distribution of where FlexPass participants live in the Twin Cities Metro Area, representing 31 cities or towns, including one in Wisconsin that's not pictured. There is not a clear pattern of interest in FlexPass at ABC Ramps based on geography. The wide distribution is indicative of large area from which downtown Minneapolis commuters travel.

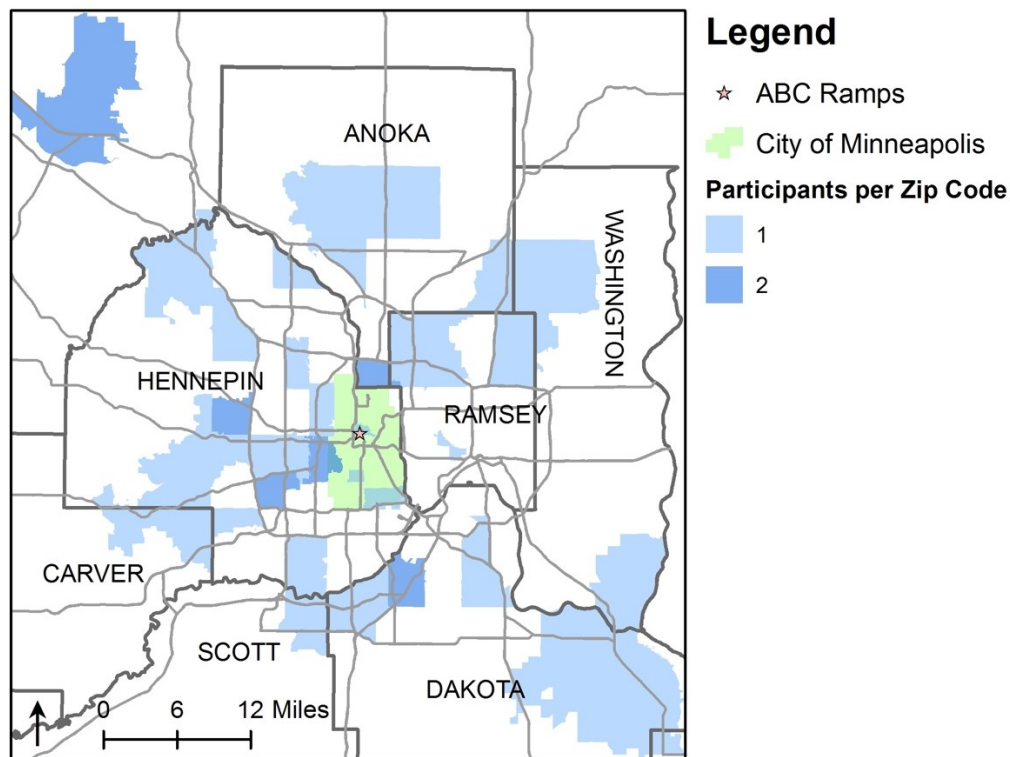


Figure 8.2 Distribution of Phase 2 FlexPass participants by zip code (N = 42)

Table 8.2, on the next page, details several averages from the Enrollment Survey. The average length of participation in the study is about 3 months. The range of monthly parking costs spans from \$0.00 to \$200.00 but the average sits between the cost of the FlexPark and FlexPlus contracts. Monthly transit costs are cheaper but never \$0.00 per month. Notably, the cost of the FlexPlus contract is much less than the combined averages of monthly parking and transit costs. Study participants are working 5 days per week on average but commuting just 3 days per week on average. Participants are working from home the other 2 days per week on average. The range of distance from ABC Ramps spans from 0 miles (the participant lives near downtown Minneapolis) to 66 miles (the participant lives in Wisconsin). Distance is approximate, calculated as the linear distance between the participant's zip code and ABC

Ramps. The median distance is about 12 miles. Lastly, study participants have high vehicle access. The number of vehicles per households matches the number of licensed drivers per household.

Table 8.2 Study averages from the Enrollment Survey including study duration, commuting costs, work schedule, distance to ABC Ramps, and household characteristics

Characteristic	Average	Minimum	Maximum
Study Duration	3.37	1	6
Monthly Cost of Parking	\$ 110.40	\$ 0.00	\$ 200.00
Monthly Cost of Transit	\$ 56.67	\$ 14.00	\$ 91.00
Workdays per Week	4.8	3	6
Commute Days per Week	3.2	0	7
Telecommute Days per Week	1.7	0	4
Approx. Distance from ABC Ramps (miles)	14	0	66
People per Household	2.4	1	6
Vehicles per Household	2	1	3 or more
Vehicles per Licensed Drivers in Household	1	0.5	2

Table 8.3 Participant characteristics from the Enrollment Survey including working hours per week, work schedule, commute mode, and commute satisfaction

Characteristic	Count (Percent)
Less than 20 hours	2 (5%)
20-29 hours	1 (2%)
30-39 hours	0 (0%)
40 hours	16 (38%)
More than 40 hours	23 (55%)
Begin work at a specific time of the day	21 (50%)
Work for a specific number of hours per day	13 (31%)
Start work between 7–9 AM	32 (76%)
End work between 4–6 PM	28 (67%)
Satisfied	12 (29%)
Neither satisfied nor dissatisfied	14 (33%)
Dissatisfied	16 (38%)
Drive Alone	42 (100%)
Public Transit	6 (14%)
Carpool	3 (7%)
Bike	1 (2%)

Table 8.3 (above) presents the third set of participant characteristics collected with the Enrollment Survey. All but a few participants work at least 40 hours per week and typically start their workday between 7–9 AM or end their workday between 4–6 PM, the peak commuting periods. Just over a third of respondents are dissatisfied with their commute conditions. All respondents drive alone to work while a few use public transit, carpool, or bike. No participants indicated that they use ride hailing services to commute or walk to work.

Table 8.4 Participant choice of displayed commute preference and context statements

Commute Preferences and Contexts	Count (Percent)
It's important to make my commute time as short as possible	32 (76%)
I want to use my commute time productively	27 (64%)
I like to work from home	25 (60%)
Improving walk, bike, and transit infrastructure is necessary no matter whether I use it	18 (43%)
I want to drive less to reduce my carbon footprint	14 (33%)
I want to walk or bike more to increase physical activity	10 (24%)
Many people in my social network walk, bike, or ride transit	5 (12%)

Table 8.4 (above) presents results from one question of the Enrollment Survey related to the participant's commuting or mobility preferences and contexts. Most participants value a short commute, want to use that time productively, and like to work from home. FlexPass can provide an opportunity for users to be productive during their commute if they use transit and it can incentivize working from home, but it cannot address the participant's commute time. The other statements in the table indicate that participants are primarily interested in FlexPass for how it improves their own commuting scenario. Messaging related to social benefits will likely not be as effective in marketing the FlexPass program in the future.

Table 8.5 on the next page present the final characteristics collected with the Enrollment Survey, related to participant demographics. Most of the participants are young adults, age 34 or younger, and White. Table 8.5 only presents races/ethnicities present in the study sample; the full list of races/ethnicities surveyed are in Appendix D. The study sample is about half men and half women, no other genders are present in the sample. Two study participants have a disability that affects their ability to travel throughout the region. Three study participants are foreign born. There is an approximate normal distribution of household incomes in the study sample.

Table 8.5 Participant demographics collected with the Enrollment Survey, including age, gender, race/ethnicity, disability, nativity, and household income

Characteristic	Count (Percent)
18-24	6 (14%)
25-34	26 (62%)
35-44	0 (0%)
45-54	5 (12%)
55-64	4 (10%)
65-74	1 (2%)
Men	23 (55%)
Women	19 (45%)
White	39 (93%)
Asian	4 (10%)
Black or African American	2 (5%)
Disability Affecting Travel	2 (5%)
Foreign Born	3 (7%)
Less than \$25,000	5 (12%)
\$25,000-\$49,999	6 (14%)
\$50,000-\$99,999	9 (21%)
\$100,000-\$149,999	10 (24%)
\$150,000-\$249,999	7 (17%)
\$250,000 or more	5 (12%)

8.2 FLEXPASS PARKING AND TRANSIT ACTIVITY

The study team was able to observe parking and transit activity through each use of a participant’s FlexPass card. Table 8.6 describes the average monthly and weekly parking activity of FlexPass participants. Most participants parked between 3 and 11 days per month, some never used their card while others were regularly close to the monthly maximum (14 days).

Table 8.6 FlexPass use monthly averages per participant; parking use includes all 42 participants, while transit use includes the 7 FlexPlus users only

FlexPass	Average	Std Dev	Minimum	Maximum
Monthly Parking Per Participant	7.18	3.91	0	13.5
Weekly Parking Per Participant	2.03	0.97	0	3.5
Monthly Transit Per Participant	1.5	2.33	0	6.5

Figure 8.3 shows the distribution of disaggregated parking activity, depicting the frequency of the total number of parking ramp entries per participant month from 0 days to a maximum of 15 days (e.g., a participant re-entered the ramps at least one day that month). Most participant months had between 6 and 13 parking entries. This approximates the number of days because most participants only entered the ramps once per day.

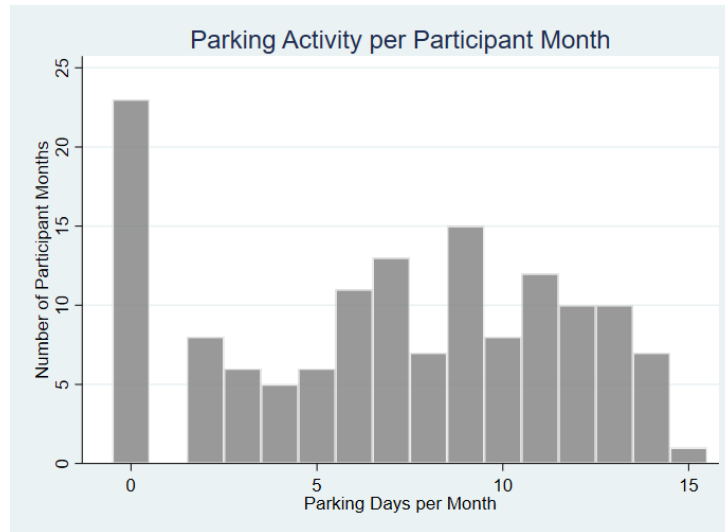


Figure 8.4 Histogram of parking activity per participant months (i.e., the number of participant months with a given number of parking days)

Figure 8.5 provides a glimpse of comparing means in four characteristic categories. There is the greatest difference between FlexPark and FlexPlus contract holders, though there are only 7 FlexPlus contract holders in the sample. The figure also illustrates that parking rates are greater among Ramp C contract holders and participants that were already existing customers of ABC Ramps at the time of enrollment. There is little difference in parking rates by gender. The sample size is too small to explore other demographic variables. These findings do not present any definitive trends but can help inform hypotheses for future studies.

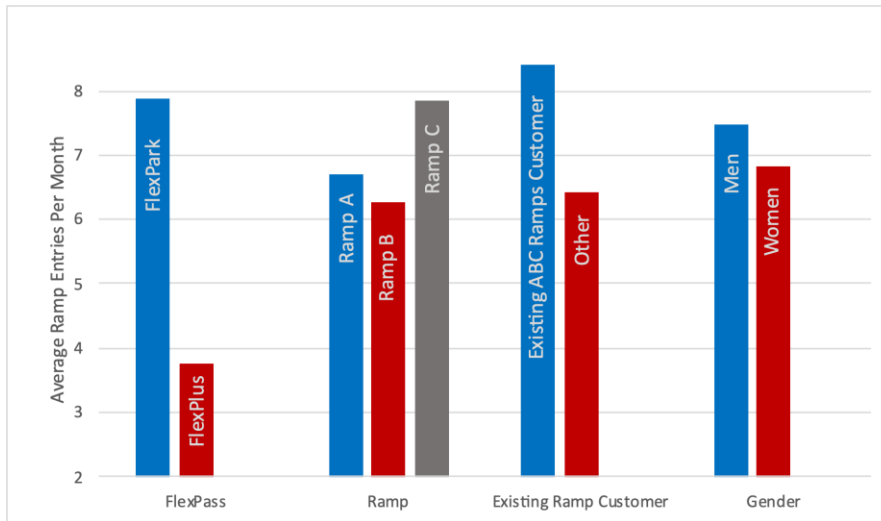


Figure 8.6 Mean comparisons among four categorical characteristics including FlexPass type, ramp location, existing ramp customers, and gender

8.3 EXIT SURVEY

In the last month of the study period, we asked all 42 FlexPass users included in our analysis to complete a 5-minute exit survey. The survey asks the same questions as the Exit Survey from Phase 1, including questions about satisfaction, parking use, transit use, ideal parking contract design, Mobility-As-A-Service (MAAS) platforms, and general feedback. We received 31 responses, including 25 FlexPark users and 6 FlexPlus users.

Participant feedback and mode use:

- Almost 80 percent of respondents reported being very satisfied with their FlexPass contract, no one reported dissatisfaction. Three quarters of respondents reported that avoiding their parking limit was “no burden at all”; other respondents reported a moderate burden. All but 6 of the respondents reported that FlexPass contract matched their existing commute pattern. Almost a quarter of respondents reported exceeding their monthly limit (14 days) at least once during the study.
- Two Flexpark participants used public transit during the study while FlexPlus participants mostly reported using transit less than expected.
- All but one respondent telecommuted during the study, mostly 1 to 2 days per week. Respondents indicated that they were primarily telecommuting because they like it rather than because of their employer or to manage their FlexPass parking limit. In addition, almost 80 of respondents reported that they’ll continue to telecommute at their current frequency for at least another year.

Contract Cost Analysis

We asked respondents to design their ideal parking contract; they could choose the amount of parking and transit they would like in a single contract. Potential transit benefits included no transit, limited transit, or unlimited transit.

The price of each contract was then calculated in line with the prices of the current FlexPass contracts and respondents were asked if they were willing to pay the calculated price for the contract they designed. How each price is calculated is displayed below. The cost per day of parking is \$6.40, a 20 percent discount of the early bird rate. The price of per day of transit is \$4.375, a discounted rate based on the \$83 per month Metro Pass.

- Parking Only = Amount of Parking × \$6.40
- Limited Transit = Amount of Parking × \$6.40 + Amount of Transit × \$4.375
- Unlimited Transit = Amount of Parking × \$6.40 + (22 days – Amount of Transit) × \$4.375

Figure 8.7 below shows the respondents' willingness to pay for their designed contract. Responses from the 2021 Exit Survey are included. Most respondents picked parking only contracts with 12 to 16 days of parking per month. Eleven respondents picked contracts with limited or unlimited transit. Trend lines are displayed showing the anticipated cost of the parking only contract and the unlimited transit contract depending on the amount of parking selected. The anticipated cost of a limited transit contract cannot be displayed due to the variable, uncorrelated amount of both parking and transit.

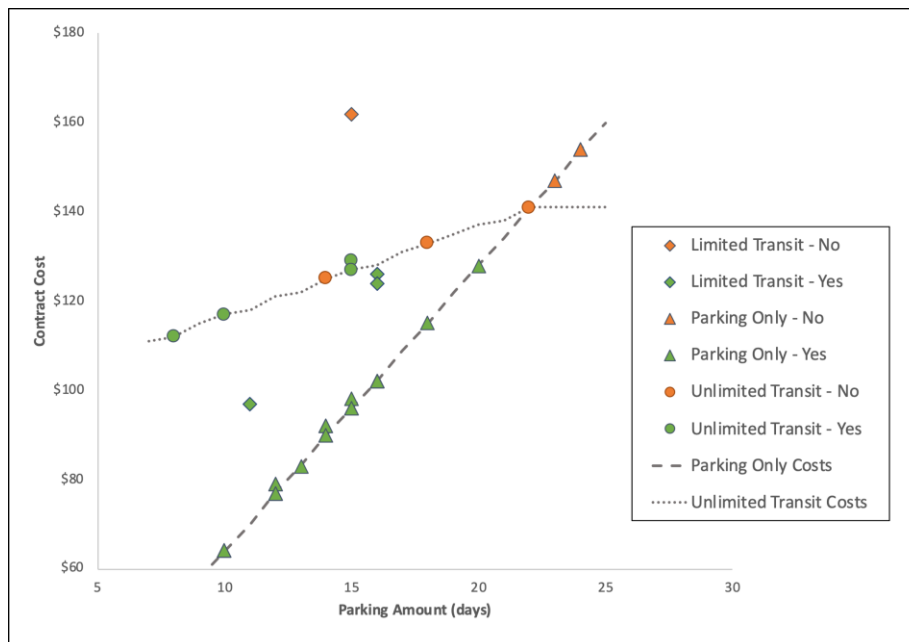


Figure 8.8 Willingness to pay for respondent designed contracts that either have no transit (limited parking only), limited transit (with limited parking), or unlimited transit (with limited parking; the figure includes two trend lines for the cost of the parking only contract and the unlimited transit contract depending on the amount of parking selected

Most respondents were willing to pay the calculated cost of the selected contract. Those with contracts over \$140 per month were not willing to pay, notably above the maximum cost of the unlimited transit contract. Two of these respondents selected parking only contracts with 23 and 24 days of parking; these respondents may be better off with a standard monthly contract. Willingness to pay for a contract with unlimited contract is more variable without a clear pattern.

All respondents with a parking only contract costing less than \$140 were willing to pay, indicating an appropriate price calculation for the contract. However, this analysis does not account for selection bias; all respondents were willing to pay for the current cost of FlexPass and participate in the study.

Mobility-As-A-Service

We also used the exit survey to ask FlexPass participants about Mobility-As-A-Service (MAAS), a new framing of connected and flexible mobility options. Respondents were asked “How interested are you in a future FlexPass program that could provide an integrated payment platform that includes additional mobility options, such as shared mobility or vehicle options (including Nice Ride, HOURCar, Lyft, Uber, Zipcar, etc.)?” Almost 50% of respondents were not interested in the MAAS platform. Respondents who were interested in the program were most interested in combining Uber, Lyft, transit and parking options. A fifth of respondents were interested in shared bike or scooter options. They were split in preference of whether they would prefer a pay-as-you-go model or a subscription model. If using a subscription model, most preferred to be able to adjust their use quota from month to month. Over half of the respondents interested in the platform preferred using a mobile app over a physical card. We last asked about using pre-tax income for the MAAS platform, most indicated pre-tax benefits as an important feature.

Due to the small sample size of the exit survey, these results are not definitive; however, they do provide a preliminary data point for the viability of various MAAS program designs.

Open Feedback

Several respondents submitted general comments about likes and dislikes of the FlexPass program during the exit survey. Several participants like the low cost of FlexPass.

- “I also enjoyed getting a discounted rate with the pass that made it cheaper than paying each day and didn't involve me using it every day to get my money's worth.”
- “Allowed me to have contract parking but only paying for the days that I would need it - no wasted dollars.”

Several respondents commented on how FlexPass fit their commuting patterns well.

- “I appreciated a more flexible parking plan that fits my downtown work requirements.”

Others highlighted the simplicity of using the FlexPass card to enter and exit the ramp and make payments each month. A few respondents wished they could change the amount of parking they were allowed each month to accommodate leave or holiday schedules. FlexPlus respondents liked the

flexibility of using transit or driving based on their particular travel needs that day. About 3 participants reported dislikes with the program, highlighting the ramp restriction, difficulty paying for extra parking, or individual difficulty with using FlexPass.

CHAPTER 9: CONCLUSION

9.1 PRIMARY TAKEAWAYS FROM PHASE 1 PROGRAM EVALUATION

With COVID-19 infections surging through much of the fall 2021 observation period, it was difficult to develop a clear evaluation of FlexPass. The most glaring data point was the small number of enrolled participants (13) compared to the initial expectation (a few hundred). It is difficult to know why downtown commuters did not enroll in the FlexPass study without conducting focus groups with these commuters. Lack of interest could be influenced by the overall reduction in commuting and parking demand, the unpredictability of future parking demand, the associated research study activities, or the features of the FlexPass contract.

Among the 13 FlexPass participants, most indicated they liked the program, primarily because it provides guaranteed parking at a lower cost than paying the daily rate. The contracts were designed for commuters parking downtown 2 or 3 days per week, but only a few participants were regularly parking at that weekly rate. FlexPass could offer fewer days of monthly parking; however, the benefit of a reduced monthly contract would be diminished if the ramps regularly failed to reach capacity. If an occasional commuter parked downtown mostly between 6 and 9 AM, they could take advantage of the early bird rate at the ramps (\$7-8 per day) and typically spend less on monthly parking than with FlexPass.

FlexPass was initially designed with an intention of influencing commuters driving downtown 5 days per week to reduce driving and instead take transit more often. The study advisory group began to consider telecommuting more prominently in the first few months of the COVID-19 pandemic. It became apparent at that time that the FlexPass program would be well suited to help downtown commuters maintain new commuting habits influenced by the COVID-19 pandemic rather than directly influencing commuters to explore these habits.

The study efforts in 2020 through 2021 indicate that FlexPass is a viable product that can be attractive to downtown commuters. However, the actual number of interested commuters and what this program means for congestion mitigation or parking demand management remain uncertain.

9.2 PRIMARY TAKEAWAYS FROM PHASE 2 PROGRAM EVALUATION

The second phase of the FlexPass program evaluation continued to investigate the viability of the FlexPass contracts offered during the first phase. Overall enrollment, and thus interest in the program, was much greater than the first phase. This provided some hint of the potential role that the COVID-19 pandemic, commuting restrictions, or study procedures played in Phase 1. Interest in the FlexPass program was still well below overall interest in monthly parking contracts at ABC Ramps.

FlexPass participants parked much more frequently in Phase 2, demonstrating that most people interested in the program were parking between 2 and 3 times per week. Interest in the FlexPlus program was still wanting, and overall transit use was much less than expected. These observations

certainly call into question the viability of a combined transit and parking program in the current commuting context (e.g., cost and availability). However, Phase 2 suggests that the FlexPark contract is worth continued evaluation at ABC Ramps without associated study procedures.

The goal of the FlexPass study was to investigate the ability of commuter programs to shape commuting behavior and test the viability of a combined parking and transit program. Overall, we were unable to examine the former amid a large shift in metro-wide commuting habits. Many employers now only require in-office work a few days per week. We were also unable to develop definitive findings for the viability of FlexPass even though we now know the difference in interest for the parking only pass versus the parking and transit pass. As commuters and employers look for more commute flexibility, FlexPass can help them establish this pattern for the long term.

9.3 OPPORTUNITIES TO EXPLORE

9.3.1 Implement Go-To card media for all new ABC Ramps parking contracts

One principle of the FlexPass program is to better integrate commute flexibility among downtown commuters. The FlexPass study has confirmed that one card product can be used in both ABC Ramps and on Metro Transit. What if all new ABC Ramps customers were to receive a Go-To Card rather than just a parking card? This card could be given with no amount or a small amount of stored value. These commuters would be reminded of the option of using public transit each time they parked. They could then add stored value or pass products as they become more interested in using public transit. This mode flexibility could also incentivize more transit use for travel to downtown Minneapolis; for example, they could take the C Line from and to Ramp A.

There are some system inefficiencies with this potential system. A Go-To Card has a 16-digit ID number in the Metro Transit system but 9-digit ID number in ABC Ramps system. It also needs to be investigated how this program would affect budgets for card media and revenue expectations for both ABC Ramps and Metro Transit. A downtown commuter can already use parking and transit flexibly by holding more than one card or by using one or more mobile apps. Thus, combining parking and transit options at this scale might not be the most important hurdle in convincing commuters to switch from cars to transit.

9.3.2 Institutionalize the FlexPass program across downtown

Human resource departments, transportation management organizations, and commuter benefits providers are best suited to advertise this program to commuters. Benefit providers are seeking to offer more flexibility to commuters. Doing so includes reducing the complexity in accessing multi-modal travel. For example, How many cards do I need? Which app do I use? How do I pay? The FlexPass program can help reduce this complexity in access. Benefit providers also have a particular influence because they offer saving through taxable income and profit reductions. These providers are looking to play a more central role in implementing commuter programs, including handing out physical cards, integrating app-based programs, and handling payment transactions.

The project team worked with Health Equity early in the development of the program to ensure that some participants could use pre-tax benefits during the study. We were able to offer this benefit to one participant in Phase 1 but ultimately did not maintain this benefit in Phase 2 of the study. We were still uncertain of overall interest in the program and the study enrollment did not match the typical method that Health Equity provides benefits to its customers. Third-party benefit providers will be able to advertise the FlexPass program more easily without associated study procedures.

Lastly, parking ramps across downtown Minneapolis could implement a reduced parking contract similar to the FlexPark contract. A reduced parking contract could help these ramps maintain a predictable source of monthly income while creating more flexibility for parking ramp customers. Whether implementing reduced parking contracts would allow parking management companies to offer more monthly contracts than they would otherwise be able to with standard monthly contracts needs to be investigated further.

9.3.3 Simplify, better tailor, or eliminate federal commuter tax benefits

The commuter tax benefit today offers a \$280 per month exclusion for qualified parking or high-occupancy transit (including commuter highway vehicles) jointly to the employee and employer (IRS, 2022). The employee can deduct the \$280 from their monthly paycheck or the employer can deduct it from their payroll taxes. There is a \$560 total monthly benefit for parking and transit, but you cannot deduct more than \$280 from either category. The spending on transit and parking must be tracked separately, requiring extra attention as to where the money is spent. This creates complexity with the payment collected for FlexPass. It is easiest for ABC Ramps and Metro Transit to have one payment made to ABC Ramps. In turn, ABC Ramps would then distribute the transit portion to Metro Transit.

For some reason not known to the study advisory group, this stipulation of money flow is not enough to meet current Internal Revenue Service (IRS) tax benefit regulations. The split between transit and parking needs to be visible on the front end, such as the human resources department cutting two checks. A commuter in Minneapolis today using tax benefits can acquire unlimited parking and unlimited transit for less than \$280 total. Parking and transit costs vary across the country, so the limits may be applicable in other metro areas, but in the Twin Cities, the separation creates an unnecessary hurdle to providing flexible commute benefits.

A single tax benefit of \$280 or more for a mix of parking and transit costs would deliver the same amount of cost savings to employees and employers while maintaining an equal incentive between driving and transit mode choice. How can this commuter benefit be better tailored to various metro regions across the country? Should state governments implement this tax instead?

Some metropolitan areas with low commuting costs may not even need this tax benefit. The benefit increases along with income, providing more savings to high-income commuters. For example, the FlexPlus contract is \$1,500 per year. Commuters making \$70,000 have a marginal tax rate of 22 percent. The pre-tax cost of the contract is \$1,500. If these commuters kept the \$1,500 in their paychecks, they would each receive \$1,170 ($\$1,500 \times 0.78$). To buy the contract with after-tax income, it would actually

take \$1,923 of pre-tax income ($\$1,500 \div 0.78$). Comparing the difference in pre-tax income, these commuters save about 28 percent. Whereas, commuters making \$40,000 per year save about 13 percent with the pre-tax benefit, while those making more than \$170,000 save almost 50 percent with the pre-tax benefit. The savings are larger for high-income commuters but they are also relatively less valuable; the stable cost of a monthly contract requires a smaller portion of income as income increases. Who is this tax benefit for? Do downtown commuters have equal access to this commute benefit regardless of employer?

Revising commuter tax benefits as suggested here could be an action required by federal or state legislative bodies or could be a discretionary policy change by the IRS or state revenue departments. We suggest that the IRS review its policies regarding commuting benefits to allow more flexibility with new technologies.

REFERENCES

- Douma, F., Cao, J., Corcoran, H., Fan, Y., Lari, A., Rohde, B., ... , & Karner, K. (2019). *The ABC parking ramps in Minneapolis: A unique past. A visionary future*. Minneapolis: University of Minnesota, Center for Transportation Studies. Retrieved from <http://cts.umn.edu/research/featured/abc-ramps-parking-garages-transportation-options-plan>
- Hamre, A., & Buehler, R. (2014). Commuter mode choice and free car parking, public transportation benefits, showers/lockers, and bike parking at work: Evidence from the Washington, DC, region. *Journal of Public Transportation*, 17(2), 67–91
- IRS. (2022) [Publication 15-B \(2022\), Employer's Tax Guide to Fringe Benefits | Internal Revenue Service \(irs.gov\)](https://www.irs.gov/publications/p15b), Available at <https://www.revisor.mn.gov/statutes/cite/216H.02>
- Khordagui, N. (2019). Parking prices and the decision to drive to work: Evidence from California. *Transportation Research Part A: Policy and Practice*, 130(December), 479–495
- Lari, A., Douma, F., Yang, K. L., Caskey, K., & Cureton, C. (2014). *Innovative parking pricing demonstration in the Twin Cities: Introducing flexibility and incentives to parking contracts*. Minneapolis: University of Minnesota, Center for Transportation Studies.
- Liu, W., Yang, H., & Yafeng, Y. (2014). Expirable parking reservations for managing morning commute with parking space constraints. *Transportation Research Part C: Emerging Technologies*, 44(July), 185–201
- Minnesota Pollution Control Agency & Minnesota Department of Commerce. (2019). 2019 Greenhouse Gas Legislative Report. Retrieved from: <https://www.pca.state.mn.us/sites/default/files/Iraq-2sy19.pdf>
- Minn. Stat. § 216H.02. (2022). Available at <https://www.revisor.mn.gov/statutes/cite/216H.02>
- Move Minneapolis. (2020). *Report on the ABC Ramps parking FlexPass pilot version 1.0*. Minneapolis: Move Minneapolis.
- Popovich, N. & Lu, D. 2019. The most detailed map of auto emissions in America. The New York Times. October 10, 2019. Retrieved from: <https://www.nytimes.com/interactive/2019/10/10/climate/driving-emissions-map.html>

APPENDIX A
INTEREST SURVEY 2020 AMONG ABC RAMPS CONTRACT
HOLDERS

1. Your Input is Requested!

The ABC Ramps is working with the University of Minnesota researchers, Metro Transit, and Move Minneapolis to design a new parking pass. The new pass may allow parking for a specific number of days each month and unlimited transit rides at a price cheaper than the current standard monthly contracts. The product will also fit within current pre-tax commuter benefit programs, providing flexible commute options and significant cost savings to pass holders. Regardless of your interest, please fill out this 5-minute survey to help us understand where you stand on this potential new commuter product. Your input will be anonymous and will be used to guide the design process of this new pass. Thank you for your time and input.

2. At what company do you work in downtown Minneapolis? Please enter the company name.

[text entry]

3. Does your employer currently subsidize your parking cost?

[select one]

Yes

No

I'm not sure

4. At which ABC Ramp do you have a Monthly Contract to park?

[select one]

Ramp A

Ramp B

Ramp C

5. On average, how many days per week do you park at your Ramp?

[select one]

Less than one day a week

1-2 days a week

3-4 days a week

At least five days a week

6. Please provide the city name where you currently live.

[text entry]

7. Are there a transit stop or Park-and-Ride station near your home that you can use to commute to downtown Minneapolis via transit?

[select one]

Yes

No

I'm not sure

8. Are you interested in a commuter pass that provides cost savings as you park less at the ABC Ramps and commute more using other options?

[select one]

Very interested

Somewhat interested
Not interested

Skip To: End of Survey If Are you interested in a commuter pass that provides cost savings as you park less at the ABC Ramp... = Not interested

9. Please check ALL commute options that you would be interested in using to park less at the ABC Ramps.

[select multiple]

- Carpooling
- Taking transit
- Biking and/or walking
- Telecommuting and/or working from home

10. On average, how many days per week do you think you could commute using these other options?

[select one]

- Less than one day a week
- 1-2 days a week
- 3-4 days a week
- At least five days a week

11. Are you interested in participating in a lunch meeting in downtown Minneapolis to help us further design this new commuter pass? (Lunch will be provided and a \$20 Target gift card will be offered for your time.)

[select one]

- Very interested
- Somewhat interested
- Not interested

Skip To: End of Survey If Are you interested in participating in a lunch meeting... = Not interested

12. Please enter the email address that you would like us to send the lunch meeting invitation.

[text entry]

13. Please indicate your gender so that we can recruit a representative sample of lunch meeting participants.

[select one]

- Male
- Female
- Non-binary
- Prefer not to answer

APPENDIX B
DAYNAMICA IN-APP SURVEYS

Trip Survey

For car trips only

Q1 During this trip, were you a [driver] [passenger]?

Q2 Did you make this trip in a [Personal vehicle] [Cab/Taxi] [Uber/Lyft] [Car sharing]?

For biking trips only

Q3. Did you make this trip with a [personal bike] [shared bike]?

For other trips only

Q4. Did you make this trip using a [motorcycle] [scooter] [other]?

For all trips

Q5. Who was with you during this trip? [No one] [Pet(s)][Spouse] [Own child] [Other family members][Friends and acquaintances]

Q6. Did you do any of the following during your trip? [Talk/phone call] [Listen to music/radio] [Relax/think] [Read] [Work] [None of the above]

On a scale of 0 to 6, with 0 as the least and 6 as the most:

Q7. How happy did you feel during this trip?

Q8. How stressed did you feel during this trip?

Q9. Select what applies to this trip: [I used my preferred mode] [I preferred a different mode] [I preferred to not take this trip]

(If [I would prefer a different mode] selected):

Q10. Which of the following is your preferred mode of transportation for this trip?

Select one: [Drive alone] [carpool] [transit] [park and ride] [bike] [walk] [ride hail] [other]

Q11. Is this trip related to your work activities (e.g., to or from work, an off-site meeting, or a work errand)? [Yes] [No]

(If [Yes] selected):

Q12. Which of the following describes the impacts of the FlexPass on this trip (check all that apply)?

[I would have used a different transportation mode without the FlexPass.]

[I would have paid more for this trip without the FlexPass.]

[I would not have made this trip without the FlexPass.]

[I would have made this trip at a different time without the FlexPass.]
[This trip was not influenced by the FlexPass at all.]

End of day Survey

Q1. Did you work from home on this day? [Yes] [No]

(If [Yes] selected):

Q2. How many hours did you work? [0-1 hr] [1-4 hrs] [4-8 hrs] [>8 hrs]

Q3. Did the FlexPass influence your decision to work from home on this day? [Yes] [No]

Q4. How well did Daynamica record the trips you made this day? [Very Well] [Well] [Not Well]

(If [Not Well] selected):

Q5. Why were trips not well-recorded (check all that apply)?

[I did not carry the phone while traveling]

[App crashed and did not record my activities and trips fully]

[App did not provide accurate activity/trip data]

[My phone was off during the time I made trips]

[Other]

(If [Other] selected):

Q6. Please enter other reasons. [text entry]

**APPENDIX C
INTEREST SURVEY 2021 AMONG DOWNTOWN MINNEAPOLIS
COMMUTERS**

1. How often do you currently commute to downtown Minneapolis?

[select one]

- 5 days a week or more
- 3–4 days a week
- 1–2 days a week
- Less than once a week
- I do not commute to downtown Minneapolis right now

2. How often do you think you will be commuting to downtown Minneapolis by August or September 2021?

[select one]

- 5 days a week or more
- 3–4 days a week
- 1–2 days a week
- Less than once a week
- I will not be commuting to downtown Minneapolis

3. {ABC_ramps}: Do you currently own a parking contract at ABC Ramps?

[select one]

- Yes
- No

4. {Eligibility}: Are you interested in parking at ABC Ramps in downtown Minneapolis?

*Display This Question:
If ABC_ramps = No*

[select one]

- Very interested
- Somewhat interested
- Not interested

5. {FlexPass_int}: Are you interested in alternative monthly contract models that allow you to pay less than the standard monthly contract price (less than \$145–165) for reduced parking use?

*Display This Question:
If Eligibility = Very interested
Or Eligibility = Somewhat interested
Or If
ABC_ramps = Yes*

[select one]

- Very interested
- Somewhat interested
- Not interested

Skip To: Not_Interested if FlexPass_int = Not interested

6. Please indicate your interest in each of the following monthly parking contracts that could be offered at ABC Ramps. The price of each contract will cost less than a standard monthly contract at ABC Ramps (\$145–165).
7. A monthly contract with a limited number of days of guaranteed parking each month at a fixed price. Once you park up to your limit, you are no longer guaranteed entry into the ramps. Example: 14 days of parking for \$96; after you reach your limit, you could utilize the early bird rate for \$8 per day if the ramp is not full.
[select one]
Very interested
Somewhat interested
Not interested
8. A monthly contract with a limited number of days of guaranteed parking each month at a fixed price plus guaranteed access for additional days of parking paid for upon your exit after each use at a discounted rate. Example: 14 days of parking for \$100, with additional parking for \$7.50 per day.
[select one]
Very interested
Somewhat interested
Not interested
9. A monthly contract for a small “membership” fee with guaranteed parking each day paid for upon exit after each use at a discounted rate. Example: A \$20 monthly fee with guaranteed parking for \$6.40 per day.
[select one]
Very interested
Somewhat interested
Not interested
10. Approximately, how many days per month will you use parking at ABC Ramps? There are about 22 workdays per month in a standard 5 days per week schedule.
[slider; 0 to 30]
11. {Transit}: Are you interested in pairing a parking contract with a public transit pass program?
[select one]
Very interested
Somewhat interested
Not interested
12. {Lyft}: Are you interested in pairing a parking contract with a Lyft account? The on-demand services would include ride hailing, Nice Ride bikes, shared scooters, and other services available through Lyft.
[select one]
Very interested
Somewhat interested

Not interested

13. Approximately, how many days per month will you use public transit in the Twin Cities?
There are about 22 workdays per month in a standard 5 days per week schedule.

Display This Question:
If Transit = Very interested
Or Transit = Somewhat interested

[slider; 0 to 30]

14. Approximately, how many days per month will you use Lyft ride hailing services?

Display This Question:
If Lyft = Very interested
Or Lyft = Somewhat interested

[slider; 0 to 30]

15. Approximately, how many days per month will you use Lyft bikeshare (Nice Ride) services?

Display This Question:
If Lyft = Very interested
Or Lyft = Somewhat interested

[slider; 0 to 30]

16. Approximately, how many days per month will you be telecommuting?

[slider; 0 to 30]

17. Thank you for your input thus far, we have just a few more questions.

18. {Pretax}: Do you pay for commuting costs with pre-tax income through your employer?

[select one]

Yes

No

19. {Subsidy}: Does your employer subsidize your commuting costs?

[select one]

Yes

No

20. Please enter the name of your employer:

Display This Question:
If Pretax = Yes
Or Subsidy = Yes

[text entry]

21. {FlexPass_study}: Are you interested in participating in a study this fall led by the University of Minnesota, called Parking FlexPass at ABC Ramps, to examine the viability of the alternate parking contracts at ABC Ramps described in this survey?

[select one]

Yes

Maybe

No

22. Please enter your email address. You will be contacted with more information about the upcoming pilot study.

Display This Question:

If FlexPass_study = Yes

Or FlexPass_study = Maybe

[text entry]

23. If you'd like to provide input on how ABC Ramps can provide more flexible parking and commute options, please do so below. (Optional)

[text entry]

Skip To: End of Survey

24. {Not_Interested}: What commute mode do you anticipate using between August and October this year to reach your employer's worksite? Select all that apply.

[select multiple]

Telework

Drive alone and park

Bike to work

Walk to work

Carpool

Metro Vanpool

Bus transit

Light rail transit

Commuter rail transit

I will be not working at that time [exclusive]

Other commute mode(s)

25. If you'd like to provide input on how ABC Ramps can provide more flexible parking and commute options, please do so below. (Optional)

[text entry]

APPENDIX D
PHASE 2 ENROLLMENT SURVEY

1. Which FlexPass contract would you like to sign up for?
FlexPark, \$90/month, includes 14 days of parking.
FlexPlus, \$125/month, includes 14 days of parking and unlimited public transit.
[select one]
 - FlexPark
 - FlexPlus

2. Which ramp would you like to park in? More info on ramps at abc-ramps.com.
[select one]
 - Ramp A
 - Ramp B
 - Ramp C

3. How did you learn about FlexPass?
[select one]
 - Google Search Ad
 - Social Media
 - News Article
 - Word of Mouth
 - Ad in ABC Ramps
 - Email
 - Move Minneapolis
 - Employer
 - Other [text entry]

4. {rampscuser}: Are you an existing ABC Ramps customer?
[select one]
 - No
 - Yes

5. Do you currently own a parking contract at another location in downtown Minneapolis?

*Display This Question:
If rampscuser = No*

[select one]
 - No
 - Yes

6. How much do you currently pay per month to park downtown?
[slider; 0 to 200]

7. {transit}: Do you currently use public transit in the Twin Cities?
[select one]
 - No
 - Yes

8. How much do you currently pay per month to use transit in the Twin Cities?

*Display This Question:
If transit = Yes*

[slider; 0 to 150]

9. Are your commuting costs subsidized in any way by your employer?

[select one]

- No
- Yes

10. Do you use pre-tax income to pay for commute expenses?

[select one]

- No
- Yes

11. Where do you live?

[multiple filed; text entry]

- City [text entry]
- Zip Code [text entry]

12. {employment}: What is your employment status?

[select one]

- Employed by Company/Organization
- Self-Employed
- Full-Time Student
- Unemployed

Skip To: Q22 If employment = Unemployed

13. Enter the name of your employer (Optional). Knowing the employers of FlexPass contract holders helps Move Minneapolis conduct outreach about commuting options.

*Display This Question:
If employment = Employed by Company/Organization*

[text entry]

14. Enter the name of your school (Optional). Knowing the affiliations of FlexPass contract holders helps Move Minneapolis conduct outreach about commuting options.

*Display This Question:
If employment = Full-Time Student*

[text entry]

15. How many days per week do you work?

[slider; 1 to 7]

16. How many hours a week do you typically work?

[select one]

More than 40 hours
40 hours
30-39 hours
20-29 hours
Less than 20 hours

17. How many days per week do you commute to downtown Minneapolis for work?
[slider; 0 to 7]

18. Which mode(s) do you typically use to commute downtown?

[select multiple]

Drive Alone
Carpool
Ride Hail or Shared Mobility
Public Transit
Walk
Bike
Other [text entry]

19. How many days per week do you work from home?
[slider; 0 to 7]

20. Which statement(s) below describe your work schedule? (Select all that apply)

[select multiple]

I typically begin work at a specific time of the day
I typically work for a specific number of hours per day
I typically start work between 7–9 AM
I typically end work between 4–6 PM

21. In general, how satisfied are you with your current commute conditions?

[select one]

Very dissatisfied
Somewhat dissatisfied
Neither satisfied nor dissatisfied
Somewhat satisfied
Very satisfied

22. Which statements below describe your mobility/commute preferences and contexts?

(Select all that apply)

[select multiple]

I want to use my commute time productively
I want to walk or bike more to increase physical activity
I want to drive less to reduce my carbon footprint
Many people in my social network walk, bike, or ride transit frequently
Improving walk, bike, and transit infrastructure is necessary no matter whether I use it
Making my commute time as short as possible is important to me
I like to work from home

23. These last nine questions are about demographics.
[text]

24. Please indicate your age range.

[select one]

18-24

25-34

35-44

45-54

55-64

65-74

75-84

85 or older

25. What is your gender?

[select one]

Man

Non-binary/third gender

Woman

Prefer to self-describe [text entry]

26. Please select your Race or Ethnicity. (Select all that apply)

[text entry]

American Indian or Alaska Native

Asian

Black or African American

Latinx, Hispanic or Spanish Origin

Middle Eastern or North African

Native Hawaiian/Pacific Islander

White

Other race, ethnicity, or origin [text entry]

27. Do you have a disability or illness that affects your ability to travel in the region?

[select one]

No

Yes

28. Were you born outside the United States?

[select one]

No

Yes

29. What was your pre-tax annual household income in 2021 (from all sources, before taxes/deductions)?

[select one]

Less than \$25,000
\$25,000-\$49,999
\$50,000-\$99,999
\$100,000-\$149,999
\$150,000-\$249,999
\$250,000 or more

30. How many people are in your household?

[select one]

1
2
3
4
5
6
7
8 or more

31. How many working vehicles (including cars, pickup trucks, SUVs, and vans) are available to your household?

[select one]

0
1
2
3 or more

32. How many licensed drivers are in your household?

[select one]

0
1
2
3 or more

APPENDIX E
FLEXPASS EXIT SURVEY

1. Thank you for your participation in the FlexPass study conducted by the University of Minnesota. This exit survey will collect additional feedback on your use of and satisfaction with your FlexPass contract. This feedback will help further refine the design of the FlexPass program.
2. How did you hear about the FlexPass Commuting Study?
[select multiple]
 - Recruitment Email
 - Social Media Post
 - Search Engine Results (e.g., on Google)
 - Flyer/Poster
 - Word of mouth
 - Other
3. Which FlexPass contract do you have?
[select one]
 - FlexPark (Parking only)
 - FlexPlus (Parking and Transit)
4. How satisfied are you with your FlexPass contract?
[select one]
 - Very satisfied
 - Somewhat satisfied
 - Neither satisfied nor dissatisfied
 - Somewhat dissatisfied
 - Very dissatisfied
5. The following questions as about your commute activity while you were enrolled in the FlexPass study.
6. Did you ever need more parking beyond the 14 guaranteed parking days within a calendar month?
[select one]
 - Yes
 - No
7. On average, how often did you pay for additional parking days beyond the limit of your contract?

*Display This Question:
If exceed_limit = Yes*

- [select one]
- Not at all
 - 1-2 days per month
 - 3-4 days per month
 - At least 5 days per month
8. Did you ever park at another location in Downtown Minneapolis beside ABC Ramps?
[select one]
 - Yes
 - No

9. How much of a burden was it for you to avoid exceeding your parking limit?

[select one]

- A great burden
- A moderate burden
- No burden at all

10. Did you use public transit (e.g, Metro Transit bus, light rail, and Northstar) more, about as much, or less than you expected.

Display This Question:

If contract = FlexPlus (Parking and Transit)

[select one]

- More than expected
- About as much as expected
- Less than expected

11. Did you use public transit at all?

Display This Question:

If contract = FlexPark (Parking only)

[select one]

- Yes
- No

12. How many days per week did you typically work from home?

[select one]

- Not at all
- Less than 1 day a week
- 1-2 days per week
- 3-4 days per week
- 5 or more days per week

13. How long do you expect to continue working from home in general?

Display This Question:

If telecommute_use != Not at all

[select one]

- Less than 3 months
- 3-6 months
- 6-12 months
- More than 12 months

14. For which of the following reasons did you work from home? (Select all that apply)

Display This Question:

If telecommute_use != Not at all

[select multiple]

- It was required by my employer
- I chose to work from home because I like it
- I chose to work from home to manage my monthly FlexPass parking limit
- Other

15. Did you use any transportation modes other than driving or transit to physically commute to work?
[select one]
Yes
No

16. Are you interested in any of the following modes despite not being able to use them during the study? (Select all that apply)

*Display This Question:
If othercommutemodeuse = No*

[select multiple]
Carpool
Bike
Shared Mobility Option (Uber/Lyft/Taxi/etc.)
Walk
Other
I am not interested in these modes [exclusive]

17. Which modes did you use? (Select all that apply)

*Display This Question:
If othercommutemodeuse = Yes*

[select multiple]
Carpool
Bike
Shared Mobility Option (Uber/Lyft/Taxi/etc.)
Walk
Other

18. Overall, did you change your commuting patterns to better match with the FlexPass contract or did the FlexPass contract match your existing commuting patterns?
[select one]
I changed my commute patterns to match the contract
The contract matched my existing commute patterns

19. Are you interested in a standalone Metropass (unlimited Metro Transit pass) that could be partially or fully subsidized by your employer? The non subsidized cost of Metropass is \$83 per month.
[select one]
Very interested
Somewhat interested
Not interested

20. Next, we will ask you about potential future designs of FlexPass at ABC Ramps.

21. There are about 22 workdays per month for a standard Monday–Friday work schedule. In your ideal situation, how many days of guaranteed parking should the FlexPass offer?
[slider; 1 to 31]

22. Which type of transit option below would you like to pair with your guaranteed $\{Q21NumericValue\}$ days of parking in your FlexPass?

[select one]

$\{Q21NumericValue\}$ parking days with no transit

$\{Q21NumericValue\}$ parking days with limited transit

$\{Q21NumericValue\}$ parking days with unlimited transit

23. For limited transit, how many days per month would you like to use transit? Again, there are about 22 workdays per month for a standard Monday–Friday work schedule.

Display This Question:

If transit_option = $\{Q21NumericValue\}$ parking days with limited transit

[slider; 1 to 31]

24. Would you be willing to pay \$ $\{e://Field/parkingcost\}$ per month for a FlexPass contract with $\{Q21NumericValue\}$ parking days and no transit?

Display This Question:

If transit_option = $\{Q21NumericValue\}$ parking days with no transit

[select one]

Yes

No

25. Would you be willing to pay \$ $\{e://Field/parkingtransitcost\}$ per month for a FlexPass contract with $\{Q21NumericValue\}$ parking days and $\{Q23NumericValue\}$ days of transit?

Display This Question:

*If transit_option = $\{Q21NumericValue\}$ parking days with limited transit
And transit_days [Slide to Select] Is Not Empty*

[select one]

Yes

No

26. Would you be willing to pay \$ $\{e://Field/parkingtransitcost\}$ per month for a FlexPass contract with $\{Q21NumericValue\}$ parking days and unlimited transit?

Display This Question:

If transit_option = $\{Q21NumericValue\}$ parking days with unlimited transit

[select one]

Yes

No

27. {maas}: How interested are you in a future FlexPass program that could provide an integrated payment platform that includes additional mobility options, such as shared mobility or vehicle options (including Nice Ride, HOURCar, Lyft, Uber, Zipcar, etc.)?

[select one]

Very interested

Somewhat interested

Not interested

Skip To: End of Block If maas = Not interested

28. Which mobility options would you like to see included in the integrated mobility payment platform? (Select all that apply).

[select multiple]

Uber vehicle services

Lyft vehicle services

Shared scooters

Shared Bikes (e.g., NiceRide)

HOURLCar

Zipcar

Metro Transit services (Bus, Light rail, Northstar)

Parking options (at ABC Ramps and/or other parking ramps)

Other

29. Would you prefer to pay for these mobility options through a subscription model (like the FlexPass, with a set monthly discounted cost and use quota) or through a pay-as-you-go model (such that you pay the regular rate for each mode used but the monthly cost varies depending on your use)?

[select one]

I prefer a subscription model

I prefer a pay-as-you-go model

I do not have a preference

30. The subscription model typically requires the user to set a fixed quota for mobility services. How important is it that you would be able to adjust your use quota from month to month?

[select one]

Very important

Somewhat important

Not important

31. Would you prefer the integrated mobility payment platform to be implemented via a smartphone application or a physical card?

[select one]

I prefer a smartphone app

I prefer a physical card

I do not have a preference

32. How important is it for the integrated mobility payment platform to be eligible for pre-tax payments through an employer?

[select one]

Very important

Somewhat important

Not important

33. Thank you for taking the time to complete this survey about FlexPass and thank you again for your participation in the study. If you would like to provide more feedback about FlexPass, please do so below.

34. In general, what did you like about the FlexPass Contract? (Optional)

[text entry]

35. In general, what did you dislike about the FlexPass Contract? (Optional)
[text entry]