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# Urban Connector Year 3: Field Tests

*Final Report*

December 2020



**C2SMART Center** is a USDOT Tier 1 University Transportation Center taking on some of today's most pressing urban mobility challenges. Using cities as living laboratories, the center examines transportation problems and field tests novel solutions that draw on unprecedented recent advances in communication and smart technologies. Its research activities are focused on three key areas: Urban Mobility and Connected Citizens; Urban Analytics for Smart Cities; and Resilient, Secure and Smart Transportation Infrastructure.

Some of the key areas C2SMART is focusing on include:

### **Disruptive Technologies**

We are developing innovative solutions that focus on emerging disruptive technologies and their impacts on transportation systems. Our aim is to accelerate technology transfer from the research phase to the real world.

### **Unconventional Big Data Applications**

C2SMART is working to make it possible to safely share data from field tests and non-traditional sensing technologies so that decision-makers can address a wide range of urban mobility problems with the best information available to them.

### **Impactful Engagement**

The center aims to overcome institutional barriers to innovation and hear and meet the needs of city and state stakeholders, including government agencies, policy makers, the private sector, non-profit organizations, and entrepreneurs.

### **Forward-thinking Training and Development**

As an academic institution, we are dedicated to training the workforce of tomorrow to deal with new mobility problems in ways that are not covered in existing transportation curricula.

Led by the New York University Tandon School of Engineering, C2SMART is a consortium of five leading research universities, including Rutgers University, University of Washington, the University of Texas at El Paso, and The City College of New York.

[c2smart.engineering.nyu.edu](http://c2smart.engineering.nyu.edu)

## **Urban Connector Year 3: Field Tests**

Ruey Long Cheu  
*The University of Texas at El Paso*

Joseph Chow  
*New York University*

Natalia Villanueva-Rosales  
*The University of Texas at El Paso*

Guillermina Gina Nunez-Mchiri  
*The University of Texas at El Paso*

Raul Alejandro Vargas Acosta  
*The University of Texas at El Paso*

Diana Becerra  
*The University of Texas at El Paso*

Ruth Priscilla Granados  
*The University of Texas at El Paso*

Fernie Briones  
*The University of Texas at El Paso*

Emiliano Ruiz  
*The University of Texas at El Paso*

Okan Gurbuz  
*The University of Texas at El Paso*

Mina Lee  
*New York University*

Nicolas Gomez Rojas  
*New York University*

Alicia Ting Luo  
*New York University*

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## Executive Summary

Seniors have different lifestyle and mobility needs than the rest of the population. Past research funded by C2SMART and performed by this multidisciplinary research team, with the assistance of the City of El Paso, Texas, included a survey for seniors in the City of El Paso for better understanding their mobility needs. A similar survey with a smaller sample was also conducted in the City of New York, New York. Using the survey findings, the researchers developed a beta version of a smartphone application named Urban Connector (UC) for addressing the mobility needs of seniors. The UC beta version, available for Android devices, was subsequently tested with seniors in the City of El Paso.

In this project, the research team continued to address the mobility challenges faced by the seniors:

- The UC beta version was redesigned to make it available for iOS devices and to provide additional functions that catered to the mobility needs of the seniors in the City of New York, producing the NY UC beta version.
- The experience and knowledge of engaging seniors to conduct the beta test of the UC in El Paso were transferred by The University of Texas at El Paso (UTEP) researchers to the researchers in New York University (NYU). A beta test was performed by the NYU researchers, who recruited seniors in the City of New York, with the lessons learned from the UTEP researchers.
- A release candidate of the UC application (UC Release Candidate 1.0) was developed to elicit the experiences of seniors when using it to make a trip. The UC Release Candidate 1.0 was made available for limited distribution for both Android and iOS devices.
- A plan for implementing a field test in the City of El Paso was developed. The field test involves the engagement of seniors, installation of the UC Release Candidate 1.0 in their smartphones, and its use for a period of two weeks. Two survey instruments were designed to collect anonymous UC application usage data during the field test. The first survey instrument requests information about the characteristics of a participant's trip. The second survey instrument is an exit survey questionnaire about the participant's travel behavior and demographics. The exit survey is designed to be administered at the end of the two-week field test period. The field test plan involves recruitment, training of participants to use the UC application, and data collection.

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## Section 1 Introduction

### 1.1 Background

The Center for Connected Cities for Sustainable Mobility towards Accessible and Resilient Transportation (C2SMART) is a United States Department of Transportation (USDOT) Tier 1 University Transportation Center established in 2016. C2SMART has supported researchers at The University of Texas at El Paso (UTEP) in collaboration with researchers at New York University (NYU), and with the engagement of the City of El Paso's Parks & Recreation Department for the development of an Android-based smartphone application named Urban Connector (UC), from March 2017 to February 2019. The UC application aims to assist seniors while traveling in urban areas. Initial surveys were conducted in the City of El Paso, Texas, and the City of New York, New York to understand the lifestyles and mobility needs of the seniors. Based on the findings of these initial surveys, a prototype of the UC application (UC prototype) was created in the Android operating system. A usability survey was then conducted in the City of El Paso to gather feedback on the menu options and user interface of the UC prototype. Subsequently, the UC prototype was improved to the beta version, i.e., the UC beta version. Towards the end of year two, researchers recruited seniors in the City of El Paso to test the UC beta version of the application. The UC beta version was installed on participant's Android smartphones. The participants were asked to use the UC beta version for one month before providing feedback via a survey. The results of this work are documented in *Cheu et al. (2019)*. The researchers have further refined the UC application in the third year. This report documents the research work performed in year three of the UC application development, from March 2019 to March 2020.

### 1.2 Objectives

The objectives of year three of the UC application development project are:

1. To customize the UC beta version, originally developed for the seniors in the City of El Paso who used Android-based smartphones, to meet the needs of seniors in the City of New York.
2. To perform a beta test in the City of New York.
3. To fine-tune the UC beta version, which ran on the Android operating system, to Version 1.0 of the UC application that runs on the Android operating system and iOS.
4. To design a survey that will involve the participation of seniors in the City of El Paso to use Version 1.0 of the UC application for two weeks to collect anonymous mobility data.

## 1.3 Research Methodology

Year three of the UC application development work was divided into four tasks.

### Task 1 – Adapt Urban Connector Application for the City of New York

Researchers at UTEP and NYU collaborated to extend the Android UC beta version, which had been developed for use in the City of El Paso, to cater to the needs of the seniors in the City of New York. With the information and functional requirements provided by the NYU researchers, combined with the information found in the initial survey on the lifestyles and mobility needs in the City of New York, the UTEP researchers adapted the UC beta version for use in Android and iOS devices, i.e., the NY UC beta version

### Task 2 – Beta Test of Urban Connector Application in the City of New York

With technical advice and assistance provided by the UTEP researchers, the NYU researchers conducted a beta test of the NY UC beta version of the application in the City of New York. This task replicated the third survey conducted in the City of El Paso in year two.

### Task 3 – Fine Tune Urban Connector Application for the City of El Paso

The UTEP researchers redesigned the Android UC beta version for the seniors in the City of El Paso, based on the feedback obtained through the beta test in year two. These improvements led to the UC Release Candidate 1.0 which is available for devices with both the Android operating system and iOS.

### Task 4 – Design a Field Test to Collect Mobility Data Using Urban Connector in the City of El Paso

For this task, the UTEP research team designed a field test of UC Release Candidate 1.0 which includes two survey instruments. The field test aims to recruit 30-40 seniors in El Paso. This field test involves the use of the UC Release Candidate 1.0 for two weeks and collecting anonymous trip characteristics and UC usage information as well as feedback on user experience and mobility patterns.

The work performed and the outcome of each task is reported in separate sections.

## 1.4 Outline of Report

The outline of this report is as follows:

- Section 1 explains the background of this project, the objectives, research methodology, and outline of this report.
- Section 2 reviews the previous development efforts on the UC application.
- Section 3 reports on the NY UC beta version, the customized UC beta version for use in the City of New York.
- Section 4 describes the UC Release Candidate 1.0.
- Section 5 describes the plan for a field test in the City of El Paso using the UC Release Candidate 1.0.

## Section 2 Review of Past Work on Urban Connector Application

This section summarizes the efforts that the research team had made in first two years of the UC developments, with two sequential annual research projects funded by C2SMART. The UC research team is a multidisciplinary research team of civil engineers, computer scientists, anthropologists from UTEP, and NYU. The development of the UC application in the first two years may be summarized in three sequential stages as shown in Table 1. The product at the end of the second year or stage three was the UC beta version targeting the needs of seniors in the City of El Paso, available for Android devices. All the surveys in the City of El Paso were conducted with assistance from the City of El Paso’s Parks and Recreation Department and approved by UTEP’s Institutional Review Board (IRB). The survey in the City of New York was conducted with approval of the IRB ay NYU. The rest of the section describes the development process, product, survey, and the findings at each stage.

Stage	Activity	Location	Survey date	No. of seniors participated
1	A. First survey, on lifestyles and mobility needs of the seniors	El Paso, TX	Fall semester 2017	458
1	B. First survey, on lifestyles and mobility needs of the seniors	New York, NY	Spring semester 2018	61
2	Development of UC prototype followed by the second (usability) survey	El Paso, TX	Spring semester 2018	65
3	Development of UC beta version followed by the beta test and the third survey	El Paso, TX	Spring semester 2019	38

**Table 1. Urban Connector application development in years one and two.**

### 2.1 Stage 1 – Surveys on Lifestyles and Mobility Needs of the Seniors

The development of the UC application started with Stage 1, which aimed to understand the lifestyles, mobility needs, and smartphone literacy of seniors as the targeted end-users. Surveys were conducted in the City of El Paso (Survey 1A in Table 1) and the City of New York (Survey 1B in Table 1).

Survey 1A had the participation of 458 seniors during the Fall 2017 semester. These participants answered a questionnaire (provided in English and Spanish) composed of 17 questions about demographics, lifestyles, mobility needs, and familiarity with smartphones and smartphone applications. The same survey was used by the NYU researchers in the City of New York with NYU's IRB approval (Survey 1B) in the Spring 2018 semester. The NYU researchers collected 61 responses.

The finding of these surveys can be found in Vechione et al. (2018). The key points are summarized as follows:

- The greatest mobility challenge faced by the seniors was traffic congestion, and for those who drive was finding parking spaces near their destinations. The weather was also a consideration for seniors when making trip decisions.
- The design considerations for smartphone applications included that they (the applications) should be intuitive and easy-to-use, provide larger font, speech-to-text, and text-to-speech capabilities, provide information about The American Disabilities Act-compliant transportation modes, and accessible infrastructure, and distributed free of charge.

## 2.2 Stage 2 – Development of UC Prototype and Survey on Usability

The findings of the Stage 1 surveys informed the development of the UC prototype using Android Studio (Android, 2018). The UC prototype functions and user interface were evaluated with Survey 2 (usability survey) performed in the City of El Paso. This second survey consisted of 16 questions which were divided into four parts: demographic characteristics of the senior participant, menu design and navigation, user interface design, and rating of the prototype application. In the Spring and Summer semesters of 2018, the UTEP researchers surveyed 65 seniors at five senior centers in the City of El Paso. For each senior participant, a research team member demonstrated the prototype of the UC application in an Android-based smartphone followed by the participant answering the survey. The results of this survey indicated that the UC prototype design met the user's needs.

## 2.3 Stage 3 – Development and Test of UC Beta Version

After the usability survey, the research team refined the UC prototype, created the UC beta version for Android devices. An evaluation of the UC beta version, called the beta test (Stage 3 in Table 1), was performed in the City of El Paso. The beta test involved the participants using the UC beta version for one month in the Spring 2019 semester and then answering a survey. For this study, the UTEP researchers recruited 38 seniors as participants. The survey of this study consisted of 24 questions about the participants' demographic characteristics, frequency and use of the UC application, user interface

designs, ease of use of menu, frequently used functions, perceived benefits, and finally their rating/recommendation.

The findings of the beta test can be found in Vargas-Acosta et al. (2019) and include that most of the participants (95%) were satisfied with the user interface elements (e.g., size of buttons), with 98% of the participants indicating the UC beta version was simple to use. Fifty-three percent of the users experienced less fear of getting lost or arriving late to their destination. The beta test provided information that informed the development of the UC Release Candidate 1.0.

## Section 3 Adaptation of Urban Connector Application for City of New York

This section documents the process of adapting the UC beta version developed for the seniors in the City of El Paso to the NY UC beta version that met the specific needs of the seniors in the City of New York. The aim was to have a UC beta version available in the Android operating system and iOS for the NYU researchers to conduct a beta test in the City of New York.

First, relevant information about the transportation systems in the City of New York was collected by the NYU researchers, to supplement the data obtained in the City of New York in Survey 1B. Using the information collected, the NY UC beta version was created with the following enhancements:

- Incorporating links to mass transit system (subway) and taxis information in the City of New York. These transportation modes were identified as frequently used by the seniors in the City of New York (Vechione et al., 2018).
- The NY UC beta version was developed by redesigning the source code in the Flutter application development environment (Flutter, 2020). This environment allowed the NY UC beta version to run in both the Android operating system and iOS.

## Section 4 Beta Test in the City of New York

### 4.1 Overview of Beta Test in the City of New York

This section describes the implementation of the beta test, using the NY UC beta version in the City of New York.

### 4.2 Preparation

The UTEP researchers provided the NY UC beta version to the NYU researchers and resolved technical issues encountered before the beta test. UTEP and NYU researchers held virtual sessions to share the experience of the UTEP researchers in implementing the beta test in the City of El Paso. The UTEP researchers shared the survey instruments, a recruitment video, and promotional flyers with the NYU researchers. The NYU researchers adapted the materials for use in the City of New York, including the surveys for the beta test in El Paso and documented in Cheu et al. (2019). This beta test study received approval from NYU's IRB. The survey instrument is shown in Appendix A.

### 4.3 Implementation

The beta test in the City of New York was administered by the NYU researchers. The recruitment of seniors took place at the Raices Times Plaza Senior Center and the Park Slope Center for Successful Aging in December 2019 (see **Figure 2**). After the consent form was signed by a senior who agreed to participate in the beta test, the NY UC beta version was installed on the participant's mobile device. The researchers also invited the participant to take a pre-beta test survey. The NYU researchers observed that compatibility issues with certain mobile devices hindered the ability to install the NY UC beta version on some devices. After the installation, the researchers demonstrated the functions and features of the NY UC beta version and answered questions. A technical issue observed in the NY UC beta version installed in iOS devices was the inability of the application to access the device's location data. This limited some of the functionalities of the UC beta version. A return visit was made to the Park Slope Center in January 2020 when the NYU researchers recruited additional participants. **Table 2** lists the outcomes of these visits.



Date	Senior center	No. of signed consent forms	Successful Android installations	Successful iOS installations
Dec., 2019	Raices Times Plaza	4	2	0
Dec., 2019	Park Slope Center	10	0	0
Jan., 2020	Park Slope Center	6	0	4

**Table 2. Outcomes of beta test in the City of New York.**



**Figure 1. NYU Researchers at Park Slope Center, City of New York.**

#### 4.4 Outcome

Thirteen participants responded to the pre-beta test survey. The main findings of this survey are:

- The respondents of the pre-beta test survey included eleven females and two males.
- There were more users of iOS devices (eight) than Android devices (five).
- The majority of the participants (12) were regular smartphone users.
- All the participants (13) used their smartphones to make phone calls, send/receive text messages and take photographs.

- Eight out of 13 of the participants used smartphones for navigation services, send/receive emails, engage with social media, browse the internet, listen to music, and watch videos.

Four weeks after the installation of the NY UC beta version, the six participants were interviewed by the NYU researchers by telephone to collect feedback on the use of the application. However, only one senior used the application after the installation.

## Section 5 Fine-Tuned Urban Connector Application for the City of El Paso

This section reports the enhancements made to the UC beta version to develop the UC Release Candidate 1.0 targeting the senior population in the City of El Paso.

### 5.1 UC Release Candidate 1.0 Features

The development of the UC Release Candidate 1.0 included (i) improvement of the functionality based on the feedback gathered during the beta test in the city of El Paso and (ii) redesigning the UC beta version using Flutter (Flutter, 2020) to make it compatible with Android and iOS devices. The UC Release Candidate 1.0 was made available for iOS devices through the pre-release platform TestFlight (Apple, 2020) for the designed field test with the support of UTEP's Technology Support department. The research team observed compatibility and technical issues in some devices where the UC Release Candidate 1.0 was installed, which should be addressed in future versions.

The UC Release Candidate 1.0 allows users to input and retrieve information for the Senior Centers in the City of El Paso (an initial list of the Senior Centers is preloaded into the UC Release Candidate 1.0), most frequently visited places such as religious centers, restaurants, health providers, and workplaces. The UC Release Candidate 1.0 continues to provide the functionality to share addresses with third-party navigation applications installed in the same device. An added functionality in this version is the ability to store information about local events.

## Section 6 Design of Field Test for the UC Release Candidate 1.0 in the City of El Paso

This section describes a field test for the UC Release Candidate 1.0 designed for the City of El Paso.

### 6.1 Field Test Overview

The field test designed for the UC Release Candidate 1.0 has two stages:

- The recruitment of 30-40 participants (seniors) in the City of El Paso to field test the UC Release Candidate 1.0 in their mobile devices for two weeks; and
- A survey (Survey 4) to collect anonymous usage data from participants during and at the end of the field test.

### 6.2 Survey Instruments

Two survey instruments have been created to collect data from the field test participants on the use of the UC Release Candidate 1.0. The first survey instrument is a Trip Log that has been integrated into the UC Release Candidate 1.0. The second survey instrument is an Exit Survey in the form of a questionnaire. Both survey instruments have been created in English and Spanish (see Appendix B) considering feedback from representatives from the City of El Paso's Parks & Recreation Department.

#### 6.2.1 Trip Log

The Trip Log embedded in the application has been designed to collect trip-specific data. The Trip Log questions were adapted from previous surveys designed for the Urban Connector development (Cheu et al., 2020) and from the National Household Travel Survey (FHWA, 2019) to compare results with previous and national studies. At a pre-determined time on each day within the two-week field test period, after a participant has used the UC Release Candidate 1.0 for a trip earlier during the day, a window will pop up on the smartphone screen to invite the participant to answer the following eight suggested questions:

1. Where did this trip begin?
2. Where did you go?
3. What transportation mode did you use?
4. How far (the distance) was this trip?
5. How long (the travel time) was this trip?
6. Did you use the suggested route provided by the navigation tool available on your phone?
7. I chose this route because...
8. I did not choose the suggested route because...

If a participant has used the UC Release Candidate 1.0 for multiple trips in a day, the participant can select one trip he or she wants to provide the requested information.

### 6.2.2 Exit Survey

The Exit Survey consists of 15 suggested questions. The first seven questions are related to the participant's mobility characteristics followed by one question about the type of smartphone used. This question was also included in the pre-beta test survey in New York. The last six questions request participants' basic demographic information (e.g., age range, ethnicity, gender) and zip code information to avoid including questions on personal/household income. Lastly, the participant has an opportunity to provide feedback about his/her experience when using the UC Release Candidate 1.0.

Questions about mobility characteristics, type of smartphone, and demographics are adapted from previous surveys designed for the Urban Connector development (Cheu et al., 2019; Cheu et al., 2020) and from the National Household Travel Survey (FHWA, 2019).

## 6.3 Field Test Considerations

The field test and survey methodology include:

1. Recruitment of participants;
2. Installation of the UC Release Candidate 1.0 in participants' devices;
3. Collection of trip information (at the rate of one trip per day, for two weeks) through the Trip Log;
4. Transfer of the UC Release Candidate 1.0 anonymous usage data from the participants' devices to a UTEP researcher's device; and
5. Completion of an exit survey questionnaire.

### 6.3.1 Recruitment Plan

The UTEP researchers will aim to recruit 30-40 seniors in the City of El Paso. The researchers will leverage the experience and lessons learned from the UC beta test previously performed in El Paso (Section 2.3, Survey 3), including the use of visual displays, having bilingual researchers (English and Spanish speakers) in the team, demonstrating the tasks to be performed (e.g., filling out the Trip Log), answering questions of the purpose of the field test, and providing a participation incentive. It is recommended to have a list of mobile devices that are compatible with the UC Release Candidate 1.0 ready to provide to potential participants. To keep the survey anonymous, the researchers should not collect names, addresses, or any personal contact information from the participant.

### 6.3.2 Data Collection

The data collection will be done through the Trip Log (subsection 6.2.1) daily for two weeks. After the 14-day field test period, the participant and the research team will meet again. This second meeting should be held at a public venue, preferably the same venue where the participant was recruited. During this meeting, the researcher will download the Trip Log data from the participant's smartphone and conduct the exit survey. No personal or location data will be downloaded from the participant's device (to keep the data anonymous). The transfer of data should be via a direct physical connection to provide better security of the data transmission.

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## Appendix A - Survey Instrument for the City of New York

### Urban Connector Pilot survey

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#### A. General information and Smartphone use

- |   |   |
|---|---|
| <p>1. What is your age?<br/><input type="checkbox"/> Less than 55<br/><input type="checkbox"/> 55 to 59<br/><input type="checkbox"/> 60 to 64<br/><input type="checkbox"/> 65 to 74<br/><input type="checkbox"/> 75 or older<br/><input type="checkbox"/> Prefer not to say</p> <p>2. What is your gender?<br/><input type="checkbox"/> Male<br/><input type="checkbox"/> Female</p> <p>3. Are you a regular smartphone or tablet user?<br/><input type="checkbox"/> Yes<br/><input type="checkbox"/> No</p> <p>4. What type of smartphone or tablet do you use?<br/><input type="checkbox"/> Android<br/><input type="checkbox"/> iOS</p> <p>5. If you have a smartphone or tablet, do you usually need assistance to use it?<br/><input type="checkbox"/> Yes<br/><input type="checkbox"/> No</p> | <p>6. What do you use your smartphone or tablet for? (Select all that apply)<br/><input type="checkbox"/> Making calls<br/><input type="checkbox"/> Texting<br/><input type="checkbox"/> Taking pictures<br/><input type="checkbox"/> Music or Video streaming<br/><input type="checkbox"/> Social media / Email<br/><input type="checkbox"/> Videogames<br/><input type="checkbox"/> Navigation<br/><input type="checkbox"/> Internet browsing<br/><input type="checkbox"/> Other: _____</p> <p>7. Which navigation apps do you use, if any? (Select all that apply)<br/><input type="checkbox"/> Google/Apple Maps<br/><input type="checkbox"/> Waze<br/><input type="checkbox"/> Uber/Lyft<br/><input type="checkbox"/> My MTA<br/><input type="checkbox"/> Other: _____</p> <p>8. Did you get assistance in demonstrating the Urban Connector application?<br/><input type="checkbox"/> Yes<br/><input type="checkbox"/> No</p> |
|---|---|

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THANK YOU!



## Appendix B - Survey Instruments for the City of El Paso

### C2SMART In-App Trip Log Questions

The following questions will be asked once a day for a randomly selected trip in the day:

1. Where did this trip begin? Please select 1 answer.
  - Home
  - Workplace
  - Volunteering place
  - Residence of family member, relative or friend
  - Grocery store, market or retail shop
  - Healthcare facility or pharmacy
  - Senior center, library, park, or gym
  - Religious center
  - Restaurant, coffee shop, diner
  - Bank, ATM
  - Others
  - Prefer not to answer
  
2. Where did you go? Please select 1 answer.
  - Home
  - Workplace
  - Volunteering place
  - Residence of family member, relative or friend
  - Grocery store, market or retail shop
  - Healthcare facility or pharmacy
  - Senior center, library, park, or gym
  - Religious center
  - Restaurant, coffee shop, diner
  - Bank, ATM
  - Others
  - Prefer not to answer
  
3. What transportation mode did you use? Please select 1 answer.
  - Drive my own car
  - Get a ride from family, relative, friend
  - Paid taxi, Uber or Lyft
  - Public bus (Sun Metro, BRIO)
  - On-demand service for people with special needs (LIFT)
  - Bicycle
  - Scooter
  - Walking
  - Others
  - Prefer not to answer

4. How far (the distance) was this trip? Please select 1 answer.
- Up to 1 mile
  - Up to 2 miles
  - Up to 5 miles
  - Up to 10 miles
  - Up to 20 miles
  - More than 20 miles
5. How long (the travel time) was this trip? Please select 1 answer.
- Up to 15 minutes
  - Up to 30 minutes
  - Up to 45 minutes
  - Up to 1 hour
  - More than 1 hour
6. Did you use the suggested route provided by the navigation tool available on your phone? Please select 1 answer
- Yes (Please go to question 7 and answer question 8 as N/A)
  - No (Please go to question 8 and answer question 7 as N/A)
7. I chose this route because ... Please select 1 answer
- It is a safe route
  - It is my familiar route
  - It has well-maintained streets
  - It has no construction work
  - It has no traffic congestion
  - It is the fastest route
  - It is the shortest route (by distance)
  - It is the cheapest route
  - I can arrive on time
  - Other
  - N/A

End of survey

8. I did not choose the suggested route because ... Please select 1 answer
- It is an unsafe route
  - It is an unfamiliar route
  - It has poorly maintained streets
  - It has construction work
  - It has traffic congestion
  - It is not the fastest route
  - It is not the shortest route (by distance)
  - It is not the cheapest route
  - I may not arrive on time
  - Other

N/A

End of survey

## C2SMART Registro de Viaje

Las siguientes preguntas se harán una vez al día para un viaje seleccionado al azar en el día:

1. ¿Dónde comenzó este viaje? Por favor seleccione 1 respuesta.
  - Hogar
  - Lugar de trabajo
  - Lugar donde realiza voluntariado
  - Residencia de familiares o amigos
  - Tienda de comestibles, mercado, o de comercio menor
  - Centro de salud o farmacia
  - Centro para adultos mayores, biblioteca, parque, o gimnasio
  - Centros religiosos
  - Restaurantes o cafeterías
  - Bancos, cajeros automáticos u oficinas
  - Otro
  - Prefiero no responder
  
2. ¿A dónde fue? Por favor seleccione 1 respuesta.
  - Hogar
  - Lugar de trabajo
  - Lugar donde realiza voluntariado
  - Residencia de familiares o amigos
  - Tienda de comestibles, mercado, o de comercio menor
  - Centro de salud o farmacia
  - Centro para adultos mayores, biblioteca, parque, o gimnasio
  - Centros religiosos
  - Restaurantes o cafeterías
  - Bancos, cajeros automáticos, u oficinas
  - Otro
  - Prefiero no responder
  
3. ¿Qué medios de transporte usó? Por favor seleccione 1 respuesta.
  - Mi propio vehículo
  - Familiar, pariente, o amigo me llevó
  - Taxi, Uber o Lyft
  - Transporte público (Sun Metro, BRIO)
  - Servicio especial (LIFT)
  - Bicicleta
  - Scooter
  - Caminando
  - Otro
  - Prefiero no responder

4. ¿Qué tan lejos fue este viaje? Por favor seleccione 1 respuesta.
- Hasta 1 milla
  - Hasta 2 millas
  - Hasta 5 millas
  - Hasta 10 millas
  - Hasta 20 millas
  - Más de 20 millas
5. ¿Cuánto duró este viaje? Por favor seleccione 1 respuesta.
- Hasta 15 minutos
  - Hasta 30 minutos
  - Hasta 45 minutos
  - Hasta 1 hora
  - Más de 1 hora
6. ¿Usó la ruta sugerida por la aplicación de navegación de su teléfono? Por favor seleccione 1 respuesta.
- Sí (Por favor vaya a la pregunta 7 y conteste la pregunta 8 como N/A)
  - No (Por favor vaya a la pregunta 8 y conteste la pregunta 7 como N/A)
7. Elegí esta ruta porque ... Por favor seleccione 1 respuesta.
- Es una ruta segura
  - Es mi ruta usual
  - Tiene calles bien mantenidas
  - No está en construcción
  - No tiene congestión vehicular
  - Es la ruta más rápida
  - Es la ruta más corta (por distancia)
  - Es la ruta más barata.
  - Puedo llegar a tiempo
  - Otro
  - N/A

Fin de la encuesta

8. No elegí la ruta sugerida porque... Por favor seleccione 1 respuesta.
- No es una ruta segura
  - No es mi ruta usual
  - Tiene calles mal mantenidas
  - Está en construcción
  - Tiene congestión vehicular
  - No es la ruta más rápida
  - No es la ruta más corta (por distancia)
  - No es la ruta más barata.
  - Puedo no llegar a tiempo
  - Otro

N/A

Fin de la encuesta

### Exit Questionnaire Survey Questions

1. In a week, how many times do you go to the following places? Please select 1 answer per row.

	Never	Less than once/ week	1 to 3 times/ week	4 to 6 times/ week	7 times or more /week
Workplace					
Volunteering place					
Family member, relative or friend residence					
Grocery store, market or retail shop					
Healthcare facility or pharmacy					
Senior center, library, park, or gym					
Religious center					
Restaurant, coffee shop, diner					
Bank, ATM					
Other:					

2. In a week, how often do you use the following modes of transportation? Please select 1 answer per row.

Modes of Transportation	Never	Less than once/ week	1 to 3 times/ week	4 to 6 times/ week	7 times or more /week
Drive my own car					
Get a ride from family, relative, friend					
Paid taxi, Uber or Lyft					
Public bus (Sun Metro, BRIO)					
On-demand service for people with special needs (LIFT)					
Bicycle					
Scooter					
Walking					
Other:					

3. How far do you usually travel to the following places. Please select 1 answer per row.

	Never	Up to 1 mile	Up to 2 miles	Up to 5 miles	Up to 10 miles	Up to 20 miles	More than 20 miles
Workplace							
Volunteering place							
Family member, relative or friend residence							
Grocery store, market or retail shop							
Healthcare facility or pharmacy							
Senior center, library, park, or gym							
Religious center							
Restaurant, coffee shop, diner							
Bank, ATM							
Other:							

4. How long does it take for you to travel to the following places? Please select 1 answer per row.

Home to Destination	Never	Up to 15 minutes	Up to 30 minutes	Up to 45 minutes	Up to 1 hour	More than 1 hour
Workplace						
Volunteering place						
Family member, relative or friend residence						
Grocery store, market or retail shop						
Healthcare facility or pharmacy						
Senior center, library, park, or gym						
Religious center						
Restaurant, coffee shop, diner						
Bank, ATM						
Other:						



5. My typical trips from home to the following places begin at... Please select 1 answer per row.

	Before 7:00 am	7:00 to 8:59 am	9:00 to 11:59 am	12:00 to 1:59 pm	2:00 to 3:59 pm	4:00 to 6:59 pm	7:00 pm or later
Workplace							
Volunteering place							
Family member, relative or friend residence							
Grocery store, market or retail shop							
Healthcare facility or pharmacy							
Senior center, library, park, or gym							
Religious center							
Restaurant, coffee shop, diner							
Bank, ATM							
Other:							

6. When selecting a route, I usually choose... (Please select all that apply)

- Safe route
- Familiar route
- Well maintained streets
- Routes without construction work
- Routes without traffic congestion
- Fastest route
- Shortest route (by distance)
- Cheapest route
- Route that gives on-time arrival
- Other (please specify):

7. When selecting a route, I usually avoid... (Please select all that apply).

- Unsafe route
- Unfamiliar route
- Poorly maintained streets
- Construction work
- Traffic congestion
- Not the fastest route
- Not the shortest route (by distance)
- Not the cheapest route
- Route that has unreliable arrival time
- Other (please specify):

8. What type of smartphone do you currently use?

- Android (Samsung, LG, Motorola, Google, Nokia)
- Apple iPhone

9. What is your race/ethnicity?
- White
  - Black/ African American
  - Hispanic/ Latino
  - Asian/ Pacific Islander
  - American Indian or Alaska Native
  - Native Hawaiian or Pacific Islander
  - Other (Please Specify)
10. What is your gender?
- Masculine
  - Feminine
  - Other (Please Specify)
11. What is your age range?
- Less than 55
  - 55-59
  - 60-64
  - 65-69
  - 70-74
  - 75 and over
12. What is your current marital status?
- Single
  - Married
  - Widowed
  - Divorced
  - Living in a committed partnership
  - Other (Please Specify)
13. How would you describe your type of residency?
- House
  - Apartment
  - Senior citizen home
  - Other
14. What is the zip code of your primary residence?
15. How would you describe your experience using the Urban Connector application?

## Cuestionario Encuesta

1. ¿Cuántas veces a la semana visita los siguientes lugares? (Seleccione una respuesta por línea)

	Nunca	Menos de una vez/semana	1 a 3 veces/semana	3 a 6 veces/semana	7 veces o más /semana
Lugar de trabajo					
Lugar donde realiza voluntariado					
Residente de familiares o amigos					
Tienda de comestibles, mercado, o de comercio menor					
Centro de salud o farmacia					
Centro para adultos mayores, biblioteca, parque, o gimnasio					
Centros religiosos					
Restaurantes o cafeterías					
Bancos o Cajeros automáticos					
Otro:					

2. ¿Cuántas veces usa cada uno de los siguientes medios de transporte en una semana? (Seleccione una respuesta por línea)

Modos de transportacion	Nunca	Menos de una vez/semana	1 a 3 veces/semana	3 a 6 veces/semana	7 veces o más /semana
Conduzco mi propio auto					
Familiar, pariente, o amigo me llevo					
Taxi pagado, Uber o Lyft					
Autobús público (Sun Metro, BRIO)					
Servicio para personas con necesidades especiales (LIFT)					
Bicicleta					
Motocicleta					
Caminando					
Otro:					

3. ¿Que lejos viaja a los siguientes lugares? (Seleccione una respuesta por línea)

	Nunca	Hasta 1 milla	Hasta 2 millas	Hasta 5 millas	Hasta 10 millas	Hasta 20 millas	Mas de 20 millas
Lugar de trabajo							
Lugar donde realiza voluntariado							
Residente de familiares o amigos							
Tienda de comestibles, mercado, o de comercio menor							
Centro de salud o farmacia							
Centro para adultos mayores, biblioteca, parque, o gimnasio							
Centros religiosos							
Restaurantes o cafeterías							
Bancos o Cajeros automáticos							
Otro:							

4. ¿Cuanto tiempo es su viaje a los siguientes lugares? (Seleccione una respuesta por línea)

De casa a su destinación	Nunca	Hasta 15 minutos	Hasta 30 minutos	Hasta 45 minutos	Hasta 1 hora	Mas de 1 hora
Lugar de trabajo						
Lugar donde realiza voluntariado						
Residente de familiares o amigos						
Tienda de comestibles, mercado, o de comercio menor						
Centro de salud o farmacia						
Centro para adultos mayores, biblioteca, parque, o gimnasio						
Centros religiosos						
Restaurantes o cafeterías						
Bancos o Cajeros automáticos						
Otro:						

5. Mis viajes a los siguientes lugares desde casa comienzan a las... (Seleccione una respuesta por línea)

	Antes de 7:00 am	7:00 a 8:59 am	9:00 a 11:59 am	12:00 a 1:59 pm	2:00 a 3:59 pm	4:00 a 6:59 pm	7:00 pm o mas tarde
Lugar de trabajo							
Lugar donde realiza voluntariado							
Residente de familiares o amigos							
Tienda de comestibles, mercado, o de comercio menor							
Centro de salud o farmacia							
Centro para adultos mayores, biblioteca, parque, o gimnasio							
Centros religiosos							
Restaurantes o cafeterías							
Bancos o Cajeros automáticos							
Otro:							

6. Al seleccionar una ruta, generalmente elijo... (Puede seleccionar más de una respuesta)

- Ruta segura
- Ruta familiar
- Calles bien mantenidas
- Rutas sin areas de construccion
- Rutas sin congestión de tráfico
- Ruta mas rapida
- Ruta más corta (por distancia)
- Ruta mas barata
- Puedo llegar a tiempo
- Otro

7. Al seleccionar una ruta, generalmente evito... (Puede seleccionar más de una respuesta)

- Ruta insegura
- Ruta desconocida
- Calles mal mantenidas
- Areas de construcción
- Congestión de tráfico
- Ruta que no es más rápida
- Ruta que no es más corta (por distancia)
- Ruta que no es más barata
- Ruta que no puedo llegar a tiempo
- Otro

8. ¿Cual tipo de of celular usa?

- Android (Samsung, LG, Motorola, Google, Nokia)
- Apple iPhone

9. ¿Cuál es su etnia/raza?
- Caucásico
  - Afroamericano
  - Hispano o Latino
  - Asiático / Islas del Pacífico
  - Nativo americano/ Nativo de Alaska
  - Nativo de Hawái o de las islas del Pacífico
  - Otro
10. ¿Cuál es su género?
- Femenino
  - Masculino
  - Otro:
11. ¿Cuál es su rango de edad?
- Menos de 55
  - 55 a 59
  - 60 a 64
  - 65 a 69
  - 70 a 74
  - 75 o mayor
12. ¿Cuál es su estado civil actual?
- Soltero, (Nunca Casado)
  - Casado
  - Viudo
  - Separado/Divorciado
  - Viviendo en una relacion comprometida
  - Otro
13. ¿Cuál es el tipo de su residencia?
- Casa
  - Apartamento
  - Residencia para adultos mayores
  - Otro
14. ¿Cuál es el código postal de su residencia principal?
15. ¿Cuál fue su experiencia usando la aplicación del Urban Connector?