

# **Effectiveness of Disseminating Traveler Information on Travel Time Reliability Implement Plan and Survey Results Report**

**December 2016**



U.S. Department of Transportation  
**Federal Highway Administration**

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16. Abstract <p>Travel time variability is that characteristic of the transportation system that means a traveler's trip will vary from what is normally expected and will potentially take longer than planned. By helping travelers make travel choices that take into account travel time variability, agencies have the potential to improve roadway congestion.</p> <p>Travel Time Reliability (TTR) information includes static data about traffic speeds or trip times that capture historic variations from day to day and enable individuals to understand the level of variability in traffic. A key component to addressing the reliability issue related to urban mobility is conveying this TTR information to system users so that they can make informed decisions about their travel. The challenge for transportation professionals lies in selecting the best means of conveying that information so that it is usable and effective to the traveler and other stakeholders.</p> <p>The Strategic Highway Research Program 2 (SHRP2) Reliability Project L14 established a preliminary set of suggested terminology and guidelines for conveying TTR information to road users so that they may make optimal travel choices from their point of view, such as whether to take a trip or not, departure time, mode choice, and/or route choice. Specifically, a Lexicon of phrases was developed for each of eight TTR terms, which contained detailed guidelines for TTR information that would most likely be understood and used by travelers. To help agencies and other transportation-related entities better deploy and use the recommended Lexicon terminology, a field study was conducted to test the phrases to demonstrate the technical and institutional feasibility of their use and determine the potential costs and benefits of using these products of L14.</p> <p>Overall, the field study found that the particular Lexicon phrases tested performed equally well. Only one survey question resulted in statistically significant differences between the Lexicon phrases. The biggest finding of the field study was that dissemination of TTR information via the 511 information channel was less preferred than via the Web or App access channels. In a few instances, the App access demonstrated superior responses over both the Web and 511 access.</p>					
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## LIST OF ABBREVIATIONS

API	Application Programming Interface
ATIS	Advanced Traveler Information Systems
AWAM	Anonymous Wireless Address Matching
DCHC MPO	Durham-Chapel Hill-Carrboro Metropolitan Planning Organization
DF	Degrees of Freedom
FHWA	Federal Highway Administration
FAQs	Frequently Asked Questions
GPS	Global Positioning System
GTM	Government Task Manager
IVR	Interactive Voice Response
ODOT	Ohio Department of Transportation
OSU	Ohio State University
RTP	Research Triangle Park
SHRP2	Strategic Highway Research Program 2
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TxDOT	Texas Department of Transportation
TMC	Traffic Message Channel
TTR	Travel Time Reliability
TTRI	Travel Time Reliability Index
VoIP	Voice Over IP



## EXECUTIVE SUMMARY

Travel time variability is that characteristic of the transportation system that means a traveler's trip will vary from what is normally expected and will potentially take longer than planned. This transportation system characteristic is important for travelers and shippers. It also is a component of the congestion problem for which transportation agencies can make significant and measurable gains, even as travel demand grows. By providing the means to help travelers make travel choices that take into account travel time variability, agencies have the potential to reduce roadway congestion. This reduced congestion has the added benefit of reducing primary and secondary crashes, vehicle emissions, and fuel use, as well as yielding other benefits.

One measure of travel time variability is Travel Time Reliability (TTR). Transportation professionals describe TTR in terms of historical average travel times calculated over periods of a year or longer. TTR information includes static data about traffic speeds or trip times that capture historic variations from day to day and enable individuals to understand the level of variability in traffic. TTR information is considerably different from real-time travel time information and may have different uses. A traveler can use reliability information to plan and budget in advance for a trip rather than simply react to current conditions. A key component to addressing the reliability issue related to urban mobility is conveying this TTR information to system users so that they can make informed decisions about their travel. The challenge for transportation professionals lies in selecting the best means of conveying that information so that it is usable and effective to the traveler and other stakeholders.

The Strategic Highway Research Program 2 (SHRP2) Reliability Project L14 established a preliminary set of suggested terminology and guidelines for conveying TTR information to road users so that they may make optimal travel choices from their point of view, such as whether to take a trip or not, departure time, mode choice, and/or route choice. Specifically, a Lexicon of phrases was developed for each of eight TTR terms, which contained detailed guidelines for TTR information that would most likely be understood and used by travelers. To help agencies and other transportation-related entities better deploy and use the recommended Lexicon terminology, a field study was conducted to test the phrases to demonstrate the technical and institutional feasibility of their use and determine the potential costs and benefits of using these products of L14. Two Lexicon assemblies and three dissemination platforms were tested in the field study.

The field study was conducted in three locations: Houston, Texas; Columbus, Ohio; and Raleigh-Durham, North Carolina. Using a custom Smartphone application, study participants collected Global Positioning System (GPS) and travel characteristic data for all trips made over a four-week period along specific travel corridors in each study location. The travel period was divided into two equal phases. Only travel data was collected during the first phase, while in the second phase, TTR information also was provided to participants according to their randomly assigned Lexicon assembly and dissemination platform (i.e., App, 511, website). Baseline and exit surveys were administered, as well, to obtain participants' typical travel patterns and perceptions of the provided TTR information. Four rounds of data collection occurred between April 2015 and April 2016, with more than 750 participants completing all phases of data collection.

Local partners from each study location provided historical traffic datasets as a source for determining the TTR calculations utilized in the study. Based on the availability of data in each region, datasets were provided from different sources, timeframes, and formats. In order to present the data in a consistent format, the data from each region had to be manipulated into a common data format. The final result of the data manipulation was a comma-delimited file for each region for each day of the week containing location identification information, aggregation start time, average travel time, and 95<sup>th</sup> percentile travel time.

Overall, the field study found that the particular Lexicon phrases tested performed equally well. Only one survey question resulted in statistically significant differences between the Lexicon phrases. The biggest finding of the field study was that dissemination of TTR information via the 511 information channel was less preferred than via the Web or App access channels. In a few instances, the App access demonstrated superior responses over both the Web and 511 access.

Statistical models accounted for several exogenous factors, and this clearly seems important to properly interpreting the results of interest for the Lexicon assemblies and information channels. The city of the participants only rarely appeared as a significant factor in the models, suggesting that location was not an important differentiator in the outcomes. Among other exogenous variables, education level and the number of Phase 2 trips taken with the TTR information were found to significantly correlate with responses for multiple questions.

Following the first round of data collection, the project team and the Federal Highway Administration (FHWA) held a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis meeting with the partner agencies to try to identify lessons learned by the project team and the partner agencies through the testing of the Lexicon in the field deployment. The intent was to use the lessons learned and the project research results to refine the Lexicon for voluntary deployment in other cities. Although the final study results were not available at the time, the workshop participants agreed that the information provided at the conclusion of the study could be used for a variety of purposes by operating agencies. For example, TTR information could be used by operating agencies to help mitigate the impact of traffic congestion or the effects due to construction activities to the extent that reliability information and information pertinent to construction events is readily accessible. The availability of the information to travelers could help them compare real-time conditions with reliability (historic) conditions and possibly change travel behavior to avoid congestion. Additionally, the information could be used by agencies to share reliability information to key decision-makers and planners.

## CHAPTER 1. OVERVIEW

The report *A Lexicon for Conveying Travel Time Reliability Information*, developed as part of the Strategic Highway Research Program 2 (SHRP2) Reliability Project L14 – *Effectiveness of Different Approaches to Disseminating Traveler Information on Travel Time Reliability* – established a preliminary set of suggested terminology and guidelines for conveying Travel Time Reliability (TTR) information to road users so that they may make optimal travel choices from their point of view, such as whether to take a trip or not, departure time, mode choice, and route choice.<sup>(1,2)</sup> Specifically, a Lexicon of phrases was developed for each of eight TTR terms. Each Lexicon contained detailed guidelines for TTR information that would most likely be understood and used by the travelers. The Lexicon terminology and guidelines developed in L14 were laboratory studies, and none of these terms were tested in a field environment. Only in a field test can the true impacts and benefits of the use of travel time reliability information on behavior and resulting trip performance be determined. To help state agencies and the private sector better deploy and use the recommended Lexicon terminology, a field study was conducted to test the phrases to demonstrate the technical and institutional feasibility of their use and determine the costs and benefits of using these products of L14. The overall study objectives were to:

- Convey TTR information from theory to reality.
- Better understand travelers' perceived value of TTR information.
- Better understand the current and future dimensions of the TTR information marketplace.
- Better understand what network travel and TTR information travelers require.
- Develop and implement a plan to test and evaluate the preliminary design guidelines and Lexicon phrases for disseminating TTR information.
- Develop guidelines based on the outcome of the test and evaluation.
- Lay out the barriers to communicating TTR information to travelers and steps to overcome barriers.
- Outline how different travelers will use TTR information differently (e.g., one-time visitor vs. regular commuter).

---

<sup>1</sup> Kuhn, B., L. Higgins, A. Nelson, M. Finley, G. Ullman, S. Chrysler, K. Wunderlich, V. Shah, C. Dudek. *A Lexicon for Conveying Travel Time Reliability Information*. SHRP2 Reliability Project L14. SHRP 2 Report S2-L14-RW-2, National Academy of Sciences, 2014.

<sup>2</sup> Kuhn, B., L. Higgins, A. Nelson, M. Finley, G. Ullman, S. Chrysler, K. Wunderlich, V. Shah, C. Dudek. *Effectiveness of Different Approaches to Disseminating Traveler Information on Travel Time Reliability*. SHRP2 Reliability Project L14. SHRP 2 Report S2-L14-RW-1. National Academy of Sciences, 2014.

- Recommend and develop outreach activities in order to encourage use and adoption of the recommended Lexicon phrases and guidelines.
- Outline clear steps that agencies need to take to start getting the TTR information into travelers' decision processes.

The field study was conducted in three different metropolitan areas: one each in Texas, Ohio, and North Carolina. At each of the three study locations, two separate assemblies of Lexicon terms for travel time reliability information were delivered using three distinct methods: study website, mobile smartphone application, and traditional keypad response 511 system.

The study approach allowed the research team to compare the results of travelers' survey responses regarding a particular trip with their actual recorded position data during that trip. The trip data, combined with participants' survey responses from the beginning and end of the study, were used to assess the effectiveness and utility of TTR data to travelers in these three different areas of the United States.



## CHAPTER 2. SITE SELECTION

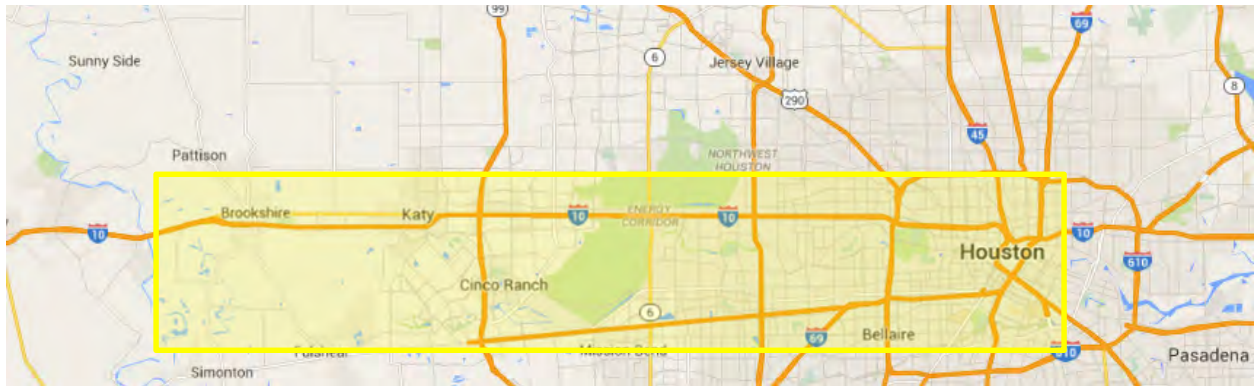
The following sections describe the sites selected for the study. Overall, the three sites were chosen based on a variety of criteria – the corridors had challenges with congestion, reliability data for the facilities were available, and the project team had personal knowledge about the locations and close working relationships with local stakeholders that would facilitate deployment of the project.

### HOUSTON, TEXAS

The Houston District of the Texas Department of Transportation (TxDOT) plans, designs, builds, operates, and maintains the state transportation system in Brazoria, Fort Bend, Galveston, Harris, Montgomery, and Waller counties. The population of the Houston District is more than 5.7 million people, with the largest city in the district being Houston, the 4<sup>th</sup> largest city in the United States. The following are key aspects of the region, which played an integral part in the study:

- Houston TranStar<sup>®</sup>, the Houston traffic management center, is a national leader in freeway incident management and uses state-of-the-art technologies to reduce congestion on major roadways.
- Houston TranStar<sup>®</sup> uses Anonymous Wireless Address Matching (AWAM) for traffic monitoring, which uses anonymous addresses from Bluetooth<sup>™</sup> network devices to identify probes and calculate travel times and speeds on instrumented roadway segments.
- The Houston region has the ability to provide travel updates to drivers during daily commutes as well as in emergency evacuation situations.
- Houston TranStar<sup>®</sup> collects and archives historical speed data that could be utilized for this effort.

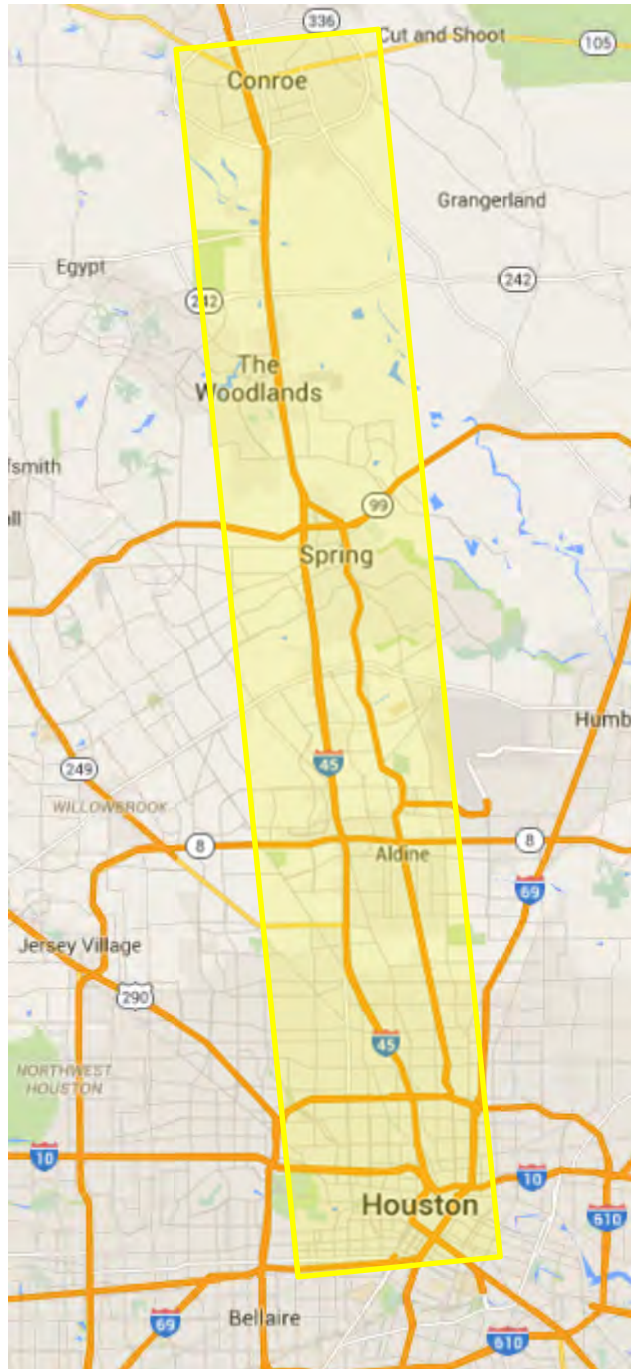
The study team, in conjunction with TxDOT staff, agreed to focus the study on commuters in the area bordered by I-10 (Katy Freeway) on the north, the Westpark Tollway on the south, the Brazos River on the west, and downtown Houston on the east. A map of this section of the city is provided in Figure 1. This section was selected because TxDOT had travel time reliability data that could be used for the study. The target roadways for the study were the Katy Freeway main lanes, the Katy Freeway Managed Lanes (a four-lane, bi-directional, barrier-separated, managed-lanes facility operating in the middle of the freeway with peak period, High-Occupancy Vehicle [HOV] discounts), and the Westpark Tollway. Travel time reliability information was available for all three of these facilities. The study was branded as the West Houston Transportation Study.



**Figure 1. Map. West Houston transportation study region.**

Source: Google Maps.

An extension of the study focused on commuters in the area bordered by I-45 (North Freeway) on the west and the Hardy Toll Road on the east from downtown Houston to Conroe. A map of this section of the city is provided in Figure 2. This section was selected because TxDOT had travel time reliability data that could be used for the study. The target roadways for the study were the North Freeway, the North Freeway HOV Lane, and the Hardy Toll Road. Travel time reliability information was available for all three of these facilities. The study was branded as the North Houston Transportation Study.



**Figure 2. Map. North Houston transportation study region.**

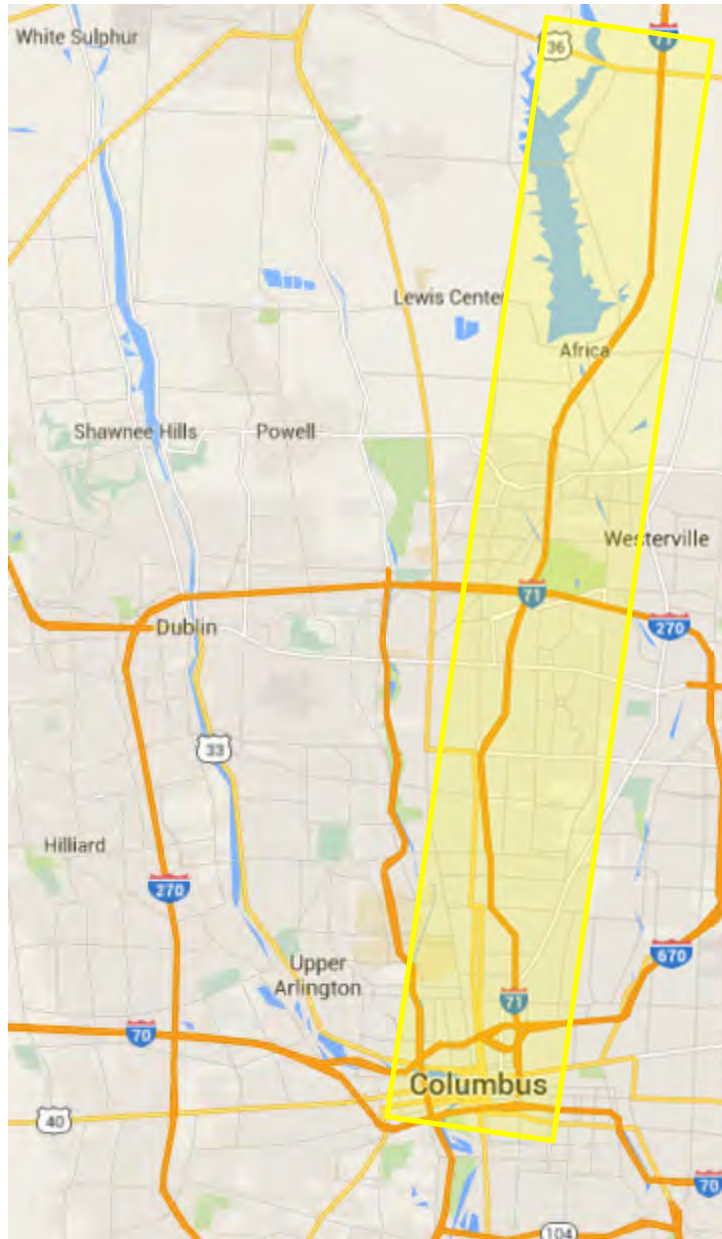
Source: Google Maps.

## **COLUMBUS, OHIO**

The Ohio Department of Transportation (ODOT) maintains and/or monitors 49,250 Interstate, U.S., and State Route lane miles on which 310 million vehicle miles are travelled each day. This equates to the nation's 4<sup>th</sup> largest Interstate network and 5<sup>th</sup> highest vehicle miles traveled. Because of this high volume, ODOT has been a strong advocate of travel time reliability information and has a robust program to collect and utilize these data. The following are key aspects of ODOT's TTR capabilities, which played an integral part in the study:

- As of 2015, ODOT has both historic and real-time data capabilities.
- Historic data primarily consist of vehicle/cell probe information as available from traffic data provider INRIX.
- Real-time data are captured along 2,400 centerline miles using Doppler radar from traffic data provider SpeedInfo.
- Information from both of these sources, along with the corresponding travel time reliability index (TTRI) calculated by ODOT, were used as part of this effort.

The study team, in conjunction with ODOT staff, agreed to focus the study on commuters in the area along the I-71 corridor from downtown Columbus north to US 36. This section was selected because ODOT has access to travel time reliability data that could be used for the study. A map of this section of the region is shown in Figure 3. The study was branded as the North Columbus Transportation Study.



**Figure 3. Map. North Columbus transportation study region.**

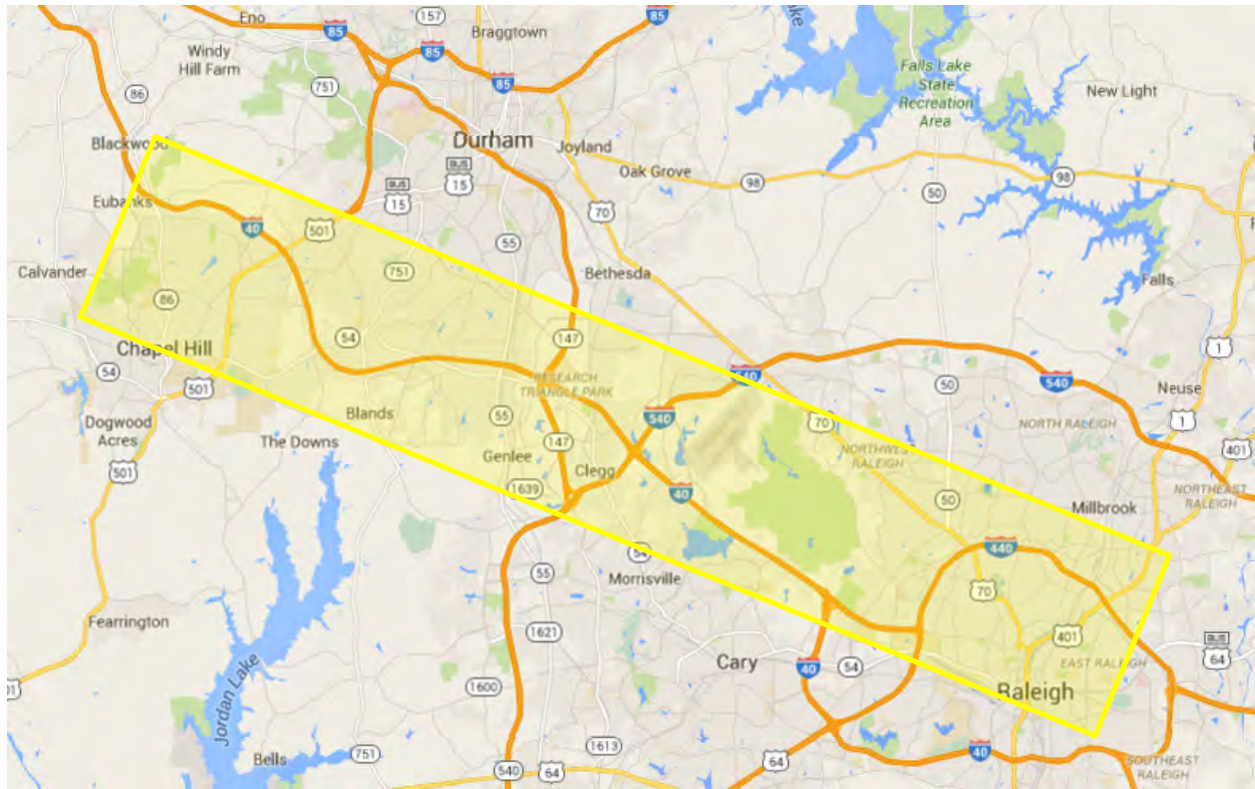
Source: Google Maps.

## **DURHAM – CHAPEL HILL – CARRBORO, NORTH CAROLINA**

The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) is comprised of an urban area that includes the City of Durham and several towns in Orange County, North Carolina. The Durham metropolitan area has a population of more than 500,000, and the combined Raleigh-Durham statistical area population exceeds two million. The region's growth is tied to the expanding health science, medicine, and university research sectors, which keep the region among the top ten fastest growing areas in the United States. The following are key aspects of the region, which played an integral part in the study:

- The DCHC MPO has collected transportation data on highway demand, vehicular travel time, bicyclists, pedestrians, and transit services since 2010 on a comprehensive basis, and also has data for particular parameters dating back to 2001.
- The DCHC MPO's most congested corridors are the interstates, U.S. highways, and major arterials that provide access to the region's major employment centers, including the Research Triangle Park, Downtown Durham, Duke University, and UNC-Chapel Hill. These areas were the target areas for conducting the study in North Carolina.

The study team, in conjunction with DCHC MPO staff, agreed to focus the study on commuters in the area along the I-40 corridor between Raleigh and Durham, which encompasses the Research Triangle Park. A map of this section of the region is shown in Figure 4. The study was branded as the Triangle Transportation Study.



**Figure 4. Map. Triangle transportation study region.**

Source: Google Maps.





### CHAPTER 3. LEXICON SELECTION

The Travel Time Reliability (TTR) terms and the alternate phrases for these terms that were tested in this study were initially generated in the Strategic Highway Research Program 2 (SHRP2) L14 research project and Lexicon document. The terms included in the SHRP2 Lexicon document were selected after analyzing results from a robust series of human factors experiments. The individual terms were selected because they performed well under all combinations of the scenarios and experiments. Furthermore, the information conveyed with each of the terms was discrete and independent of the other terms with respect to the intent of the information delivery and the desired outcome of the user.

The research in SHRP2 L14 found that it was difficult to determine if one phrase for a particular TTR term was significantly better than another and drastically outperformed another. However, that study did offer an opportunity to identify phrases that were bad, unclear, and/or needed to be avoided for numerous reasons. The differences in the performance of phrases in the original study were not major. If a term was identified as “best,” in almost all cases it was only slightly better than those in the “adequate” category. Thus, in many of the Lexicon tables, there are two, three, and even four options for the “adequate” category.

The alternate phrases tested in this project are provided in Table 1. The Lexicon alternate phrases were tested for the following TTR terms:

- 95<sup>th</sup> percentile.
- Arrival time.
- Average travel time.
- Buffer time.
- Departure time.
- Recommended departure time.
- Reliability.

The Lexicon phrases for “Recommended Route” were not tested because an alternate route was available in only one of the three test sites. The phrases were divided into two assemblies, denoted as Assembly A and Assembly B. The intent of dividing the phrases into two assemblies was to attempt to determine if one set of phrases performed better than the other with respect to user behavior and preference. Assembly A included the “best” alternate phrase for each travel time reliability term from the original SHRP2 report. In most instances, Assembly B included terms from the “adequate” list because only one phrase was in the “best” category. In the case of Alternate Travel Time, the second “best” phrase of Approximate Travel Time was tested. In the case of “Departure Time,” the alternate phrase of “What time will you start your trip?” was used

for Assembly B because the other “best” phrase of “Leave at” was so similar to the “best” phrase of “Departing at” that the study team did not think any difference in performance would be seen.

**Table 1. Assemblies of travel time reliability lexicon alternate phrases for testing.**

<b>Travel Time Reliability Phrase</b>	<b>Alternate Phrase</b>	
	<b>Assembly A</b>	<b>Assembly B</b>
<b>95<sup>th</sup> Percentile</b>	Majority of the time*	Most of the time**
<b>Arrival Time</b>	Arrive by*	What time do you want to get there?***
<b>Average Travel Time</b>	Estimated travel time*	Approximate travel time*
<b>Buffer Time</b>	Extra time*	Recommended cushion**
<b>Departure Time</b>	Departing at*	What time will you start your trip?***
<b>Recommended Departure Time</b>	Recommended departure time*	Suggested departure time**
<b>Reliability</b>	Predictable*	Reliable**

\*Alternate phrase originally identified as “best” in SHRP2 L14 Lexicon.

\*\*Alternate phrase originally identifies as “adequate” in SHRP2 L14 Lexicon.

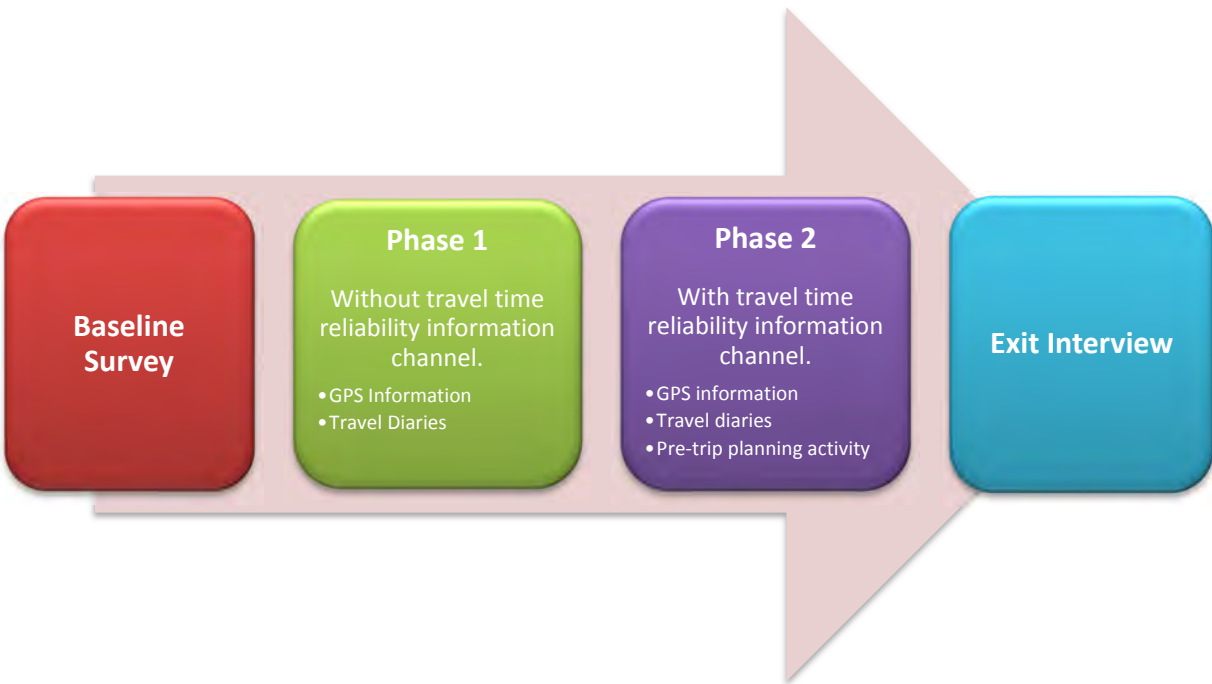
It is important to note that it was highly unlikely that a participant would see all of the individual Lexicon terms in an assembly together at one time, but rather would be far more likely to see only one or two terms at a time based on their individual preference. For example, different phrases were used if participants constrained their trip planning by departure time vs. arrival time. Finally, the differences between the terms used in the two assemblies in many cases were so minor (i.e., only one or two words added or replaced – “majority of the time” vs. “most of the time”), that any interdependency between the terms was expected to be negligible.

Overall, the study team did not expect to see drastic differences between the two assemblies, because they were two sets of terms that the SHRP2 L14 study found were reasonably well understood by a substantial portion of the population. The primary intent of the field study was to learn whether the TTR information itself had an effect on behavior in a real-life setting.

The application and use of these assemblies, their assignment to subject groups, and their evaluation is discussed later in this report.

## CHAPTER 4. PARTICIPANT TASKS

The various tasks participants completed throughout the duration of the study are illustrated in Figure 5. The following sections discuss in detail the various activities of the participants and their relationship to the overall goals and objectives of the study. The overall design of the study and additional details regarding the overall architecture and data flows are provided in Appendix A.



**Figure 5. Chart. Field study phases and data.**

### **BASELINE SURVEY**

To begin participation in the study, participants completed a web-based baseline survey that screened them to ensure they met the minimum criteria (i.e., regular travel on the study highway and smartphone ownership) and collected information to establish pre-study travel and information-use habits. The collected baseline information included:

- Usual commute routes, modes, and trip times, including the variability of those trip times.
- Alternate commute routes and modes.
- Frequency of non-commute travel to familiar and unfamiliar destinations in the region.

- Level of familiarity and comfort with travel time information, including travel time reliability (TTR) information in particular, as well as the channels they currently used to obtain traveler information (e.g., radio stations, websites, apps).
- Impacts of traveler information on travel behavior.
- Basic demographic information (e.g., gender, age, household size and income).

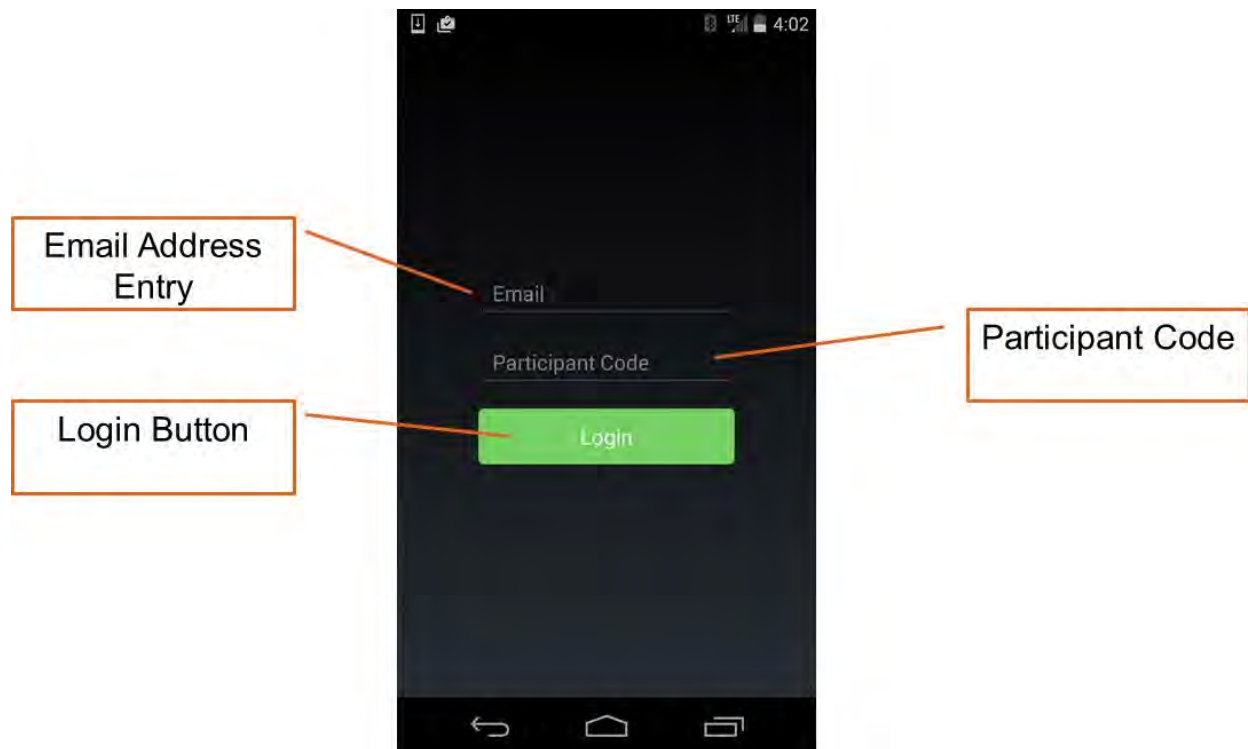
The baseline survey also collected contact email addresses to facilitate administration of the remaining tasks (email addresses and other personal identifying information were deleted at the conclusion of the study to protect privacy). The baseline surveys for West Houston, North Houston, North Columbus, and Triangle Transportation studies are provided in Appendix B, Appendix C, Appendix D, and Appendix E, respectively.

As part of the recruitment materials and baseline survey, participants were informed that the project would study the experiences of regular drivers and that input would help regional agencies prioritize improvements to the transportation system. Also, the baseline survey indicated that it would establish a baseline awareness of, comfort with, and use of traveler information resources and how they use them to influence travel choices. The participants were not specifically notified that the study was related to TTR information nor what that information is and how they might use it. As normal procedure with research experiments involving human subjects, providing specific information about the purpose of the study may bias responses or confound the overall results, thereby minimizing the usefulness of the study. Even though the concept of TTR and its potential usefulness is complex, providing participants with information related to TTR at the beginning of the study would have been counterproductive.

## **PHASE 1**

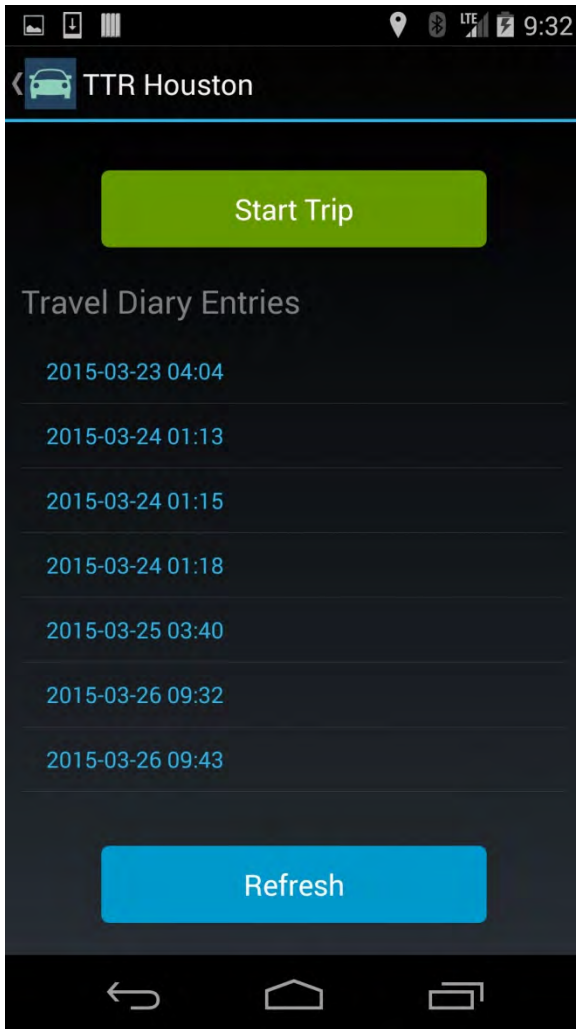
At the end of the baseline survey, qualifying participants were asked to install a mobile application on their smartphones to capture information about where and when they traveled during the study period (details about the smartphone application are provided in the next section). At this time, participants were also assigned to a Lexicon assembly (Assembly A or B, encompassing the groups of terms listed in Table 1) and to an information platform (website, App, or 511 telephone system, as the channel where participants would access TTR information). Participants were not informed about their assignments for Phase 1; the assignments were established in preparation for distribution and use in Phase 2 (discussed in the next section). More information about the assignment process is provided later in the report.

Once the participants downloaded the mobile application, they needed to log into the application, as illustrated in Figure 6, using their email address and participant code that was sent to them with the download instructions. This unique code was cross-linked with the participant information, including the study in which they participated (i.e., West Houston, North Houston, North Columbus, or Triangle). It also linked to their assigned Lexicon assembly and TTR information platform to be used in Phase 2, which is discussed in the next section.

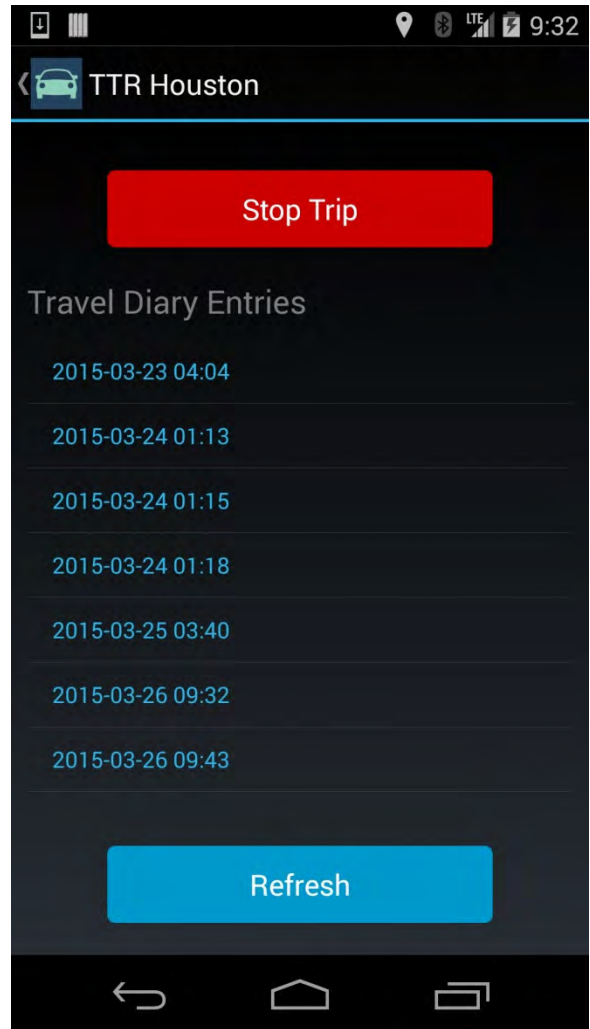


**Figure 6. Screen shot. Mobile application login screen.**

During the first phase of the field study, participants were asked to use the mobile application when traveling and to complete daily travel diary entries for each trip they took. It is important to note that participants were asked to open the application prior to making a trip, but NOT operate the application while driving. The travel diary captured information about their pre-trip travel decisions, including any information sources (website, television, or radio news reports) they used to plan a trip. Travel diary information was matched with information about the route(s) traveled by participants' vehicles as recorded by the smartphone application. A screen shot of the mobile application home screen used in Phase 1 is shown in Figure 7. The participants accessed the home screen each time they took a trip, pressing the "Start Trip" button at the beginning of the trip and the "Stop Trip" button (shown in Figure 8) at the end of the trip. This application collected GPS-related data while in use.



**Figure 7. Screen shot. Mobile application home screen, phase 1.**



**Figure 8. Screen shot. Mobile application in trip, phase 1.**

The travel diaries were designed to be completed as easily and efficiently as possible, using a form that participants accessed via the smartphone application. To maximize the likelihood that participants would consistently complete the travel diaries, participants received a daily notification in the application to remind them to complete their travel diary entries. During later rounds of data collection, participants also received regular emails to help them remember to track their trips and complete travel diaries. The transcript of the questions that were included in the Phase 1 travel diary is provided in Appendix F. The overall objective of the Phase 1 travel diary was to identify the following:

- Trip mode and purpose.
- Resources used to plan trip (e.g., websites, TV, radio).
- Impact of any information obtained through those resources on mode choice, departure time, and/or route decisions made before the trip began.

## **PHASE 2**

In the second phase of the field study, participants completing at least four trips during Phase 1 were provided access to one of three pre-assigned information channels: a dedicated website, a smartphone application module that was part of the study application, or a 511 phone number.<sup>3</sup> These three channels provided travel time reliability information for the users' selected routes prior to the beginning of their trip. As in Phase 1, participants were asked to use the smartphone application when making a trip and complete a modified version of the daily travel diary that captured information regarding their pre-trip travel decisions, their use of the study's information channel (and any other information sources used), and the influence of pre-trip travel time reliability information on their travel decisions. Travel diary information was again matched with information about the routes traveled by participants' vehicles as recorded by the smartphone application.

### **Trip Planning Website Description**

Working with the respective partner agencies, the study website delivery of the travel time reliability information was implemented to support this phase of the study. Secured access to the website ensured the general public was not able to access the site. The conceptual website design and page flow and the Lexicon terms presented on these pages for the study sites (West Houston, North Houston, North Columbus, and Triangle) are provided in Appendix G, H, I, and J, respectively. The website for the West Houston Transportation Study is provided in Figure 9 and Figure 10. The websites for the North Houston, North Columbus, and Triangle studies were similar to this one, yet varied according to the corridors selected for the studies in those regions. They are provided in Figure 11, Figure 12, Figure 13, Figure 14, Figure 15, and Figure 16. In each figure, the use of the phrases from Assembly A and Assembly B are displayed to illustrate fully what the participants saw depending on which location and Assembly they were assigned.

---

<sup>3</sup> For the first round of the West Houston study, participants who completed at least three trips in Phase 1 were also invited to Phase 2, due to the smaller number of participants who had completed four trips.

**Plan a Predictable Trip**

Facility: IH-10 Katy

Direction: Inbound

Where are you starting from? Pin Oak

Where are you going? IH-610 West Loop

Base Output On:  Departure Time  Arrival Time

Departing at: 7:00 AM on 3/30/2015

[Get Travel Time Info](#)

IH-10 Katy Eastbound from Pin Oak to IH-610 West Loop (21.70 miles)

**Selected Departure Time: 7:00 AM**

Your estimated travel time will be 50 minutes.

Plan 37 minutes of extra time if you are departing at 7:00 AM.

The majority of the time, your trip will take 1 hour and 27 minutes or less.

You will arrive by 8:27 AM at your destination.

**Figure 9. Screen shot. West Houston transportation study trip planning website (Assembly A).**

**Plan a Reliable Trip**

Facility: IH-10 Katy

Direction: Inbound

Where are you starting from? Pin Oak

Where are you going? IH-610 West Loop

Base Output On:  Departure Time  Arrival Time

What time will you start your trip? 7:00 AM on 3/30/2015

[Get Travel Time Info](#)

IH-10 Katy Eastbound from Pin Oak to IH-610 West Loop (21.70 miles)

**Selected Departure Time: 7:00 AM**

Your approximate travel time will be 50 minutes.

Use a recommended cushion of 37 minutes if you start your trip at 7:00 AM.

Most of the time, your trip will take 1 hour and 27 minutes or less.

You will get there by 8:27 AM.

**Figure 10. Screen shot. West Houston transportation study trip planning website (Assembly B).**



**NORTH HOUSTON**  
TRANSPORTATION STUDY

### Plan a Predictable Trip

Facility: IH-45 North

Direction: Inbound

Where are you starting from? FM-1488

Where are you going? Allen Parkway

Base Output On:  Departure Time  Arrival Time

Departing at: 7:00 AM on 3/29/2016

[Get Travel Time Info](#)

**IH-45 North Southbound from FM-1488 to Allen Parkway (33.30 miles)**

**Selected Departure Time: 7:00 AM**

Your estimated travel time on IH-45 North will be 56 minutes.

Plan 1 hour and 23 minutes of extra time if you are departing at 7:00 AM.

The majority of the time, your trip on IH-45 North will take 2 hours and 19 minutes or less.

You will arrive by 9:19 AM at your destination.

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**Figure 11. Screen shot. North Houston transportation study trip planning website (Assembly A).**

**NORTH HOUSTON**  
TRANSPORTATION STUDY

### Plan a Reliable Trip

Facility: IH-45 North

Direction: Outbound

Where are you starting from? Allen Parkway

Where are you going? FM-1488

Base Output On:  Departure Time  Arrival Time

What time do you want to get there? 7:00 PM on 3/29/2016

[Get Travel Time Info](#)

**IH-45 North Northbound from Allen Parkway to FM-1488 (33.30 miles)**

**Selected Arrival Time: 7:00 PM**

Your approximate travel time on IH-45 North will be 35 minutes.

A recommended cushion of 1 hour and 4 minutes will get you there by 7:00 PM.

Most of the time, your trip on IH-45 North will take 1 hour and 39 minutes or less.

Your suggested departure time is 5:21 PM.

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**Figure 12. Screen shot. North Houston transportation study trip planning website (Assembly B).**

**NORTH COLUMBUS**  
TRANSPORTATION STUDY

### Plan a Predictable Trip

Facility: I-71  
 Direction: Southbound  
 Where are you starting from?: US-36  
 Where are you going?: 11th Ave  
 Base Output:  Departure Time  Arrival Time  
 Arrive by: 9:00 AM on 3/29/2016

**Get Travel Time Info**

I-71 Southbound from US-36 to 11th Ave (19.3 miles)

**Selected Arrival Time: 9:00 AM**

Your estimated travel time on I-71 will be 19 minutes.  
 Plan 4 minutes of extra time to arrive by 9:00 AM.  
 The majority of the time, your trip on I-71 will take 23 minutes or less.  
 Your recommended departure time is 8:37 AM.

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**Figure 13. Screen shot. North Columbus transportation study trip planning website (Assembly A).**

**NORTH COLUMBUS**  
TRANSPORTATION STUDY

### Plan a Reliable Trip

Facility: I-71  
 Direction: Southbound  
 Where are you starting from?: US-36  
 Where are you going?: Polans Parkway  
 Base Output:  Departure Time  Arrival Time  
 What time will you start your trip?: 7:00 AM on 3/29/2016

**Get Travel Time Info**

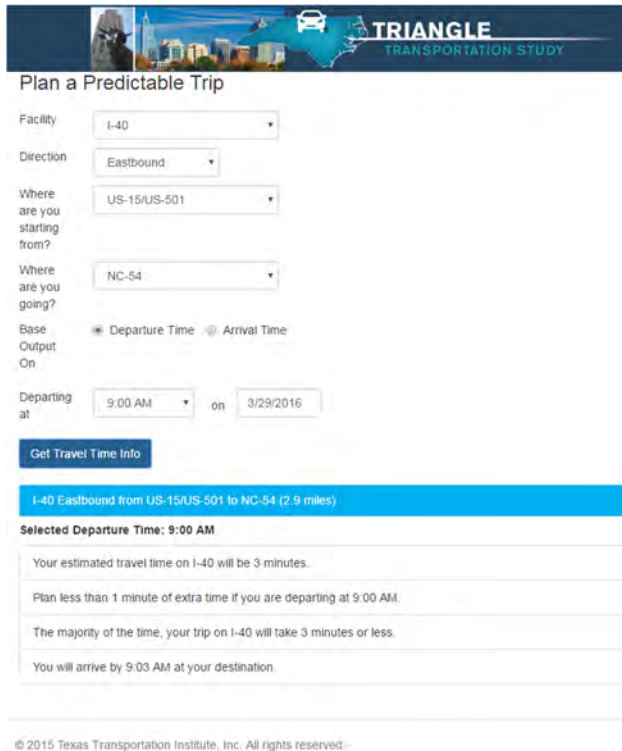
I-71 Southbound from US-36 to Polans Parkway (8.2 miles)

**Selected Departure Time: 7:00 AM**

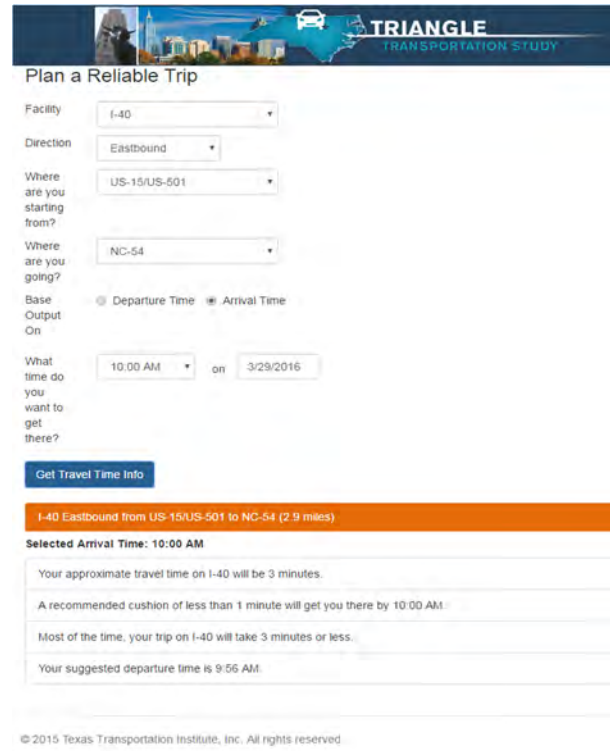
Your approximate travel time on I-71 will be 8 minutes.  
 Use a recommended cushion of less than 1 minute if you start your trip at 7:00 AM.  
 Most of the time, your trip on I-71 will take 8 minutes or less.  
 You will get there by 7:07 AM.

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**Figure 14. Screen shot. North Columbus transportation study trip planning website (Assembly B).**



**Figure 15. Screen shot. Triangle transportation study trip planning website (Assembly A).**

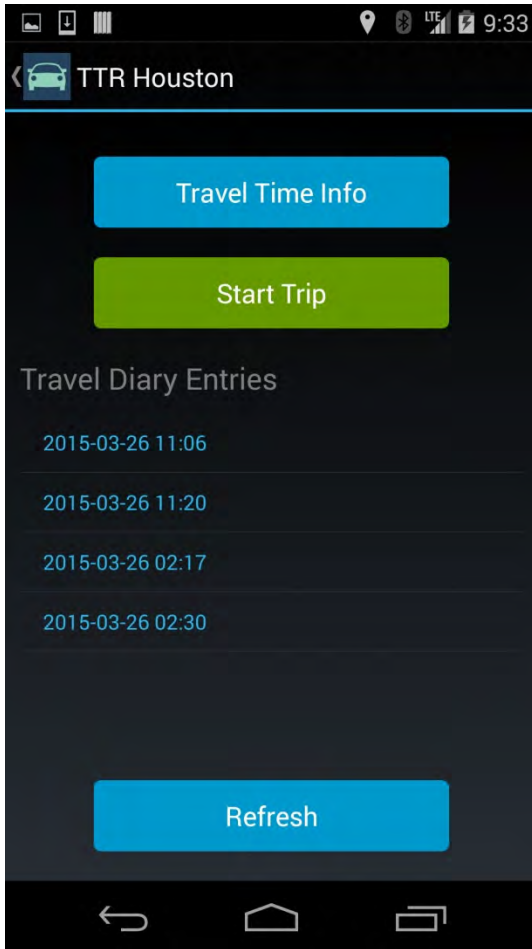


**Figure 16. Screen shot. Triangle transportation study trip planning website (Assembly B).**

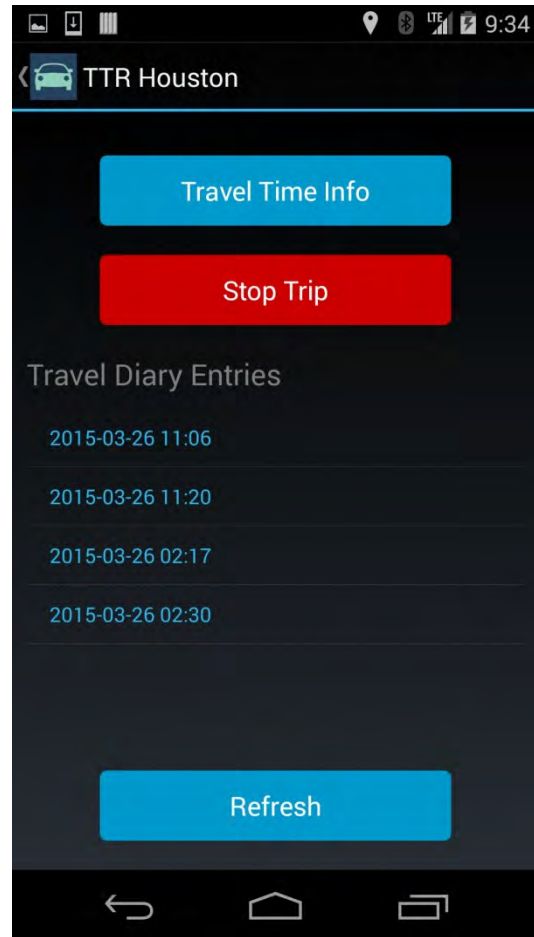
## Smartphone Mobile Application Description

A trip planning mobile application for delivery of the travel time reliability information was implemented to support this phase of the study. The trip planning mobile application was a smartphone application module embedded within the Global Positioning System (GPS) data collection application that all participants downloaded at the start of the study. This module was activated only for participants who were assigned to the mobile application portion of TTR information delivery.

In Phase 2, those participants who were assigned to the groups accessing the TTR information via the mobile application had that portion of the trip planning module of their application activated. The home screen then looked like the example provided in Figure 17. The “Travel Time Info” button took the participant to the mobile application travel time planning screen (e.g., Figure 9). Figure 18 shows the home screen after the trip was begun (i.e., after the “Start Trip” button was pressed). The “Travel Time Info” button behaved in the same fashion on this page. For each location, the website developed to provide the TTR information was embedded in the smartphone mobile application trip planning module to ensure consistency across dissemination platforms.



**Figure 17. Screen shot. Mobile application home screen, phase 2.**



**Figure 18. Screen shot. Mobile application in trip, phase 2.**

### Mobile Application Technical Details

Development of the TTR mobile application was performed using Xamarin, a Microsoft product that allows for multiple-platform mobile development using C# and .Net. Xamarin allows for code reuse between the Android and iOS platforms, and reduces the amount of platform-specific code needed. The mobile application had a simple interface to allow the participant to start a trip, which would allow the mobile application to register a trip with the TTR backend system and send up occasional locations while the trip was active. Once the user stopped the trip using a button press, the mobile application would stop sending the trip location points, register a trip stop with the backend system, and then present the participant with a trip report. The trip report was a travel diary survey that was hosted on Survey Monkey, which was different for the two main phases of the project.

The mobile application integrated with a backend system running in the Microsoft Azure environment. The backend system contained the Web Application Programming Interface (API) methods to send and retrieve data from the databases. Microsoft SQL Server databases held the

user accounts, trips, and probe points assigned to those trips. The trip location point data were analyzed to verify that a trip indeed was in the area of interest. The trip would be marked in the database if the algorithm found it to be in the area of interest. The data collected by the TTR backend system and Survey Monkey were used for analysis.

### **Trip Planning 511 System Description**

A system for agency 511 delivery of the travel time reliability information was implemented to support this phase of the study. At the time of the study, neither Ohio nor Texas operated a statewide 511 system, nor was it the expectation that this study would implement a system of this magnitude within these states. However, the implementation of a cloud-based keypad entry system that operated in the same manner as a true 511 system was achieved using open-source tools and text-to-speech and speech-to-text translators. The study team selected Twilio as the software for deployment of the trip planning 511 system.

The study's 511 system leveraged the same data feed that was used to provide information to both the website and mobile applications. Phone numbers related to each demonstration location were provided. A flow diagram of the 511 system is provided in Figure 19. The system functioned in the same manner for each study site, and provided the TTR information for trip planning purposes exactly as it was presented in the website and smartphone application platforms.

## TRR 511 System

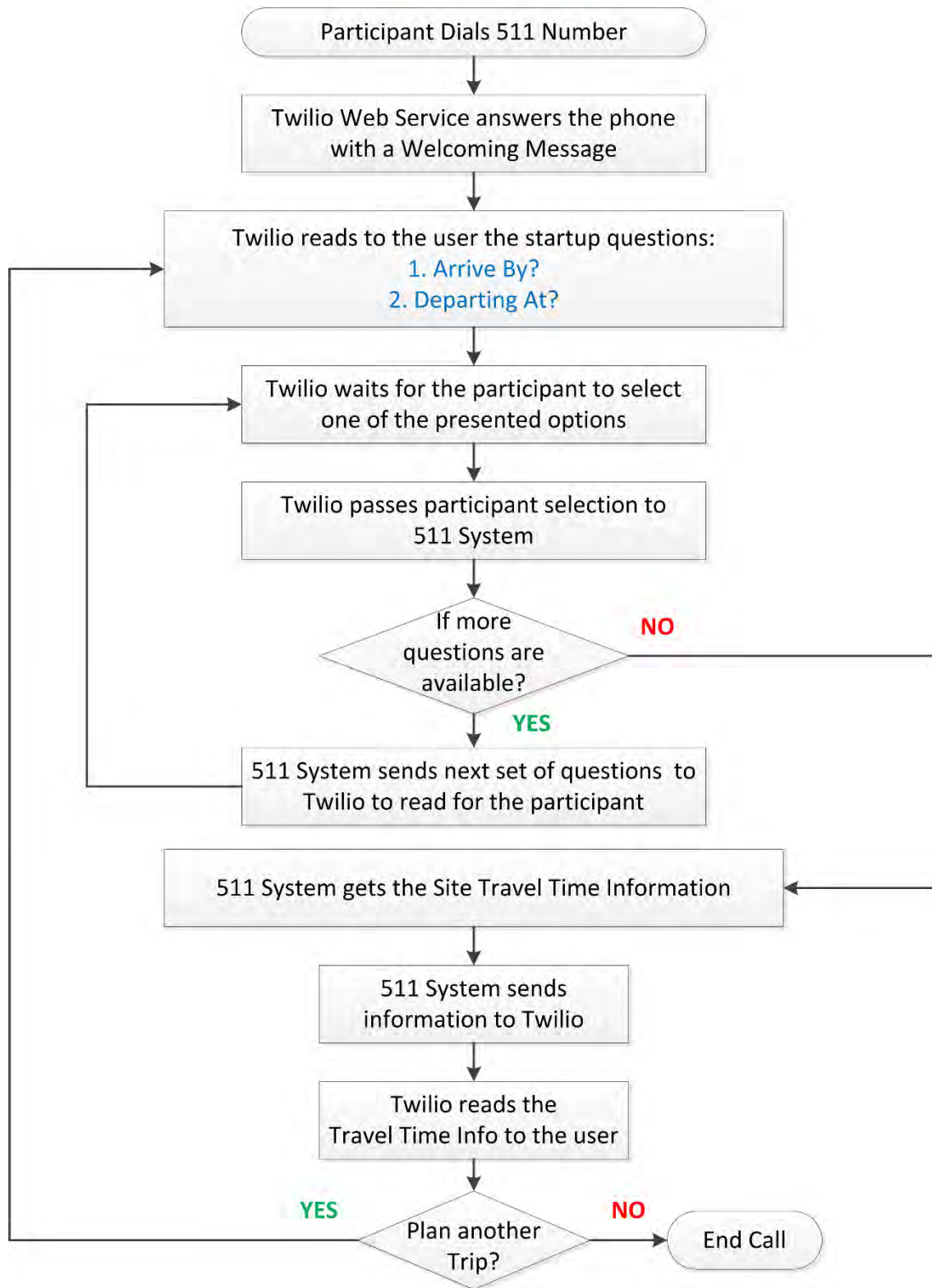
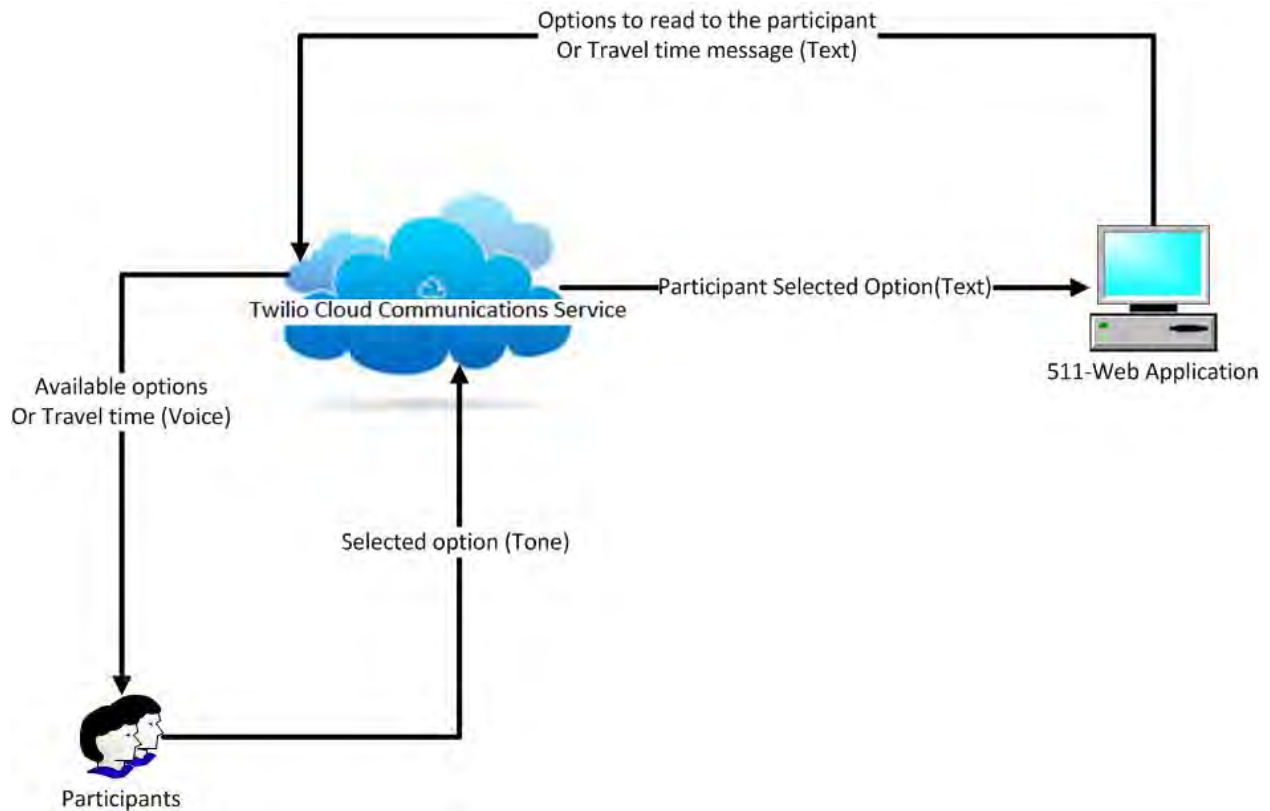


Figure 19. Chart. Travel time reliability 511 system flow diagram.

The 511 system was developed using the Twilio API. Twilio is a cloud communications platform that enables a user to develop apps to interact with participants using voice, video calls, and messaging. The Twilio service also leases Voice Over IP (VoIP) phone lines that can be used to communicate with participants. The study team used the Twilio API to develop a 511 web-based Interactive Voice Response (IVR) application to interact with study participants through the use of voice and tones input via keypad. Anytime a participant called one of the VoIP lines, the Twilio service read to the participant the available options and forwarded the participant's selected option to the 511 application. The 511 application then sent Twilio a new series of options to read to the participant and received from Twilio the selected option until all the information required to provide the user with a travel time for their planned trip had been answered. The 511 application then provided a textual message to Twilio to read to the participant that contained the travel time information for their trip. Figure 20 illustrates the communication flow between the participants and Twilio.



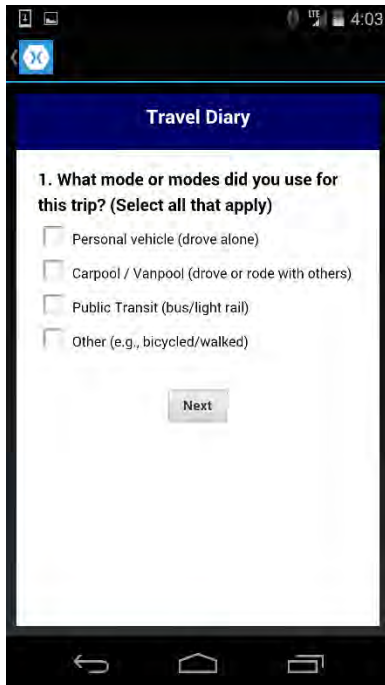
**Figure 20. Chart. Travel time reliability 511 communication flow.**



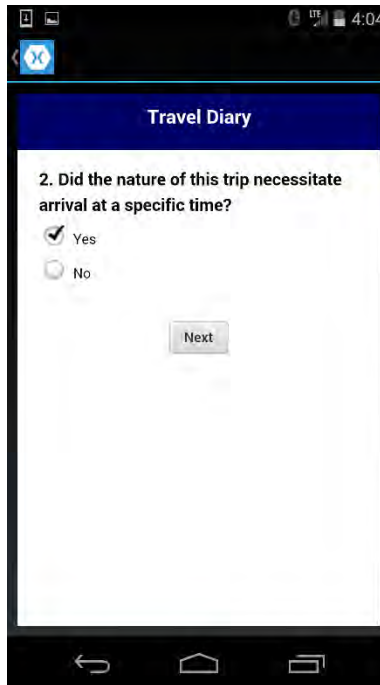
## Phase 2 Travel Diary Fields

In Phase 2, participants were asked to complete travel diary entries as in Phase 1 via the smartphone mobile application. Screen shots of the travel diary module of the smartphone application are provided in Figure 21, Figure 22 and Figure 23 (selected questions only). In addition to the questions asked in the Phase 1 diary (Appendix F), the Phase 2 diary (see Appendix K) assessed the following:

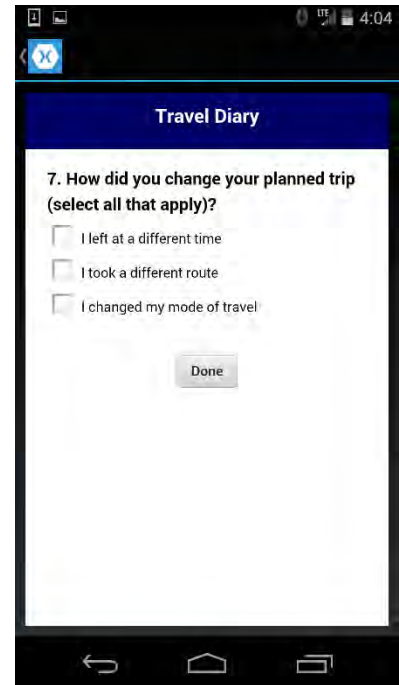
- Usefulness of the TTR information provided by the study’s website, mobile application, or 511 system for mode, departure time, and/or route decisions.
- Impact, if any, of the TTR information on mode choice, departure time, and/or route decisions made before the trip began.



**Figure 21. Screen shot. Mobile application travel diary screen (question 1), phases 1 and 2.**



**Figure 22. Screen shot. Mobile application travel diary screen (question 2), phases 1 and 2.**



**Figure 23. Screen shot. Mobile application travel diary screen (question 7), phases 1 and 2.**



## **EXIT SURVEY**

Following the second phase of the field study, all participants who had completed at least four recorded trips in each phase<sup>4</sup> participated in a web-based exit survey. The primary purpose of the exit survey was to collect information about if and how respondents used the TTR information they were provided by collecting self-reported behaviors based on respondents' recollections of how often they used the TTR information and how often they changed trip plans in response to that information (separate from the trip behavior observed passively by the smartphone application during Phase 2). The exit survey also collected respondents' perceptions of and satisfaction with that information. Questions included respondents' perceptions or recollections of:

- How often they used the TTR information for different kinds of trips.
- What kind of impacts the TTR information had on behavior (if any) (e.g., changes in departure time, route, mode choice).
- How satisfied they were with various aspects of the information (e.g., clarity, ease of access, trustworthiness, overall usefulness).
- What kind of impacts the TTR had on trip experience (if any) (e.g., reduced stress, congestion avoidance, shorter trip, overall trip satisfaction).
- Factors that might make the information more useful for different kinds of trips or in an unfamiliar city (or what might make participants likely to use the information in the future).

A number of questions about information use and satisfaction were modeled after baseline questions (particularly where comparability could be useful between baseline perceptions of traveler information and post-study perceptions of TTR information). Other questions from the baseline (e.g., typical travel patterns and demographics) did not need to be repeated; because the exit survey was conducted approximately 5 weeks after the baseline, it was assumed that participants' circumstances and typical behaviors had not changed. The exit survey questions for West Houston, North Houston, North Columbus, and Triangle are included in Appendices L, M, N, and O, respectively.

## **STUDY ADMINISTRATION METHODS**

The following section provides an overview of additional tasks conducted to facilitate and encourage participation in the study. These tasks directly and indirectly supported the primary participant tasks and included recruitment efforts, participant assignment to treatment groups, participant communication management, and study incentive distribution.

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<sup>4</sup> For the first round of the West Houston study, participants who completed at least three trips in Phase 1 were also invited to Phase 2, due to the smaller number of participants who had completed four trips.

## Participant Recruitment

Potential participants were identified and recruited in a variety of ways throughout the study. The initial study plan had included only one “round” of recruitment and data collection in each study area, using an address-based sample to recruit residents who lived near the study corridors. However, this first round of data collection resulted in response and retention rates that were lower than expected for several stages of the process. Therefore, additional “rounds” of data collection were conducted using outreach and advertising to recruit additional participants through convenience sampling, sending more direct and frequent communications to participants to keep them engaged throughout the study, and offering a variety of incentives in an effort to increase recruitment and retention. These activities are discussed below and are summarized in Table 3. To reach the needed response rate, one study round was conducted in Triangle, while three rounds were required in North Columbus and Houston. Note that the rounds are numbered according to the overall number of sequential efforts conducted during the study across all three sites, rather than for the number of efforts conducted within each site.

During the first round of data collection, participants were identified for the study using an address-based sample approach. A sample of residential addresses in the zip codes adjacent to the study corridors were invited to the study by mail. This approach was used to minimize self-selection bias and other potential invitation biases, while targeting residents who might be more likely to use the study corridor frequently (due to their proximity to the highway). The number of residents invited from each city was based on preliminary estimates of required sample sizes, response rates, and retention rates throughout each participant activity. The target sample size was 900 participants completing every step in the study; the sample budget allowed for a “cushion” of 100 extra participants (for a total of 1,000). These targets were distributed across the three study areas. Table 2 summarizes the initial response and retention rate assumptions for each step of the study and the resulting number of invitations to be mailed to each site.

**Table 2. Initial Response Rate Assumptions and Invitation Requirements.**

<b>Study Area</b>	<b>Response Rate Assumption*</b>	<b>West Houston (Texas)</b>	<b>North Columbus (Ohio)</b>	<b>Triangle (North Carolina)</b>
Proposed invitations to mail	--	35,800	23,900	19,900
Baseline response (pre-screening)	7%	2,500	1,667	1,389
Baseline completion (screened & qualified)	60%	1,500	1,000	833
Diary retention (Phase 1 & 2)	40%	600	400	333
Target sample size (Exit Response)	75%	450	300	250
<i>* Response rate assumptions reflect the percentage of people from each stage who were expected to complete the next stage. Assumptions were based on experience from previous similar studies and on data about smartphone ownership in the U.S.</i>				

As the study progressed, the actual response and retention rates were evaluated, and adjustments were made to the study plans (including increasing the number of invitations in the Triangle area

and using different outreach methods to recruit more participants in later rounds of data collection). More details about the address-based sample design for each city are provided in the specific sections on participant selection for the West Houston (Round 1), North Columbus (Round 1), and Triangle study sites.

Each of the Round 1 potential participants received an invitation postcard (containing a unique study password) delivered to their home address when the baseline survey started, and a reminder postcard a few days later. Examples of these postcards and all other recruitment materials (described in later sections) used for the West Houston, North Houston, North Columbus, and Triangle Transportation studies are provided in Appendices P, Q, R, and S, respectively. During this round, all participants began each task at the same time (after all participants in their cohort completed the previous task).

For Round 2 in the West Houston study area, participants were re-invited from the panel of participants who had initially completed the baseline survey in Round 1, but had not completed the rest of the study. For Rounds 3 and 4 of data collection, potential participants were recruited through outreach in their communities, such as advertisements on websites or social media, in newsletters or email lists, or on fliers posted at large institutions (such as colleges near the corridor). Details of these recruitment efforts are discussed in the specific sections on participant selection for West Houston (Round 2), North Houston (Round 3) and North Columbus (Round 3 and Round 4). Potential participants who responded to one of these advertisements called a recruiter for pre-screening, and then were given a link to complete the baseline survey. After providing their email address at the end of the baseline survey, participants were then assigned a unique study password to use throughout the remainder of the study. During these recruitment efforts, participants began each task of the study on a weekly basis, as outreach and pre-screening continued to enroll more participants.

### **Treatment Group Assignment**

Participants who completed the baseline survey and were qualified to continue in Phase 1 were randomly assigned to one of six treatment groups. These treatment groups determined how the participant would access TTR information during Phase 2 (web, App, or 511), and which of the two TTR Lexicon assemblies the participant would receive (A or B). Each treatment group contained approximately the same distribution of participants by gender and age categories to minimize unintentional demographic biases. These assignments were made prior to Phase 1, because it was assumed that the demographic distribution of active participants would not change significantly during Phase 1; pre-assignment also helped facilitate a seamless transition from Phase 1 to Phase 2. This assignment process was identical for all rounds of data collection.

### **Participant Communication Management**

Throughout the study, the study administrators regularly communicated with participants through a variety of channels. As previously described, initial recruitment involved communication by mailed postcards or fliers and newsletters. During Round 1, once participants completed the baseline survey and provided their email address, all communication to the participants was sent via email or through the smartphone application downloaded for the study.

During later rounds, participants could call or email study recruiters before completing the baseline survey to ask questions or to sign up, but they were still required to provide an email in the baseline survey to receive follow-up information and reminders.

“Help” email accounts for each study site were established to manage in-bound communication from participants, such as questions about the study and requests for help with each of the tasks if needed. One set of email accounts was set up to manage questions and comments about the baseline and exit surveys during the first round of data collection. Another set of email accounts was used to manage questions and comments about the smartphone application and TTR information resources, and in later rounds of data collection to facilitate study recruitment.

Out-bound emails were sent to participants regularly throughout the study, including invitations to each phase and to the exit survey, regular reminders to log trips and complete travel diaries, and distribution of study incentives. During the first round of data collection, participants received an invitation email at the start of each phase and at the start of the exit survey, and a reminder email a few days later if they did not respond. During later rounds, participants received more frequent reminders to use the smartphone application during Phase 1 and Phase 2 if the study team observed that they were not recording trips.

### **Study Incentives**

To encourage response and to thank participants for their input, a nominal incentive was offered to participants who completed the entire study (including the baseline survey, trip reporting and trip diaries in Phase 1 and Phase 2, and the exit survey). During the first round of data collection, a \$25 gift card to Amazon.com was initially offered. This is the amount that was distributed to all participants who completed Round 1 of the West Houston study. However, based on feedback and the low response in Round 1 of the West Houston study, this incentive was increased to a \$50 gift card per participant for the North Columbus and Triangle Round 1 studies and the West Houston Round 2 study. This increase was communicated to participants via email and in the online frequently asked questions (FAQs). For the second round of data collection in Houston, participants also were entered into a drawing for a “grand prize” of an additional \$500 from Amazon.com. Incentives were distributed by email within one week after the exit survey closed for each study area.

For Round 3 of data collection, participants in North Houston were offered an incentive of \$100 cash (or \$75 if they completed everything except the exit survey), while participants in North Columbus were entered into a drawing for one of several iPad tablets. For the final round of data collection in North Columbus (Round 4), participants were offered \$100 cash.

Table 3 summarizes the administration efforts in each round of data collection.

**Table 3. Study administration overview by study site and round.**

Study Site		West Houston (Texas)	North Houston (Texas)	North Columbus (Ohio)	Triangle (North Carolina)
<b>Round 1</b>	Dates	April-June 2015	-	April-June 2015	May-July 2015
	Recruitment	Mailed postcard	-	Mailed postcard	Mailed postcard
	Incentives	\$25 Amazon card	-	\$50 Amazon card	\$50 Amazon card
<b>Round 2</b>	Dates	July-August 2015	-	-	-
	Recruitment	Re-invited from Round 1	-	-	-
	Incentives	\$50 Amazon card, \$100 grand prize drawing	-	-	-
<b>Round 3</b>	Dates	-	October 2015- January 2016	October- December 2015	-
	Recruitment	-	Outreach	Outreach	-
	Incentives	-	\$75-100 cash	iPad prize drawing	-
<b>Round 4</b>	Dates	-	-	February-March 2016	-
	Recruitment	-	-	Outreach and ads	-
	Incentives	-	-	\$100 cash	-



## CHAPTER 5. TRAVEL TIME RELIABILITY DATA MANIPULATION

Each region participating in the study provided historical traffic datasets as a source for determining the Travel Time Reliability (TTR) calculations utilized by the mobile application, website, and 511 systems. To ensure compatibility across these platforms and provide information that could easily be understood by the study participants, the study team developed the following requirements for each dataset:

- Average segment-based travel time data with origins and destinations corresponding to the majority of entry/exit points along each of the study corridors by direction. These average values are used as the “typical” travel time for display in the traveler information applications.
- For each of the segments in the study corridors and for each aggregation period, the 95<sup>th</sup> percentile travel time for use in determining the worst-case travel times.
- Travel time data aggregated by day of week in at least hourly intervals for a 6-month period or more. The aggregation time (e.g., 15 minutes, hourly) limits the resolution of the departure and arrival times in the traveler information applications, and the 6-month timeframe allows for an average traffic flow to be determined without being influenced by singular extraordinary traffic conditions on specific days that can occur during a shorter timeframe. The 6-month timeframe leads to a larger sample size, reduced variability of the data, and has a positive impact on the quality of the data. (Although the study team did not perform exhaustive checks on the quality of data, it is recommended that metrics such as sample size and data variability be provided in the future to make these assessments possible).
- The most recent historical dataset possible in order to reflect the latest typical traffic conditions as accurately as possible.

Based on the availability of data in each region, datasets were provided from different sources, timeframes, and formats. In order to present the data on the mobile application, website, and 511 system in a consistent format, the data from each region had to be manipulated into a common data format. The data sources and required manipulation specific to each region are described in the following sections. The final result of the data manipulation was a comma-delimited file for each region for each day of the week containing location identification information, aggregation start time, average travel time, and 95<sup>th</sup> percentile travel time. These files were used as the data source for the App, website, and 511 systems. An example of the processed dataset for the Triangle region is provided in Table 4.

**Table 4. Processed dataset for Triangle Transportation Study.**

Roadway Name	Direction of Travel	Origin Cross Street	Destination Cross Street	Segment Length (mi)	Summary Time	Travel Time (min)	95 <sup>th</sup> Perc. Travel Time (min)	Speed (mph)	95 <sup>th</sup> Perc. Speed (mph)
I-40	Eastbound	US-15/ US-501	NC-54	2.94933	1/1/2013 0:00	160	180	66.36	58.99
I-40	Eastbound	US-15/ US-501	NC-54	2.9493	1/1/2013 0:15	155	172	68.50	61.73
I-40	Eastbound	US-15/ US-501	NC-54	2.9493	1/1/2013 0:30	155	162	68.50	65.54
I-40	Eastbound	US-15/ US-501	NC-54	2.9493	1/1/2013 0:45	159	167	66.78	63.58

## **WEST HOUSTON AND NORTH HOUSTON TRANSPORTATION STUDY**

The Houston region has an extensive deployment of ITS-based sensors installed throughout each of the study corridors that provide speed and travel time information through the region’s traffic management center, Houston TranStar®. The source of the Houston study data was the information collected by these sensors that utilize either Bluetooth or toll-tag-based re-identification for estimating travel times. The sensors are operated by the Texas Department of Transportation (TxDOT), which provided data for the study’s usage for the I-10 Katy, I-10 Katy Managed Lanes, Westpark Tollway, I-45 North, I-45 North HOV, and Hardy Toll Road corridors.

The origins and destinations for each travel time segment were based on the locations of the roadside sensors. In most cases, the sensors were located near major entry and exit points along the corridors, with 1- to 3-mile spacing. The software internal to Houston TranStar® collects and processes the travel time data in both real-time and historically, and aggregates the data into 15-minute summaries by day of week. For the purpose of this study, a historical dataset for July through December of 2014 was used.

For each 15-minute period and for each day of the week, the dataset contained a location identifier (including the roadway name, direction of travel, origin cross street, and destination cross street), a timestamp indicating the time of the summary, an average travel time, and a 95<sup>th</sup> percentile travel time. Because the Houston dataset was the first to be manipulated and met all of the original requirements, this data format was used for the other two study regions.

The Houston data contained additional background information on the process that generated the historical data which allowed the study team to determine data quality. In producing the historical data, quality was assessed by using the number of sample periods with available data along with the standard deviation of the individual speed samples in miles per hour. For a



historical average to be viable, 80% of the time periods had to contain data samples and the standard deviation of the speed samples had to be less than 15 mph for each segment during each time period for each individual day. For example, in a 6-month period using 15-minute summaries, 80% of the Mondays at 7:00 AM needed to have samples. Additionally, for each time period on each day, the segment had to have a standard deviation that was less than 15 mph. There were no instances where the data did not meet the quality control check.

## **NORTH COLUMBUS TRANSPORTATION STUDY**

The North Columbus study area on I-71 used INRIX data provided by the Ohio Department of Transportation (ODOT). INRIX collects data from Global Positioning System (GPS) equipped mobile devices to estimate traffic conditions. The dataset provided by ODOT contained aggregated hourly averages of travel time and 95<sup>th</sup> percentile travel time by day of week for July through December of 2014. Although 15-minute aggregation data was preferred because of the lower time resolution it provides, those data could be obtained only for a short timeframe consisting of several weeks. To limit the historical averages being influenced by extraordinary traffic conditions on specific days, the study team decided that having hourly aggregations over a 6-month timeframe was preferable to having 15-minute aggregations over a much shorter timeframe. For the contents of the dataset, INRIX was responsible for providing the travel time, and ODOT calculated a reliability index that was translated into the 95<sup>th</sup> percentile travel time. The INRIX data was pre-processed and screened for quality by ODOT and did not contain any quality assessment metrics in the output used by the study team.

The travel times associated with INRIX data are provided for predefined segments called Traffic Message Channels (TMCs). The TMC segments typically correspond to very short sections of roadway and provide more granular information than was needed for the study. In order to provide travel time information between exit and entry points on the corridor, data from multiple TMC segments had to be aggregated together. For instance, there might be five or more TMC segments between an entry and exit point on the freeway. In this case, data from all the TMC segments corresponding to that section of roadway were added together to obtain a total travel time. An example of the TMC segments used in the North Columbus dataset are provided in Table 5. The example shows an origin and destination on I-71 between I-270 and OH-161 that comprises two TMC segments, which are uniquely identified by the TMC ID.

**Table 5. Multiple traffic management center segments between exit points.**

<b>TMC ID</b>	<b>Roadway</b>	<b>Direction</b>	<b>Origin</b>	<b>Destination</b>	<b>Length (mi)</b>	<b>Average Travel Time (min)</b>	<b>95<sup>th</sup> Perc. Travel Time (min)</b>
122-04201	I-71	Southbound	I-270/Exit 119	OH-161/Exit 117	0.57308	0.54	0.59
122N04201	I-71	Southbound	I-270/Exit 119	OH-161/Exit 117	1.275554	1.21	1.43

## TRIANGLE TRANSPORTATION STUDY

The Triangle study area along the I-40 corridor in the Raleigh-Durham-Chapel Hill region used data provided by the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), which obtained them from HERE. HERE is a traffic data provider similar to INRIX that collects data from GPS-equipped probes to estimate traffic conditions. The dataset provided by the DCHC MPO was 15-minute data summarized by day for the entire calendar year of 2013. The daily summarized data included a location identifier, segment length, average speed, and various speed percentile values. For the purpose of this study, only the 95<sup>th</sup> percentile value was used. To make the dataset compatible with the required format, the study team had to aggregate the data into day of week summaries and convert the speed values provided into travel time by using the segment length value.

Similar to INRIX, the speeds associated with the HERE data are provided for predefined TMC segments that had to be aggregated in order to provide a total travel time between entry and exit points along the corridor.

The HERE data contained the number of samples and standard deviation for each time period, and these metrics were used to assess data quality using thresholds similar to the ones applied to the Houston data. All of the variability and sample size issues were addressed by the one-year timeframe that the data represented.

## SUMMARY OF STUDY TRAVEL TIME RELIABILITY DATASETS

The historical TTR datasets for each study location that were used in the study are summarized in Table 6.

**Table 6. Historical Travel Time Reliability Dataset Summary.**

<b>Study Location</b>	<b>Data Source</b>	<b>Data Timeframe</b>	<b>Aggregation Time</b>
West/North Houston (Texas)	TxDOT roadside sensors (Toll tag/ <i>Bluetooth</i> )	July-December 2014	15 minutes by day of week
North Columbus (Ohio)	INRIX provided by ODOT	July-December 2014	1 hour by day of week
Triangle (North Carolina)	HERE provided by DCHC MPO	January-December 2013	15 minutes by day of week

## WEBSITE DATA INTERFACE TECHNICAL DESCRIPTION

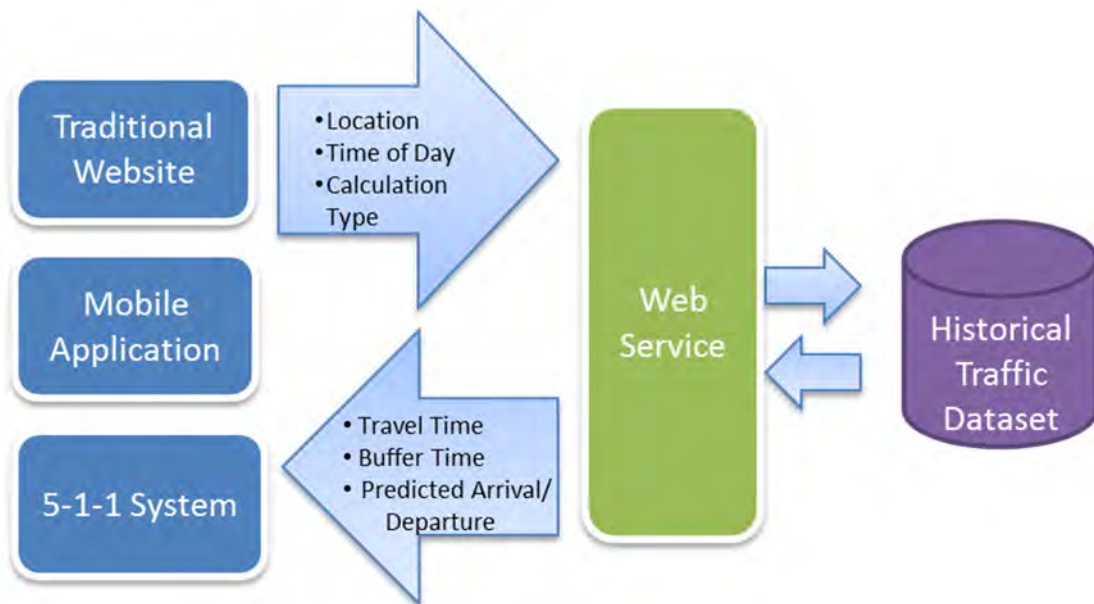
The backend architecture for the website provided a data interface framework for each of the information channels used in Phase 2 of the study. A web Application Programming Interface (API) was developed that allowed other applications to query the historical datasets that were developed for each study region. Both the traditional website and the 511 system made queries to

the web interface to obtain the traffic conditions data. The mobile application embedded the traditional website into its framework, thus using the same data source.

To initiate a query to the web service, the client (i.e., website, 511 system) made a call to a web address with the following parameters included:

- Starting Location ID.
- Ending Location ID.
- Time of Day.
- Date of Travel.
- Departure or Arrival Calculation.
- Assembly Type.

Based on the information passed via the parameters, the web service queried the appropriate historical dataset and returned a text string containing the approximate travel time, buffer time, and predicted arrival or departure time. The different information channels then were able to relay this information in an appropriate format (i.e., webpage via the website and mobile application, via 511). A diagram of the web service architecture is shown in Figure 24.



**Figure 24. Graphic. Web service architecture.**



## CHAPTER 6. WEST AND NORTH HOUSTON TRANSPORTATION STUDY

The following sections describe in detail the various recruiting rounds of study in Houston.

### STUDY SITE DEPLOYMENT TIMELINE

As previously discussed, several rounds of data collection were conducted in Houston (i.e., Rounds 1 and 2 in West Houston, and Round 3 in North Houston). The following sections provide an overview of the recruitment and participation timeline for each round.

#### West Houston, Round 1

Invitation postcards were sent to potential participants in the Houston area on April 3, 2015. The baseline survey was opened on April 6. Qualifying participants were notified by email on April 17, invited to download the smartphone application, and given instructions for recording trips and completing trip diary questions. Phase 1 of the travel study began on April 22. On May 6, Phase 1 participants who had completed at least three recorded trips were invited to continue to Phase 2. Phase 2 concluded on May 24, and participants who had completed at least four trips during Phase 2 were invited on May 27 to take the exit survey. Incentives were distributed by email on June 8 to participants who had completed all steps of the study. Table 7 illustrates the timeline for Round 1 of the West Houston Transportation Study.

**Table 7. Timeline of activities for Round 1 of the West Houston Transportation Study.**

West Houston (Texas) Transportation Study	Weekly Timeline of Activities ( <i>Date</i> )										
	April 2015				May 2015				June 2015		
Recruitment postcards mailed	3 <sup>rd</sup>										
Potential participants begin taking baseline survey		6 <sup>th</sup>									
Reminder postcards mailed		7 <sup>th</sup>									
Participants assigned to treatment groups			16 <sup>th</sup>								
Phase 1 “Welcome” email sent			17 <sup>th</sup>								
West Houston Phase 1				22 <sup>nd</sup>							
West Houston Phase 1 reminder email sent					29 <sup>th</sup>						
Phase 2 “Welcome” email sent						6 <sup>th</sup>					
West Houston Phase 2							13 <sup>th</sup>				
Exit survey invitation sent									27 <sup>th</sup>		
Exit survey reminder sent										1 <sup>st</sup>	
Incentive distribution											8 <sup>th</sup>

## West Houston, Round 2

The second round of the West Houston Transportation Study targeted participants who had completed the baseline survey in Round 1 but had not proceeded to Phase 1. The intent was to encourage participants who had invested a nominal amount of time in the study to continue forward into the next phase; additionally, inviting participants who had already been recruited was expected to be a low-cost way to encourage additional completions. Directed email messages were sent to the participants to encourage participation. Table 8 illustrates the timeline for Round 2 of the West Houston Transportation Study.

**Table 8. Timeline of activities for Round 2 of the West Houston Transportation Study.**

West Houston (Texas) Round 2	Weekly Timeline of Activities ( <i>Date</i> )						
	June 2015	July 2015			August 2015		
West Houston Round 2 Phase 1	30 <sup>th</sup>						
Phase 2 “Welcome” email sent			15 <sup>th</sup>				
West Houston Round 2 Phase 2			15 <sup>th</sup>				
Exit survey invitation sent						3 <sup>rd</sup>	
Exit survey reminder sent							10 <sup>th</sup>
Incentive distribution							17 <sup>th</sup>

## North Houston, Round 3

A third round of subject recruitment and site deployment in Houston was initiated to continue to increase participation to reach the target subject number. The study corridor was changed to IH-45 north from downtown Houston to Conroe. The study team thought that the likely subject pool had been exhausted for the Katy freeway corridor, thus the shift to a different corridor. The IH-45 north corridor is similar to the Katy Freeway corridor in that the travel time reliability was readily available and the interstate freeway has a tolled alternative for a considerable length of the corridor. Recruitment efforts began in September 2015, and participants were invited to the baseline survey beginning October 5. Following baseline completion, participants were invited to Phase 1 in weekly batches. Batching participants was more efficient for administration and smartphone application activation efforts, while still allowing recruitment to continue. It also allowed the first participants to begin Phase 1 soon after enrollment without waiting until all potential participants had finished. Similarly, participants began and completed Phase 2 and the exit survey in batches. Table 9 illustrates the timeline for Round 3 of data collection in Houston.

**Table 9. Timeline of activities for Round 3 of the North Houston Transportation Study.**

North Houston (Texas) Round 3	Weekly Timeline of Activities ( <i>Date</i> )															
	October 2015				November 2015				December 2015				January 2016			
Outreach recruitment & prescreening	3 <sup>rd</sup>															
Baseline survey	5 <sup>th</sup>															
North Houston Round 2 Phase 1				26 <sup>th</sup>												
North Houston Round 2 Phase 2					10 <sup>th</sup>											
Exit survey								24 <sup>th</sup>								
Incentive distribution										14 <sup>th</sup>						

**PARTICIPANT SELECTION AND ASSIGNMENT**

The following sections provide a summary of the participation recruitment, selection, and assignment for the Houston study.

**West Houston, Round 1**

For West Houston, the study area was defined as the Katy Freeway (I-10) and Westpark Tollway between Grand Parkway in Katy, Texas, and downtown Houston. As shown in the map and table on the following pages, the geographic sample frame included twenty-two zip code areas adjacent to and between the Katy Freeway and Westpark Tollway, and between Katy (just west of Grand Parkway) and the western segment of I-610 (the West Loop Freeway). Zip codes inside the West Loop Freeway were not included because it was assumed that residents closer to downtown were less likely to regularly drive on a significant portion of either freeway, particularly in the direction with the most frequent congestion (inbound towards downtown in the morning, outbound away from downtown in the evening).

A sample of 35,800 addresses (approximately 10 percent of the addresses in the selected area) was randomly selected, proportional to the population across the entire area. As previously discussed, this quantity of invitations was determined based on initial predictions about response rates and retention rates throughout the study. The sample included all types of residential mailing addresses (single-family houses, apartments, post office boxes, etc.), but excluded “seasonal” and “vacant” addresses. A list of the zip codes used for the invitations is provided in Table 10, while a map illustrating the locations of these zip codes in the region is shown in Figure 25. Recruitment materials used to collect participants for West Houston are provided in Appendix P.

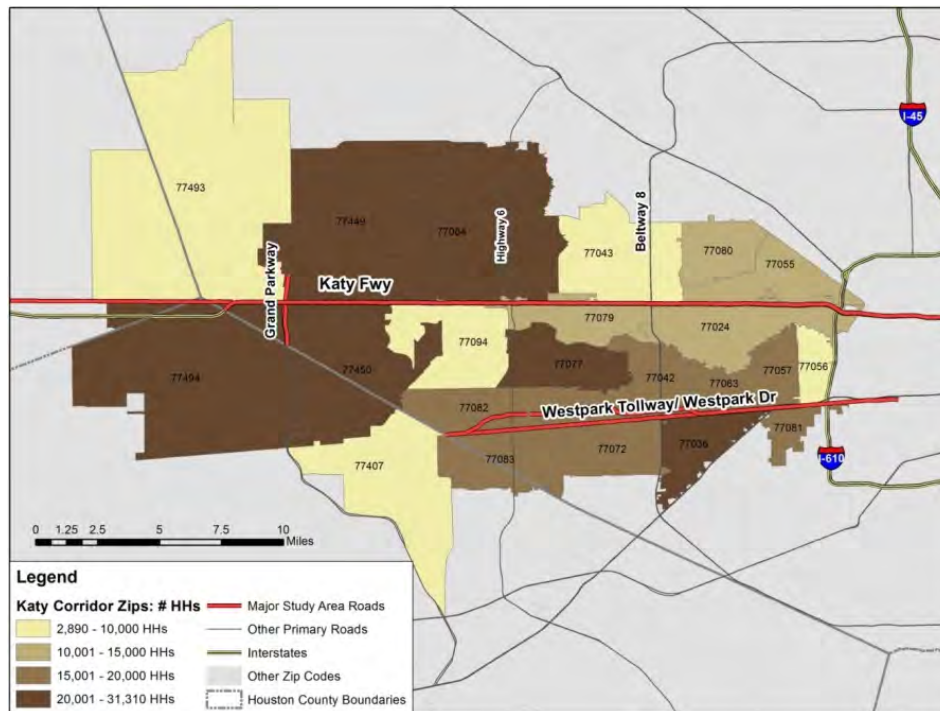
**Table 10. Houston sample zip codes.**

<b>Zip Code</b>	<b>Estimated Number of Households<sup>5</sup></b>	<b>Percent</b>
77094	2,890	0.8
77493	7,090	1.9
77043	7,830	2.1
77407	9,076	2.5
77056	9,288	2.5
77079	11,891	3.3
77055	14,255	3.9
77024	14,275	3.9
77080	14,993	4.1
77081	15,460	4.2
77042	16,838	4.6
77072	16,915	4.6
77063	17,527	4.8
77082	19,124	5.2
77057	19,708	5.4
77083	19,976	5.5
77494	20,042	5.5
77036	22,890	6.3
77450	23,249	6.4
77077	23,644	6.5
77449	26,855	7.4
77084	31,310	8.6
<b>Total</b>	<b>365,126</b>	<b>100</b>

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<sup>5</sup> Estimated household counts based on American Community Survey (ACS) 5-year estimates, 2008-2012.





**Figure 25. Map. Houston sample zip codes geography.**

### **West Houston, Round 2**

In Round 2, participants who had been invited to participate in Round 1 but had not participated at that time were re-invited. In an attempt to address potential privacy concerns of participants, Round 2 eliminated the phone application requirement, providing a website-based alternative for logging information about trips. The information collected with the website-based alternative was identical to that for the phone application and did not impact the accuracy nor amount of the data collected.

### **North Houston, Round 3**

Participants were recruited in a variety of ways, including postings on the Texas A&M Transportation Institute (TTI) website and TTI social media channels, a link on the Houston TranStar® website, and posting of flyers at community college campuses in the corridor. These additional recruiting notifications are included in Appendix Q.

### **BASELINE SURVEY RESULTS**

Table 11 through Table 16 summarize the results of the baseline survey for the Houston area for all three rounds. Note that all tables include only valid responses, and do not include any responses from participants who were screened out due to infrequent corridor use or lack of a smartphone. Some tables include fewer than 100 percent of qualified participants if the question was skipped by certain participants (for example, participants who reported “never” using the

Travel Time Reliability [TTR] information resources in Phase 2 skipped questions about TTR information ratings and satisfaction and instead were asked why they did not use the information). The total number of baseline responses provided in each round in Houston are shown in Table 11.

**Table 11. Number of baseline completions by round, Houston.**

<b>Data Collection Round</b>	<b>Count</b>	<b>Percent</b>
Rounds 1 & 2 (Spring/Summer 2015)*	623	68.8
Round 3 (Fall 2015)	282	31.2
<b>Total Baseline Participants</b>	<b>905</b>	<b>100</b>
<i>*Rounds 1 &amp; 2 in West Houston completed the baseline at the same time.</i>		

Table 12 and Table 13 summarize how often participants reported typically driving on the main freeway and tollway, respectively, in the study corridor. The majority of participants drive more frequently on the freeway than they do the tollway (note that all participants were asked about their travel behavior on both facilities, and therefore each person reported on travel frequency in the study corridor twice (once for each road)).

**Table 12. Number of weekdays typically driven on primary freeway (Katy Freeway or North Freeway) in study area, Houston.**

<b>Number of Weekdays Typically Driven on Primary Freeway in Study Area*</b>	<b>Count</b>	<b>Percent</b>
5 weekdays/week	584	64.5
4 weekdays/week	98	10.8
3 weekdays/week	113	12.5
2 weekdays/week	30	3.3
1 weekday/week	21	2.3
Weekends only	27	3.0
Less than weekly	27	3.0
Never*	5	0.6
<b>Total Baseline Participants</b>	<b>905</b>	<b>100</b>
<i>* Participants who traveled less than 3 days/week on the primary freeway were required to travel at least three days/week on the tollway to qualify.</i>		

**Table 13. Number of weekdays typically driven on parallel tollway (Westpark Tollway or Hardy Tollway) in study area, Houston.**

<b>Number of Weekdays Typically Driven on Parallel Tollway in Study Area*</b>	<b>Count</b>	<b>Percent</b>
5 weekdays/week	172	19.0
4 weekdays/week	50	5.5
3 weekdays/week	74	8.2
2 weekdays/week	76	8.4
1 weekday/week	70	7.7
Weekends only	47	5.2
Less than weekly	281	31.0
Never	135	14.9
<b>Total Baseline Participants</b>	<b>905</b>	<b>100</b>
<i>* Participants who traveled less than 3 days/week on the tollway were required to travel at least three days/week on the primary freeway to qualify.</i>		

Table 14 summarizes the age groups of participants who completed the baseline survey. The majority were between 25 and 55 years old, which is expected given the requirements of the study (regular highway users and smartphone owners).

**Table 14. Respondent age, Houston.**

<b>Respondent Age</b>	<b>Count</b>	<b>Percent</b>
18-24	34	3.8
25-34	243	26.9
35-44	247	27.3
45-54	192	21.2
55-64	134	14.8
65-74	46	5.1
75-84	8	0.9
85 or older	1	0.1
<b>Total Baseline Participants</b>	<b>905</b>	<b>100</b>

Table 15 summarizes participants’ baseline use of informational sources (prior to being provided the TTR information). Given that participants were required to use smartphones in the study, it is not surprising that a large majority of them already used apps on a regular basis.

**Table 15. Types of information sources used at least one day per week, Houston.**

Types of Information Sources*	For Familiar Trips		For Unfamiliar Trips	
	Count	Percent	Count	Percent
Websites	491	54.3	433	47.8
Smartphone apps	670	74.0	579	64.0
Telephone numbers**	102	11.3	80	8.8
TV	326	36.0	177	19.6
Radio	479	52.9	273	30.2
Built-in GPS device	144	15.9	140	15.5
Portable GPS device	100	11.0	105	11.6
Other sources	31	3.4	30	3.3
<b>Total Baseline Participants</b>	<b>905</b>	<b>--</b>	<b>905</b>	<b>--</b>
* Participants could report using multiple sources.				
** Generalized question about telephone information use; may or may not include existing 511 services where applicable or other local services (e.g., a state or city toll-free information number).				

Table 16 summarizes participants’ baseline tendencies for behavioral change; specifically, participants were asked how often they made different kinds of changes to their travel plans based on traveler information that they used. Almost all participants change their routes or start their trips earlier at least some of the time, but fewer reported starting later or canceling their trips, and only a very small percentage reported switching to transit.

**Table 16. Types of travel behavior changes made “sometimes” or “frequently” due to traveler information, Houston.**

Types of Travel Changes*	For Familiar Trips		For Unfamiliar Trips	
	Count	Percent	Count	Percent
Start trip earlier	838	94.1	823	92.2
Start trip later	583	65.4	559	62.6
Make minor route changes	849	95.3	819	91.7
Change to toll road	741	83.2	730	81.7
Completely change route	695	78.0	683	76.5
Change to public transit	75	8.4	60	6.7
Cancel or postpone trip	335	37.6	360	40.3
Telecommute	177	19.9	96	10.8
<b>Total participants answering</b>	<b>891</b>	<b>--</b>	<b>893</b>	<b>--</b>
* Participants could report multiple changes; some participants skipped these questions because they “never” used traveler information.				

## EXIT SURVEY RESULTS

Table 17 through Table 20 summarize the results of the exit survey in Houston for all rounds of data collection. The total number of exit survey responses collected in each round in Houston are shown in Table 17.

**Table 17. Number of exit responses by round, Houston.**

<b>Data Collection Round</b>	<b>Count</b>	<b>Percent</b>
Round 1 (Spring 2015)	107	27.6
Round 2 (Summer 2015)	27	7.0
Round 3 (Fall 2015)	253	65.4
<b>Total Exit Participants</b>	<b>387</b>	<b>100</b>

Table 18 summarizes the proportion of participants assigned to each treatment group. As previously noted, prior to Phase 1 the study team assigned participants to treatment groups of approximately equal sizes. This distribution remained roughly equal through the end of the study.

**Table 18. Exit responses by treatment group, Houston.**

<b>Treatment Group</b>	<b>Count</b>	<b>Percent</b>
Web, Lexicon A	58	15.0
Web, Lexicon B	69	17.8
App, Lexicon A	67	17.3
App, Lexicon B	63	16.3
511, Lexicon A	64	16.5
511, Lexicon B	66	17.1
<b>Total Exit Participants</b>	<b>387</b>	<b>100</b>

Table 19 and Table 20 summarize some of the participant perceptions towards the TTR information that was provided to them during the study. Approximately two thirds of participants felt that it was clear and easy to understand, and a little more than half felt that it was reliable. Similarly, about a half of participants reported feeling satisfied with the information they were provided. As previously discussed, the exit survey measured participant perceptions of their activities, information use, and information satisfaction during Phase 2, rather than objectively observed behaviors or outcomes. The questions included attitudinal statements designed to measure participants’ satisfaction with various aspects of the TTR information, as shown in the tables below.

**Table 19. Travel time reliability information ratings (“somewhat agreed”, “agreed”, or “strongly agreed”), Houston.**

<b>TTR Ratings Statement*</b>	<b>Count</b>	<b>Percent</b>
The Transportation Study Resource was easy to understand	217	67.4
The Transportation Study Resource was reliable	181	56.2
Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	227	70.5
Overall, the Transportation Study Resource was useful	160	49.7
The Transportation Study Resource helped me reduce my travel time	77	23.9
The Transportation Study Resource helped me avoid congestion	101	31.4
The Transportation Study Resource reduced the stress of my trip	77	23.9
The Transportation Study Resource helped me plan my trips	124	38.5
<b>Total participants answering</b>	<b>322</b>	<b>--</b>
<i>* Participants could agree with multiple statements; some participants skipped these questions because they “never” used TTR information.</i>		

**Table 20. Travel time reliability lexicon satisfaction (“somewhat satisfied”, “satisfied”, or “very satisfied”), Houston.**

<b>TTR Lexicon Category*</b>	<b>Count</b>	<b>Percent</b>
Estimated/approximate travel time	174	54.0
Extra time/recommended cushion	159	49.4
Recommended/suggested departure time	157	48.8
Total travel time estimate for most/majority of the time	165	51.2
<b>Total participants answering</b>	<b>322</b>	<b>--</b>
<i>* Participants could agree with multiple statements; some participants skipped these questions because they “never” used TTR information.</i>		

## CHAPTER 7. NORTH COLUMBUS TRANSPORTATION STUDY

The following sections describe in detail the various recruiting rounds of study in Columbus.

### SITE DEPLOYMENT TIMELINE

As previously discussed, several rounds of data collection were conducted in Columbus (Rounds 1, 3 and 4). The following sections provide an overview of the timeline for the various rounds of subject recruitment and participation.

#### North Columbus, Round 1

Invitation postcards were mailed to potential participants in the Columbus study area on April 17, 2015. The baseline survey was opened on April 20. Qualifying participants were notified by email on May 4, invited to download the smartphone application, and given instructions for recording trips and completing trip diary questions. Phase 1 of the travel study began on May 6. On May 15, Phase 1 participants who had completed at least four recorded trips were invited to continue to Phase 2. Phase 2 concluded on June 8, and participants who had completed at least four trips during Phase 2 were invited on June 10 to take the exit survey. Incentives were distributed by email on June 24 to participants who had completed all steps of the study. Table 21 illustrates the timeline for Round 1 of the North Columbus Transportation Study.

**Table 21. Timeline of activities for Round 1 of the North Columbus Transportation Study.**

North Columbus (Ohio) Transportation Study	Weekly Timeline of Activities (Date)									
	April 2015			May 2015				June 2015		
Recruitment postcards mailed	17 <sup>th</sup>									
Potential participants begin taking baseline survey		20 <sup>th</sup>								
Participants assigned to treatment groups				4 <sup>th</sup>						
Phase 1 “Welcome” email sent				4 <sup>th</sup>						
Columbus Phase 1				6 <sup>th</sup>						
Phase 2 “Welcome” email sent					15 <sup>th</sup>					
Columbus Phase 2					15 <sup>th</sup>					
Exit survey invitation sent									10 <sup>th</sup>	
Exit survey reminder sent										21 <sup>st</sup>
Incentive distribution										24 <sup>th</sup>

### North Columbus, Rounds 3 & 4

Additional rounds of recruitment in Columbus were conducted during the fall of 2015 and spring of 2016, similar to the third round of data collection in Houston. These were the second and third rounds of data collection, but were conducted in parallel with and following Houston Round 3 (fall 2015 and winter 2016); therefore, they are nominally described as Rounds 3 and 4 for Columbus as well. The same study corridor (I-71) was used because no alternatives were identified where travel time data could be readily available and quickly processed for dissemination in the study.

Round 3 recruitment efforts began in September 2015, and participants were invited to the baseline survey beginning September 29. Following baseline completion, participants were invited to Phase 1 in weekly batches (similar to the North Houston). Again, batching participants was more efficient for administration purposes and moving participants promptly into the study, while still allowing recruitment to continue. Table 22 illustrates the timeline for Round 3 of data collection in Columbus.

**Table 22. Timeline of activities for Round 3 of the North Columbus Transportation Study.**

North Columbus (Ohio) Transportation Study	Weekly Timeline of Activities ( <i>Date</i> )								
	September 2015		October 2015				November 2015		
Outreach recruitment & Prescreening	21 <sup>st</sup>								
Baseline survey		28 <sup>th</sup>							
North Columbus Round 3 Phase 1				12 <sup>th</sup>					
North Columbus Round 3 Phase 2						26 <sup>th</sup>			
Exit survey								16 <sup>th</sup>	
Incentive distribution									30 <sup>th</sup>



A final round of recruitment (including an increased incentive offering) was conducted in North Columbus due to low response to Columbus Round 3. Round 4 recruitment efforts began in January 2016, and participants were invited to the baseline survey beginning February 4. Table 23 illustrates the timeline for Round 4 of data collection in Columbus.

**Table 23. Timeline of activities for Round 4 of the North Columbus Transportation Study.**

North Columbus (Ohio) Transportation Study	Weekly Timeline of Activities ( <i>Date</i> )									
	February 2016				March 2016			April 2016		
Outreach recruitment & prescreening	1 <sup>st</sup>									
Baseline survey	4 <sup>th</sup>									
North Columbus Round 4 Phase 1		9 <sup>th</sup>								
North Columbus Round 4 Phase 2					3 <sup>rd</sup>					
Exit survey						10 <sup>th</sup>				
Incentive distribution									3 <sup>rd</sup>	

## PARTICIPANT SELECTION AND ASSIGNMENT

The following sections provide a summary of the participation recruitment, selection, and assignment for the Columbus study.

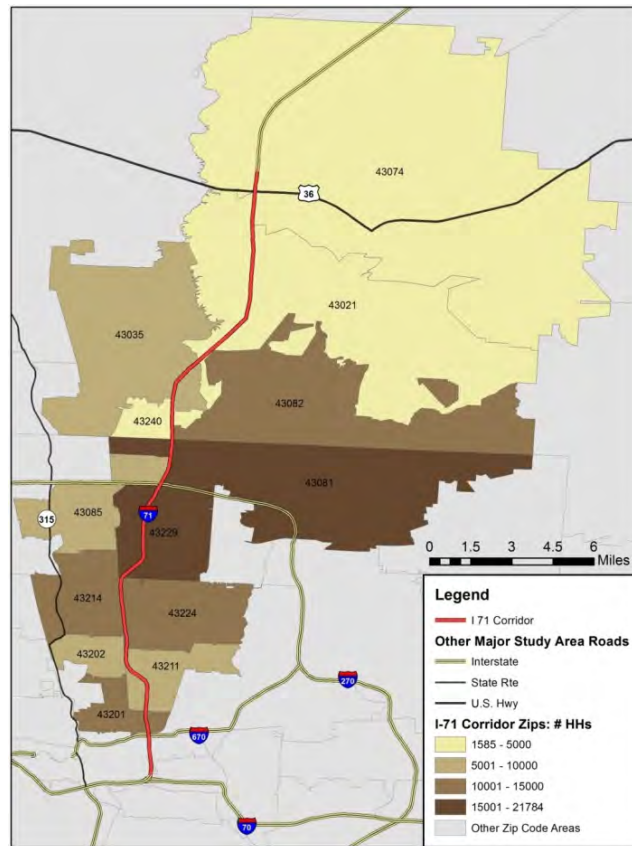
### North Columbus, Round 1

For Columbus, the study area was defined as the I-71 freeway between U.S. 36 (north of Columbus) and I-70 (in downtown Columbus). As shown in the map and table on the following pages, the geographic sample frame included thirteen zip code areas adjacent to I-71 between (and just north of) U.S. 36 and I-670. Zip codes south of I-670 were not included because it was assumed residents closer to downtown were less likely to regularly drive on a significant portion of the freeway, particularly in the direction with the most frequent congestion (inbound towards downtown in the morning, outbound away from downtown in the evening).

A sample of 23,900 addresses (approximately 18 percent of the addresses in the selected area) was randomly selected, proportional to the population across the entire area. As previously discussed, this quantity of invitations was planned based on initial predictions about response rates and retention rates throughout the study. The sample included all types of residential mailing addresses (single-family houses, apartments, post office boxes, etc.), but excluded “seasonal” and “vacant” addresses. A list of the zip codes used for the invitations is provided in Table 24, while a map illustrating the locations of these zip codes in the region is shown in Figure 26. Recruitment materials used for the North Columbus region are included in Appendix Q.

**Table 24. Columbus sample zip codes.**

<b>Zip Code</b>	<b>Estimated Number of Households</b>	<b>Percent</b>
43240	1,585	1.2
43021	3,371	2.5
43074	4,690	3.5
43211	8,037	5.9
43035	8,489	6.3
43202	9,263	6.8
43085	9,323	6.9
43082	10,837	8.0
43201	11,883	8.8
43214	12,214	9.0
43224	14,838	11.0
43229	19,091	14.1
43081	21,784	16.1
<b>Total</b>	<b>135,405</b>	<b>100</b>



**Figure 26. Map. Columbus sample zip codes geography.**

### North Columbus, Round 3

Additional rounds of recruitment were conducted in Columbus, using the same study corridor (I-71), to obtain additional participants for the overall study. The second round of data collection was conducted during “Round 3” (with a timeline parallel to Round 3 in Houston). Similar to Houston Round 3, Columbus Round 3 participants were recruited through a variety of outreach methods including newspaper articles, local television news spots, and recruiting with local businesses. For an incentive, Columbus Round 3 participants were entered into a drawing for one of several iPads. This incentive structure was used to manage costs and avoid limitations to additional recruitment based on incentive-funding constraints.

### North Columbus, Round 4

The final round of recruitment in Columbus occurred shortly after Round 3 concluded. For this round, advertisements were placed in various electronic newsletters distributed to students and staff at the Ohio State University (OSU), which is located within the study corridor. In addition, notices were placed on selected OSU websites (e.g., Off-Campus and Commuter Student Services). Columbus Round 4 participants were offered \$100 as an incentive (similar to Houston Round 3), because it was determined that the prize drawing offered for Columbus Round 3 was not effective in encouraging enrollment and participation in the study.

## BASELINE SURVEY RESULTS

Table 25 through Table 29 summarize the results of the baseline survey for the Columbus area for all rounds of data collection. Note that all tables include only valid responses, and do not include any responses from participants who were screened out due to infrequent corridor use or lack of a smartphone. Some tables include fewer than 100 percent of qualified participants if the question was skipped by certain participants (for example, participants who reported “never” using the Travel Time Reliability [TTR] information resources in Phase 2 skipped questions about TTR information ratings and satisfaction and instead were asked why they did not use the information). The total number of baseline responses provided in each round in Columbus are shown in Table 25.

**Table 25. Number of baseline completions by round, Columbus.**

<b>Data Collection Round</b>	<b>Count</b>	<b>Percent</b>
Round 1 (Spring 2015)	621	76.9
Round 3 (Fall 2015)	70	8.7
Round 4 (Winter 2016)	117	14.5
<b>Total Baseline Participants</b>	<b>808</b>	<b>100</b>

Table 26 summarizes how often Columbus participants traveled on the main highway in the study area. Approximately two-thirds traveled on the highway daily. No participants who qualified and completed the baseline traveled on the highway less than three weekdays per week, because those who did travel infrequently were screened out of the survey.

**Table 26. Number of weekdays typically driven on primary freeway (I-71) in study area, Columbus.**

<b>Number of weekdays typically driven on primary freeway in study area*</b>	<b>Count</b>	<b>Percent</b>
5 weekdays/week	526	65.1
4 weekdays/week	101	12.5
3 weekdays/week	181	22.4
<b>Total Baseline Participants</b>	<b>808</b>	<b>100</b>
<i>* Participants who traveled less than 3 days/week on the primary freeway were not qualified.</i>		

Similar to the Houston panel, the majority of Columbus participants were between 25 and 55 years old, though the Columbus panel was slightly more dispersed across age groups (see Table 27).

**Table 27. Respondent age, Columbus.**

<b>Respondent Age</b>	<b>Count</b>	<b>Percent</b>
18-24	73	9.0
25-34	219	27.1
35-44	229	28.3
45-54	144	17.8
55-64	115	14.2
65-74	27	3.3
75-84	1	0.1
85 or older	0	0.0
<b>Total Baseline Participants</b>	<b>808</b>	<b>100</b>

Table 28 and Table 29 summarize what kinds of traveler information participants used prior to the study, as well as how they changed their travel behavior. Compared to Houston, fewer participants in Columbus typically use any type of information. Again, smartphone apps were most common, but radio was almost as common for Columbus participants' familiar trips.

**Table 28. Types of information sources used at least one day per week, Columbus.**

Types of Information Sources*	For Familiar Trips		For Unfamiliar Trips	
	Count	Percent	Count	Percent
Websites	247	30.6	271	33.5
Smartphone apps	460	56.9	430	53.2
Telephone numbers**	48	5.9	48	5.9
TV	249	30.8	133	16.5
Radio	428	53.0	212	26.2
Built-in GPS device	51	6.3	57	7.1
Portable GPS device	70	8.7	105	13.0
Other sources	15	1.9	17	2.1
<b>Total Baseline Participants</b>	<b>808</b>	<b>--</b>	<b>808</b>	<b>--</b>
* Participants could report using multiple sources.				
** Generalized question about telephone information use; may or may not include existing 511 services where applicable or other local services (e.g., a state or city toll-free information number).				

As shown in Table 29, Columbus participants were less likely to make significant changes such as canceling their trips or completely changing their routes, but were still fairly likely to start their trip earlier or make small route adjustments.

**Table 29. Types of travel behavior changes made “sometimes” or “frequently” due to traveler information, Columbus.**

Types of Travel Changes*	For Familiar Trips		For Unfamiliar Trips	
	Count	Percent	Count	Percent
Start trip earlier	514	66.3	482	62.8
Start trip later	193	24.9	173	22.6
Make minor route changes	559	72.1	426	55.5
Change to toll road	20	2.6	25	3.3
Completely change route	256	33.0	237	30.9
Change to public transit	19	2.5	17	2.2
Cancel or postpone trip	46	5.9	75	9.8
Telecommute	48	6.2	31	4.0
<b>Total participants answering</b>	<b>775</b>	<b>--</b>	<b>767</b>	<b>--</b>
<i>* Participants could report multiple changes; some participants skipped these questions because they “never” used traveler information.</i>				

## EXIT SURVEY RESULTS

Table 30 through Table 33 summarize the results of the exit survey in Columbus for all rounds of data collection. The total number of exit survey responses collected in each round are shown in Table 30.

**Table 30. Number of exit responses by round, Columbus.**

Data Collection Round	Count	Percent
Round 1 (Spring 2015)	125	45.6
Round 3 (Fall 2015)	55	20.1
Round 4 (Winter 2016)	94	34.3
<b>Total Exit Participants</b>	<b>274</b>	<b>100</b>

As with Houston, the distribution of participants across treatment groups remained roughly even through the end of the study (see Table 31).

**Table 31. Exit responses by treatment group, Columbus.**

<b>Treatment Group</b>	<b>Count</b>	<b>Percent</b>
Web, Lexicon A	44	16.1
Web, Lexicon B	49	17.9
App, Lexicon A	50	18.2
App, Lexicon B	42	15.3
511, Lexicon A	51	18.6
511, Lexicon B	38	13.9
<b>Total Exit Participants</b>	<b>274</b>	<b>100</b>

More than two thirds of Columbus participants rated the TTR information sources as clear and reliable (see Table 32). Also, compared to Houston, it appears that Columbus participants had slightly higher satisfaction with the TTR information resource (see Table 33). As previously discussed, the exit survey measured participant perceptions of their activities, information use, and information satisfaction during Phase 2, rather than objectively observed behaviors or outcomes. The questions included attitudinal statements designed to measure participants' satisfaction with various aspects of the TTR information, as shown in the tables below.

**Table 32. Travel time reliability information ratings (“somewhat agreed”, “agreed”, or “strongly agreed”), Columbus.**

<b>TTR Ratings Statement*</b>	<b>Count</b>	<b>Percent</b>
The Transportation Study Resource was easy to understand	188	78.7
The Transportation Study Resource was reliable	161	67.4
Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	171	71.5
Overall, the Transportation Study Resource was useful	118	49.4
The Transportation Study Resource helped me reduce my travel time	49	20.5
The Transportation Study Resource helped me avoid congestion	63	26.4
The Transportation Study Resource reduced the stress of my trip	57	23.8
The Transportation Study Resource helped me plan my trips	82	34.3
<b>Total participants answering</b>	<b>239</b>	<b>--</b>
<i>* Participants could agree with multiple statements; some participants skipped these questions because they “never” used TTR information.</i>		

**Table 33. Travel time reliability lexicon satisfaction (“somewhat satisfied”, “satisfied”, or “very satisfied”), Columbus.**

<b>TTR Lexicon Category*</b>	<b>Count</b>	<b>Percent</b>
Estimated/ approximate travel time	169	70.7
Extra time/ recommended cushion	129	54.0
Recommended/ suggested departure time	115	48.1
Total travel time estimate for most/majority of the time	160	66.9
<b>Total participants answering</b>	<b>239</b>	<b>--</b>
<i>* Participants could agree with multiple statements; some participants skipped these questions because they “never” used TTR information.</i>		



## CHAPTER 8. TRIANGLE TRANSPORTATION STUDY

As opposed to the other locations, a single round of data collection was conducted in the Triangle study area. Subsequent rounds in Houston and Columbus were conducted using direct outreach through local contacts of the study team. Given that no members of the study team had local contacts in the Triangle area, it was determined that similar outreach would be costly and less efficient.

### SITE DEPLOYMENT TIMELINE

Invitation postcards were mailed to potential participants in the Triangle study area on May 15, 2015. The baseline survey was opened on May 18. Qualifying participants were notified by email on June 1, invited to download the smartphone application, and given instructions for recording trips and completing trip diary questions. Phase 1 of the travel study began on June 3. On June 18, Phase 1 participants who had completed at least four recorded trips were invited to continue to Phase 2. Phase 2 concluded on July 6, and participants who had completed at least four trips during Phase 2 were invited on July 7 to take the exit survey. Incentives were distributed by email on July 20 to participants who had completed all steps of the study. Table 34 illustrates the timeline for the Triangle Transportation Study.

**Table 34. Timeline of activities for the Triangle Transportation Study.**

Triangle (North Carolina) Transportation Study	Weekly Timeline of Activities ( <i>Date</i> )									
	May 2015		June 2015				July 2015			
Recruitment postcards mailed	15 <sup>th</sup>									
Potential participants begin taking baseline survey		18 <sup>th</sup>								
Participants assigned to treatment groups			1 <sup>st</sup>							
Phase 1 “Welcome” Email Sent			1 <sup>st</sup>							
Triangle Phase 1				3 <sup>rd</sup>						
Phase 2 “Welcome” Email Sent						18 <sup>th</sup>				
Triangle Phase 2						18 <sup>th</sup>				
Exit survey invitation sent								7 <sup>th</sup>		
Exit survey reminder sent									11 <sup>th</sup>	
Incentive distribution										20 <sup>th</sup>

### PARTICIPANT SELECTION AND ASSIGNMENT

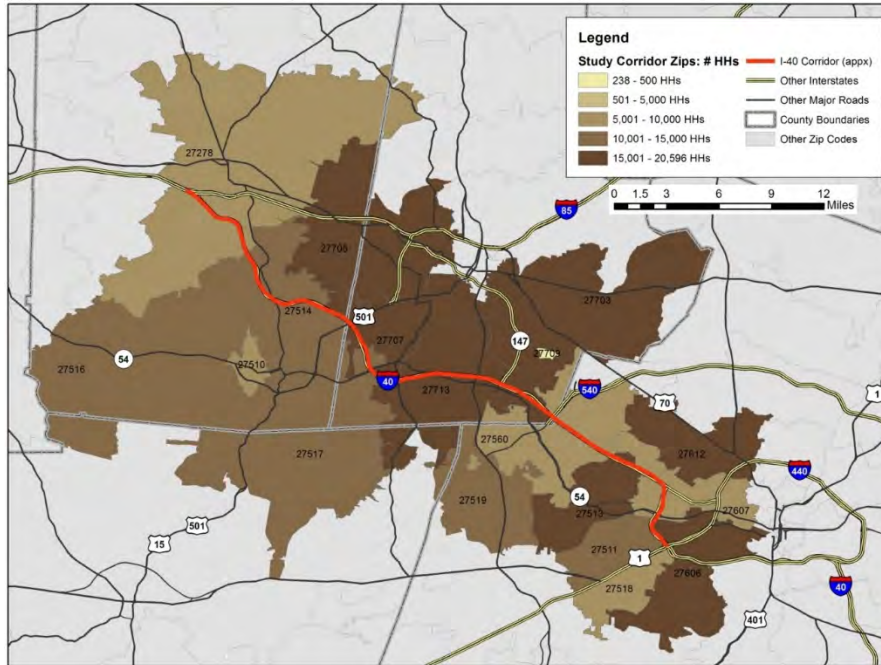
For the Triangle region, the study area was defined as the I-40 freeway between U.S. 1 (just west of Raleigh) and just past U.S. 501 (between Durham and Chapel Hill). As shown in the map and

table on the following pages, the geographic sample frame included eighteen zip code areas adjacent to I-40 in this area. Unlike the Houston and Columbus study areas, where it was assumed the central city was the largest attractor of regular trips, it was assumed that in the Triangle study area, there were multiple large attractors (Chapel Hill, Durham, Raleigh, and the Research Triangle Park in between) and therefore significant traffic volumes in both directions. However, the geographic sample area selection (based on proximity to the freeway) was consistent with the approach in Houston and Columbus, because there was no known data to indicate whether one attractor was stronger than the others.

Originally, the study team planned to invite a sample of 19,900 addresses to the study (approximately 9 percent of the addresses in the selected area). As previously discussed, this quantity of invitations was planned based on initial predictions about response rates and retention rates throughout the study. However, after reviewing the response from the Houston and Columbus areas in Round 1, the team increased the sample size. Based on revised response rate expectations and available resources, the Triangle address sample was increased to 28,000 (approximately 12 percent of the area population). As with the previous samples, these addresses were randomly selected proportional to the population across the entire area. The sample included all types of residential mailing addresses (single-family houses, apartments, post office boxes, etc.), but excluded “seasonal” and “vacant” addresses. A list of the zip codes used for the invitations is provided in Table 35, while a map illustrating the locations of these zip codes in the region is shown in Figure 27.

**Table 35. Triangle sample zip codes.**

<b>Zip Code</b>	<b>Estimated Number of Households</b>	<b>Percent</b>
27709	238	0.1
27510	7,082	3.1
27518	7,659	3.4
27607	8,086	3.6
27278	9,310	4.1
27560	9,331	4.1
27517	10,540	4.7
27514	10,616	4.7
27511	12,719	5.7
27519	12,967	5.8
27516	13,420	6.0
27703	15,875	7.1
27513	15,902	7.1
27612	16,153	7.2
27606	17,035	7.6
27705	18,429	8.2
27707	19,120	8.5
27713	20,596	9.2
<b>Total</b>	<b>225,078</b>	<b>100</b>



**Figure 27. Map. Triangle sample zip codes geography.**

## **BASELINE SURVEY RESULTS**

Table 36 through Table 39 summarize the results of the baseline survey for the Triangle area. Note that all tables include only valid responses, and do not include any responses from participants who were screened out due to infrequent corridor use or lack of a smartphone. Some tables include fewer than 100 percent of qualified participants if the question was skipped by certain participants (for example, participants who reported “never” using the Travel Time Reliability [TTR] information resources in Phase 2 skipped questions about TTR information ratings and satisfaction and instead were asked why they did not use the information).

There was only one round of data collection in the Triangle study area, resulting in 634 complete baseline responses.

Table 36 summarizes how often participants traveled on the main highway in the study area. Compared to Houston and Columbus, Triangle participants traveled on the highway somewhat less frequently. As with Columbus and Houston, participants in the Triangle area were required to travel on the highway at least three times per week to qualify for the study.

**Table 36. Number of weekdays typically driven on primary freeway (I-40) in study area, Triangle.**

<b>Number of Weekdays Typically Driven on Primary Freeway in Study Area*</b>	<b>Count</b>	<b>Percent</b>
5 weekdays/week	359	56.6
4 weekdays/week	111	17.5
3 weekdays/week	164	25.9
<b>Total Baseline Participants</b>	<b>634</b>	<b>100</b>
<i>* Participants who traveled less than 3 days/week on the primary freeway were not qualified.</i>		

The Triangle panel age distribution is shown in Table 37. As in the other study areas, the majority of participants were 25 and 55 years old.

**Table 37. Respondent age, Triangle.**

<b>Respondent Age</b>	<b>Count</b>	<b>Percent</b>
18-24	42	6.6
25-34	199	31.4
35-44	139	21.9
45-54	121	19.1
55-64	105	16.6
65-74	26	4.1
75-84	2	0.3
85 or older	0	0.0
<b>Total Baseline Participants</b>	<b>634</b>	<b>100</b>

Triangle participants' baseline information also tended to favor smartphone apps (see Table 38).

**Table 38. Types of information sources used at least one day per week, Triangle.**

Types of Information Sources*	For Familiar Trips		For Unfamiliar Trips	
	Count	Percent	Count	Percent
Websites	245	38.6	244	38.5
Smartphone apps	378	59.6	360	56.8
Telephone numbers**	46	7.3	32	5.0
TV	136	21.5	60	9.5
Radio	199	31.4	98	15.5
Built-in GPS device	79	12.5	90	14.2
Portable GPS device	86	13.6	94	14.8
Other sources	17	2.7	11	1.7
<b>Total participants answering</b>	<b>634</b>	<b>--</b>	<b>634</b>	<b>--</b>
* Participants could report using multiple sources.				
** Generalized question about telephone information use; may or may not include existing 511 services where applicable or other local services (e.g., a state or city toll-free information number).				

Similar to Columbus, Triangle participants were much more likely to make minor changes (leaving earlier, minor route adjustments) than any other type of change (see Table 39).

**Table 39. Types of travel behavior changes made “sometimes” or “frequently” due to traveler information, Triangle.**

Types of Travel Changes*	For Familiar Trips		For Unfamiliar Trips	
	Count	Percent	Count	Percent
Start trip earlier	375	62.3	361	58.5
Start trip later	174	28.9	152	24.6
Make minor route changes	423	70.3	347	56.2
Change to toll road	123	20.4	114	18.5
Completely change route	181	30.1	193	31.3
Change to public transit	18	3.0	12	1.9
Cancel or postpone trip	36	6.0	52	8.4
Telecommute	45	7.5	28	4.5
<b>Total participants answering</b>	<b>602</b>	<b>100</b>	<b>617</b>	<b>100</b>
* Participants could report multiple changes; some participants skipped these questions because they “never” used traveler information.				

## EXIT SURVEY RESULTS

Table 40 through Table 42 summarize the results of the exit survey in the Triangle study. As shown in Table 40, 111 participants completed the Triangle exit survey.

**Table 40. Exit responses by treatment group, Triangle.**

Treatment Group	Count	Percent
Web, Lexicon A	22	19.8
Web, Lexicon B	24	21.6
App, Lexicon A	13	11.7
App, Lexicon B	20	18.0
511, Lexicon A	18	16.2
511, Lexicon B	14	12.6
<b>Total Exit Participants</b>	<b>111</b>	<b>100</b>

As shown in Table 41, the majority of participants thought their study resource was easy to understand and reliable, but that it did not help reduce the amount of travel time they plan for their trips. Similar to the Columbus panel, Triangle participants (see Table 42) appeared to be slightly more satisfied with the TTR information they were provided (as compared to Houston participants). As previously discussed, the exit survey measured participant perceptions of their activities, information use and information satisfaction during Phase 2, rather than objectively observed behaviors or outcomes. The questions included attitudinal statements designed to measure participants' satisfaction with various aspects of the TTR information, as shown in the tables below.

**Table 41. Travel time reliability information ratings (“somewhat agreed”, “agreed”, or “strongly agreed”), Triangle.**

TTR Ratings Statement*	Count	Percent
The Transportation Study Resource was easy to understand	59	67.8
The Transportation Study Resource was reliable	51	58.6
Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	64	73.6
Overall, the Transportation Study Resource was useful	37	42.5
The Transportation Study Resource helped me reduce my travel time	13	14.9
The Transportation Study Resource helped me avoid congestion	19	21.8
The Transportation Study Resource reduced the stress of my trip	16	18.4
The Transportation Study Resource helped me plan my trips	26	30.0
<b>Total participants answering</b>	<b>87</b>	<b>--</b>
<i>* Participants could agree with multiple statements; some participants skipped these questions because they “never” used TTR information.</i>		

**Table 42. Travel time reliability lexicon satisfaction (“somewhat satisfied”, “satisfied”, or “very satisfied”), Triangle.**

<b>TTR Lexicon Category*</b>	<b>Count</b>	<b>Percent</b>
Estimated/ approximate travel time	49	56.3
Extra time/ recommended cushion	40	46.0
Recommended/ suggested departure time	33	37.9
Total travel time estimate for most/ majority of the time	45	51.7
<b>Total participants answering</b>	<b>87</b>	<b>--</b>
<i>* Participants could agree with multiple statements; some participants skipped these questions because they “never” used TTR information.</i>		





## CHAPTER 9. DATA ANALYSIS

The aggregate information for the baseline survey, Phase 2 trip diary, and exit survey data were utilized to perform the analysis for determining if Travel Time Reliability (TTR) information dissemination Lexicon (A or B) or channel (511, Web, App) generated a significant impact on the utility or satisfaction of trip planning and execution. The baseline survey data results were analyzed to assess any preexisting differences between treatment groups. The exit survey data were analyzed using logistic regression or ordinal logistic regression to establish the response probabilities associated with TTR information dissemination channel and Lexicon as a function of demographic and travel characteristic data. Separate statistical models were fit to the study survey questions using SAS<sup>®</sup> 9.3.

### BASELINE SURVEY ANALYSIS

Baseline survey data first were analyzed to establish whether the assignment of the treatment groups (dissemination method and Lexicon assembly) resulted in similar distribution patterns among key demographic and self-reported travel characteristics. This is important to assess because an association between demographic or travel characteristics and treatment group at the study start could produce subsequent results that are influenced by this initial relationship. For instance, if one dissemination method group was systematically older than the other groups, subsequent study outcomes that are found to be associated with the dissemination method might instead be attributable to this additional factor of age that had more impact in one group than another.

To assess the risk of this concern, statistical Chi-square tests of association were conducted to test whether treatment groups were associated with key demographic and travel information. Table 43 summarizes the Chi-square test results, showing the test details of degrees of freedom and the test statistic, as well as the P-value for the test. Test P-Values reflect the probability of how unusual the observed association between assigned treatment group and demographic group is compared to an ideal case of no association. P-values less than 0.05 reflect less than a 1 in 20 chance that the observed association occurred simply by chance and are used to identify a threshold for what will be referred to as a statistically significant outcome.

There were no statistically significant associations between treatment group and demographic and travel characteristics variables. Absent evidence of these significant associations, subsequent differences between the treatment groups will be interpreted to be associated with the testing and not possibly reflective of an *a priori* bias in the panel composition.

**Table 43. Summary of Chi-square test results for association between panel characteristics and assigned treatment group.**

Test Cases	DF	Value	P-Value
TreatmentGroup * Age	15	8.45	0.90
TreatmentGroup * Employment	5	7.62	0.18
TreatmentGroup * Gender	5	0.03	1.00
TreatmentGroup * Income	10	9.92	0.45
TreatmentGroup * Frequency of checking App for info	10	17.76	0.07
TreatmentGroup * Frequency of checking Web for info	10	15.22	0.12
TreatmentGroup * Frequency of checking 511 for info	10	7.35	0.69
TreatmentGroup * Frequency of departure earlier due to travel info	20	30.80	0.06

## EXIT SURVEY ANALYSIS

### Data Processing

The Exit Survey dataset includes in a total of 772 participants, with 734 (95 percent) of them completing at least four Phase 2 trips. An additional 28 participants completed between one and three Phase 2 trips, and ten participants did not complete any Phase 2 trips (these ten participants were mistakenly invited to take the Exit Survey due to a processing error in Houston Round 2). The participants who did not complete any Phase 2 trips were excluded from the modelling dataset because they would not have been able to answer questions from the perspective of their assigned Phase 2 information channel. It was desired that participants complete at least four Phase 2 trips, but the 28 that completed between one and three Phase 2 trips were retained in the results.

Table 44 shows the distribution of exit surveys by study site.

**Table 44. Distribution of exit survey completions by study site.**

Number of Phase 2 Trips	West Houston (Texas)	North Houston (Texas)	North Columbus (Ohio)	Triangle (North Carolina)	Total
4 or more	103	253	270	108	734
1-3	21	0	4	3	28
0	10	0	0	0	10
<b>Total</b>	<b>134</b>	<b>253</b>	<b>270</b>	<b>111</b>	<b>772</b>

The analysis of exit survey data focused primarily on four types of questions: information usage, behavior change, traveler opinion, and traveler satisfaction. Logistic regression models were developed to investigate the impact of Lexicon and information channels (i.e., App, website, 511) on travelers' responses. In addition, some exogenous factors were believed to be related to

the outcome of interest; therefore, the impact of these variables needed to be accounted for through the modelling process. These exogenous factors included demographic information and trip-related characteristics, and they were directly obtained or calculated from baseline surveys and Global Positioning System (GPS) trip datasets. Table 45 lists all independent variables that were included in the modelling process. Note that some of the category variables were collapsed into larger groups to address the unbalanced group issue in the raw data (e.g., the income variable was collapsed from 10 to 3 classifications for analysis).

**Table 45. Independent variables for exit survey data modelling.**

<b>Variable</b>	<b>Description</b>	<b>Type</b>	<b>Source</b>
Treatment_Assembly	Lexicon assembly for participant treatment group: A or B	Category	Exit Survey
Treatment_Mode	Information access mode for participant treatment group: App, Web, or 511	Category	Exit Survey
Location	Study location participant traveled on and reported on during the study: Houston, Columbus, or Triangle	Category	Exit Survey
Gender	Male or female	Category	Baseline Survey
Education	Education level: Less than college, college degree, higher than college	Category	Baseline Survey
Income	Income level: Under \$50,000, \$50,000-\$99,999, or \$100,000+	Category	Baseline Survey
Age	Age group: Under 25, 25-44, 45-64, or 65+	Category	Baseline Survey
Employment	Employment status: Full time employed, or Others	Category	Baseline Survey
Average_Distance	Average trip distance for all trips the participant completed during the study period	Continuous	GPS Trip
Peak_Hour	Percentage of peak hour trips (7 AM-10 AM, 4 PM-7 PM) among all trips the participant completed during the study period	Continuous	GPS Trip
Weekday	Percentage of weekday trips among all trips the participant completed during the study period	Continuous	GPS Trip
Phase2_Count	Number of Phase 2 trips the participant completed	Continuous	GPS Trip

## Statistical Analysis Methods

Throughout the subsequent analysis section, statistical results will be presented. The first result is a descriptive bar graph panel for each survey question that shows the frequency of participants responding to each question option within each of the Lexicon assembly and delivery methods examined.

The survey response data were subsequently fit to logistic or ordinal logistic regression models using the SAS<sup>®</sup> LOGISTIC procedure. Responses were collectively grouped into either an affirmative or negative category as described below within each section, or into a set of ordinal ranking groups (e.g., Strongly Disagree, Disagree, and Somewhat Disagree as one category; Neutral as a second category; and Somewhat Agree, Agree, and Strongly Agree as a third category). Each model was fit with fixed effects for the Lexicon assembly and delivery method and additional covariate fixed effects for the primarily categorical demographic and travel characteristic fields as documented in Table 45. The detailed model fits for each question are provided in Appendix T (Table 46 through Table 62).

From the statistical model fits, odds ratios and their corresponding 95<sup>th</sup> percent confidence intervals were calculated to compare the responses by TTR information delivery method and Lexicon group. An odds ratio from a logistic regression model provides the relative odds of a positive response for one category compared to another. For instance, if 60 percent of participants of one group select a positive survey response, the odds of that response are  $0.6/0.4=1.5$ . If the comparator group selects the positive response 40 percent of the time, their odds are  $0.4/0.6=0.67$ . The odds ratio is the ratio of these two odds, or  $1.5/0.67=2.25$ . In this example, the 60 percent vs. 40 percent represents 2.25 times the odds in the first group compared to the reference. Odds ratios greater than one indicate higher probability of being in the positive response group and odds ratios less than one indicate the opposite. If the 95<sup>th</sup> percent confidence interval is entirely above one (i.e., the lower bound of the interval is above one), it provides strong evidence that the treatment group probability is greater than that of the reference. Strong evidence means no more than 1 chance in 20 the observed outcome could have occurred just by chance if the reference group probability was truly equal to the treatment group. Odds ratios from the ordinal logistic regression models have a similar interpretation except that they are extended to represent the odds of being in any higher ordinal group compared to the one below (e.g., Agree vs. Neutral and Neutral vs. Disagree).

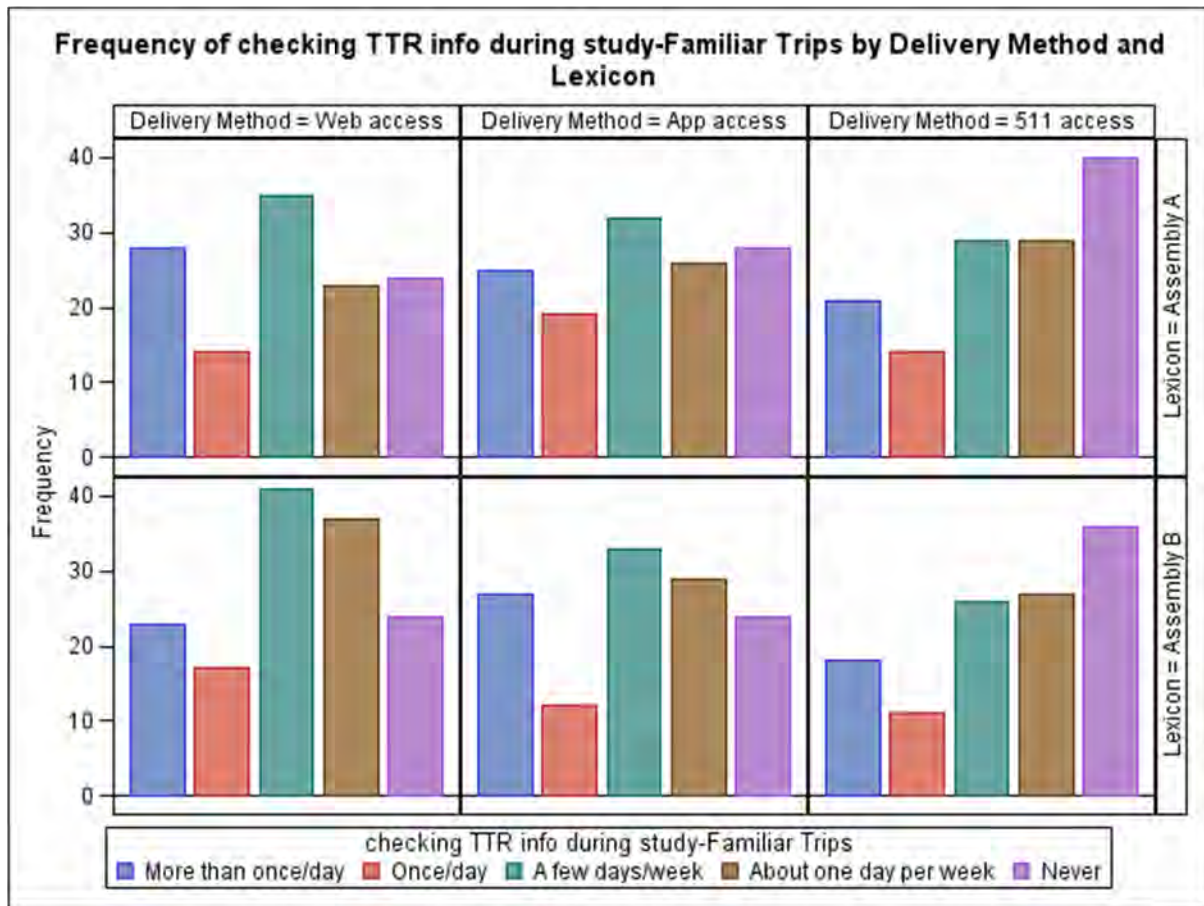
Odds ratio results are provided in a graph for each question. Separate estimates are shown for the odds ratio comparisons of positive responses of 511 participants compared to those that used the mobile phone App, 511 participants compared to those that used the website, and mobile App access versus website access; and then for those participants that obtained their travel reliability information with Lexicon A compared to those who received it with Lexicon B.

## Model Results – Information Usage

In the exit survey, participants were asked how often they checked the Transportation Study Resource for traveler information when planning familiar or unfamiliar trips on the study corridor. They were requested to select one of five frequency levels: More than once/day,

Once/day, A few days/week, About one day per week, or Never. This section presents the analysis results for information usage regarding familiar trips and unfamiliar trips, respectively.

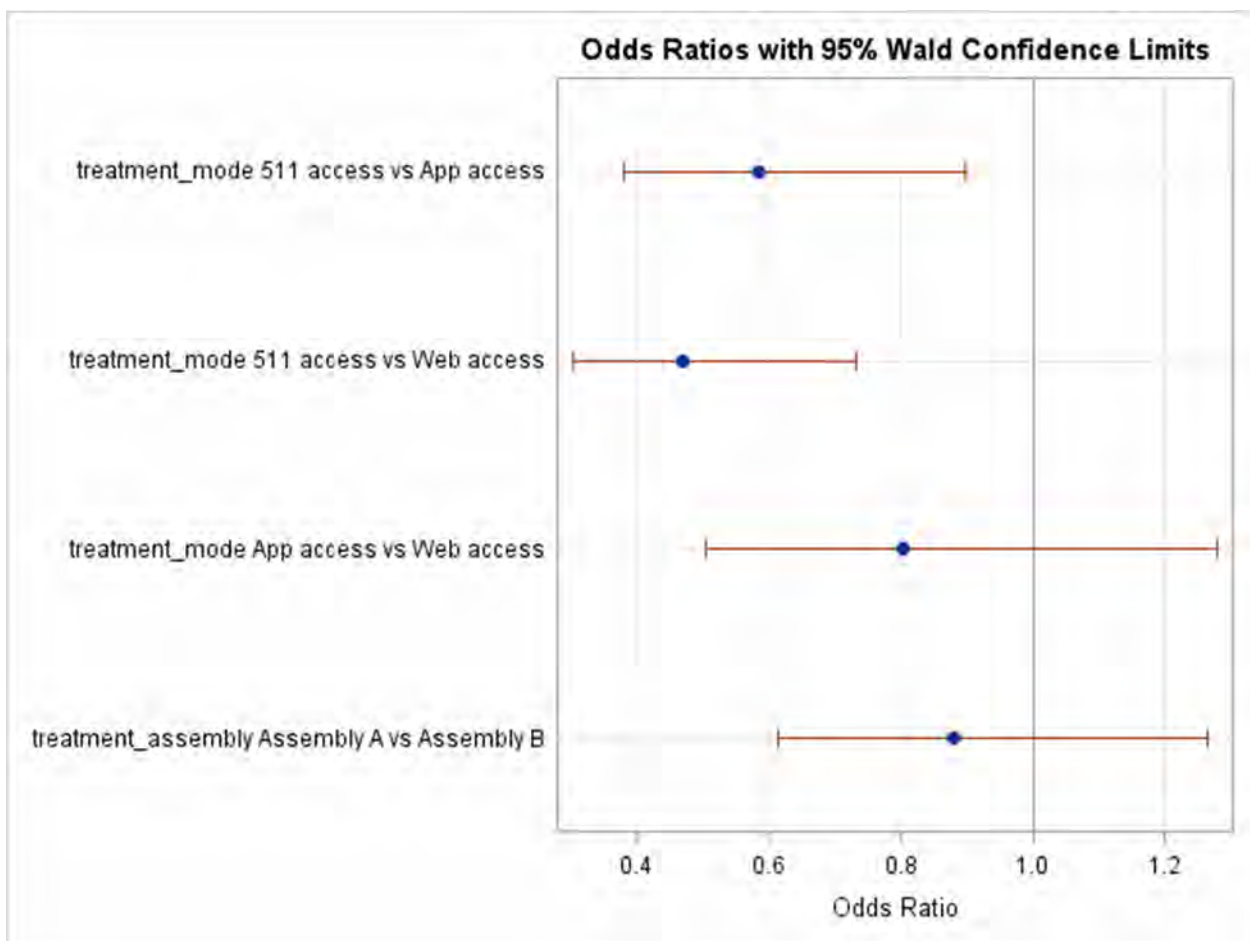
Figure 28 presents the frequency of participants' responses on planning familiar trips by delivery method and Lexicon. No obvious differences by Lexicon were observed among participants with the same information channel. However, it appears that participants who were pre-assigned to 511 access were less likely to use the Transportation Study Resources, compared with App access and Web access participants.



**Figure 28. Chart. Frequency of checking the transportation study resources for familiar trips.**

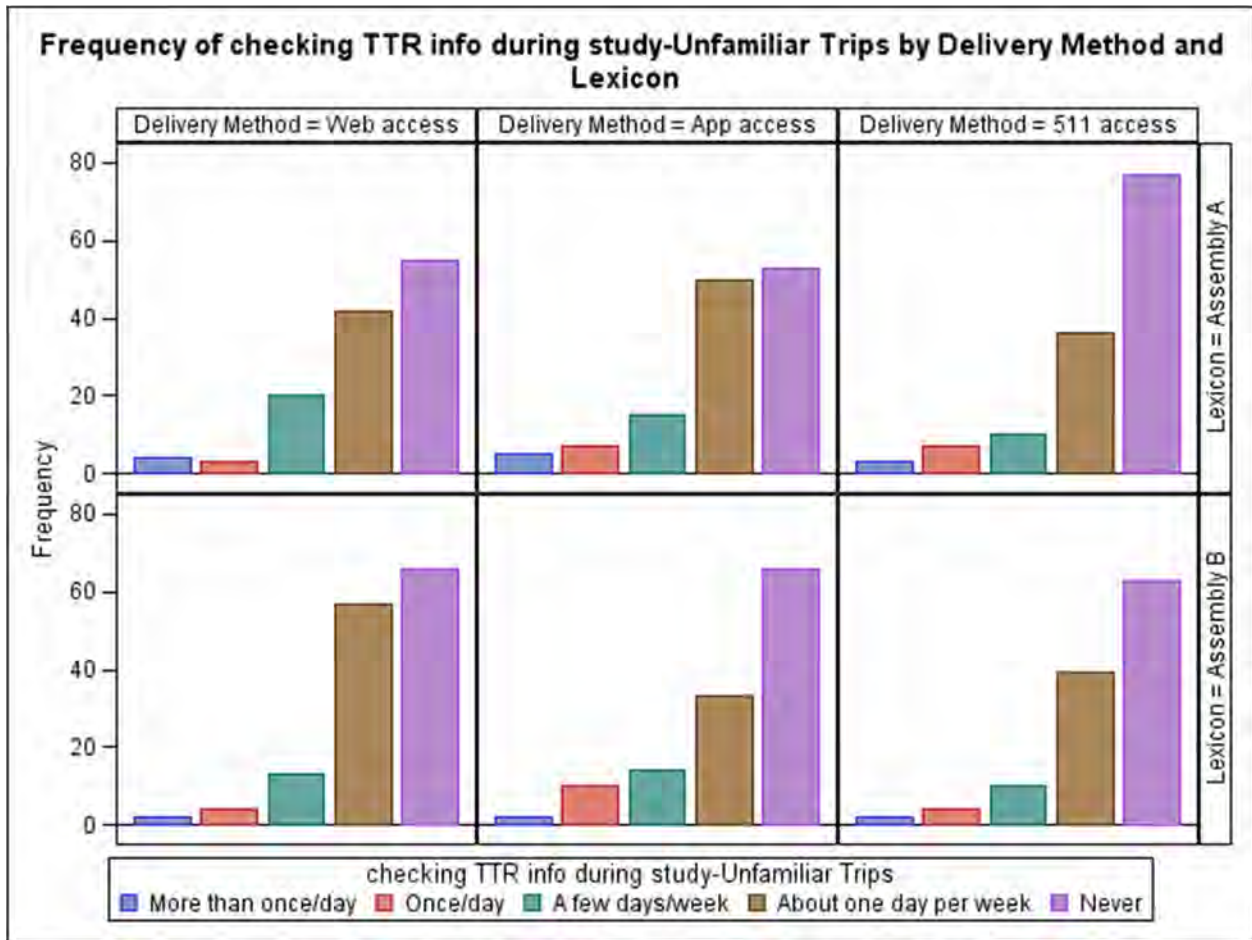
A binary logistic model was fit to test whether travelers' usage of the Transportation Study Resources correlated with the pre-assigned Lexicon and information channel. Participants' responses were aggregated into two larger groups: Never checked the resources, and Checked the resources at least one time. Table 46 shows the detailed model results, which found that Location (Columbus compared to Triangle), and Employment (Full-time vs other) were covariates linked to significantly greater probability of a positive response.

The odds ratios for Lexicons and information channels were estimated in the logistic regression model. The odds ratios quantify the change in the response via the ratio of odds in the compared group over the odds in the reference group. An odds ratio higher than one indicates an increase, while less than one indicates a decrease compared to the reference group in likelihood of checking TTR resources. Figure 29 shows the odds ratios between information channels and between Lexicons. When comparing participants with 511 access to participants with App access, the odds ratio of 0.58 was statistically significantly less than 1 at the 0.05 level. This indicates that participants with 511 access were significantly less likely to use the assigned Transportation Study Resources than participants with App access. Similarly, the odds ratio of 511 access vs. Web access also is significantly less than 1 (odds ratios=0.47), indicating that the likelihood of participants with 511 access using the assigned resources was only half of Web access participants. However, there were no statistical differences between App access and Web access, as the odds ratio is not significantly different than 1. When the two assemblies were compared, no significant impacts were found on the probability of using the Transportation Study Resources for familiar trips.



**Figure 29. Chart. Odds ratios with 95 percent confidence limits – information usage for familiar trips.**

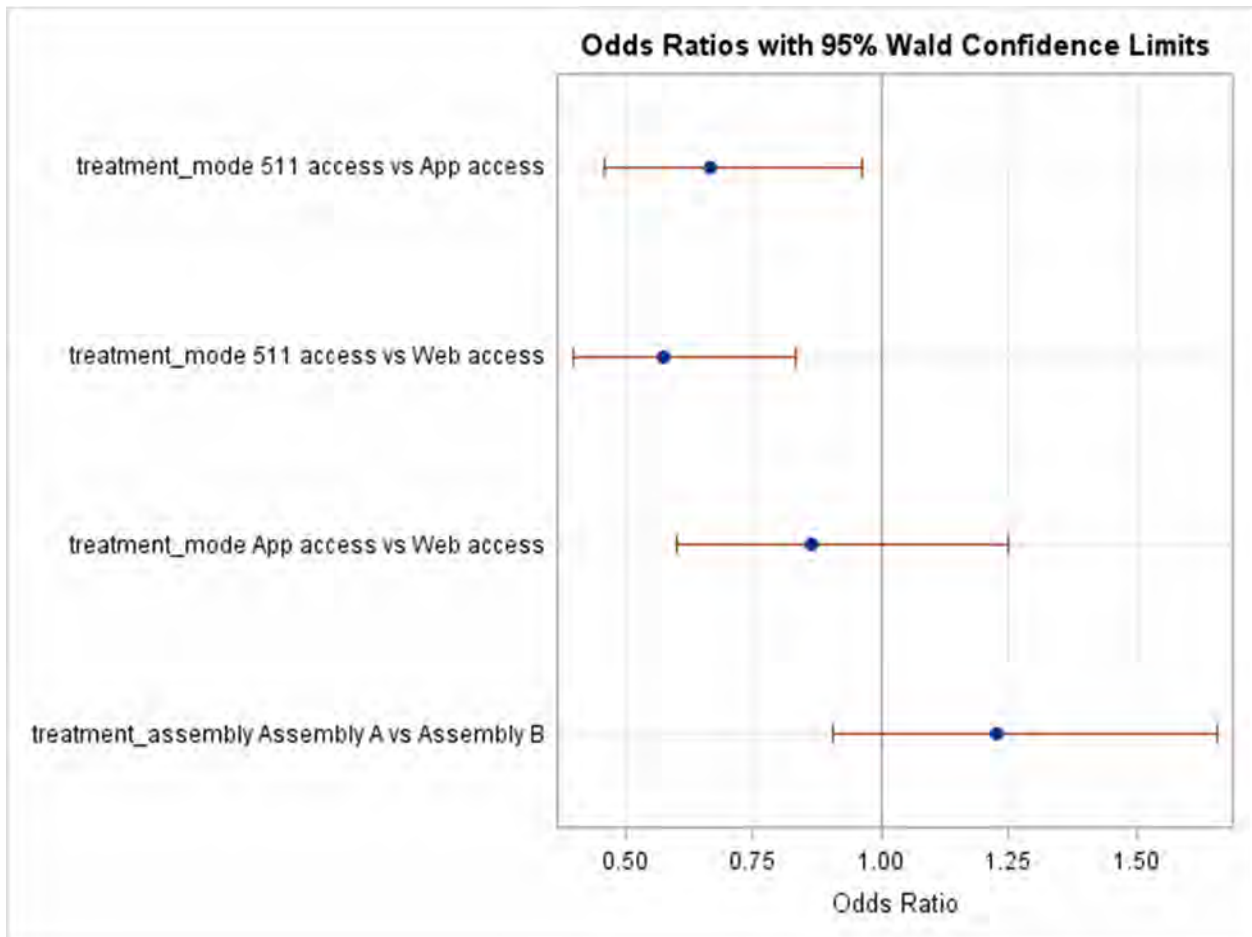
A similar analysis approach was applied to participants' responses on the frequency of checking TTR information for unfamiliar trips during the study period. Figure 30 shows the distribution of response by information channel and Lexicon. Compared with familiar trips, participants checked TTR information less frequently. Again, similar distribution patterns were found between the two Lexicons within the same delivery method/information channel. More participants with 511 access reported that they never checked TTR information than the other two channels.



**Figure 30. Chart. Frequency of checking the transportation study resources for unfamiliar trips.**

The probability of participants checking TTR information was fit to a logistic regression model. Table 47 shows the model results, which found that participants with higher proportions of Peak\_Hour and Weekday trips were more likely to check TTR for unfamiliar trips.

Figure 31 presents the odds ratios results from the logistic regression model, which are similar to the findings from the model of familiar trips. Participants with 511 access were significantly less likely to check TTR information than participants receiving information from the other two channels. There were no significant differences between the two Lexicons.



**Figure 31. Chart. Odds ratios with 95 percent confidence limits – information usage for unfamiliar trips.**



## Model Results – Behavior Change

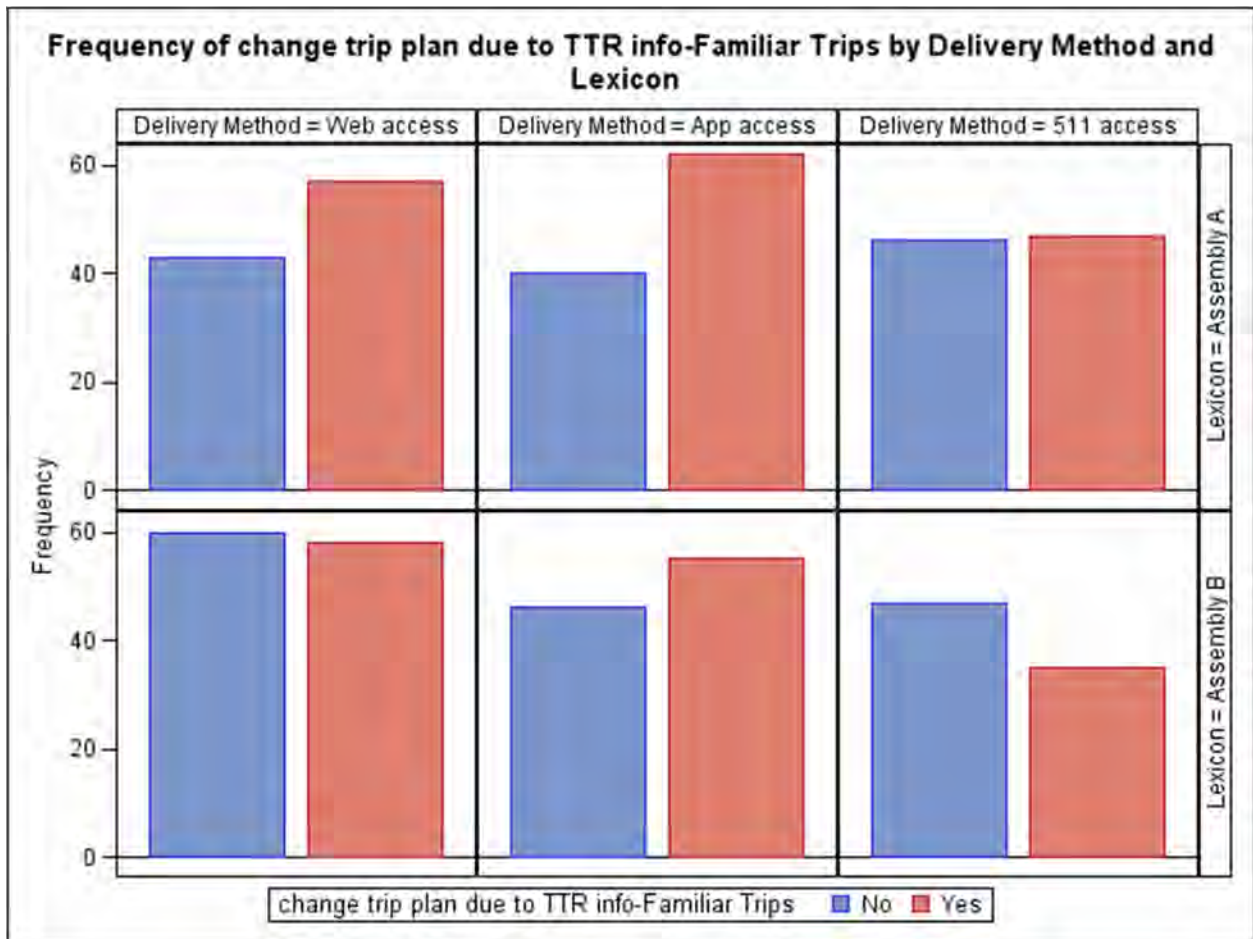
To investigate the impact of Lexicon and information channel on travelers’ behavior change, participants were asked how often they change their trip plan due to what they had learned from the TTR resources. As shown in Figure 32, eight types of trip changes were considered, and participants could choose one of the six responses for each type of trip change. The same questions were asked separately for familiar trips and unfamiliar trips.

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Figure 32. Chart. Behavior change questions.**

Depending on participants’ responses on the behavior change questions, they were divided into two groups. The first group of participants did not make any change to their trip plans or made changes based on other information. The second group of participants indicated they made at least one of the eight trip changes (from Rarely to Frequently).

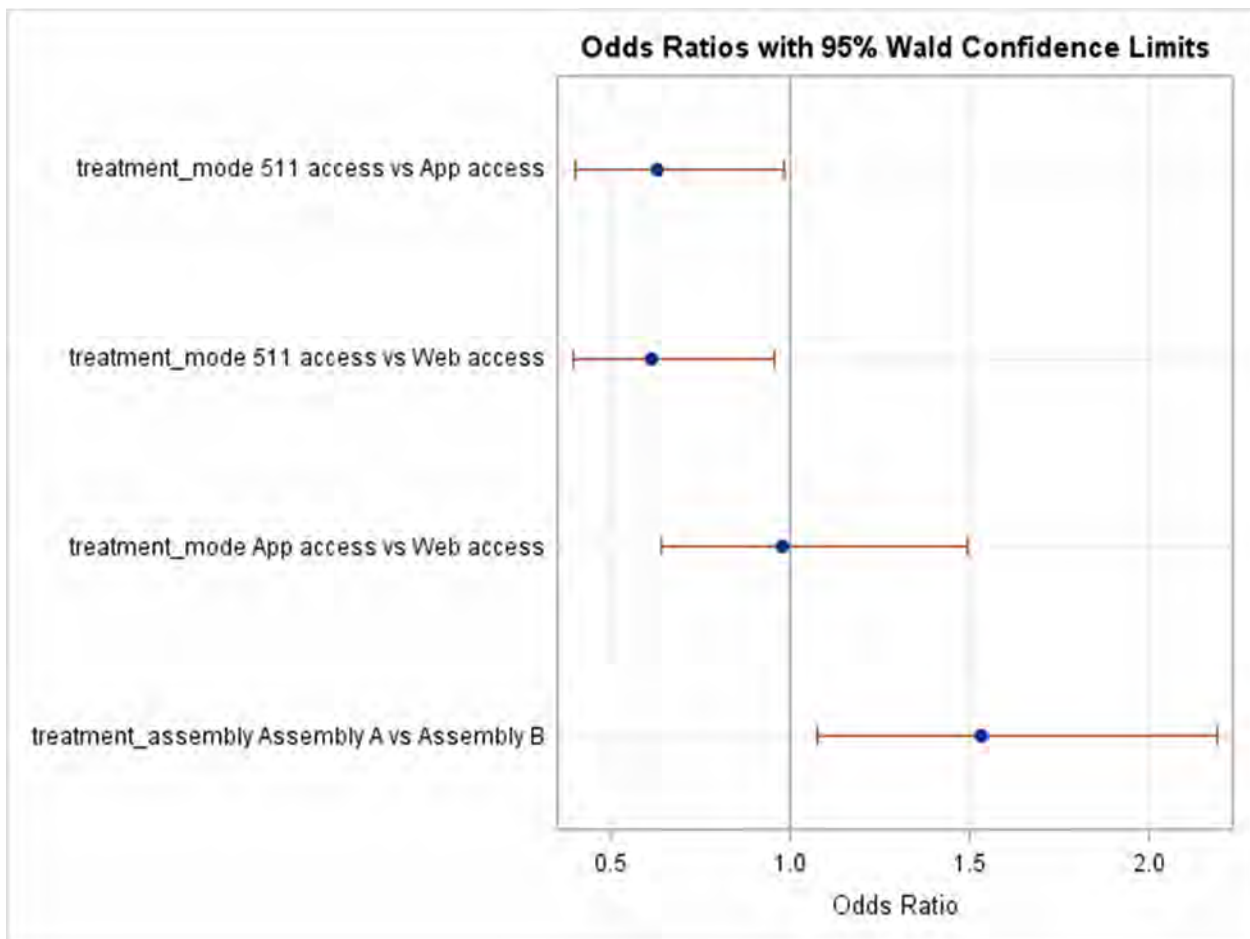
Figure 33 illustrates the frequency of whether participants changed their trip plan due to TTR information. Some difference can be observed by Lexicon and information channel. Assembly A participants with Web access more frequently reported that they changed trip plans as a results of the TTR information they received than those of Assembly B. Regardless of assigned Lexicon, more than 50 percent of participants with App access did change their trip plans due to the TTR information.



**Figure 33. Chart. Frequency of changing the plan due to travel time reliability information for familiar trips.**

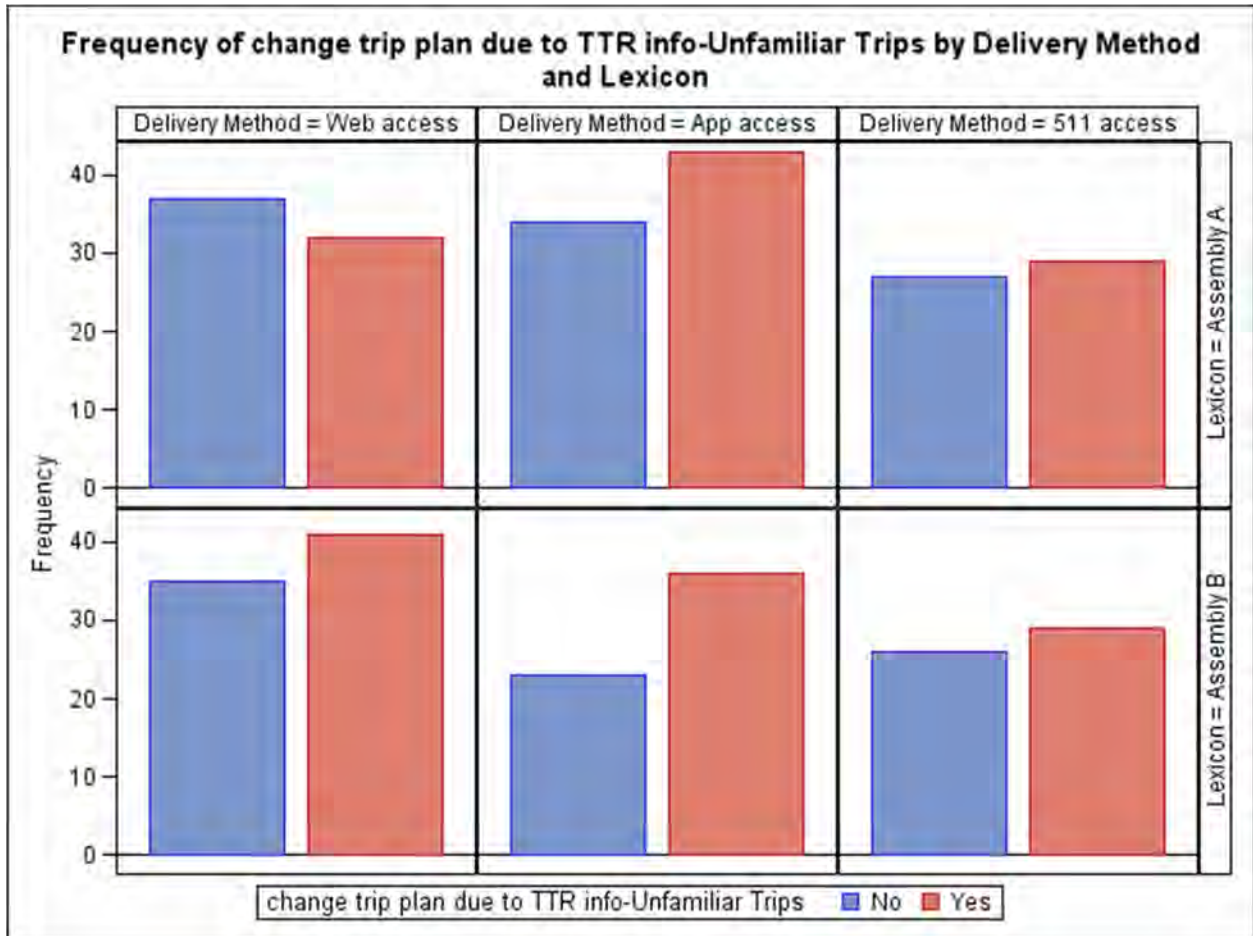
To test whether the Lexicon and information channel bring significant impact to behavior changes, a logistic regression model was applied to model the probability of changing the plan for familiar trips. Table 48 shows the model results, in which location (Houston>Triangle), Education (Less change based on TTR for college graduates), and Phase2\_Count (Less change based on TTR for more trips) were found to be significant covariates.

From the logistic model results, the odds ratios were calculated, as shown in Figure 34. The odds ratios indicate that the likelihood of participants with 511 access changing their plan due to TTR information for familiar trips was about 60 percent of that for participants with Web access or App access. The difference is statistically significant. Assembly A was found to statistically significantly increase the likelihood of behavior change due to TTR information by a factor of 1.6, compared with Assembly B.



**Figure 34. Chart. Odds ratios with 95 percent confidence limits – behavior change for familiar trips.**

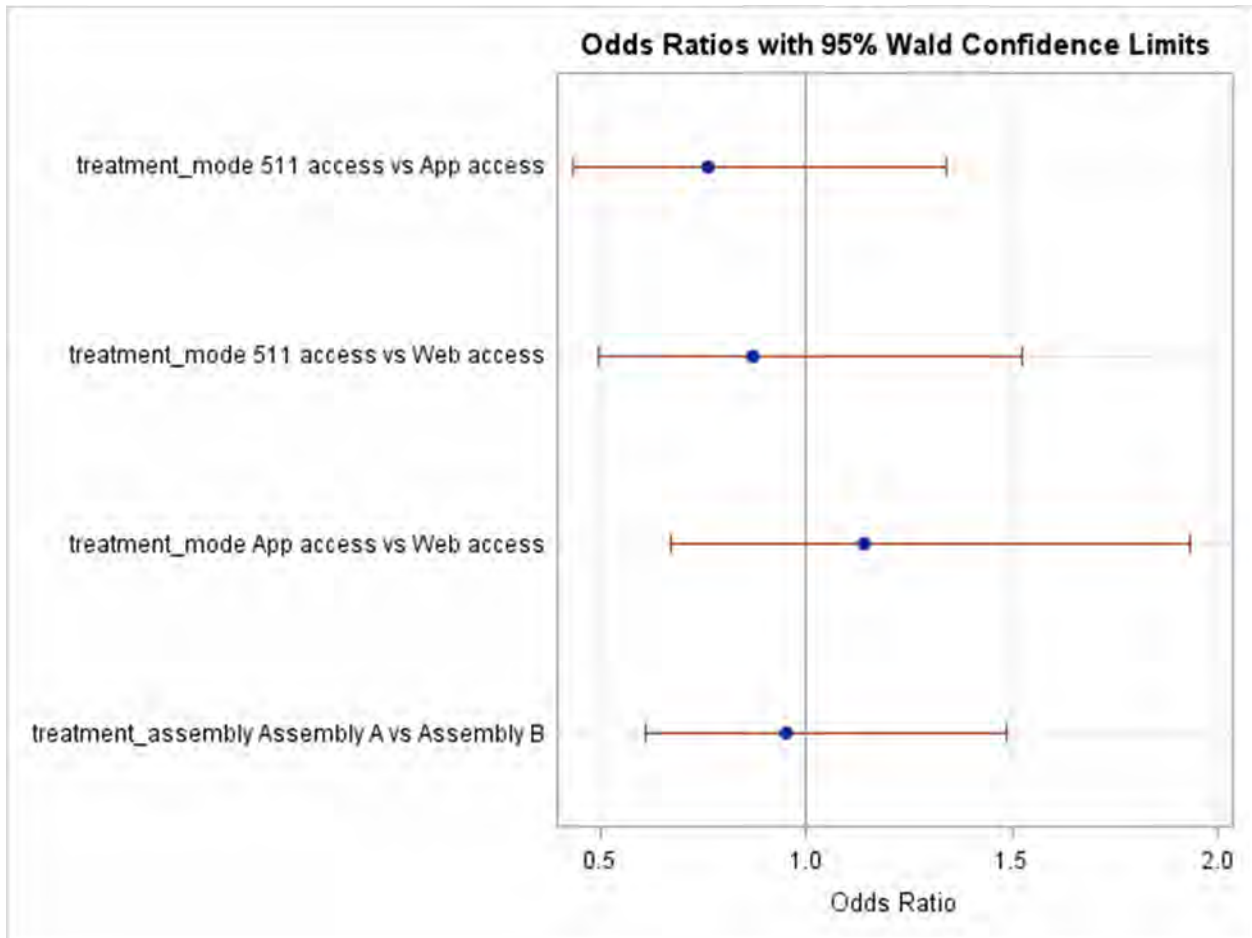
The impacts of Lexicon and information channel on behavior change for unfamiliar trips are not as considerable as those for familiar trips. However, for most delivery method and Lexicon combinations, more respondents reported using TTR information to make changes to trip plans than not (see Figure 35).



**Figure 35. Chart. Frequency of changing the plan due to travel time reliability information for unfamiliar trips.**

A logistic regression was fit to model the probability of participants changing their plans due to TTR information for unfamiliar trips. Table 49 shows the model results, in which Education (Less change based on TTR for college graduates), and Phase2\_Count (Less change based on TTR for more trips) were found to be significant covariates.

The calculated odds ratios show no significant impact of Lexicon or information channel on behavior changes due to TTR information for unfamiliar trips (see Figure 36).



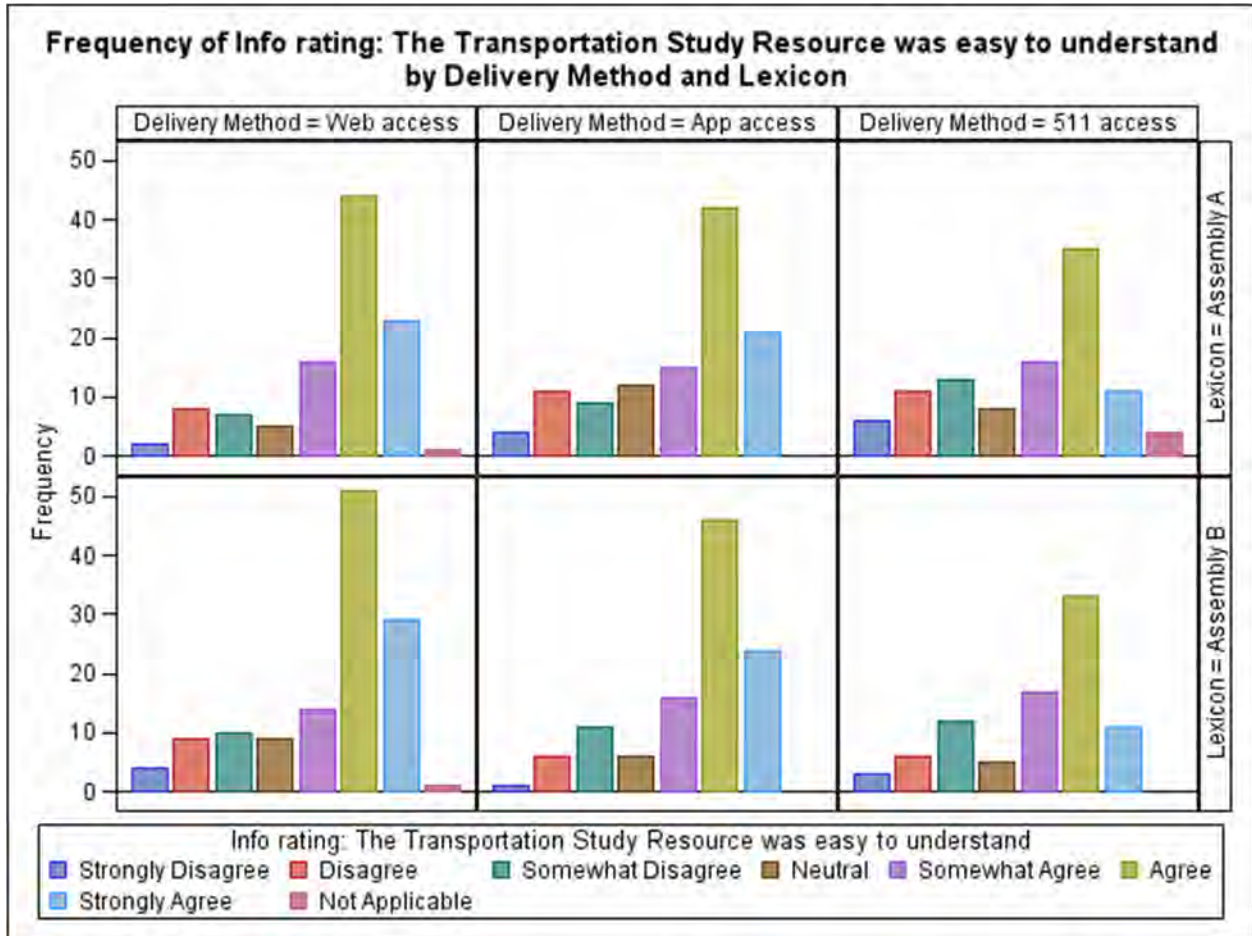
**Figure 36. Chart. Odds ratios with 95 percent confidence limits – behavior change for unfamiliar trips.**

### Model Results – Travel Time Reliability Ratings

Participants were asked to indicate their agreements with eight TTR rating statements, where responses were one of seven levels of agreement from Strongly Disagree to Strongly Agree, or Not Applicable. This section presents the analysis results for each statement.

**Statement 1: The Transportation Study Resource was Easy to Understand.**

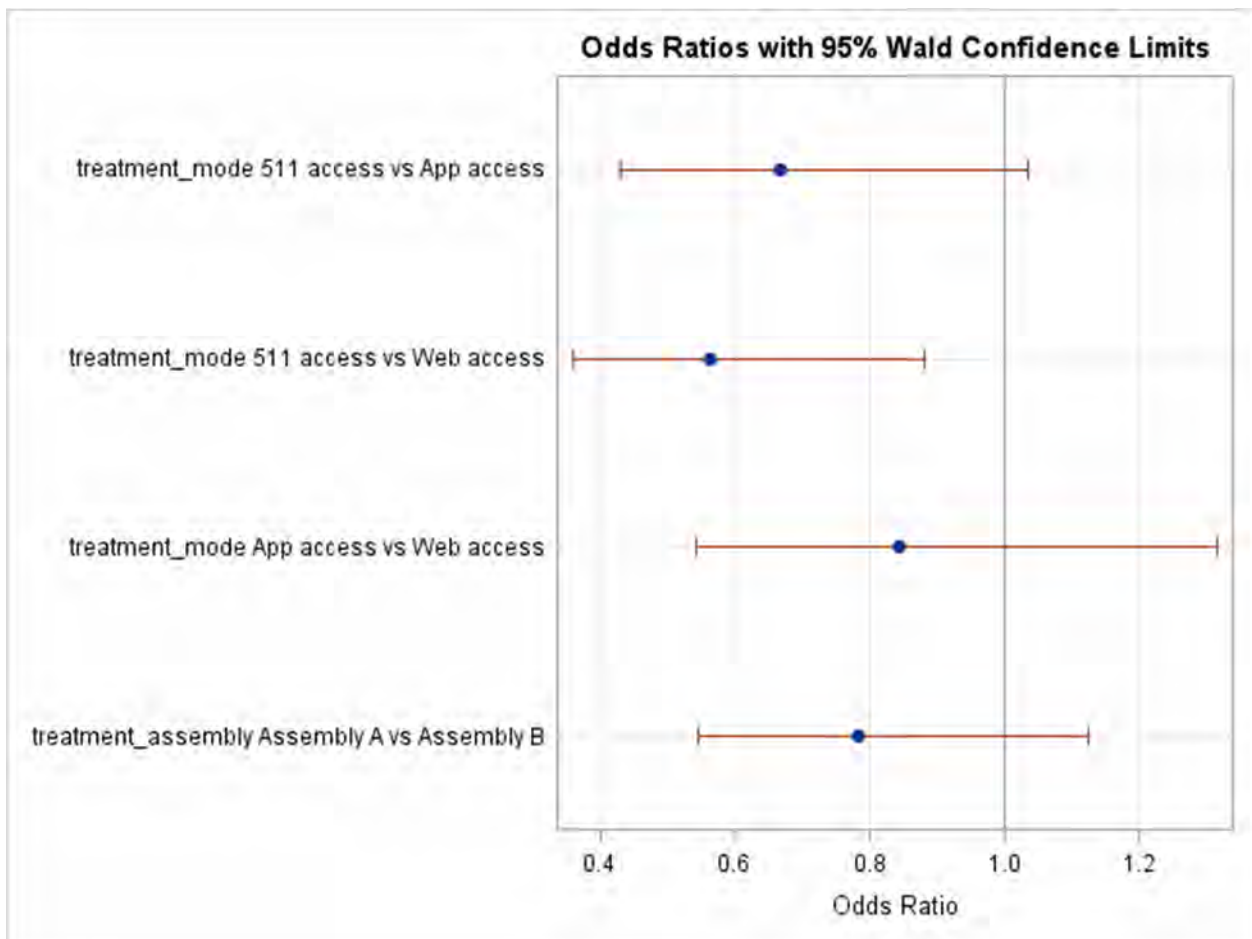
Figure 37 shows that the majority of participants agreed that the TTR information was easy to understand. The most common response was Agree, regardless of the Lexicon and delivery method.



**Figure 37. Chart. Frequency of agreement that the transportation study resource was easy to understand.**

Ordinal logistic regression modeling was applied to quantify the impacts of Lexicon and information channel in participants' agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics. In the statistical model, Not Applicable responses were excluded. Furthermore, the seven response categories were aggregated into three larger groups: Disagree (Strongly Disagree, Disagree, and Somewhat Disagree), Neutral, and Agree (Somewhat Agree, Agree, and Strongly Agree). The analysis modeled the probabilities of travelers reporting a higher agreement level. Table 50 shows the model results, with Income (50-100k group significantly higher agreement than those below 50k) being the only significant covariate.

From the ordinal logistic model results, the odds ratios were calculated, as shown in Figure 38. The odds ratios indicate that the likelihood of participants with 511 access agreeing with the statement was significantly lower than Web access participants, by a factor of 0.57. The differences between 511 access and App access, and between Web access and App access were not significant. In addition, there was no significant impact of Lexicon on the agreement.

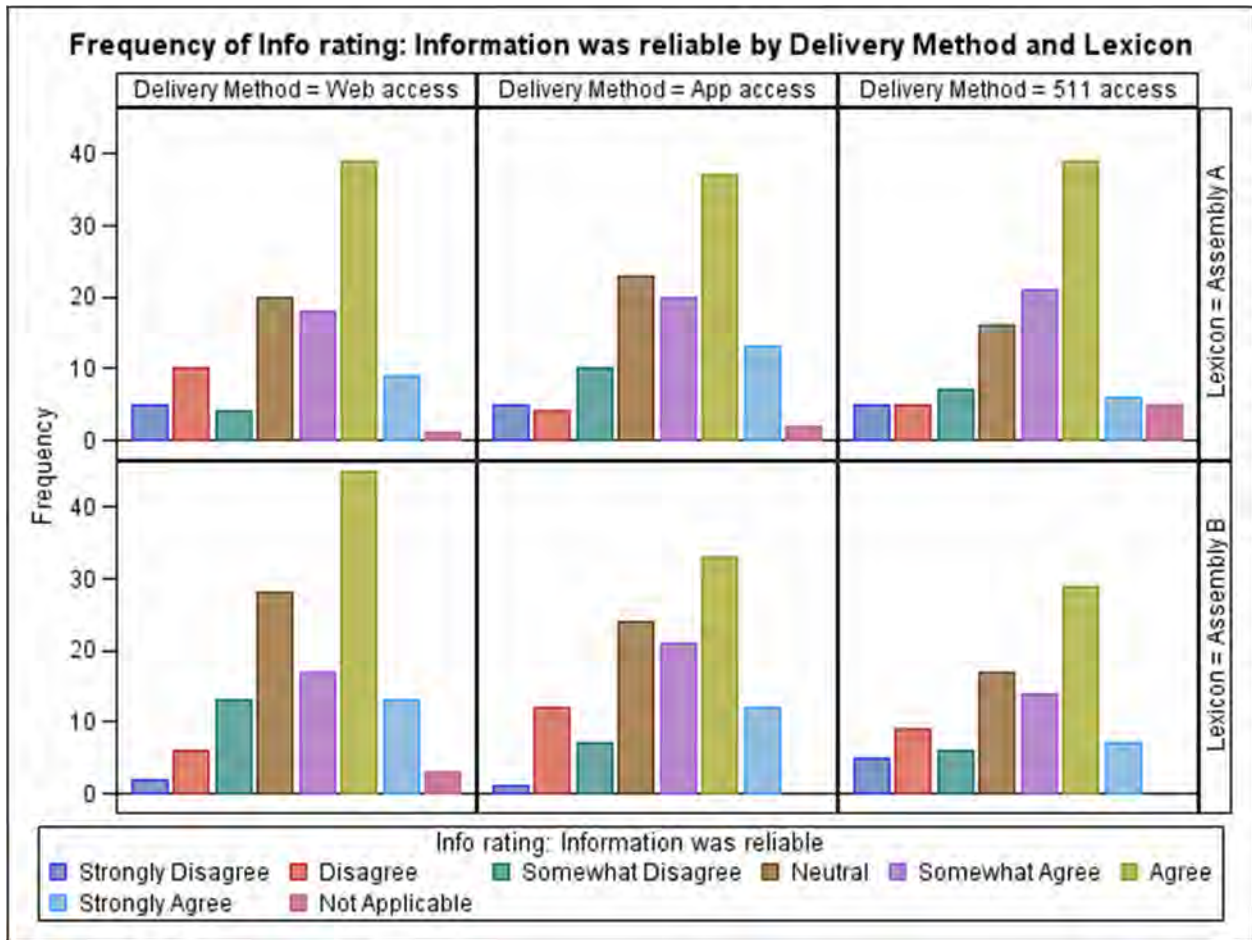


**Figure 38. Chart. Odds ratios with 95 percent confidence limits – travel time reliability ratings: ease of understanding.**



**Statement 2: Information from the Transportation Study Resource was reliable.**

Although there were more participants agreeing with the statement than disagreeing with it, the relative percentage of participants agreeing with the reliability statement was lower than those agreeing with the ease of understanding statement (Statement 1). The Agree response was the mode, or most frequently selected response, regardless of the Lexicon and information channel (see Figure 39).

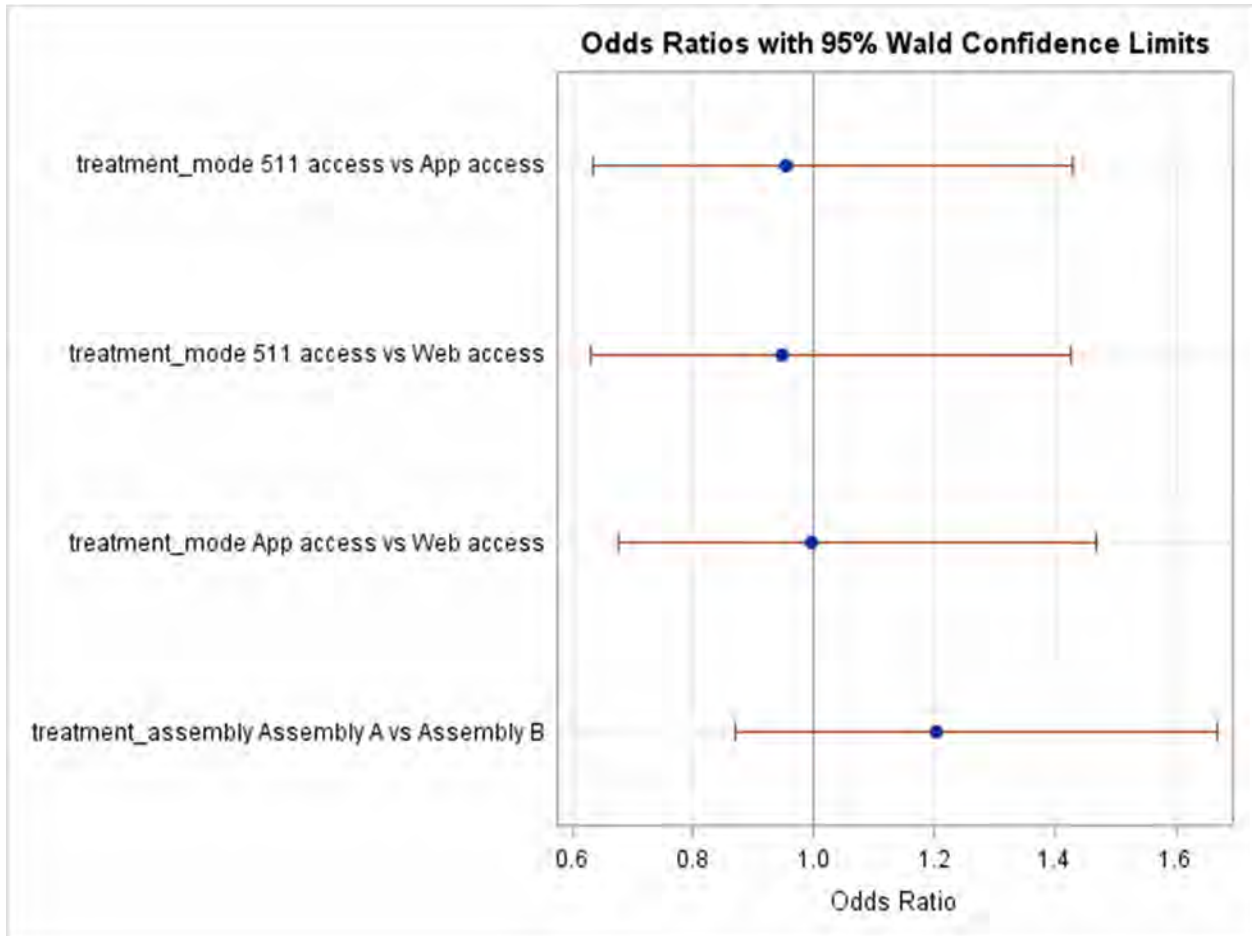


**Figure 39. Chart. Frequency of agreement that the transportation study resource was reliable.**



Table 51 shows the model results, with Education (Graduate/Professional degree agreement was lower than for no college) and Phase2\_Count (more weekly trips equating to lower satisfaction with reliability) being the significant covariates.

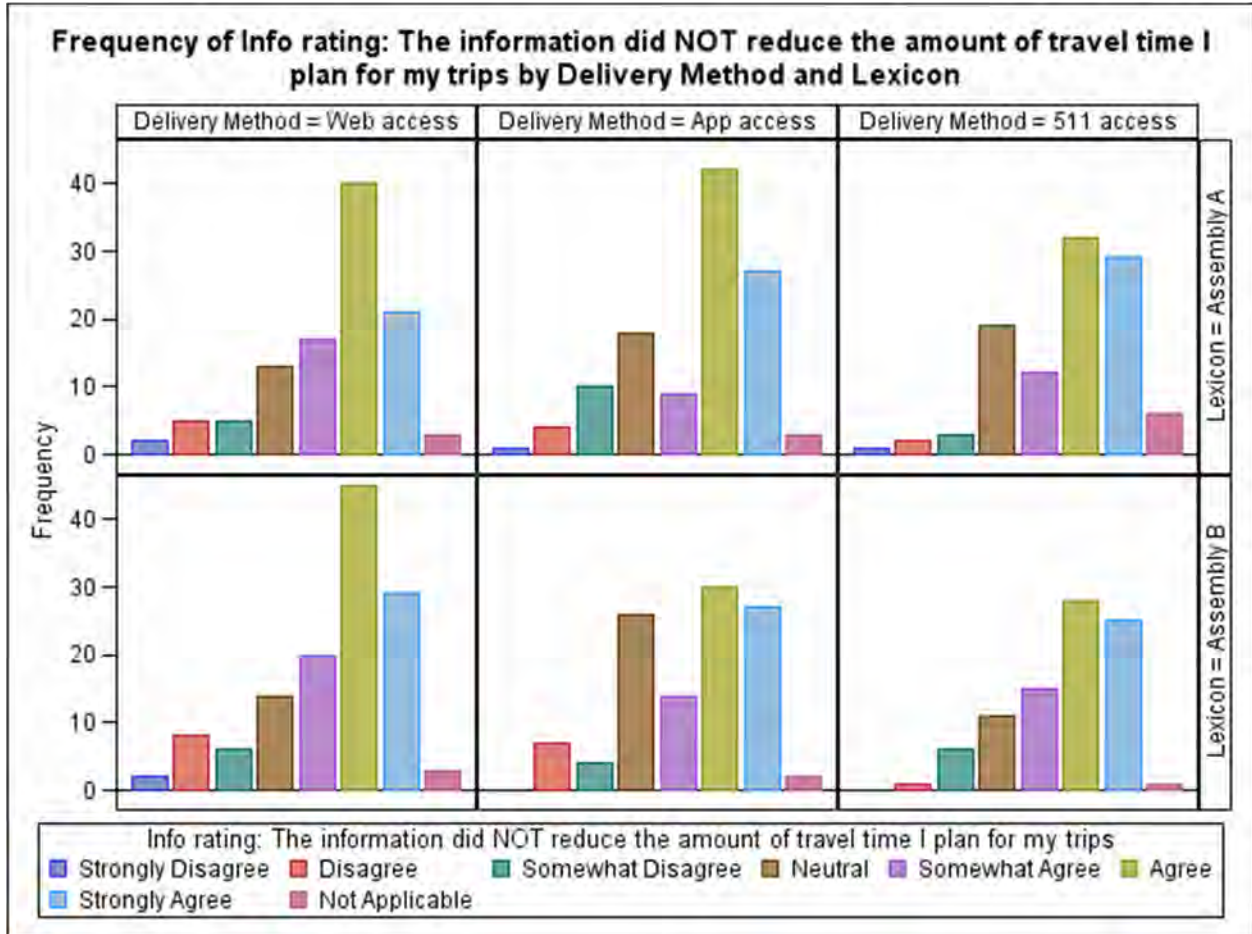
The odds ratios results showed no significant impacts of Lexicon and information channel on agreement of this statement (see Figure 40).



**Figure 40. Chart. Odds ratios with 95 percent confidence limits – travel time reliability ratings: reliability.**

**Statement 3: The information from the Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips.**

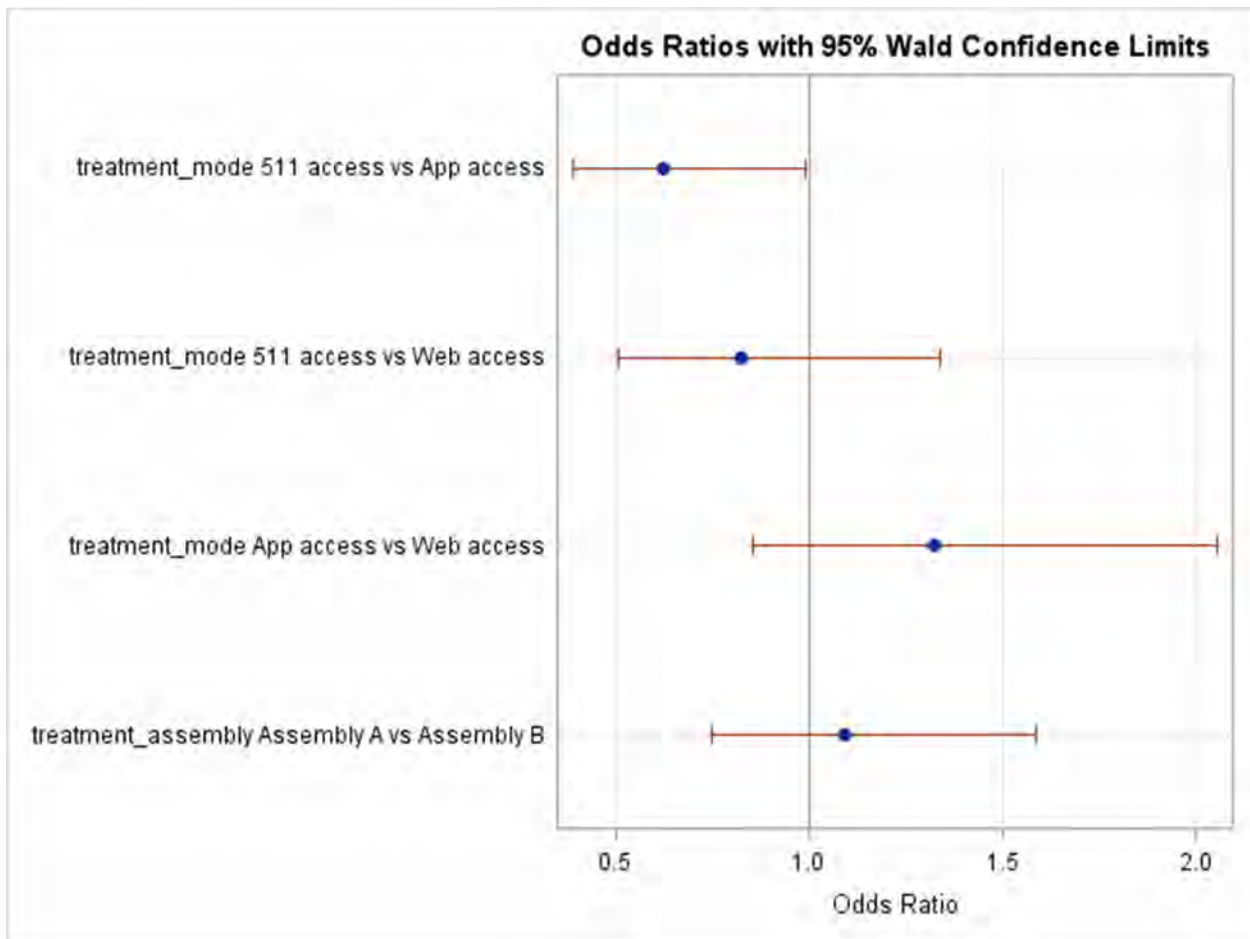
A plurality of participants agreed that the TTR information did not reduce the amount of travel time they planned. Participants who were assigned to access to 511 tended to have a higher agreement level than other participants (see Figure 41).



**Figure 41. Chart. Frequency of agreement that the travel time reliability information did not reduce planned travel time.**

The modelling of this question was slightly different than other TTR rating questions. The probability of participants reporting a LOWER level of agreement was modelled. Table 52 shows the model results, with Education (Graduate/Professional degree agreement was higher than for no college), and Phase2\_Count (more weekly trips equating to lower agreement) being the significant covariates.

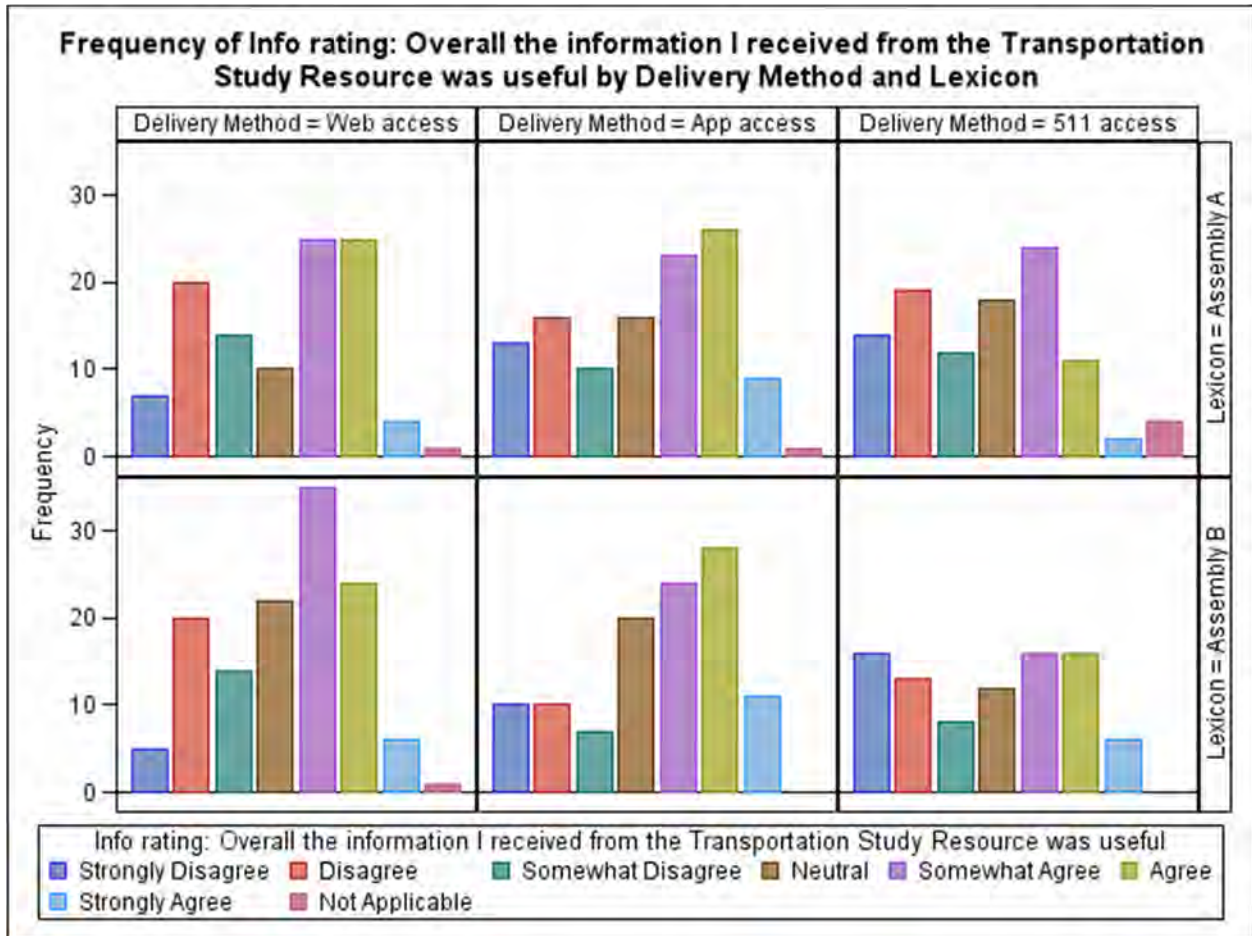
The odds ratios indicate that the likelihood of participants with 511 access disagreeing with the statement was significantly lower than App access participants, by a factor of 0.62 (see Figure 42). In other words, the 511 access participants were more accepting of the statement that the TTR information does not change their planned travel time, whereas the App access participants were apparently more open to changing their planned travel time as a result of the TTR information. The differences between 511 access and Web access, and between Web access and App access, were not significant. In addition, there was no significant impact of Lexicon on the agreement.



**Figure 42. Chart. Odds ratios with 95 percent confidence limits – travel time reliability ratings: did not reduce planned travel time.**

**Statement 4: Overall, the information I received from the Transportation Study Resource was useful.**

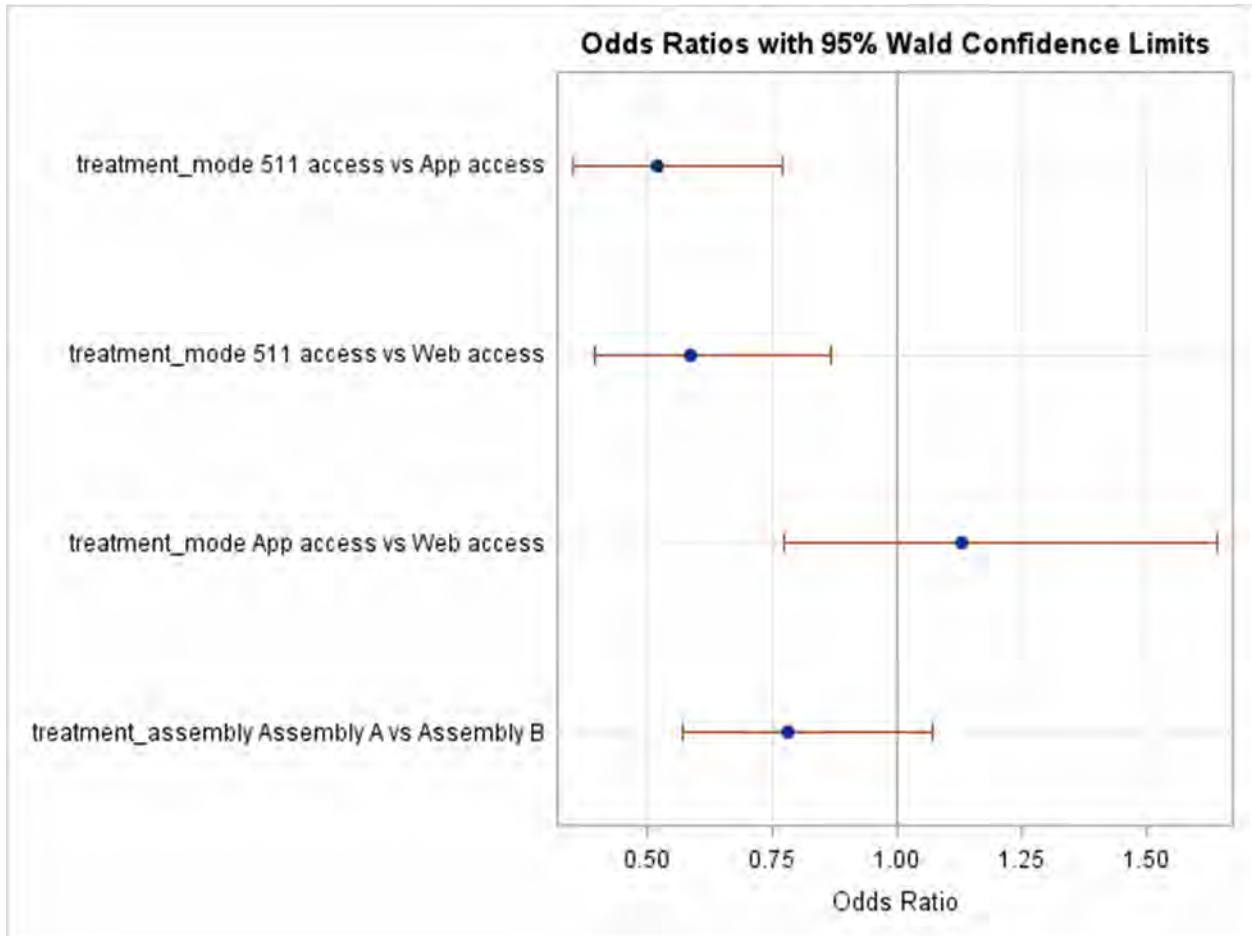
Compared with previous statements, there was much more participant disagreement with Statement 4, although the percentage of participants in agreement was still a majority (see Figure 43).



**Figure 43. Chart. Frequency of agreement that the transportation study resource was useful.**

The probability of participants reporting a higher level of agreement was modelled. Table 53 shows the model results, with Education (collegiate education showing lower agreement), Employment (full time employed showing higher agreement than all others), and Phase2\_Count (more weekly trips equating to lower agreement) being the significant covariates.

The odds ratios indicate that the likelihood of participants with 511 access agreeing with the statement was significantly lower than App and Web access participants, by a factor of 0.52 and 0.59, respectively (see Figure 44). The differences between Web access and App access were not significant. In addition, there is no significant impact of Lexicon on the agreement.

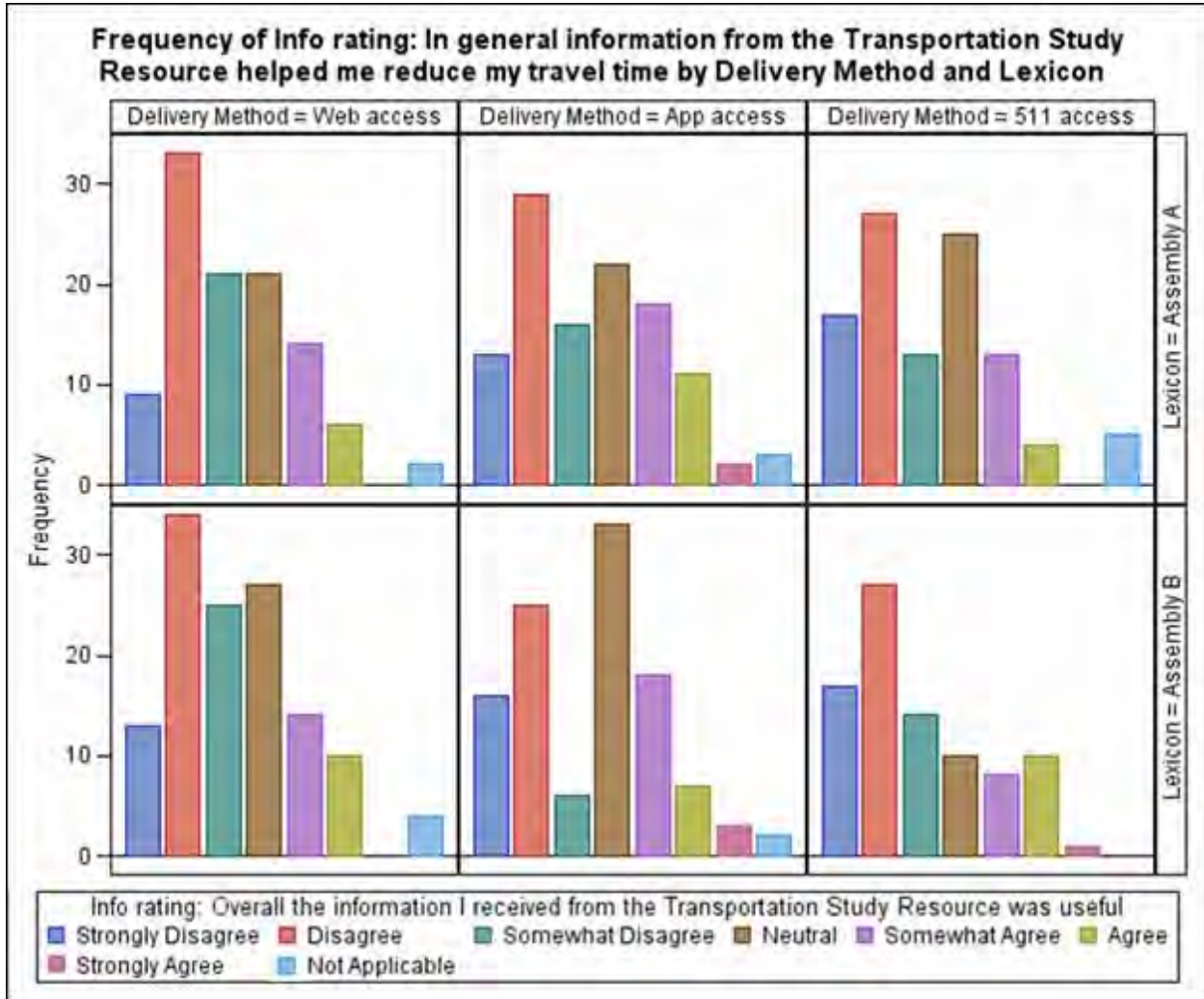


**Figure 44. Chart. Odds ratios with 95 percent confidence limits – travel time reliability ratings: information useful.**



**Statement 5: In general, information from the Transportation Study Resource helped me reduce my travel time.**

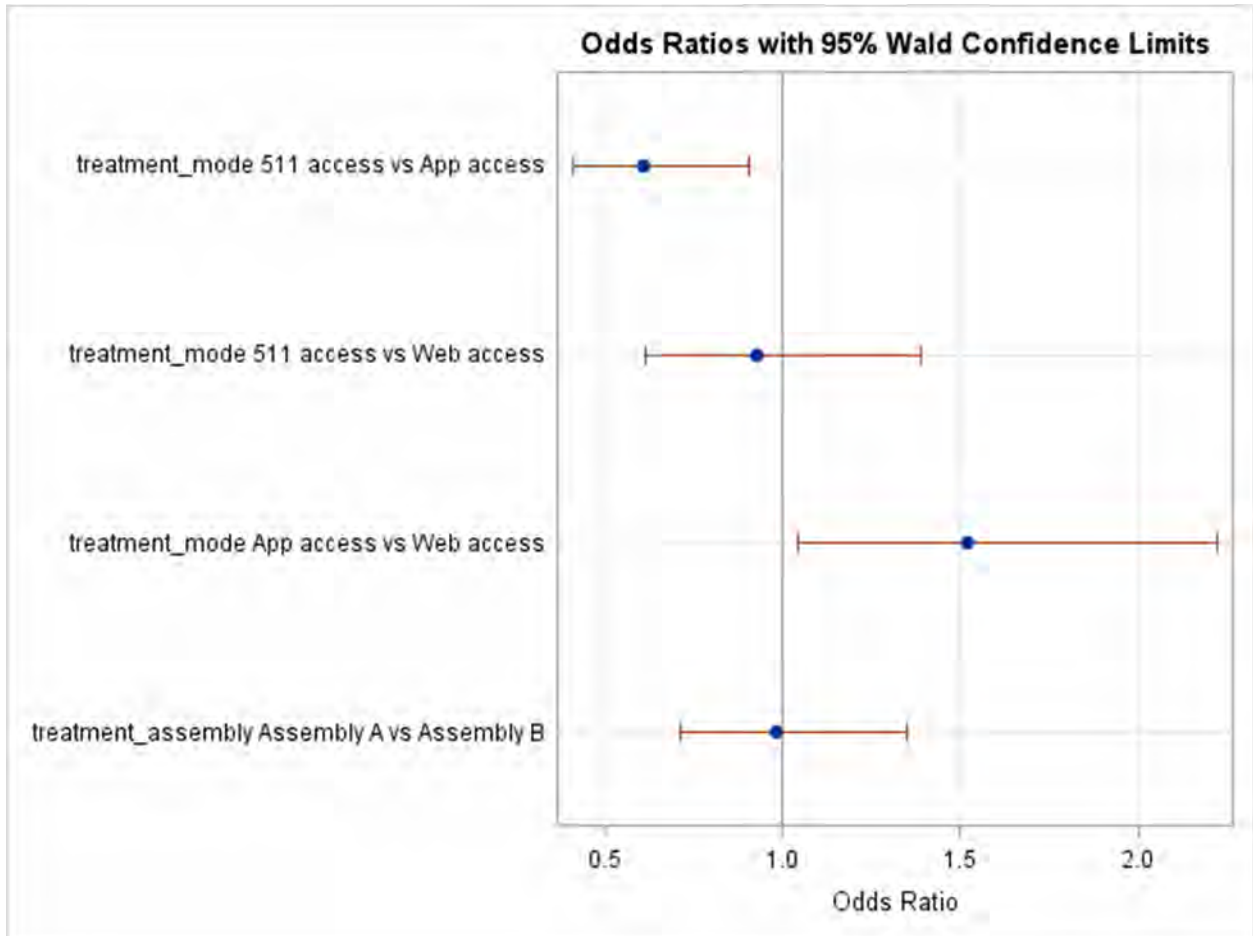
Unlike other statements, more participants disagreed with this statement than agreed with it (see Figure 45). Variations also can be observed by Lexicon and information channel.



**Figure 45. Chart. Frequency of agreement that the transportation study resource helped to reduce travel time.**

The probability of participants reporting a higher level of agreement was modelled. Table 54 shows the model results, with Education (collegiate education showing lower agreement), and Phase2\_Count (more weekly trips equating to lower agreement) being the significant covariates.

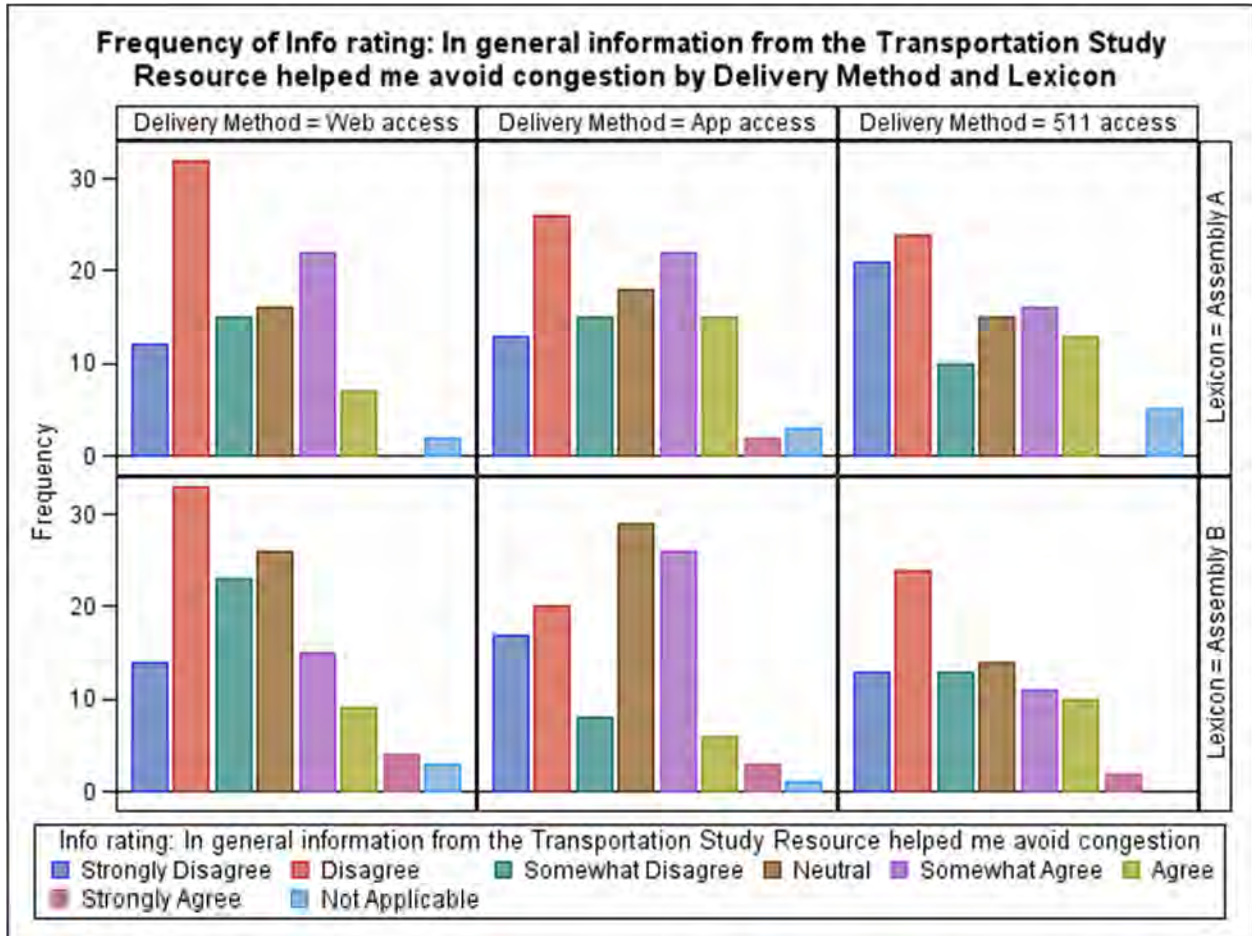
The odds ratios indicate that the likelihood of participants with 511 access agreeing with the statement was significantly lower than App access participants, by a factor of 0.61 (see Figure 46). Participants with App access were 1.51 times more likely to agree with the statement than participants with Web access. The difference between 511 access and Web access was not significant. In addition, there was no significant impact of Lexicon on the agreement.



**Figure 46. Chart. Odds ratios with 95 percent confidence limits – travel time reliability ratings: information helped reduce travel time.**

**Statement 6: In general, information from the Transportation Study Resource helped me avoid congestion.**

Participants strongly rejected the notion that TTR information could help them avoid congestion, as can be seen in Figure 47.

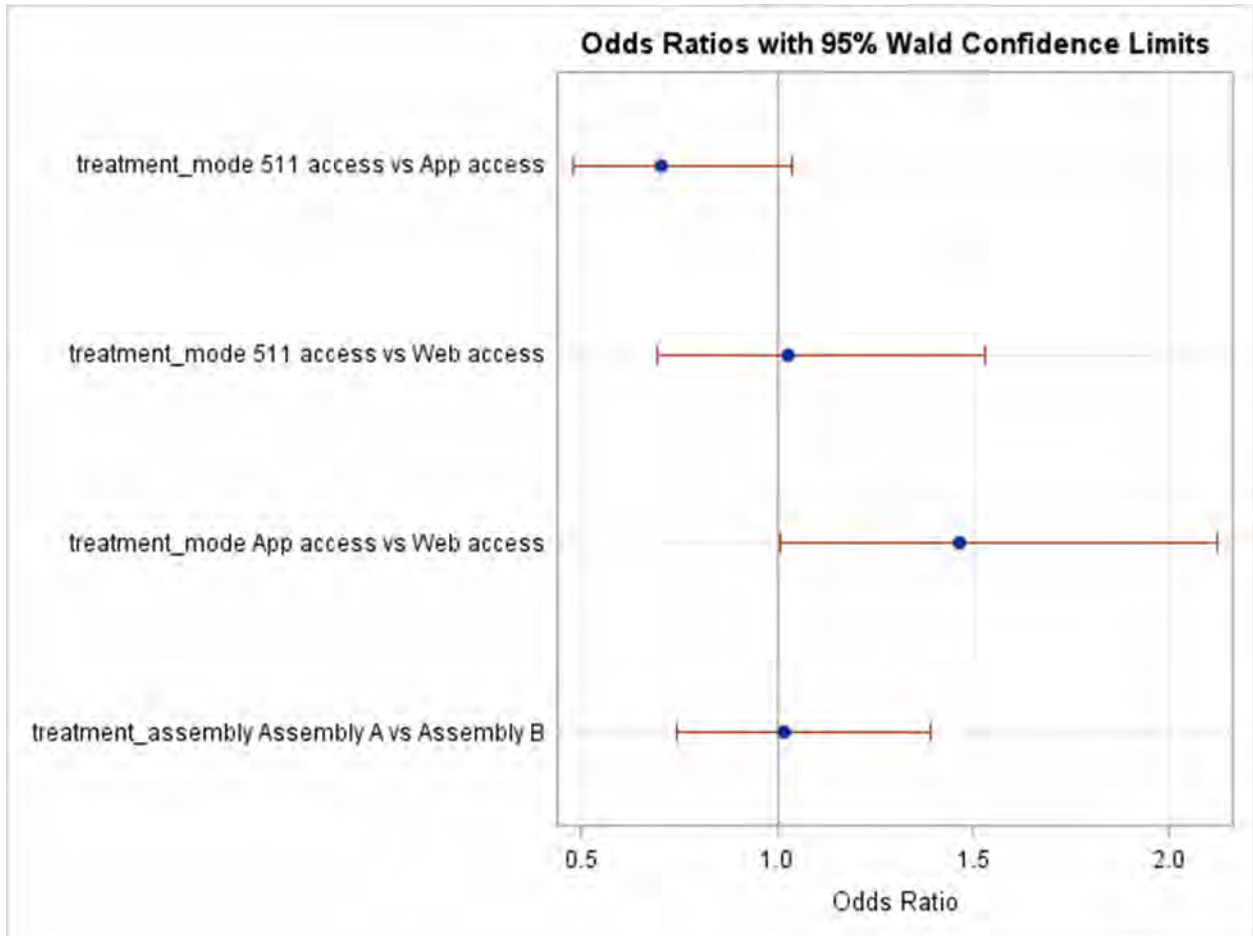


**Figure 47. Chart. Frequency of agreement that the transportation study resource helped to avoid congestion.**



The probability of participants reporting a higher level of agreement was modelled. Table 55 shows the model results, with Peak\_Hour (more peak hour trips equated with less agreement) being the significant covariate.

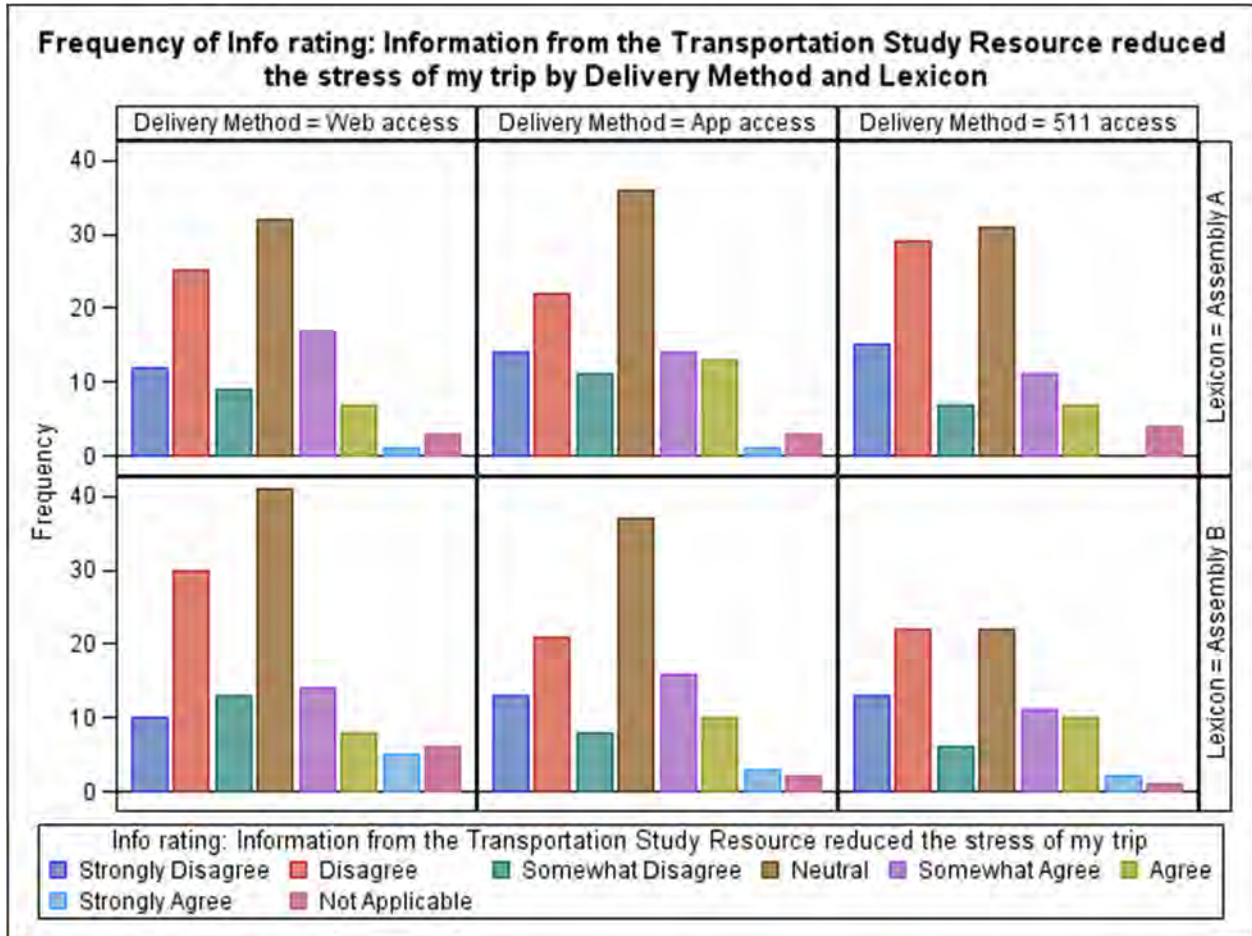
The odds ratios indicate that the likelihood of participants with App access agreeing with the statement was significantly higher than Web access participants, by a factor of 1.46 (see Figure 48). The differences between 511 access and Web access, and between 511 access and App access were not significant. In addition, there was no significant impact of Lexicon on the agreement.



**Figure 48. Chart. Model results – travel time reliability ratings: helped to avoid congestion.**

**Statement 7: Information from the Transportation Study Resource reduced the stress of my trip.**

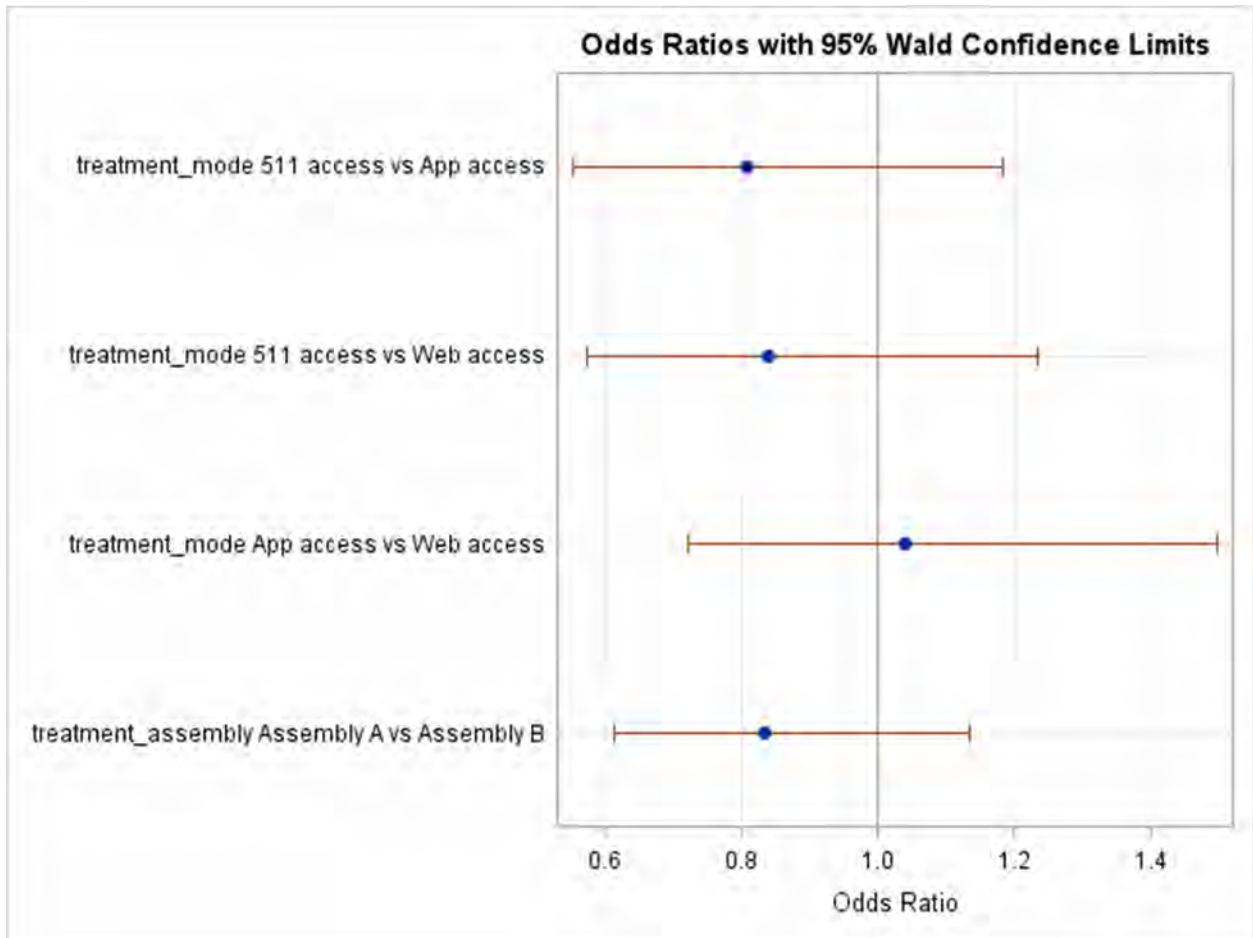
Participants tended to reject that TTR information could help them reduce the stress of their trip, as can be seen in Figure 49.



**Figure 49. Chart. Frequency of agreement that the transportation study resource helped to reduce stress.**

The probability of participants reporting a higher level of agreement was modelled. Table 56 shows the model results, with Education (college degrees associated with greater disagreement), Peak\_Hour (higher peak hour travel associated with greater disagreement), and Phase2\_Count (more weekly trips associated with greater disagreement) being the significant covariates.

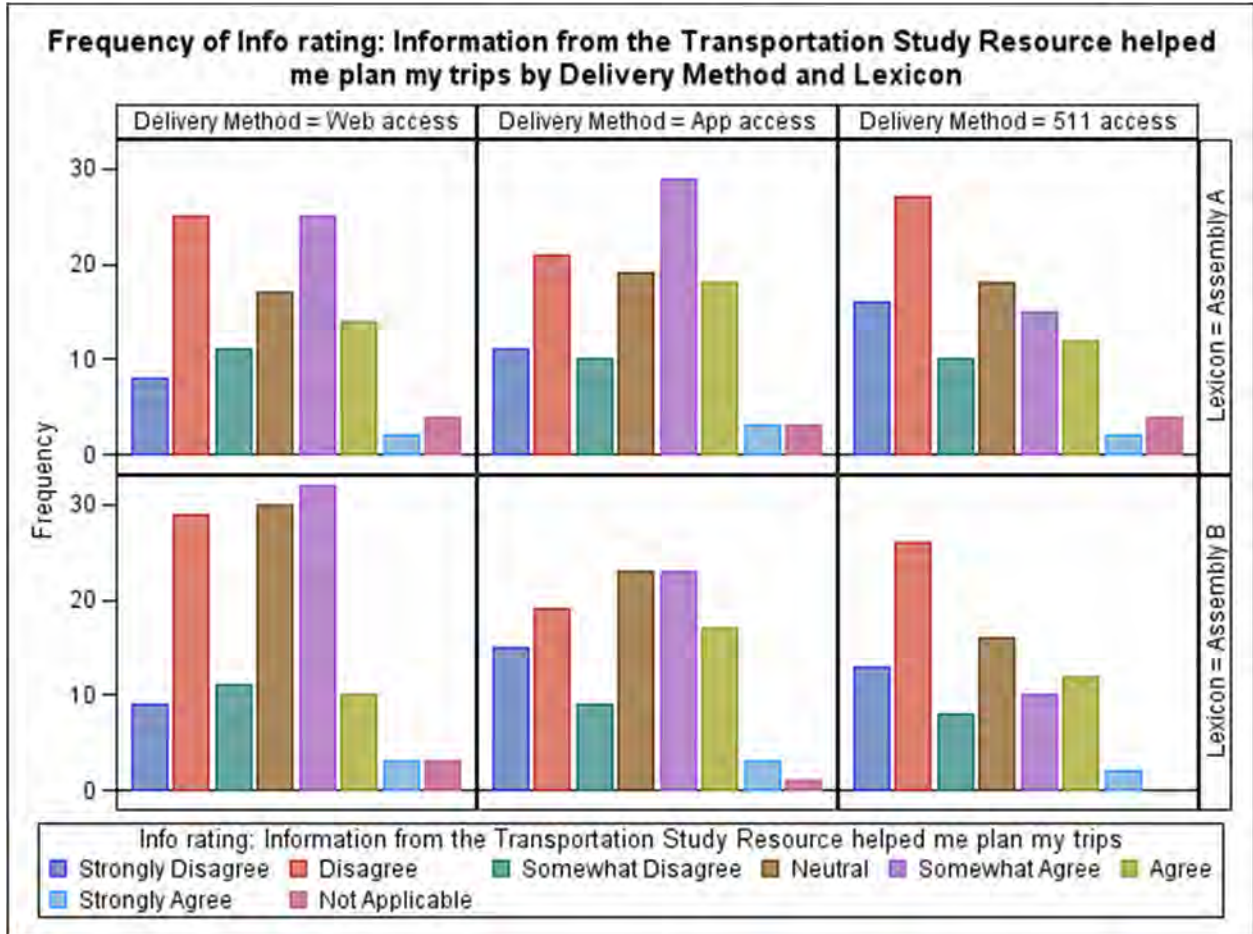
The odds ratios showed that the assigned Lexicon and information channel did not have a significant impact on the agreement level to this statement (see Figure 50).



**Figure 50. Chart. Odds ratios with 95 percent confidence limits – travel time reliability ratings: helped to reduce stress.**

**Statement 8: Information from the Transportation Study Resource helped me plan my trips.**

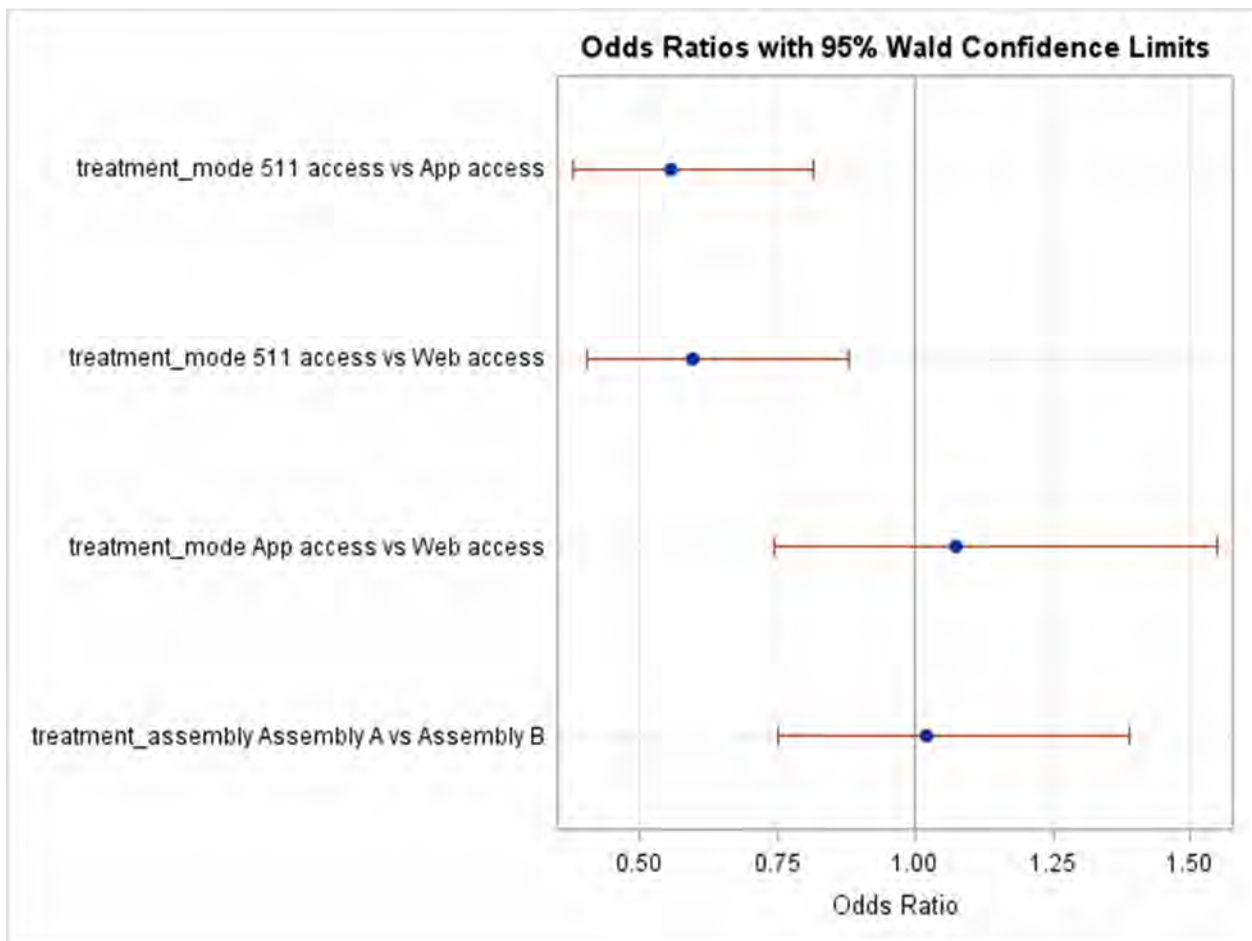
Participants provided very mixed responses to the assertion that TTR information helped them to plan their trips. There were strong peaks in the responses Disagree, Neutral, and Somewhat Agree (see Figure 51).



**Figure 51. Chart. Frequency of agreement that the transportation study resource helped me to plan trips.**

The probability of participants reporting a higher level of agreement was modelled. Table 57 shows the model results, with Education (Bachelor’s degree participants showing less agreement than those without a college degree), Employment (full time employed showing greater agreement than others), Peak\_Hour (higher peak hour travel associated with greater disagreement), and Phase2\_Count (more weekly trips associated with greater disagreement) being the significant covariates.

The odds ratios indicate that the likelihood of participants with 511 access agreeing with the statement was significantly lower than App access participants and Web access participants, by a factor of 0.55 and 0.60, respectively (see Figure 52). The difference between Web access and App access was not significant. In addition, there was no significant impact of Lexicon on the agreement.



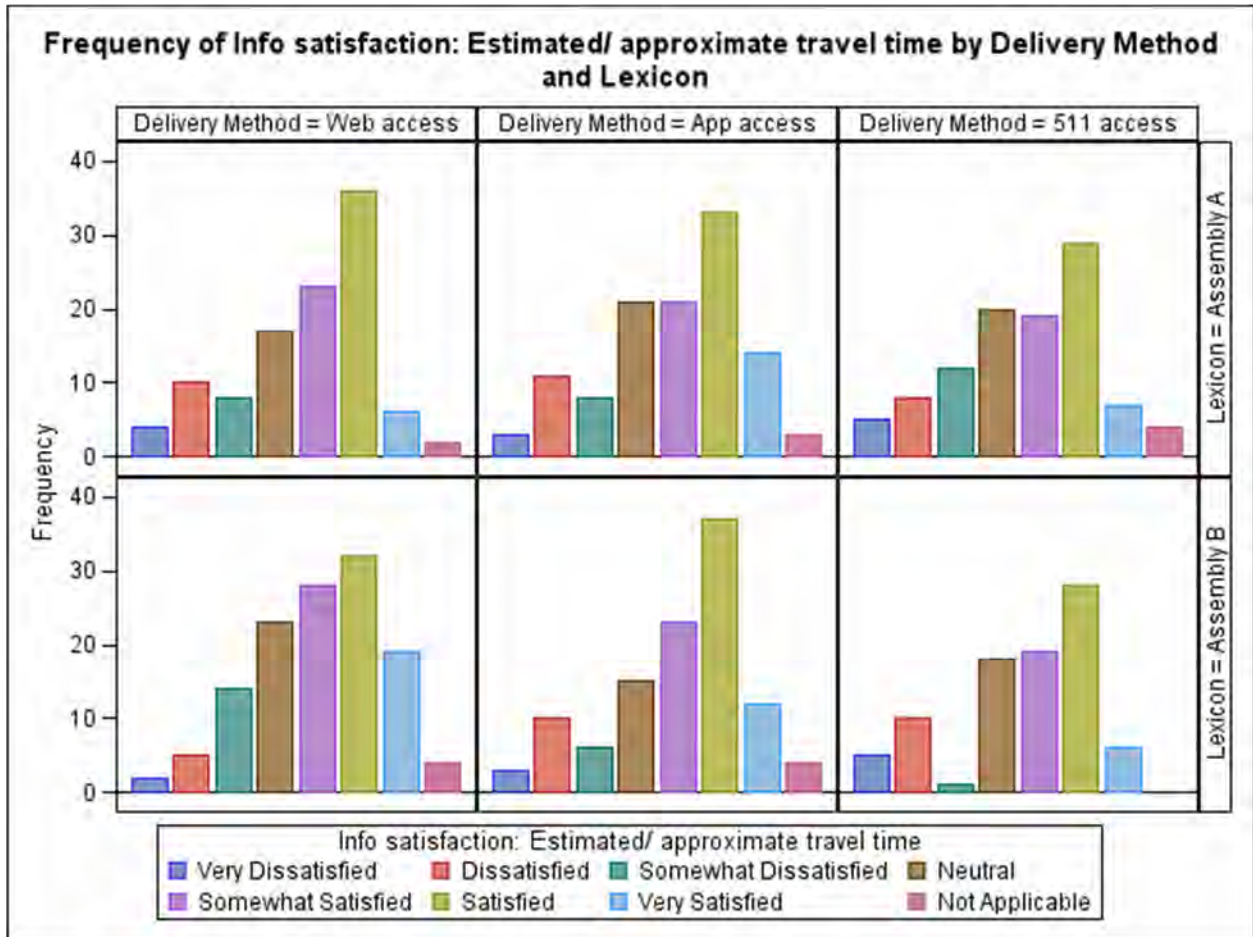
**Figure 52. Chart. Odds ratios with 95 percent confidence limits – travel time reliability ratings: helped me to plan trips.**

## Model Results – Traveler Satisfaction

Participants were asked about their satisfaction level in five aspects of trip experience.

### Satisfaction: Estimated/Approximate Travel Time

Figure 53 shows that more participants were satisfied than not with the estimated travel time from all of the TTR resources. There was no significant difference by Lexicon.

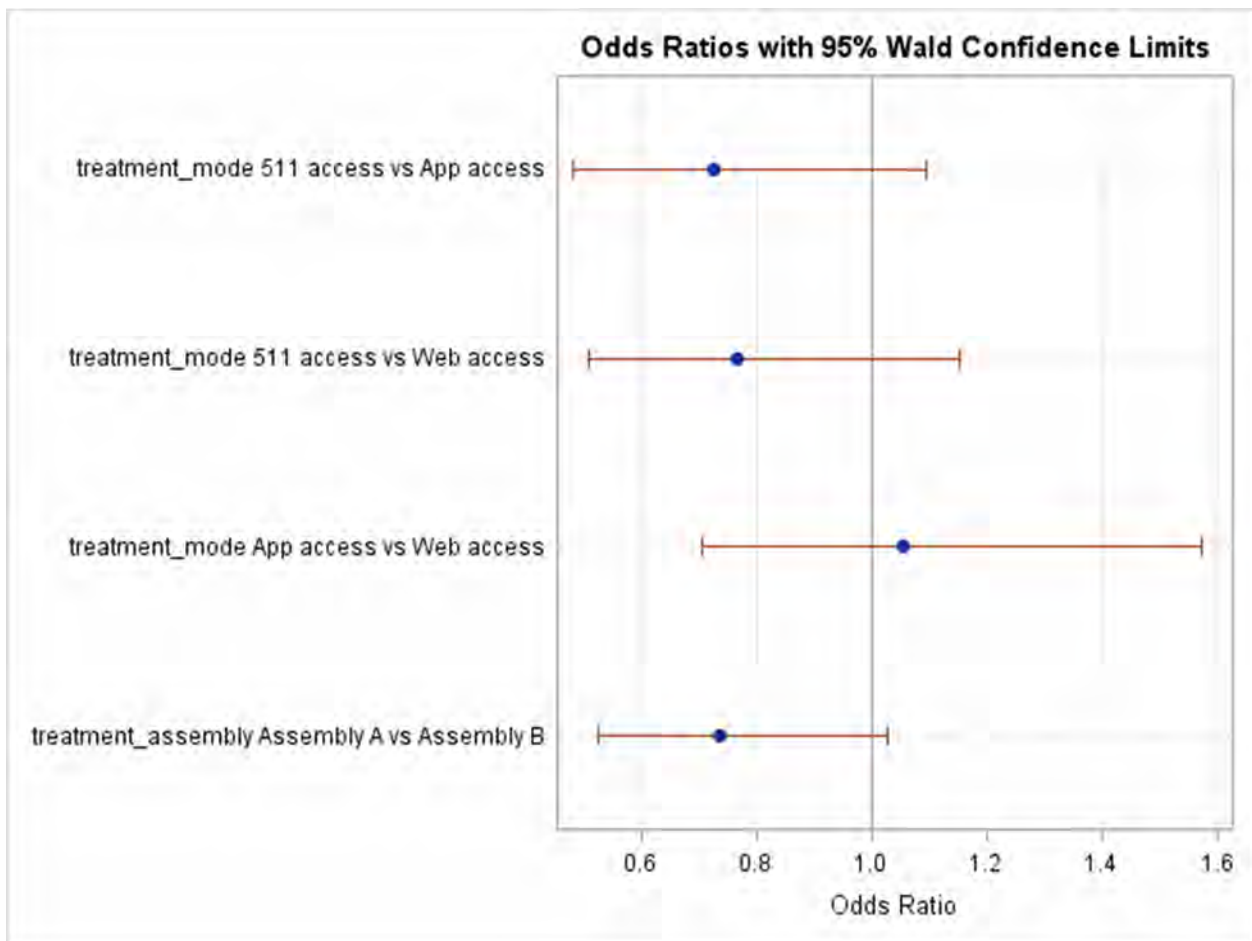


**Figure 53. Chart. Frequency of satisfaction with the estimated travel time.**



Ordinal logistic regression was applied to quantify the impacts of Lexicon and information channel on participants' satisfaction with their trip experience and to account for exogenous factors regarding demographic and trip characteristics. The Not Applicable response was excluded from the modeling. The seven remaining category responses were aggregated into three larger groups: Dissatisfied (Very Dissatisfied, Dissatisfied, and Somewhat Dissatisfied), Neutral, and Satisfied (Somewhat Satisfied, Satisfied, and Very Satisfied). The probability of participants reporting a higher level of satisfaction was modelled. Table 58 shows the model results, with Location (Columbus satisfaction significantly higher than Houston and Triangle) being the only significant covariate.

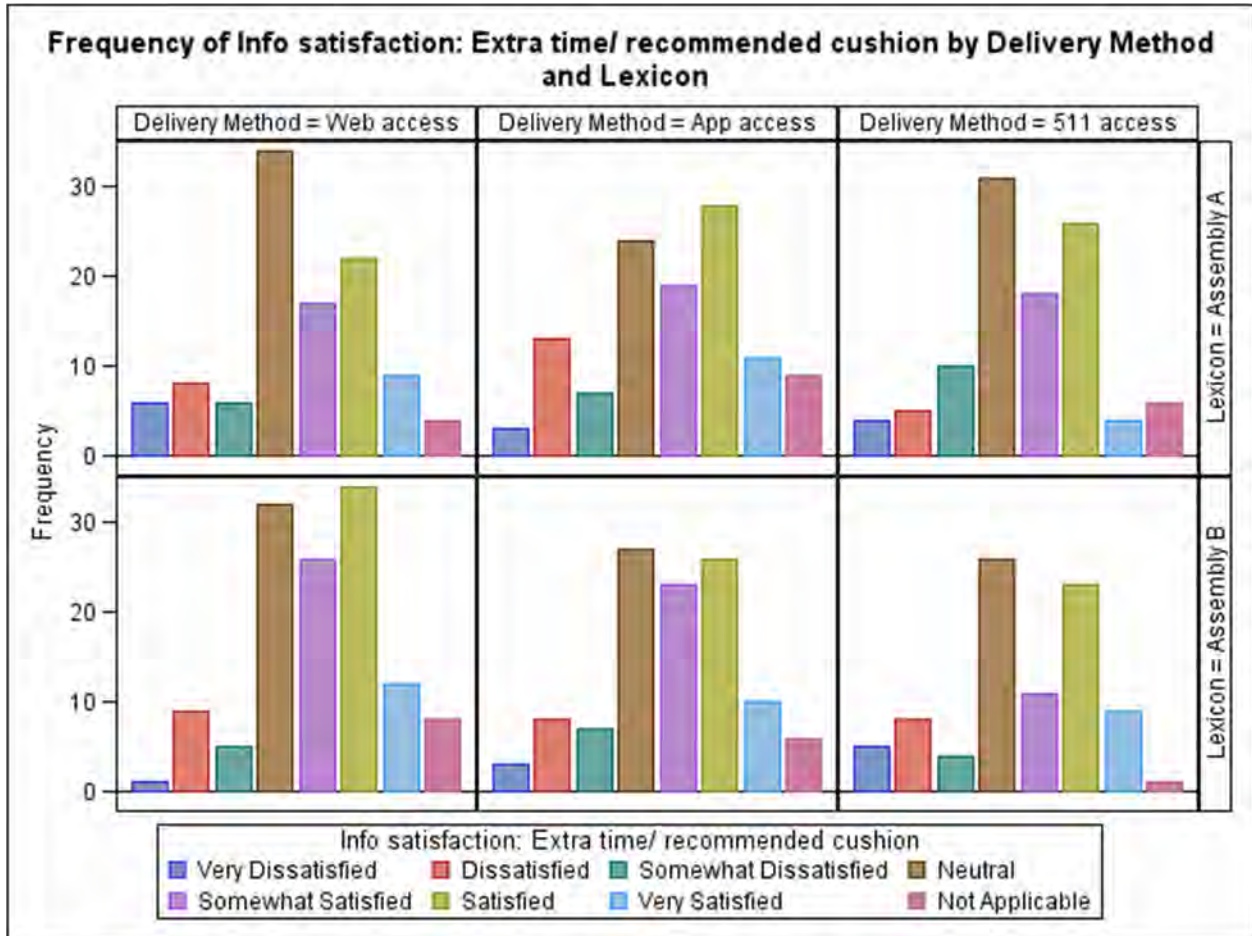
No significant differences were found in the odds ratios between Lexicons and information channels (see Figure 54).



**Figure 54. Chart. Odds ratios with 95 percent confidence limits – satisfaction with estimated travel time.**

**Satisfaction: Extra time / recommended cushion**

As seen in Figure 55, participants held a largely neutral attitude toward the extra time / recommended cushion from TTR information. There were more satisfied participants than dissatisfied participants.

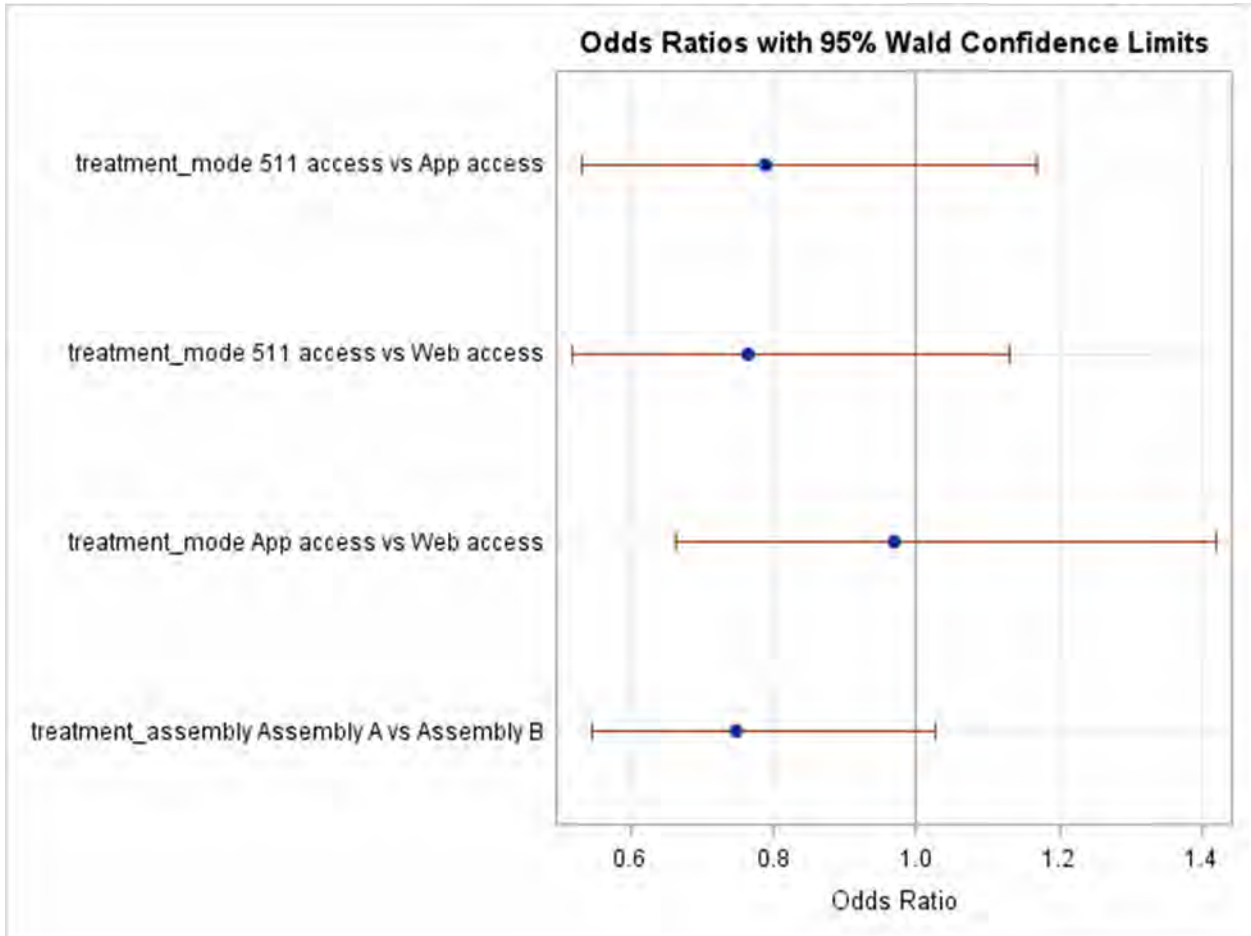


**Figure 55. Chart. Frequency of satisfaction with the extra time/recommended cushion.**



The probability of participants reporting a higher level of satisfaction was modelled. Table 59 shows the model results, with no significant covariates.

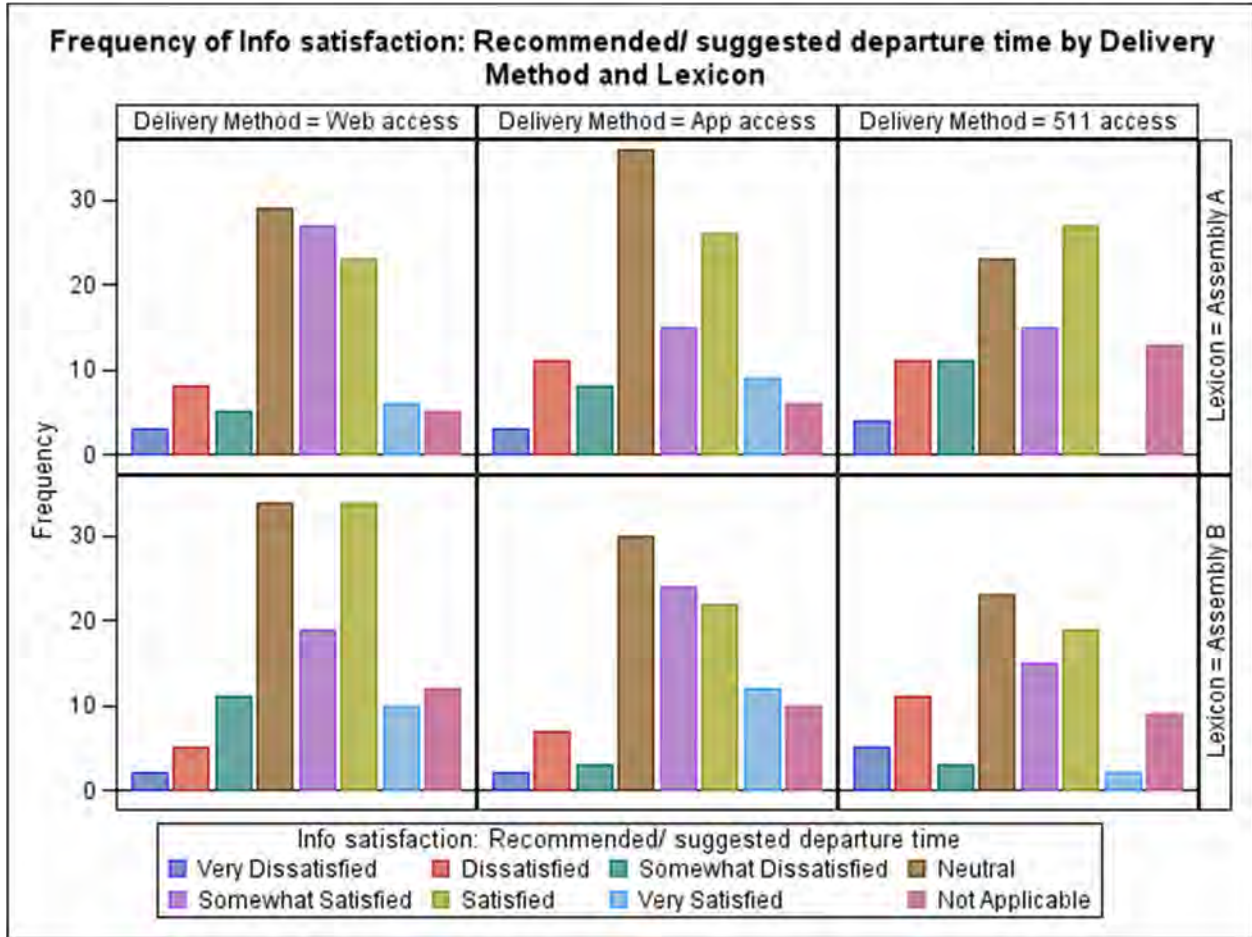
No significant differences were found in the odds ratios between Lexicons and information channels (see Figure 56).



**Figure 56. Chart. Odds ratios with 95 percent confidence limits – satisfaction: extra time/recommended cushion.**

**Satisfaction: Recommended/Suggested Departure Time**

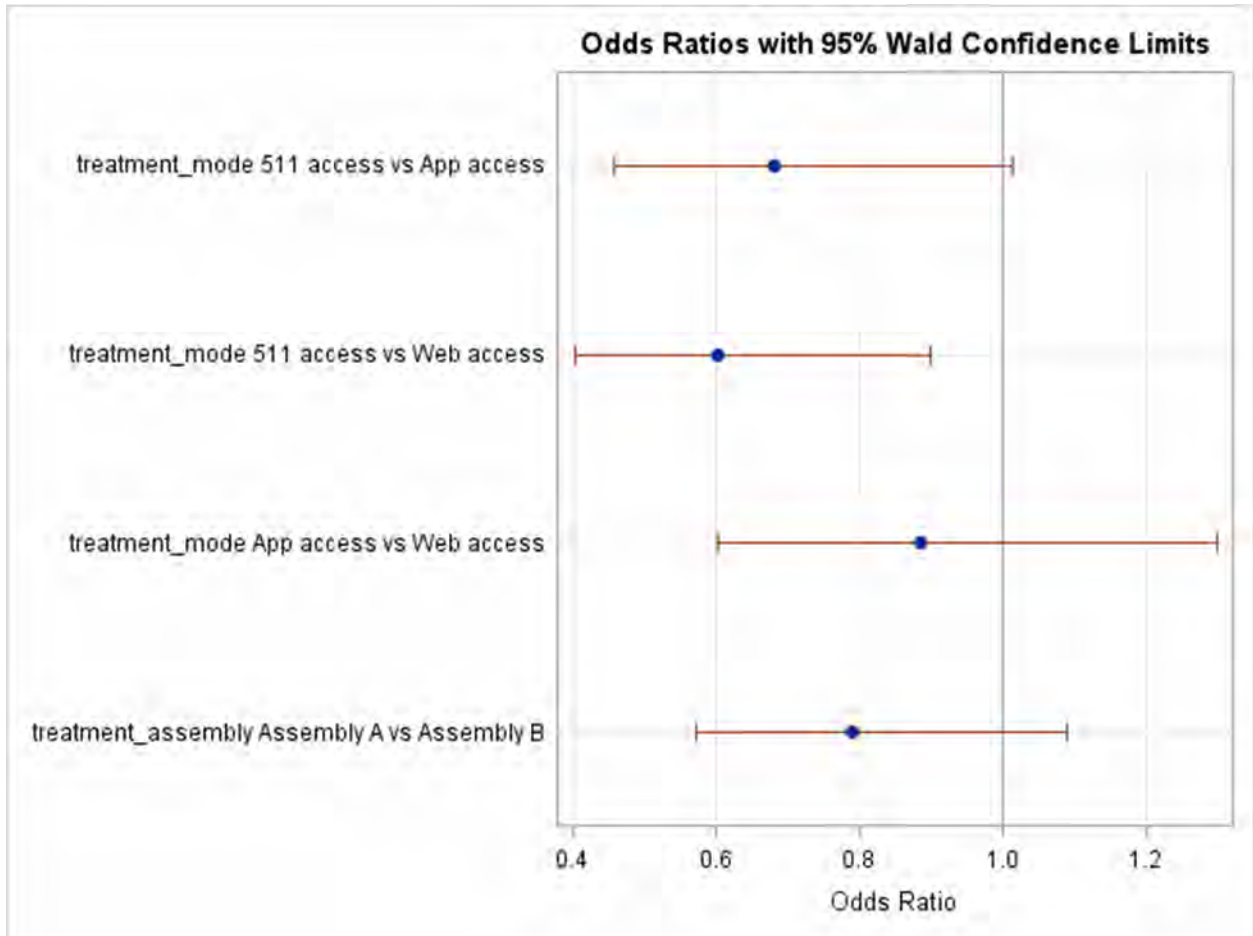
Figure 57 shows that more participants were satisfied with the recommended departure time by TTR information than dissatisfied with it. The most frequent (mode) response was Neutral.



**Figure 57. Chart. Frequency of satisfaction with the recommended departure time.**

The probability of participants reporting a higher level of satisfaction was modelled. Table 60 shows the model results, with Peak\_Hour (lower satisfaction for those with more peak hour trips) being the significant covariate.

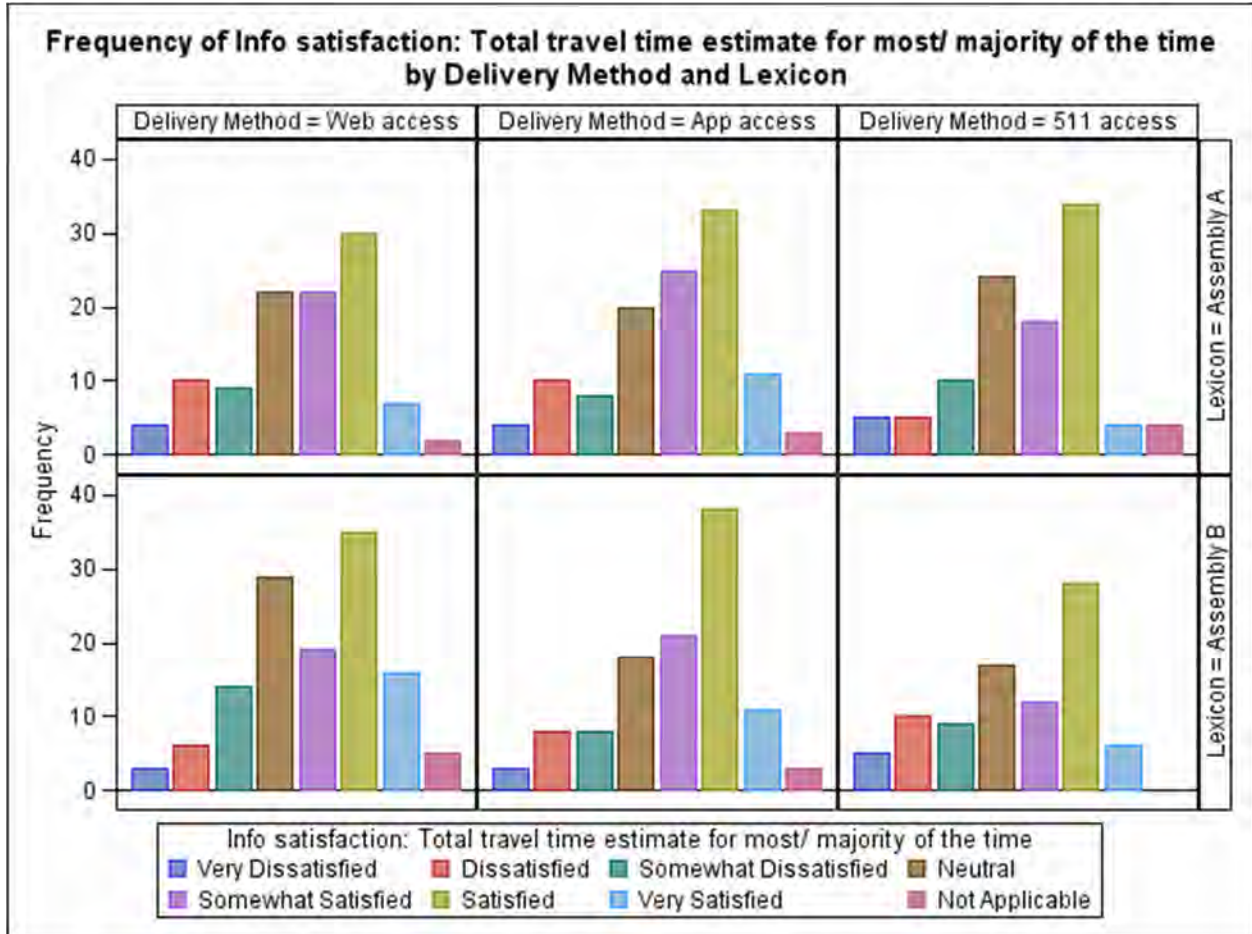
The odds ratios indicate that the likelihood of participants with 511 access being satisfied with the recommended departure time was significantly lower than Web access participants, by a factor of 0.60 (see Figure 58). The differences between 511 access and App access, and between Web access and App access were not significant. In addition, there was no significant impact of Lexicon on the agreement.



**Figure 58. Chart. Odds ratios with 95 percent confidence limits – satisfaction with recommended departure time.**

**Satisfaction: Total Travel Time Estimate for Most/Majority of the Time**

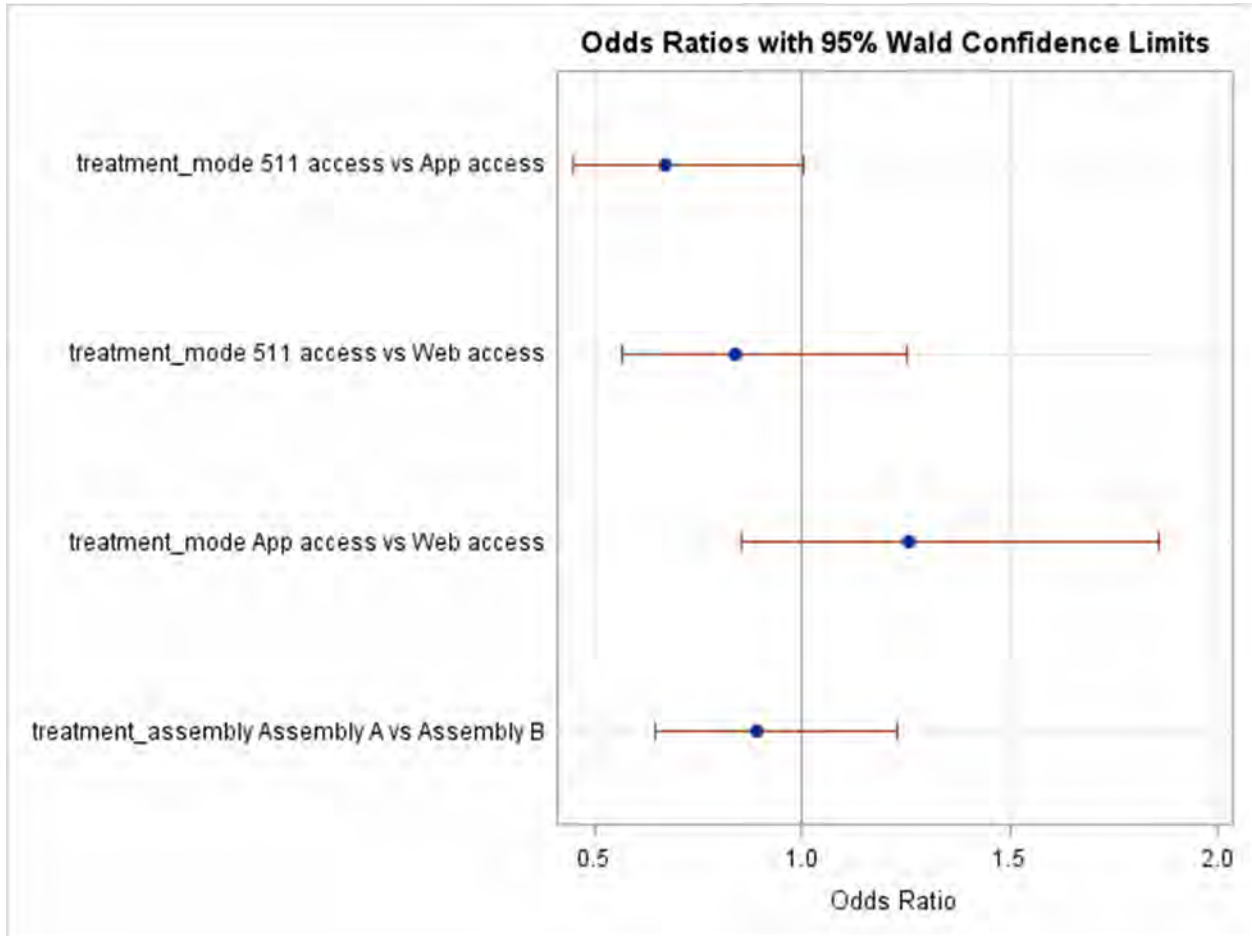
The most common (mode) response was Satisfied. More participants were satisfied with the total travel time estimated by the TTR information than dissatisfied (see Figure 59).



**Figure 59. Chart. Frequency of satisfaction with total travel time.**

The probability of participants reporting a higher level of satisfaction was modelled. Table 61 shows the model results, with no significant covariates.

No significant differences were found in the odds ratios between Lexicons and information channels (see Figure 60).



**Figure 60. Chart. Odds ratios with 95 percent confidence limits – satisfaction with total travel time.**

### Satisfaction: Trips while Using the Transportation Study Resource

The most common (mode) response was Satisfied. More participants were satisfied with trips using the TTR information than dissatisfied (see Figure 61).

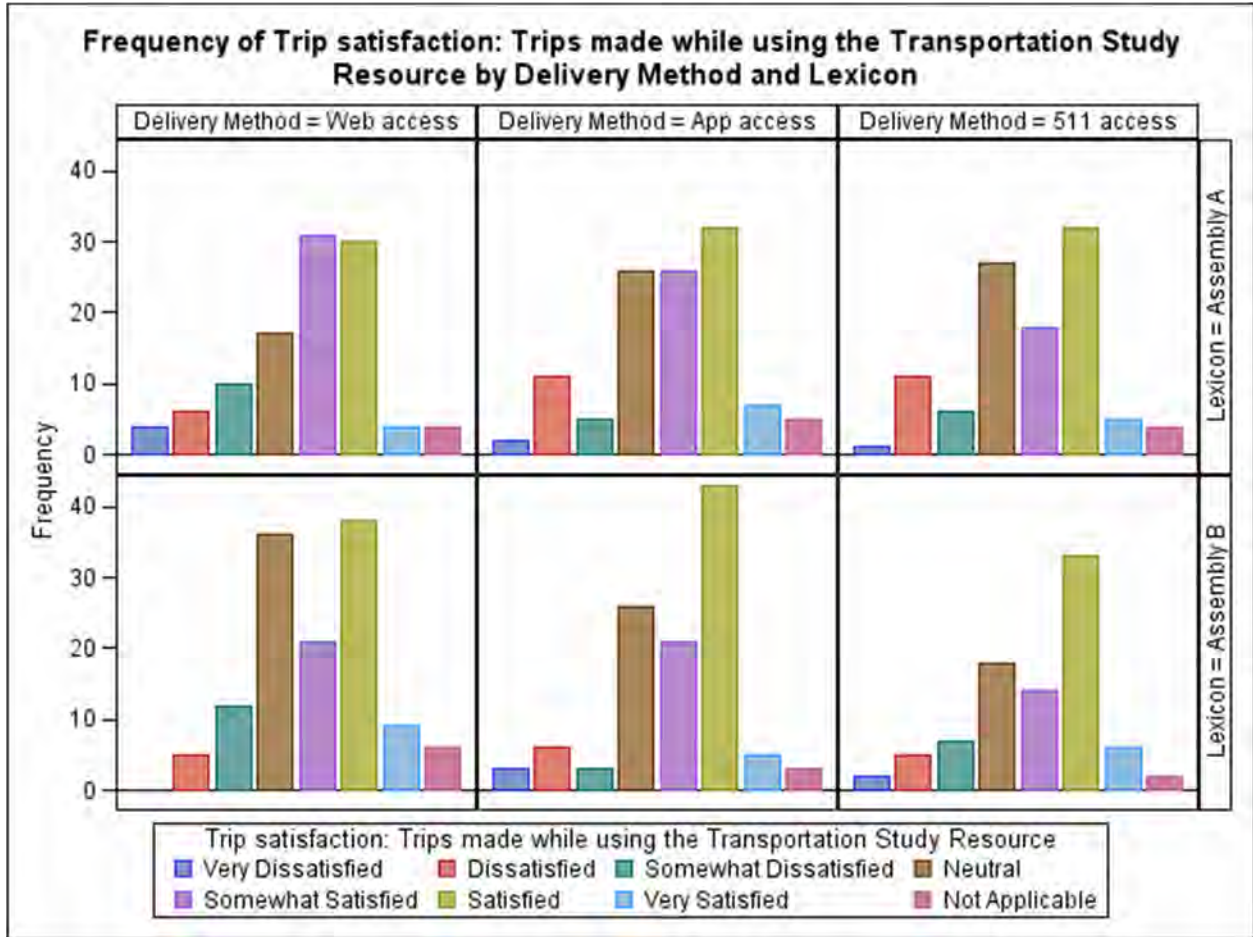
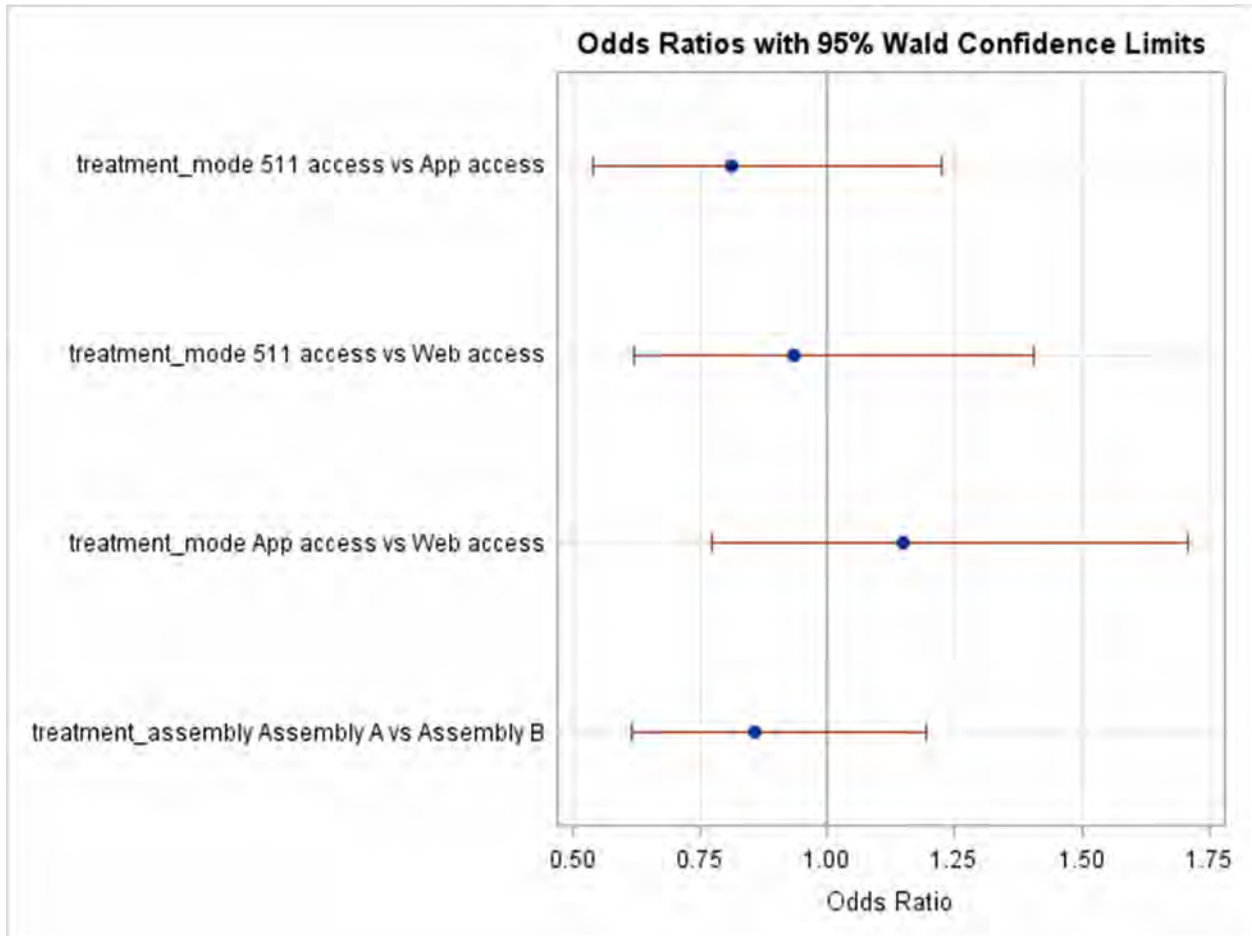


Figure 61. Chart. Frequency of satisfaction on the trips made with the transportation study resource.



The probability of participants reporting a higher level of satisfaction was modelled. Table 62 shows the model results, with Location (Houston satisfaction lagging that of Columbus and Triangle), Education (graduate degree participant satisfaction below those without a degree), Age (65 or older participants less satisfied than those under 25), Average\_Distance (longer distance travelers less satisfied), and Peak\_Hour (more frequent peak hour travelers less satisfied) being the significant covariates.

No significant differences were found in the odds ratios between Lexicons and information channels (see Figure 62).



**Figure 62. Chart. Odds ratios with 95 percent confidence limits – satisfaction with transportation study resource trips.**

## Other Results

### Why Travel Time Reliability Information was Never Used during the Study.

For those participants who reported that they never used TTR information for both familiar and unfamiliar trips, the exit survey also asked them to provide the reason. Figure 63 summarizes their responses. As shown in the figure, the most common reason was that they traveled in familiar conditions, followed by that they already used other information.

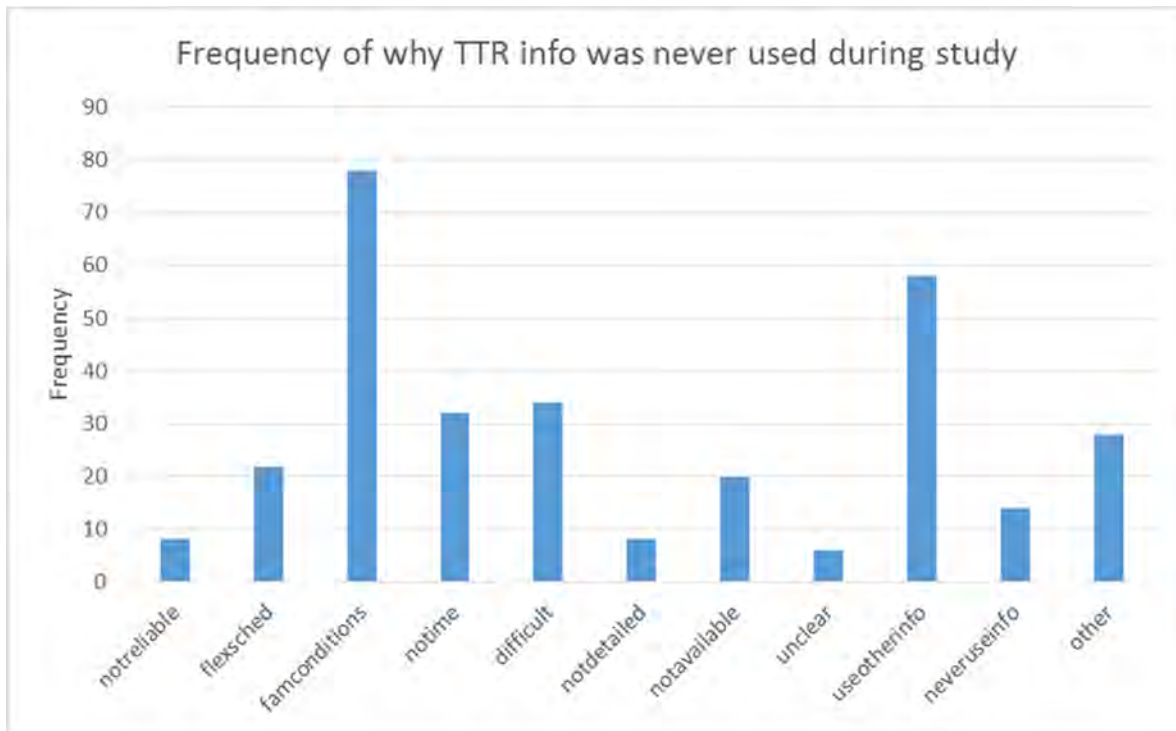
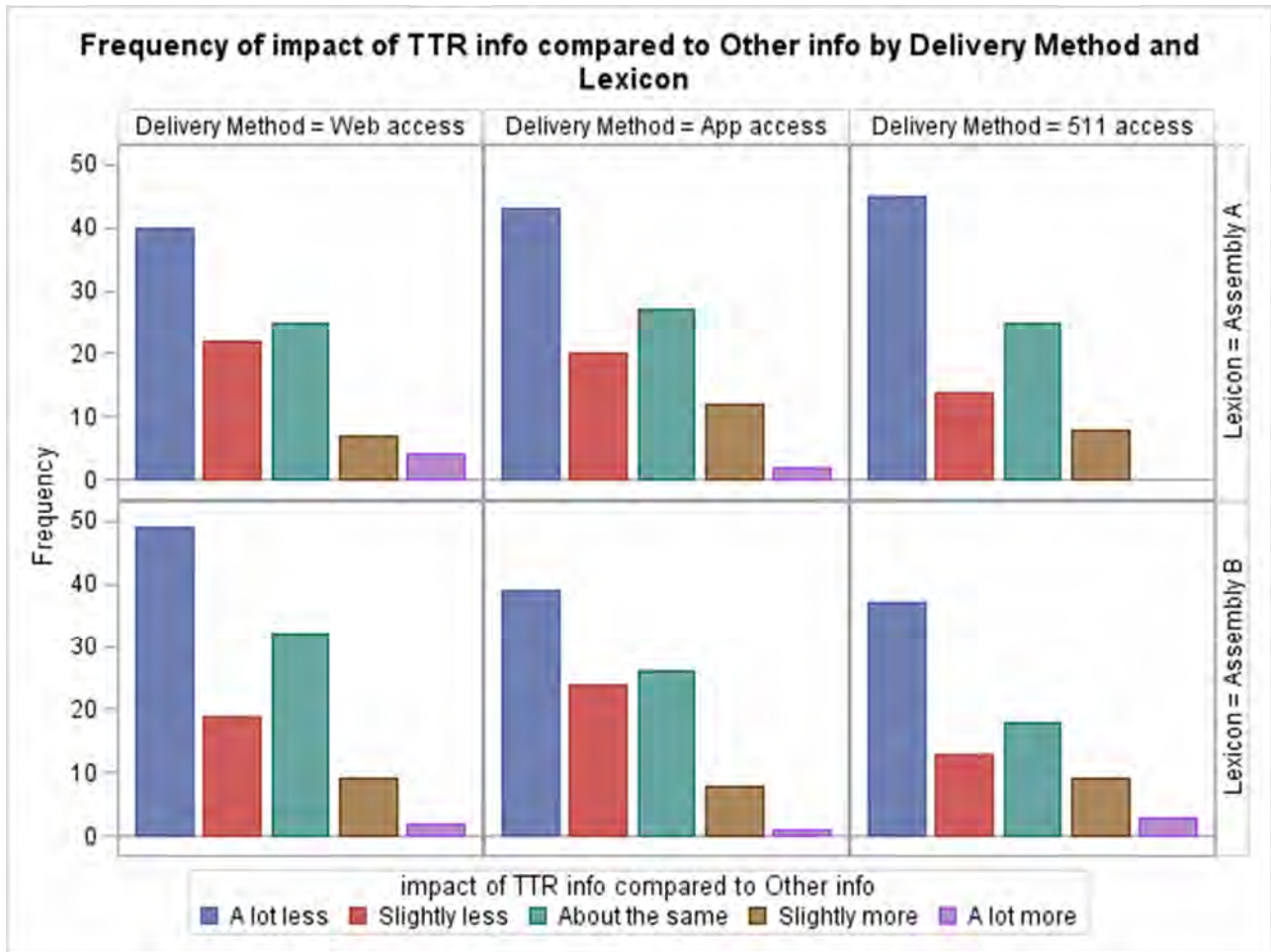


Figure 63. Chart. Why travel time reliability information was never used?



**Compared to information from the other traveler information resources, how much impact did information from the Transportation Study Resource have on your travel plans?**

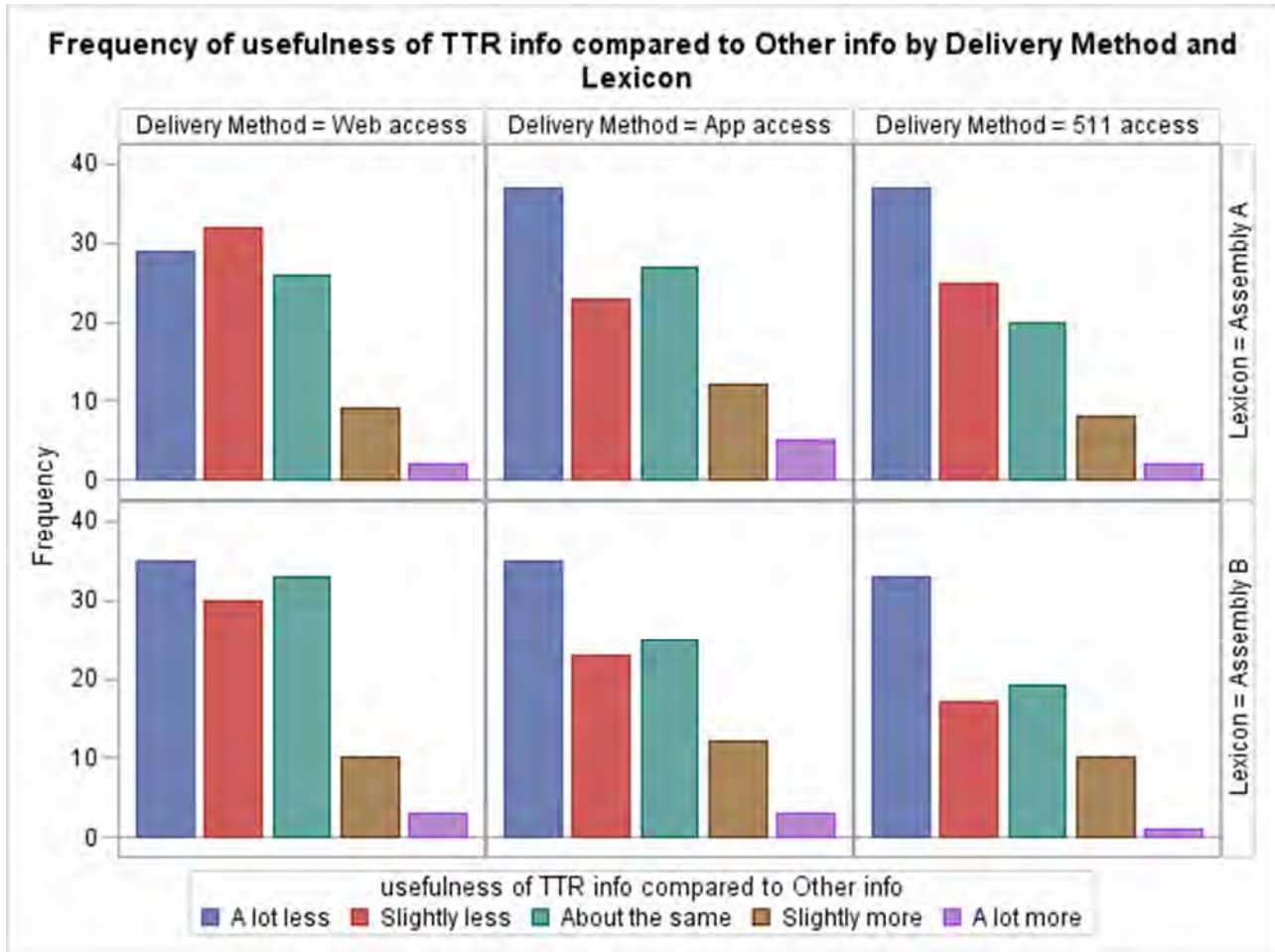
As shown in Figure 64, more participants considered the TTR information had less impact on their travel plans than those who felt the impact was about the same or more than other information resources. No significant difference caused by Lexicon or information channel was observed.



**Figure 64. Chart. Impact of travel time reliability information compared to other resources.**

**Compared to information from the other traveler information resources, how useful was the information from the Transportation Study Resource for you?**

As shown in Figure 65, more participants considered the TTR information to be less useful than those who felt the usefulness was about the same or more than other information resources. No significant difference caused by Lexicon or information channel was observed.



**Figure 65. Chart. Usefulness of travel time reliability information compared to other resources.**

## **CHAPTER 10. STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS ANALYSIS**

At the end of Round 1, the project team and the Federal Highway Administration (FHWA) held a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis meeting with the partner agencies from the study sites to try to identify lessons learned by the project team and the partner agencies through the testing of the Lexicon in the field deployment. The intent was to use the lessons learned and the project research results to refine the Lexicon for voluntary deployment in other cities. Participants were encouraged to use the workshop as an exercise in determining what other agencies will need to know for future development of Travel Time Reliability (TTR) information in their cities. FHWA emphasized the importance of the project as one of numerous pilots of the Strategic Highway Research Program 2 (SHRP2) products and their importance for the overall SHRP2 program. The following sections summarize the discussions held about the different study sites.

### **REVIEW OF WEST HOUSTON TRAVEL TIME RELIABILITY SYSTEMS AND PLATFORMS**

The study team provided an overview of the West Houston TTR systems and platforms for the participants. In general, the study team found it was difficult to keep participants in the study for the duration. It was questioned as to whether the high number of data sources available in Houston made people less willing to participate. Using the App, the study team pushed notifications to participants each morning every day of the week to encourage them to participate in the study. It is possible to automate the notification at a particular time of the day should other cities deem that to be better. Another alternative in the event of a permanent deployment could be to have individuals subscribe to the alerts and the system to push the information out. The reliability of the TTR data is another question that may need to be examined as it relates to participation and use of the information.

### **REVIEW OF NORTH COLUMBUS TRAVEL TIME RELIABILITY SYSTEMS AND PLATFORMS**

The study team provided an overview of the North Columbus TTR systems and platforms for the participants. Generally, the north and northwest side of the Columbus metropolitan area is the highest growth region around the city. This region includes large developments in the north of the city near US 36. The INRIX data used for the study was compartmentalized into Traffic Message Channel (TMC) segments. Because a built-in set of data for the region and major corridor was not readily available, the Ohio Department of Transportation (ODOT) worked to estimate what the buffer side of the number would be. As participants moved from the baseline survey to Phase 1, a little higher disqualification rate than Houston was seen because of the selected corridor. However, the participation rate for those continuing in the study was better. The ODOT team indicated that participation may have been higher because Ohio is a known good test market and people are willing to do surveys. Overall, the North Columbus pilot saw more regular users and more people who took 10-20 trips during Phase 2. All but one of the invitees had completed the exit survey.

In the future, other agencies should make sure the scrubbing and/or parsing of the data is accurate for their sites. The origin of the data also is an important factor. Other items noted during the Ohio discussion indicated that Ohio State University and its semester schedule may have had an impact on the responses and/or the usage of the App. When schools are in session, participation may make a difference. The availability of the INRIX data also impacted the corridor selection. Construction in various locations impacted selection as well; there was none scheduled for I-71 during the project.

## **REVIEW OF TRIANGLE TRAVEL TIME RELIABILITY SYSTEMS AND PLATFORMS**

The study team provided an overview of the Triangle TTR systems and platforms for the participants. The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) team noted this region does not have the alternative routes like other locations had. US 70 runs north through the region but has some limited access; it is not very viable as an alternate route. The region has three major universities: University of North Carolina at Chapel Hill, Duke, and North Carolina State in Raleigh, along with Research Triangle Park (RTP). Most of the traffic in this region is going to the RTP, and there is not really a viable alternate route for I-40. At the time of the meeting, school had been out since early May, so it may have had an impact on participation; traffic counts are typically conducted in the fall when they are in session.

The study team used HERE data for the study. A comparison of HERE and INRIX data showed that the segment justifications were different for the two data sets; there is a difference between the North Carolina Department of Transportation data and the HERE data. At the time of the meeting, the study team indicated that it seemed that more people were filling out more surveys than in Columbus. The breakdown was closer to 50/50 across gender in this region. About 60 percent of the baseline survey participants did not qualify because of various reasons. Of the 5 percent response rate from the mailed postcards, half of the responses were eliminated for various reasons. The DCHC MPO team also indicated that this type of data is beneficial for economic development purposes, employers, builders, etc.

## **VALUE PROPOSITION FOR DEPLOYING TRAVEL TIME RELIABILITY INFORMATION**

The workshop participants discussed the value proposition for deploying travel time reliability information to stakeholders and travelers. Discussions across the group took place regarding the top priority of the use of this information. Specific values that the partner agencies identified include:

- Improving facility efficiencies within a given metropolitan area.
- Gaining satisfaction from the public, which further entails optimizing the system from the consumer's perspective.

- Assessing the potential impact that TTR information may have on the environment.
- Assessing the potential impact that TTR information may have on system demand.
- Assessing the value or benefits of putting reliability into the travel models.

## **REVIEW OF STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS ANALYSIS**

The following comments represent brainstorming items from the review of the initial SWOT analysis of disseminating TTR information as conducted during the meeting:

- **Strengths**
  - The relationship between the provider and the audience is strengthened because the provider is giving additional information. However, it could become a bother in terms of providing yet another type or source of information.
  - There is a need to point to what is reliable information to increase trust, as this will serve to strengthen the trusted relationships with the public.
  - Every metropolitan area has third parties that have this type of data available, but it is provided in their own platform/format. An agency needs to determine how it competes with that option and works to become a trusted and reliable source.
  - This information service would be enhanced if the coverage were more expansive to include the arterials beyond the interstates and freeways. Building in the extra travel time is a routine habit, but if this information is available, then perhaps the public does not have to plan for a time buffer with every trip and this would be a good first step.
  - The provision of this information could benefit just-in-sequence delivery freight systems.
  - An agency could build on the historical information of the TTR for predictive purposes so other factors or impacts match the current conditions.
  - An effective way to compare reliability data is when it allows a user to make more informed decisions in a timely fashion.
  - The market is narrow for those who are new to the region and there are usually limited options for travel routes. TTR information may be more helpful, the more alternative route options there are available for selection.
  - The technology benefits of this approach are that it uses already fielded equipment with the addition of basic mobile applications.

- All information is shared from the back-end data collection engine to drive the platforms for information delivery.
  - Providing the capability to customize and/or personalize applications may strengthen usage.
- **Weaknesses**
    - The granularity of the reliability data impacts the ability to provide beneficial information.
    - The need to process reliability data for dissemination in a useful format may be a challenge for agencies.
    - The need to interface reliability data with real-time data is not common.
    - The preferences of the traveler are a weakness in terms of what they prefer to see and how they will use that information.
- **Opportunities**
    - The logistics community can help provide input on this kind of project in the future. It would support routing on the national highway system as opposed to a just a commute. Freight has the potential to be a bigger consumer of these data than the general traveling public.
    - Automating the processing of the data to disseminate can speed up the delivery.
    - Knowing and choosing what data sources are the right ones to be used at specific times of the day is important.
    - Identifying ways to consistently integrate real-time and reliability data is needed.
    - Providing new information to travelers and offering the potential for travelers to make better trip choices is a new opportunity.
    - TTR data can offer the near-term potential to impact transportation mode choices in many situations and areas. It can optimize the usage of existing networks.
    - Accessibility to reliability information can influence the demand on the system and enhance economies in terms of cost, time, and utility. It also offers a means to reduce congestion as well as emissions.

- TTR data may provide a means through expansion to provide continuity of information across major state or regional locales and the arterials and feeders (e.g., first and last mile).
  - Agencies can apply the information for other uses: planning processes, event scheduling, and improving incident response. It can also become an integral part of performance measurements in a region.
  - A more customized experience can be offered to the traveler, as well as the ability to share that information with the traveler, thereby meeting the consumer's preference.
  - Agencies can investigate ways for the information to be used to add operational strategies to keep the reliability of the system at a steady state. The data offer a means to quantify direct and indirect benefits of projects (e.g., economic impact models).
  - Agencies can utilize the data to assess or compare the value of potential projects to more effectively target spending. It could be used in the future to rank project prioritization. This could be involved with methods for state and federal funding, such as the strategic transportation initiative or detail how projects are ranked.
  - This approach makes the information absolutely easy to use. The consumer may not ask for the information because they do not understand it, but they may start asking for it once they get used to seeing it and *knowing* what they are seeing.
- **Threats**
    - Consistent accessibility to reliability data is essential for success.
    - Travelers' failure to access the information (either through ability or willingness to access data) limits the value of the data. With other apps and resources being available to travelers, they may not use the information provided.
    - Benefits are limited if the data provided are not compatible with other sources and/or there is discontinuity with the data.
    - Travelers' perception of the usefulness of the information may limit its impact.
    - The lack of trip changes or mode changes made in response to information limits the impact of the system.
    - Discontinuity across state lines and regional boundaries where existing information is available minimizes the broader impact of TTR data.

- There is a need to have and offer the value-added benefit of gaining more trustworthy data in exchange for giving up some level of privacy.
- Incompatibility of data and inability to make comparisons between data information sources increases the work required to deliver useful information.
- Making clear the goal of providing the information to the traveler is necessary (e.g., to push travelers to a different route, to push travelers to a different mode, or shift the time at which a trip is taken).

Overall, the workshop participants agreed that the information provided at the conclusion of the study could be used for a variety of purposes by operating agencies. For example, TTR information could be used by operating agencies to help mitigate the impact of traffic congestion or the effects due to construction activities to the extent that reliability information and information pertinent to construction events is readily accessible. The availability of the information to travelers could help them compare real-time conditions with reliability (historic) conditions and possibly change travel behavior to avoid congestion. Additionally, the information could be used by agencies to share reliability information with key decision-makers and planners. The alternate phrases could help ensure that these audiences understand the terminology and their meaning within the overall mobility discussion.

The partner agencies and FHWA team were also interested in the usage information for the 511 systems. They indicated that it is critical to understand the usage of the system for possible future deployments, and are particularly interested in the results from the exit survey, because they may provide background information for the next generation Advanced Traveler Information Systems (ATIS). At the time of the SWOT analysis meeting, the results were not available. The results of the usage of 511 for the study were discussed in the previous chapter and were not positive for this information platform.

At the time of the SWOT analysis meeting, the data collection efforts were still underway. As such, no changes were made to the study design and procedures. To make changes to any aspects of the research mid-project would nullify the hypotheses and confound any results gathered because clear, direct comparisons between the assemblies and dissemination platforms would not have been possible.

Overall, the SWOT analysis provided insight into the potential usefulness of the study results from the perspective of operating agencies. It was synthesized with the study results to arrive at the overall information presented in the companion document to this report.



## CHAPTER 11. FINAL REMARKS

As stated previously, the report *A Lexicon for Conveying Travel Time Reliability Information*, developed as part of the Strategic Highway Research Program 2 (SHRP2) Reliability Project L14 – *Effectiveness of Different Approaches to Disseminating Traveler Information on Travel Time Reliability* – established a preliminary set of suggested terminology and guidelines for conveying Travel Time Reliability (TTR) information to road users so that they may make optimal travel choices from their point of view, such as whether to take a trip or not, departure time, mode choice, and route choice. Specifically, a Lexicon of phrases was developed for each of eight TTR terms. Each Lexicon contained detailed guidelines for TTR information that would most likely be understood and used by the travelers.

The documented limitation of the initial research was that the Lexicon terminology and guidelines were developed as part of laboratory studies, and none of the terms were tested in a field environment. The intent of this project was to begin to assess the real-world impacts of using this information so that operating agencies could better deploy and use the recommended Lexicon terminology. The results of that research are presented herein, and the salient findings are provided below.

The field study permitted statistical comparison of the Lexicon terminology across three different information channels and for two different Lexicon assemblies. The study spanned different physical locations and utilized participants with different demographic and travel characteristics. Statistical models adjusted for these exogenous factors, which did prove to be important to properly interpreting the results of interest for the Lexicon assemblies and information channels. The city of the participants only rarely appeared as a significant factor in the models, suggesting that location was not an important differentiator in the outcomes. Among other exogenous variables, though, education level and the number of Phase 2 trips taken with the TTR information were found to significantly correlate with responses for multiple questions. Specifically, those participants with college degrees and those taking more trips in the TTR phase were less likely to report that they had made changes to either a familiar or unfamiliar trip as a result of the information. This finding was reinforced by the fact that in subsequent survey questions, these two groups were identified as finding TTR information less useful and reliable, and disagreeing that it reduced their travel time or their travel stress.

### **Lexicon Assemblies/Alternate Wording**

**Observation:** Only one survey question of seventeen evaluated resulted in statistically significant differences between the Lexicon assemblies. Those that were provided Assembly A were more likely to change their trip plans for a familiar trip than those provided Assembly B. It should be noted that across all the questions evaluated, no multiple comparison adjustments were made to the statistical test results. Therefore, any “statistically significant” result has a potential to have been reached in error. Across a large number of such results, it becomes likely that a significant result really represents only random variability in the responses and should be evaluated with caution.

**Recommendation:** Given that the statistical analysis of the study data showed that Assembly A was found to significantly increase the likelihood of behavior change on familiar trips due to TTR information compared with Assembly B (shown previously in Figure 30), the study team recommends that the initial Lexicon tables developed as part of SHRP2 L14 be modified to reflect the noted preference for Assembly A over B for familiar trips. Only nominal changes need to be made, because in all but one case those terms noted as “best” remained so. In the case of “Average Travel Time,” one of the “best” terms performed better than the other, so the other term can be moved to “adequate.” As a result, the “Average Travel Time” table was modified in the companion document to demote “Approximate travel time” from “Best” to “Adequate”.

### **Information Channel for Delivering Travel Time Reliability Information**

**Observation:** Throughout the survey responses, there were several instances showing lower utility or satisfaction for the 511 information channel than either of the Web or App access channels. In a few instances, the App access demonstrated superior responses to both 511 and the Web. The preference of dissemination platform in terms of appeal to users is (1) application, (2) website, and (3) 511 system.

**Recommendation:** Given the lower preference for the 511 system, it is not recommended that an agency develop a 511 system solely for the purpose of providing TTR information. Rather, if an agency develops a system for its existing applications (e.g., mobile application, mobile website, traditional website) and already has a 511 system, the agency may also want to provide the TTR information via 511 since the mechanism to transfer that information to a 511 system is fairly straightforward.

### **Value of Travel Time Reliability Information**

As discussed in the original SHRP2 research, the expectations were that TTR information might have value to travelers in specific circumstances and for specific types of trips rather than for every type of trip on a daily basis. Typical circumstances where travelers might perceive a benefit would be for drivers new to a region trying to plan trips in the unfamiliar landscape, or familiar drivers taking unfamiliar trips on either new routes or to new destinations at unfamiliar times of the day. Furthermore, the original research discussed the fact that drivers may underestimate the realized benefit of TTR information in terms of reduced delay, improved on-time reliability, and reduced stress. Additionally, the value of the TTR information for travelers – especially those unfamiliar to a region – would decline over time as they gain familiarity with the region and the overall aspects of congestion and performance of the regional network.

**Observation:** It is important to note that the results of this study provided mixed and/or inconclusive results in terms of the value and benefit of TTR information to travelers. Those survey participants who reported using TTR information used it for unfamiliar trips less frequently than they did for familiar trips. The reasons for this difference were not obvious from the survey responses. On the other hand, the most common reason for not using TTR information expressed by those survey participants who never used it was that they did not need it for familiar trips. This finding indicates that these participants did not believe that the information would be helpful to them for their regular commutes or likely any other trips, so they did not use it. It also indicates that they may not fully understand how the information could have helped them for these trips by providing a snapshot of typical conditions for specific time periods.

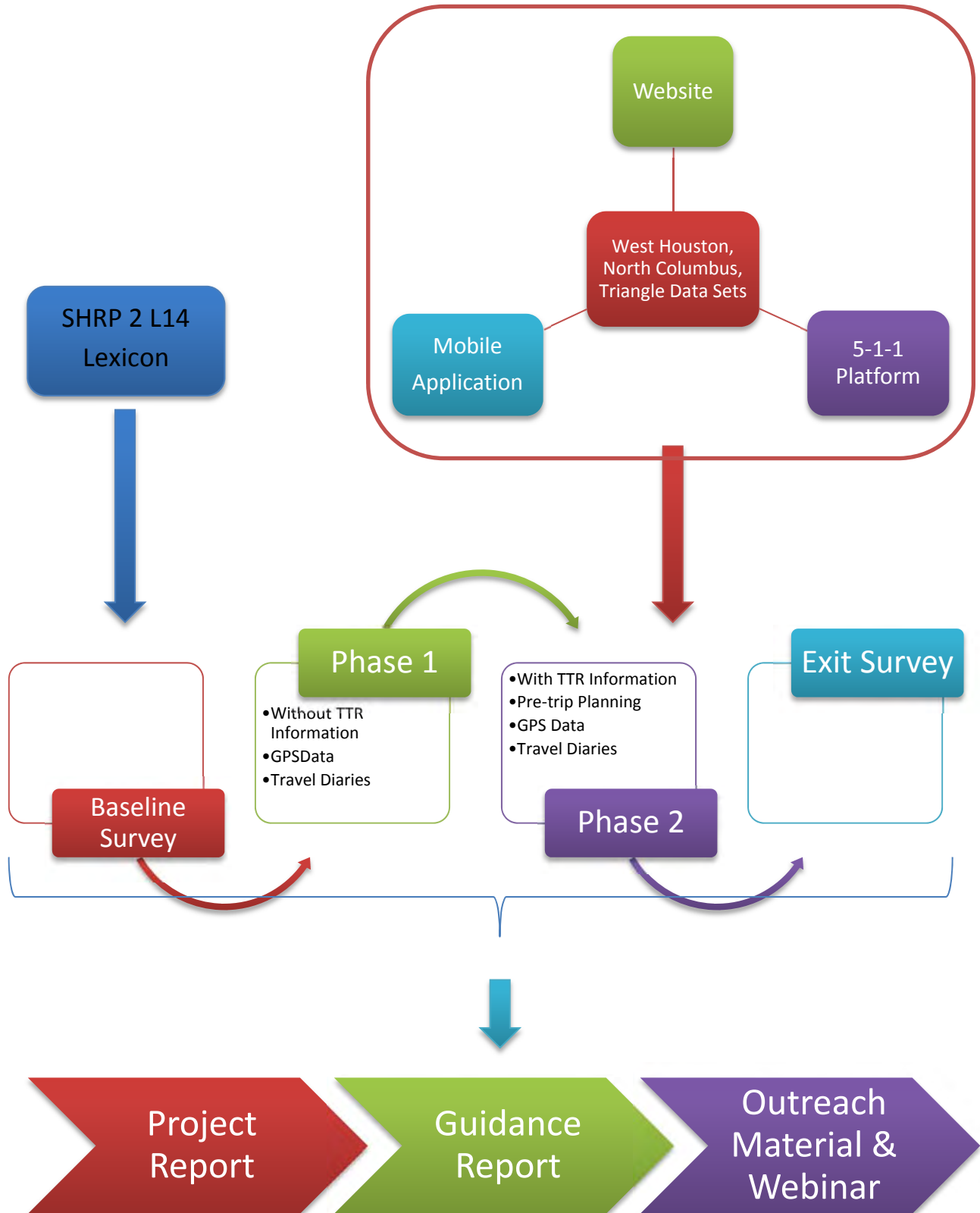
Educating potential users might help improve this understanding and, therefore, increase its use in future applications.

For the field study, the inconclusiveness of the value of TTR information could be attributed to a variety of factors. First, travelers may have primarily accessed the information for recurrent trips to familiar locations, thereby possibly offering only nominal value to the user. This trend would support the original hypothesis that drivers would find the information more useful for unfamiliar trips. Second, the lack of TTR information on alternate routes in two of the three locations may have limited the opportunity or willingness of users to change to less familiar routes in those locations. Thus, they may have felt that the provided TTR information did not have much value. Third, when completing the final user survey, drivers may have underestimated the benefits of the TTR information on their on-time performance, again supporting the finding from the original research as noted above.

**Recommendation:** While the overall results were somewhat inconclusive in terms of the value of TTR, they tend to support the findings of the original research indicating that the overall intrinsic value of TTR information alone is better for specific trips rather than for all types of trips. Combining this information with real-time information may further enhance the value to travelers by providing context for the current conditions on facilities. Additionally, providing an easy-to-understand explanation of the TTR information might help improve usage of the information.




# APPENDIX A. TRAVEL TIME RELIABILITY STUDY DESIGN





**APPENDIX B. WEST HOUSTON TRANSPORTATION STUDY BASELINE SURVEY**



**TTR Study: Baseline  
Questionnaire**

**Houston – Rounds 1 & 2**

May 2015

## Baseline survey design goals/ considerations for reviewers

### What are the primary goals of this survey?

- Screen regular travelers to determine who is qualified for this study
- Collect information about typical commuting behavior and non-work travel behavior in the corridor, including mode, route, and flexibility (ability to choose alternate times/routes/modes)
- Establish a baseline awareness of, comfort with and use of traveler information resources (including what sources they currently use, what kind of information they look for, and how it affects their travel choices)
- Collect basic demographic information to assess how travel behavior and information use vary for different types of corridor users
- Collect email address for continued study administration

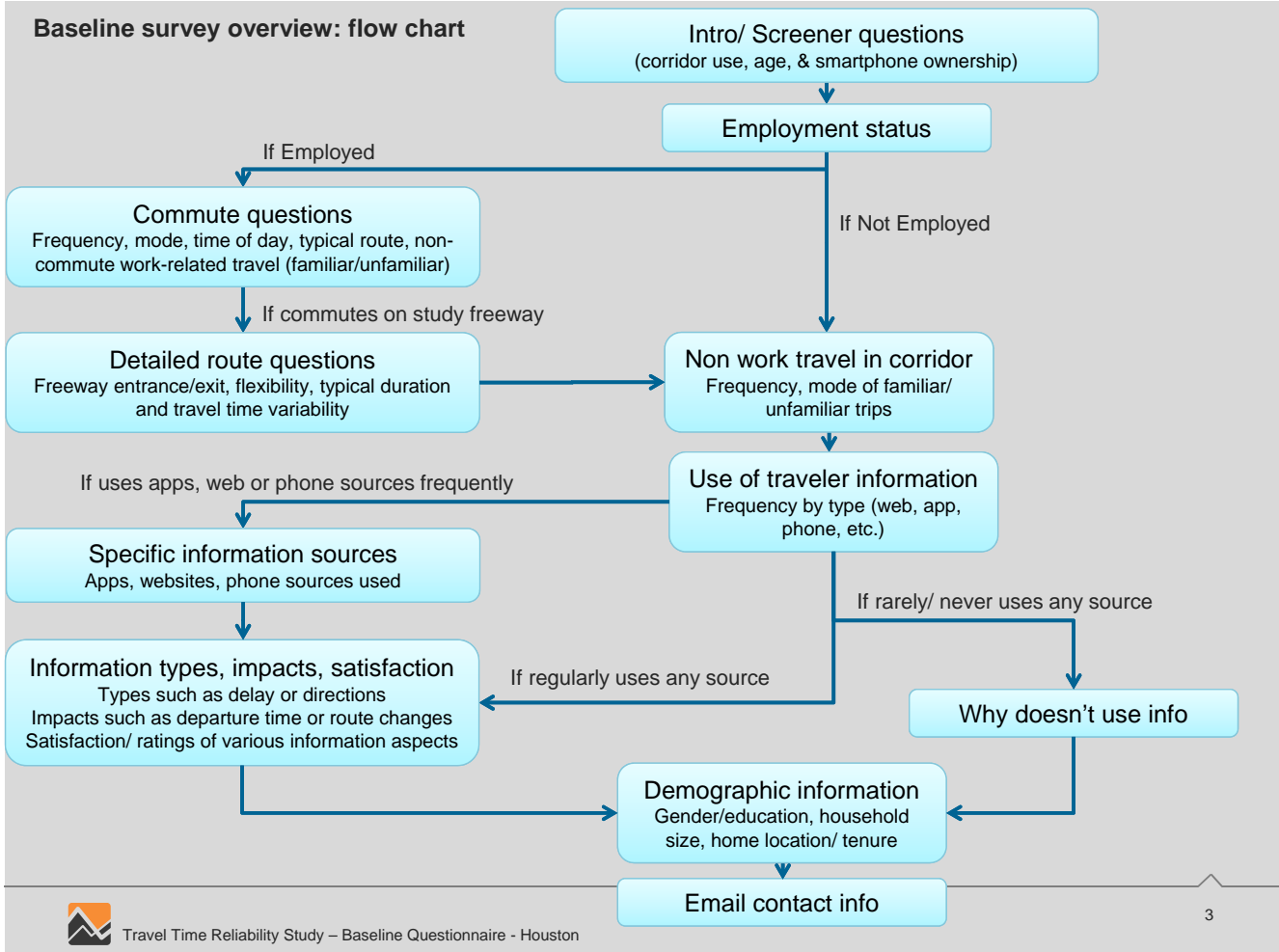
### The survey aims to balance the need for detail with the goal of minimizing respondent burden.

- This survey includes many detailed questions, some of which may be considered “extra” or “optional” questions that provide extra context but are not essential to the final analysis.
- Some survey questions ask for more detail than initially suggested as a way of reducing ambiguity and improving data quality.
  - For example, if a person uses travel apps once a month, they may be unsure of whether to answer yes or no about whether they typically use apps. Also, people who only use apps once/month may be significantly different than those who use apps daily.
- Some survey topics are broken into several smaller/ simpler questions to reduce ambiguity or make the questions easier to understand, and/or to improve data quality.
  - For example, rather than asking for open-ended route descriptions, the survey prompts respondents with route suggestions (e.g. Katy, Westpark or other) and then provides a list of entrances or exits in the corridor to choose from. This data is typically cleaner and more complete than open-ended descriptions.
- Some FAQs and survey questions intentionally use general language to try and avoid influencing how participants respond.
  - For example, information about who qualifies for the study says “regular” freeway users qualify, but does not specify how many days per week are required as this may encourage some people to simply provide an answer that allows them to continue.





**Baseline survey overview: flow chart**



## Baseline questionnaire formatting overview


This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)




Password Entry Page



# WEST HOUSTON

## TRANSPORTATION STUDY

WELCOME



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[Study FAQs](#)

[Privacy Policy](#)

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## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Houston area drivers who regularly use the Katy Freeway, Westpark Tollway and other roads west of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the West Houston Study Corridor.

- What is the West Houston Study Corridor?

The West Houston Study Corridor includes about 25 miles of the Katy Freeway (I-10), the Westpark Tollway, and other roads between Grand Parkway/ Highway 99 in Katy, TX and downtown Houston.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the West Houston Study Corridor. This survey will take about 15 minutes to complete. To start this survey, use the unique password you received on your postcard to log into the secure survey website: <https://surveyrsg.com/westhouston>

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a **\$25 Amazon.com gift card!**



## Frequently Asked Questions

### General Information

- **Why should I participate?**

As one of a small number of travelers in the Houston area invited to participate, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.
- **How was I selected to participate?**

Invited participants were randomly selected from all residential addresses in the West Houston study area.
- **How are my privacy and personal information protected?**

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.
- **What if I change my mind about participating?**

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.
- **Who do I contact if I have questions or need help during the study?**

For help on how to complete the surveys or for general questions or feedback about the study, email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).
- **Who is sponsoring this study?**

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Texas Department of Transportation (TxDOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and TxDOT.

## **Resource Systems Group, Inc. Privacy Statement**

### **SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

### **PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

### **ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

### **THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com)



## **Welcome and thank you for your participation!**

The purpose of this study is to better understand Houston area residents' experiences while traveling on the Katy Freeway, Westpark Tollway, and other freeways in the greater Houston area. The U.S. Department of Transportation wants to understand the decisions you make to handle traffic congestion and also wants your opinions on how to improve travel conditions.

You are one of a small number of travelers invited to take part in the study, so your responses will have a significant impact. Thank you again for your participation.

Your privacy will be protected. Please [click here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com) with any questions or concerns.

Please click "Next" to continue!

Next





## Definition and description of the West Houston Study Corridor

For this study, the West Houston Corridor includes:

- About 25 miles of the Katy Freeway (I-10) between Katy, TX and downtown Houston
- The Westpark Tollway (approximately 5 miles south of the Katy Freeway)
- Other local/secondary roads near the Katy Freeway and Westpark Tollway

Please click “Next” to continue

Previous

Next



## Tips for completing this survey

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.

## Now, let’s get started!

To begin the study, you may wish to review the study information in the FAQs. Please check the box below to confirm that you would like to continue.

- By checking this box, I confirm that I have read the study information and agree to participate.

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**In a typical week, about how often do you drive on the Katy Freeway or on the Westpark Tollway in the study area on weekdays?**

What is the West Houston Transportation Study area?

[popup repeats the study area definition from the “corridor” page (not including the heading “definition and description...”)]

**How often do you typically drive on the Katy Freeway?**

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

**How often do you typically drive on the Westpark Tollway?**

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

Terminate if less than 3 weekdays per week for both

Previous

Next



## How old are you?

This information will only be used to help us understand how well survey participants represent all travelers in the study area.

- Under 18 **[terminate if selected]**
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75–84
- 85 or older

Previous

Next



## What kind of smartphone do you own?

For the next part of this study (after this survey is complete), you will be asked to log information about your daily trips in the study area on your smartphone. Information about the type of smartphone you own will help us provide you with the correct resources to complete the study.

- Apple iPhone
- Android smartphone
  - [Click here to view examples of types of Android phones](#)
- Other type of smartphone (e.g., Windows phone, Blackberry, etc.) **[terminate if selected]**
- I'm not sure **[terminate if selected]**
- I do not own a smartphone **[terminate if selected]**

Previous

Next



Popup examples from previous slide

Examples of Android smartphones:

- Samsung Galaxy
- DROID RAZR
- HTC One
- Google Nexus



Terminate if under 18, doesn't have an iPhone or Android, or travels less than 3 weekdays/week on the study freeways

### **Thank you for your answers.**

Unfortunately, we cannot ask you to continue as this study requires participants who:

- Regularly drive on the Katy Freeway or Westpark Tollway in the study area;
- Are age 18 or older; and
- Own smartphones on which they can install and operate the mobile application for the second part of the study.

Thank you again for your interest! Please email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com) if you have any questions or comments.



### What is your primary employment status?

- Employed full-time
- Employed part-time
- Self-employed (full-time or part-time)
- Student, employed full-time
- Student, employed part-time
- Student, not employed
- Homemaker
- Retired
- Not currently employed

If not employed, skip to non-work travel questions

Previous

Next





If employed (employment <= 5)

Thank you for your answers so far! The next few questions are about your work and typical work travel.

**How often do you commute to your primary workplace in a typical week?**

- 6-7 days/week
- 5 days/week
- 4 days/week
- 3 days/week
- 2 days/week
- 1 day/week
- Never – I typically telecommute/ work from home
- N/A – no primary workplace (I commute to multiple locations/job sites)

If commute\_freq is “Never” or “N/A”, skip to drivejob (questions on non-commute work-related trips)

Previous

Next



If travels to a primary workplace (commute\_freq <= 6)

**Please describe your typical commute to work.**

Please describe how you travel to work most often. We understand your commute may vary.

Approximately what time do you typically start work?

Approximately what time of day do you typically finish work?

Do you always work the same days?

What is the primary way you typically travel to work?

Do you typically use the Katy Freeway or Westpark Tollway as part of your primary route to work?

**[if route=other]** What is your typical route to work? \_\_\_\_\_

**work\_start, work\_end**

1. Between 6:00-10:00 AM
2. Between 10:00 AM-3:00 PM
3. Between 3:00-7:00 PM
4. Between 7:00 PM-6:00 AM
5. It varies

**work\_vary**

1. Yes, I always work the same days
2. No, my schedule can vary from week to week

**commute\_mode**

1. Drive alone
2. Carpool
3. Vanpool
4. Public transit (bus/light rail)
5. Other

**commute\_route**

1. I typically use the Katy Freeway to get to work
2. I typically use the Westpark Tollway to get to work
3. No, I typically use another route to get to work



If travels to a primary workplace (commute\_freq <= 6)

### How often do you commute to work another way?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit (bus/light rail)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hide row that was selected as primary commute\_mode

Previous

Next



If travels to a primary workplace (commute\_freq <= 6)

### How often do you use alternate routes to get to work?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
[if not selected] Katy Freeway	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if not selected] Westpark Tollway	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Katy Freeway frontage roads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Westheimer Road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Richmond Avenue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memorial Drive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If "other" is selected "frequently" or "sometimes"

### Optional: What other routes to you use to get to work?

*Optional text box entry*

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Next



If typically uses Katy or Westpark for primary commute route. Fill in dynamic text with selected primary route

**Please describe your typical commute to work on the <Katy Freeway/  
Westpark Tollway>.**

[if Katy] Do you typically use the managed lanes\* for any part of your commute?

What direction do you travel on your way to work?

Where do you typically get ON the freeway?

What time do you typically get ON the freeway?

Where do you typically get OFF the freeway?

What time do you typically get OFF the freeway?

How much flexibility do you have in your arrival time at work?

\* "Managed lanes" such as those on the Katy Freeway are limited access lanes on the freeway drivers of single-occupant vehicles access during congested travel times by paying a toll. High-occupancy vehicles may be allowed to use the lanes for free during certain hours.

**commute\_toll**

1. Yes
2. No

**direction**

1. Eastbound (towards downtown Houston)
2. Westbound (away from downtown Houston)

**loc\_on**

- List of **Katy** freeway entrances (if Katy)
- List of **Westpark** freeway entrances (if Westpark)
- **Filter by direction**
- (See next slides)

**time\_on**

- List of 15-minute intervals
- No filtering, show entire list, but start with 6am at top

**loc\_off**

- List of **Katy** freeway entrances (if Katy)
- List of **Westpark** freeway entrances (if Westpark)
- **Filter by direction and entrance location (so can't select the same exit or an exit "behind" entrance)**  
(i.e., if direction = 1, then only show loc\_off > loc\_on; if direction = 2, only show loc\_off < loc\_on)

**time\_off**

- List of 15-minute intervals
- No filtering (same as time\_on)

**arrival\_flex**

1. I always arrive at work at the same time
2. My arrival time can vary up to 15 minutes
3. My arrival time can vary up to 30 minutes
4. My arrival time can vary up to 45 minutes
5. My arrival time can vary by an hour or more

<b>Katy Freeway Entrances/Exits</b>		<b>Display by direction</b>
1	Other exit farther west	Both
2	Exit 743 SH 99 Toll (Grand Parkway) – Sugar Land, Tomball	Both
3	Exit 745 Mason Road	Both
4	Exit 746 Westgreen Boulevard	Both
5	Exit 747A Fry Road	Both
6	Exit 747B Greenhouse Road	Both
7	Exit 748 Barker-Cypress Road	Both
8	Exit 750 Park Ten Boulevard	Both
9	Exit 751 SH 6	Both
10	Exit 753A Eldridge Parkway	Both
11	Exit 753B Dairy Ashford Road	Both
12	Exit 754 Kirkwood Road	Both
13	Exit 755 Wilcrest Drive	Westbound
14	Exit 755 Wilcrest Drive/Beltway 8 (Frontage Road)	Eastbound
15	Exit 756 Sam Houston Tollway	Both
16	Exit 756A Beltway 8 (Frontage Road)	Westbound
17	Exit 756B Sam Houston Tollway	Both
18	Exit 757 Gessner Road	Both
19	Exit 758 Bunker Hill Road	Both
20	Exit 759A Blalock Road, Echo Lane	Both
21	Exit 759B Campbell Road	Both
22	Exit 760 Bingle Road, Voss Road	Both
23	Exit 761 Wirt Road, Chimney Rock Road/Antoine Drive, Silber Road	Eastbound
24	Exit 761A Wirt Road, Chimney Rock Road	Westbound
25	Exit 761B Antoine Drive, Silber Road	Westbound
26	Exit 762 Silber Road, Katy Road, North Post Oak Road	Eastbound
27	Exit 762B Silber Road, Katy Road, North Post Oak Road	Westbound
28	Exit 763 I-610 (West Loop Freeway)	Both
29	Exit 764 Washington Avenue, Westcott Street	Both
30	Exit 765A T. C. Jester Boulevard	Both
31	Exit 765B Durham Drive, Shepherd Drive, Patterson Street	Both
32	Exit 766 Yale Street, Heights Boulevard	Both
33	Exit 767A Studemont Drive	Both
34	Exit 767B Taylor Street	Both
35	Exit 768 I-45 (North Freeway, Gulf Freeway) – Dallas, Galveston	Both
36	Other exit farther east	Both





	<b>Westpark Tollway Entrances/Exits</b>	<b>Display by direction</b>
37	Other exit farther west	Both
38	FM 1093 west (Westheimer Road)	Both
39	SH 99 Toll (Grand Parkway)	Both
40	Peek Road	Eastbound
41	Mason Road, Grand Mission Boulevard	Both
42	Grand Mission Boulevard	Both
43	SH 6 / FM 1093 / FM 1464 / Barker Cypress Road	Both
44	Westpark Drive	Eastbound
45	SH 6 north	Both
46	Eldridge Parkway	Both
47	West Houston Center Boulevard, Dairy Ashford Road	Both
48	Sam Houston Tollway	Eastbound
49	Gessner Road	Eastbound
50	Fondren Road, Gessner Road	Both
51	I-69 / US 59 north - Downtown	Both
52	Westpark Drive	Eastbound
53	Post Oak Boulevard	Both
54	Other exit farther east	Both



If primary commute route is Katy or Westpark

**How long does your trip to work on the <Katy Freeway/ Westpark Tollway> typically take under different conditions?**

Please describe your experiences for the portion of your trip on the freeway, not including time spent getting to and from the freeway.

At your usual time on a day with typical congestion: \_\_\_\_\_ minutes

At your usual time on a day with heavy congestion: \_\_\_\_\_ minutes

When there is little or no congestion (e.g. early Sunday morning): \_\_\_\_\_ minutes

Numeric text entry 1-999.

Validate that typical time <= congested time.

Validate that freeflow time <= typical time.

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If travels to a primary workplace (commute\_freq <= 6)

### Please indicate where your primary workplace is located.

This question is asked to help us understand where travelers frequently experience congestion. Your information will be protected. Please click here to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

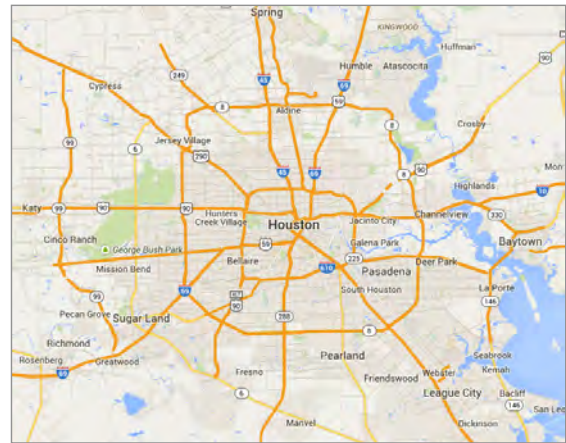
To locate by address, please enter a *street number* or the *nearest intersection* – or you can enter a business name.

- Example: 1200 McKinney St, Houston, TX
- Example: McKinney St and Caroline St, Houston, TX
- Example: Houston Center, Houston, TX

<if locate by map>

#### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.



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If employed

### How often do you need to drive to familiar or unfamiliar places around town for your job during your workday?

Familiar work-related destinations may include regular meetings, regular customers on a sales route, or any work-related destinations that you regularly visit or feel comfortable finding without directions. This does not include commuting to your primary workplace.

Unfamiliar work-related destinations may include infrequent or new meetings, sales calls to new customers, deliveries, or other places you rarely visit or need directions or navigation assistance to find.

	One or more times/ day	A few times/ week	About once/ week	A few times/ month	About once/ month	Less than once/ month	Never	Not Applicable
<u>Familiar</u> locations (e.g. regular meetings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> locations (e.g. deliveries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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All respondents

### How often do you travel on the Katy Freeway and Westpark Tollway in the study area for personal trips to familiar locations?

For example, trips to familiar locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend's house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

#### Familiar personal trips on the Katy Freeway

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

#### Familiar personal trips on the Westpark Tollway

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

[Link the words "study area" to pop-up reminder of corridor definition](#)

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Show page if Katy familiar freq is not never OR Westpark familiar freq is not never or n/a (nworkfreq\_fam\_katy <=6 OR nworkfreq\_fam\_westpark <=6)

**How do you typically travel on the Katy Freeway or Westpark Tollway when going to familiar destinations?**

	Almost always	Frequently (a few times/week)	Sometimes (a few times/month)	Rarely (less than once/month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit (bus/light rail)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “familiar” to pop-up reminder of familiar personal destination definition (from previous slide)

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All respondents

### How often do you travel on the Katy Freeway and Westpark Tollway in the study area for personal trips to unfamiliar locations?

For example, trips to unfamiliar locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.

#### **Unfamiliar personal trips on the Katy Freeway**

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

#### **Unfamiliar personal trips on the Westpark Tollway**

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

Link the words “study area” to pop-up reminder of corridor definition

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Show page if Katy UNFAMILIAR freq is not never OR Westpark UNFAMILIAR freq is not never or n/a  
 (nworkfreq\_unfam\_katy <=6 OR nworkfreq\_unfam\_westpark <=6)

**How do you typically travel on the Katy Freeway or Westpark Tollway when going to unfamiliar destinations?**

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit (bus/light rail)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “unfamiliar” to pop-up reminder of unfamiliar personal destination definition (from previous slide)

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**If you would like to provide any comments about your travel experiences on the Katy Freeway or Westpark Tollway in the West Houston study area, please share them below.**

*Optional text box entry*



## **Thank you for your answers so far!**

The next few questions are about your familiarity with and use of communication devices and traveler information resources.

Traveler information resources may include TV or radio reports, electronic message signs on highways, websites, apps, alerts, telephone information services or other information sources that the traveling public can access to help plan trips in the region.

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**In addition to your smartphone, which of the following communication and in-vehicle technologies do you own and regularly use for any purpose?**

Please select all that apply.

- Desktop computer with Internet access
- Laptop computer with Internet access
- Tablet computer (e.g. Apple iPad, Google Nexus 9) with Internet access
- Cell phone that is NOT web enabled
- Landline phone
- Toll transponder (e.g. TxTag or EZ Tag) in your vehicle
- Built-in (factory/dealer installed) GPS or navigation device in your vehicle
- Portable GPS or navigation device (e.g. Garmin, TomTom)
- Other, please specify: \_\_\_\_\_
- None of the above

Randomize (with "Other" and "None" anchored at the bottom)

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**In general, how often do you check the following sources for traveler information when planning trips to familiar destinations in the greater Houston area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom



**In general, how often do you check the following sources for traveler information when planning trips to unfamiliar destinations in the greater Houston area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom



If uses web 1+ days/week for familiar and/or unfamiliar trips

**What websites do you typically check for traveler information before a trip?**

Please select all that apply.

- Any Texas DOT website (e.g., www.drivetexas.org)
- Houston TranStar
- Google Maps
- Bing Maps
- MapQuest
- Traffic.com
- Here.com
- TV or Radio station websites
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses apps 1+ days/week for familiar and/or unfamiliar trips

**What smartphone or tablet apps do you typically check for traveler information before a trip?**

Please select all that apply.

- Houston TranStar
- Google Maps/Navigation
- Waze
- INRIX
- [if smartphone=Apple] Apple iPhone Maps
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses phone 1+ days/week for familiar and/or unfamiliar trips

**What telephone numbers do you typically check for traveler information before a trip?**

Please select all that apply.

- Texas DOT (1-800-452-9292)
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses "other" source 1+ days/week for familiar and/or unfamiliar trips

**What other information sources do you typically check for traveler information before a trip?**

Please enter text below.

*Text box entry – optional for respondent*

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If uses any info for familiar trips (infosources\_familiar are not "never" for all options)

**What kind of information do you typically look for when you are planning trips to familiar destinations in the greater Houston area?**

Please select all that apply.

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses info for unfamiliar trips (infosources\_unfamiliar are not “never” for all options)

**What kind of information do you typically look for when you are planning trips to unfamiliar destinations in the greater Houston area?**

Please select all that apply.

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with “Other” anchored at the bottom

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If `infosource_familiar` is not "Never" for all options

**How often do you change your travel plans to familiar destinations if you learn about congestion on your typical route?**

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosource\_unfamiliar is not "Never" for all options

**How often do you change your travel plans to unfamiliar destinations if you learn about congestion on your typical route?**

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**In general, how satisfied are you with the following aspects of the traveler information you receive?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Travel time or speed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction duration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Directions or alternate route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**For the travel information you receive, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
Information sources I use are easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I receive is reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use reduces the stress of my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information helps me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use does NOT reduce the amount of time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall the information I receive is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements



If never uses info (infosource\_fam and infosource\_unfam are “never” for all options)

### Can you tell us why you do not use information for your trips in the greater Houston area?

Please select all that apply.

- The information does not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with most or all of the greater Houston area and do not need directions
- I am familiar with traffic conditions/travel times for most or all of the routes I generally use
- I do not know where to find information
- I do not have time to look for information
- Accessing information is difficult or inconvenient
- The information is not detailed enough
- No information is available for my routes or destinations
- Other, please specify: \_\_\_\_\_

Randomize statements

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Thank you for your responses so far – you are almost done!  
The last few questions are about you and your household to ensure that we have a representative sample of travelers in the Houston area.

**Please tell us about yourself.**

Gender	<input type="text" value="Select..."/>
Education	<input type="text" value="Select..."/>

**gender**

1. Male
2. Female

**education**

1. Less than high school
2. High school graduate/GED
3. Some college
4. Vocational/technical training
5. Associates degree
6. Bachelors degree
7. Graduate degree (MA, PhD)
8. Professional degree (MBA, JD, MD)



Please tell us about your household.

**How many adults (other than yourself) live in your household?**

- 0 (I am the only adult)
- 1 other adult
- 2 other adults
- 3 other adults
- 4 other adults
- 5 or more other adults

**How many children live in your household?**

- 0 (no children)
- 1 child
- 2 children
- 3 children
- 4 children
- 5 or more children

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Please tell us about your current home (the residence where you received the invitation to the study or where you live the majority of the time).

**How long have you lived in your current residence?**

- Less than one year
- 1-2 years
- 2-5 years
- 5-10 years
- 10-20 years
- More than 20 years

**Do you own or rent your home?**

- Own
- Rent
- Provided by job
- Other

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## Where is your home located?

This helps us understand where you frequently travel and ensures that we have a representative sample from the Houston area. The details of your information will be protected. Please [click here](#) to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

To locate by address, please enter a *street number* or the *nearest intersection*.

- Example: 1200 McKinney St, Houston, TX
- Example: McKinney St and Caroline St, Houston, TX

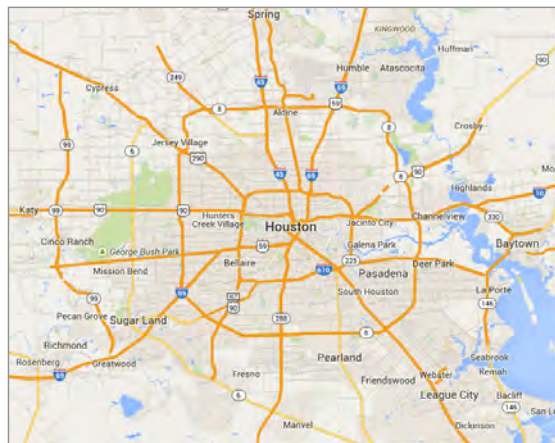
<if locate by map>

### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.

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**In 2014, what was your household's total annual income (from all sources) before taxes or other deductions from pay?**

This information is only used to ensure that we have a representative sample of Houston residents. Please [click here](#) to view the privacy policy.

- Under \$10,000
- \$10,000-\$24,999
- \$25,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000-\$199,999
- \$200,000-\$249,999
- \$250,000 or more
- Prefer not to answer

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**Please enter your email address below.**

We will only use this address to provide information about this study. We will also send the \$25 Amazon.com gift card via email after you complete all parts of the study.

You will only be contacted for this study and your information will never be shared or sold. Please click [here](#) to view the privacy policy.

Email address: \_\_\_\_\_ [verify valid format]

Previous

Finish



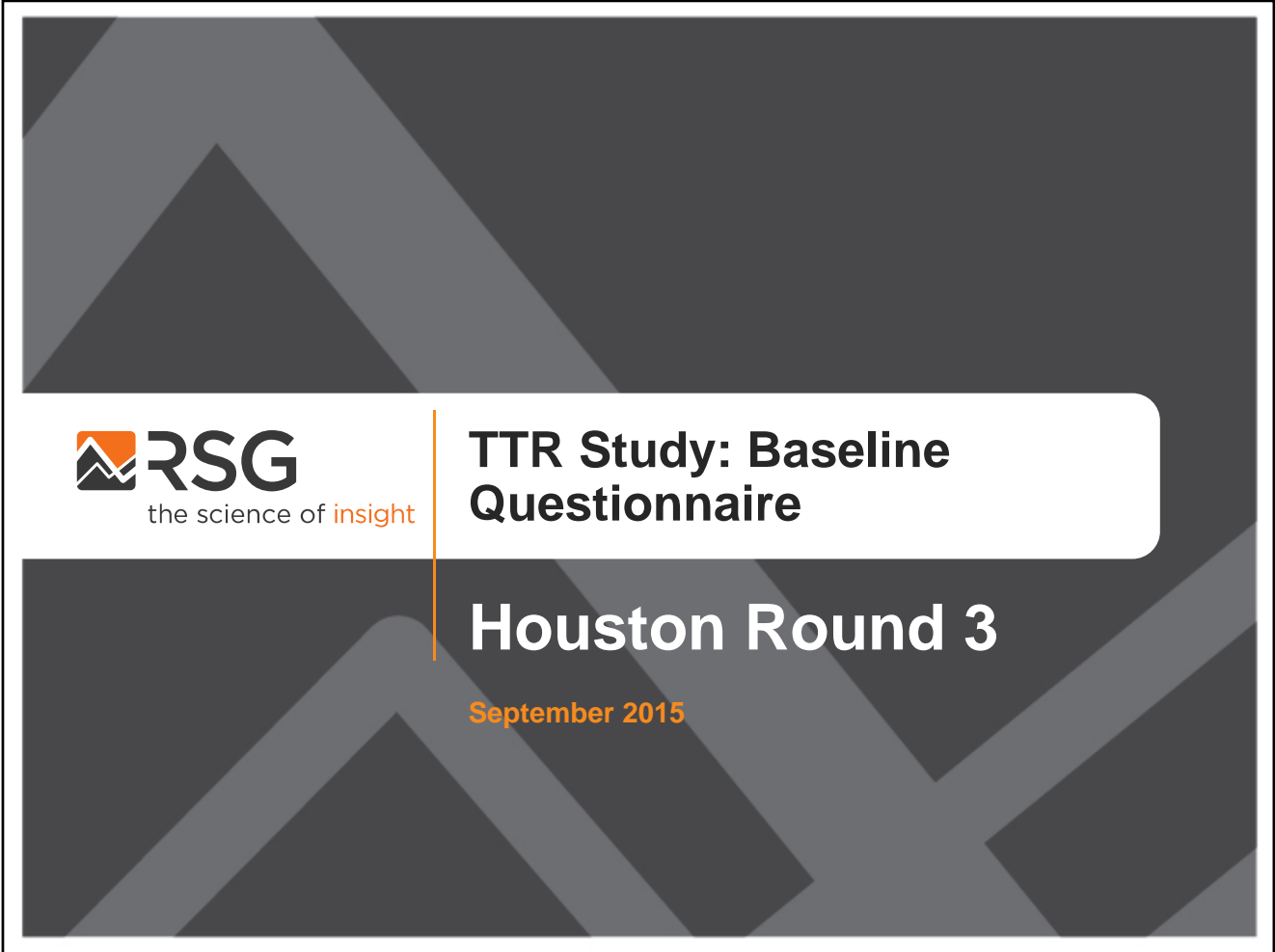
**Thank you! Your responses have been successfully submitted.**

In a few days, we will contact you with more information about participating in the West Houston Transportation Study.

In the meantime, please email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com) if you have any questions or comments.







## **Baseline survey design goals/ considerations for reviewers**

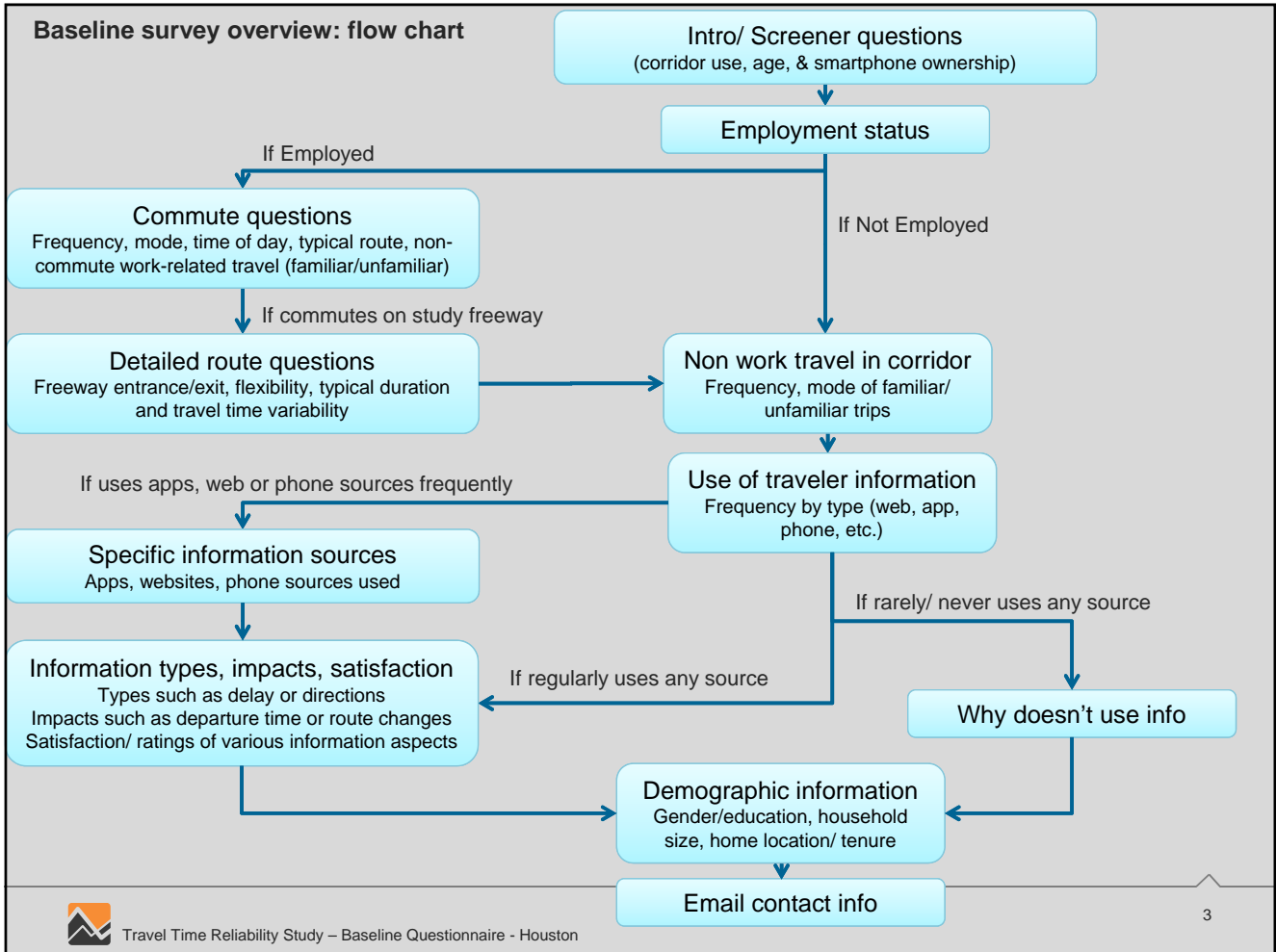
### **What are the primary goals of this survey?**

- Screen regular travelers to determine who is qualified for this study
- Collect information about typical commuting behavior and non-work travel behavior in the corridor, including mode, route, and flexibility (ability to choose alternate times/routes/modes)
- Establish a baseline awareness of, comfort with and use of traveler information resources (including what sources they currently use, what kind of information they look for, and how it affects their travel choices)
- Collect basic demographic information to assess how travel behavior and information use vary for different types of corridor users
- Collect email address for continued study administration

### **The survey aims to balance the need for detail with the goal of minimizing respondent burden.**

- This survey includes many detailed questions, some of which may be considered “extra” or “optional” questions that provide extra context but are not essential to the final analysis.
- Some survey questions ask for more detail than initially suggested as a way of reducing ambiguity and improving data quality.
  - For example, if a person uses travel apps once a month, they may be unsure of whether to answer yes or no about whether they typically use apps. Also, people who only use apps once/month may be significantly different than those who use apps daily.
- Some survey topics are broken into several smaller/ simpler questions to reduce ambiguity or make the questions easier to understand, and/or to improve data quality.
  - For example, rather than asking for open-ended route descriptions, the survey prompts respondents with route suggestions (e.g. North, Hardy Toll Road, or other) and then provides a list of entrances or exits in the corridor to choose from. This data is typically cleaner and more complete than open-ended descriptions.
- Some FAQs and survey questions intentionally use general language to try and avoid influencing how participants respond.
  - For example, information about who qualifies for the study says “regular” freeway users qualify, but does not specify how many days per week are required as this may encourage some people to simply provide an answer that allows them to continue.





## Baseline questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

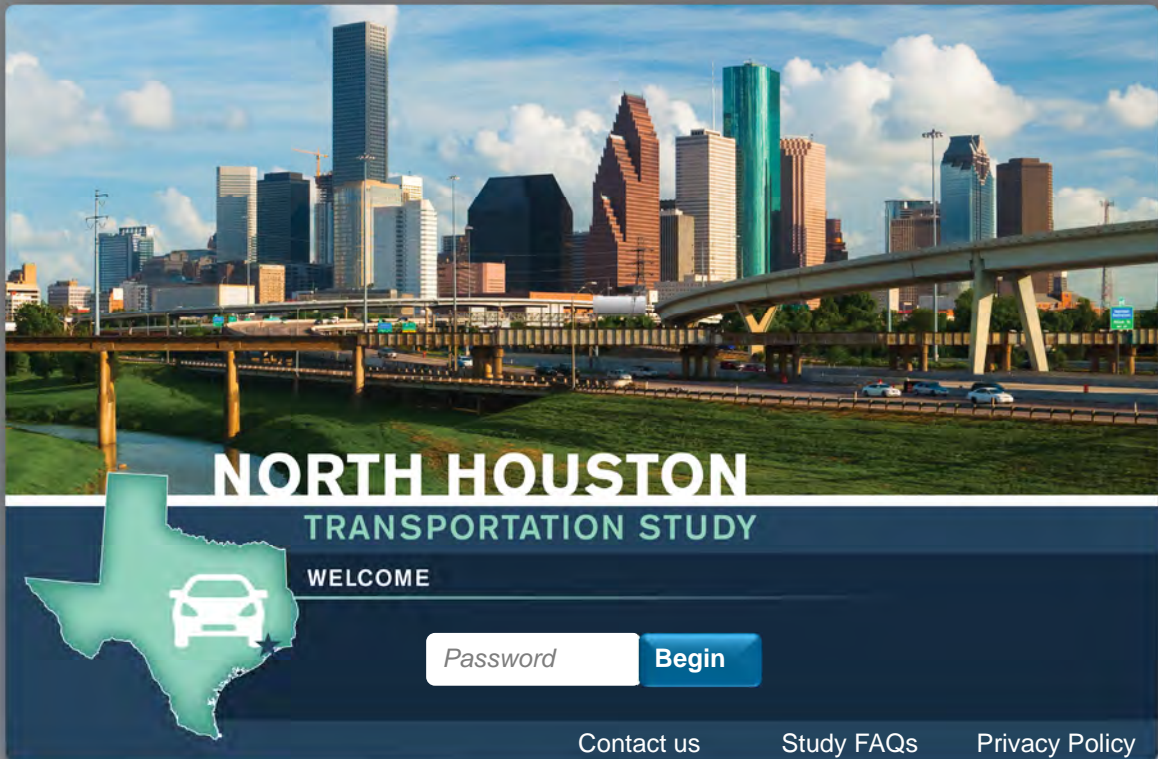
- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)

### Notable Differences from Round 1

- All corridor references changed from West Houston to North Houston
  - All freeway-related questions changed from Katy Freeway to North Freeway
  - All toll road-related questions changed from Westpark Tollway to Hardy Toll Road
- Participants were recruited through social media and advertisements
- Participants were assigned a password after completing the baseline (for use during the remaining tasks)
- The incentive offered changed; all relevant survey text and instructions were updated



Password Entry Page



The image shows a digital welcome page for the North Houston Transportation Study. The background features a photograph of the Houston skyline with several skyscrapers, including a prominent teal one, and a highway interchange with cars. The text 'NORTH HOUSTON' is displayed in large white letters, with 'TRANSPORTATION STUDY' in smaller teal letters below it. Underneath, the word 'WELCOME' is written in white. On the left side, there is a teal outline of the state of Texas with a white car icon inside. A password entry field with the placeholder text 'Password' and a blue 'Begin' button are positioned in the lower right area of the page. At the bottom of the page, there are three links: 'Contact us', 'Study FAQs', and 'Privacy Policy'.

# NORTH HOUSTON

## TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#)

[Study FAQs](#)

[Privacy Policy](#)

SPONSORED BY



## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Houston area drivers who regularly use the North Freeway, Hardy Toll Road, and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Houston Study Corridor.

- What is the North Houston Study Corridor?

The North Houston Study Corridor includes about 35 miles of the North Freeway (IH-45N), the Hardy Toll Road, and other roads between Conroe and downtown Houston.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the North Houston Study Corridor. This survey will take about 15 minutes to complete. To start this survey, simply visit the secure survey website:  
<https://surveyrsg.com/northhouston>.

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive **\$100 in cash!**



## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Houston area who is participating, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our [privacy policy](#) or [contact us](#).

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Texas Department of Transportation (TxDOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and TxDOT.

**Resource Systems Group, Inc. Privacy Statement**

**SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

**PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

**ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

**THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.





**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu)

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu)



## Welcome and thank you for your participation!

The purpose of this study is to better understand Houston area residents' experiences while traveling on the North Freeway, Hardy Toll Road, and other freeways in the greater Houston area. The U.S. Department of Transportation wants to understand the decisions you make to handle traffic congestion and also wants your opinions on how to improve travel conditions.

You are one of a small number of travelers participating in the study, so your responses will have a significant impact. Thank you again for your participation.

Your privacy will be protected. Please click here to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu) with any questions or concerns.

Please click "Next" to continue!

Next



## Definition and description of the North Houston Study Corridor

For this study, the North Houston Corridor includes:

- About 35 miles of the North Freeway (IH-45N) between Conroe, TX and downtown Houston
- The Hardy Toll Road
- Other local/secondary roads near the North Freeway and Hardy Toll Road

Please click “Next” to continue

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### Tips for completing this survey

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.

### Now, let’s get started!

To begin the study, you may wish to review the study information in the FAQs. Please check the box below to confirm that you would like to continue.

- By checking this box, I confirm that I have read the study information and agree to participate.

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**In a typical week, about how often do you drive on the North Freeway or on the Hardy Toll Road in the study area on weekdays?**

What is the North Houston Transportation Study area?

[popup repeats the study area definition from the “corridor” page (not including the heading “definition and description...”)]

**How often do you typically drive on the North Freeway?**

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

**How often do you typically drive on the Hardy Toll Road?**

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

Terminate if less than 3 weekdays per week for both

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## How old are you?

This information will only be used to help us understand how well survey participants represent all travelers in the study area.

- Under 18 **[terminate if selected]**
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75–84
- 85 or older

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## What kind of smartphone do you own?

For the next part of this study (after this survey is complete), you will be asked to log information about your daily trips in the study area on your smartphone. Information about the type of smartphone you own will help us provide you with the correct resources to complete the study.

- Apple iPhone
- Android smartphone
  - [Click here to view examples of types of Android phones](#)
- Other type of smartphone (e.g., Windows phone, Blackberry, etc.) **[terminate if selected]**
- I'm not sure **[terminate if selected]**
- I do not own a smartphone **[terminate if selected]**

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Popup examples from previous slide

Examples of Android smartphones:

- Samsung Galaxy
- DROID RAZR
- HTC One
- Google Nexus





Terminate if under 18, doesn't have an iPhone or Android, or travels less than 3 weekdays/week on the study freeways

### **Thank you for your answers.**

Unfortunately, we cannot ask you to continue as this study requires participants who:

- Regularly drive on the North Freeway or Hardy Toll Road in the study area;
- Are age 18 or older; and
- Own smartphones on which they can install and operate the mobile application for the second part of the study.

Thank you again for your interest! Please email [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu) if you have any questions or comments.



### What is your primary employment status?

- Employed full-time
- Employed part-time
- Self-employed (full-time or part-time)
- Student, employed full-time
- Student, employed part-time
- Student, not employed
- Homemaker
- Retired
- Not currently employed

If not employed, skip to non-work travel questions

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If employed (employment <= 5)

Thank you for your answers so far! The next few questions are about your work and typical work travel.

**How often do you commute to your primary workplace in a typical week?**

- 6-7 days/week
- 5 days/week
- 4 days/week
- 3 days/week
- 2 days/week
- 1 day/week
- Never – I typically telecommute/ work from home
- N/A – no primary workplace (I commute to multiple locations/job sites)

If commute\_freq is “Never” or “N/A”, skip to drivejob (questions on non-commute work-related trips)

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If travels to a primary workplace (commute\_freq <= 6)

**Please describe your typical commute to work.**

Please describe how you travel to work most often. We understand your commute may vary.

Approximately what time do you typically start work?

 ▼

Approximately what time of day do you typically finish work?

 ▼

Do you always work the same days?

 ▼

What is the primary way you typically travel to work?

 ▼

Do you typically use the North Freeway or Hardy Toll Road as part of your primary route to work?

 ▼

**[if route=other]** What is your typical route to work? \_\_\_\_\_

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**work\_start, work\_end**

1. Between 6:00-10:00 AM
2. Between 10:00 AM-3:00 PM
3. Between 3:00-7:00 PM
4. Between 7:00 PM-6:00 AM
5. It varies

**work\_vary**

1. Yes, I always work the same days
2. No, my schedule can vary from week to week

**commute\_mode**

1. Drive alone
2. Carpool
3. Vanpool
4. Public transit (bus/light rail)
5. Other

**commute\_route**

1. I typically use the North Freeway to get to work
2. I typically use the Hardy Toll Road to get to work
3. No, I typically use another route to get to work



If travels to a primary workplace (commute\_freq <= 6)

### How often do you commute to work another way?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit (bus/light rail)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hide row that was selected as primary commute\_mode

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If travels to a primary workplace (commute\_freq <= 6)

### How often do you use alternate routes to get to work?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
[if not selected] North Freeway	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if not selected] Hardy Toll Road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
North Freeway frontage roads	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
US 59	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Airline Drive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N Shepherd Drive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If "other" is selected "frequently" or "sometimes"

### Optional: What other routes to you use to get to work?

Optional text box entry

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If typically uses North or Hardy for primary commute route. Fill in dynamic text with selected primary route

**Please describe your typical commute to work on the <North Freeway / Hardy Toll Road>.**

[if North Fwy] Do you typically use the HOV lane for any part of your commute?

What direction do you travel on your way to work?

Where do you typically get ON the freeway?

What time do you typically get ON the freeway?

Where do you typically get OFF the freeway?

What time do you typically get OFF the freeway?

How much flexibility do you have in your arrival time at work?





**commute\_hov**

1. Yes
2. No

**direction**

1. Southbound (towards downtown Houston)
2. Northbound (away from downtown Houston)

**loc\_on**

- List of **North** freeway entrances (if North)
- List of **Hardy Toll Road** freeway entrances (if Hardy Toll Road)
- **Filter by direction**
- (See next slides)

**time\_on**

- List of 15-minute intervals
- No filtering, show entire list, but start with 6am at top

**loc\_off**

- List of **North** freeway entrances (if North)
- List of **Hardy Toll Road** freeway entrances (if Hardy Toll Road)
- **Filter by direction and entrance location (so can't select the same exit or an exit "behind" entrance) (i.e., if direction = 1, then only show loc\_off > loc\_on; if direction = 2, only show loc\_off < loc\_on)**

**time\_off**

- List of 15-minute intervals
- No filtering (same as time\_on)

**arrival\_flex**

1. I always arrive at work at the same time
2. My arrival time can vary up to 15 minutes
3. My arrival time can vary up to 30 minutes
4. My arrival time can vary up to 45 minutes
5. My arrival time can vary by an hour or more

<b>North Freeway Entrances/Exits</b>		<b>Display by direction</b>
1	Other exit farther north	Both
2	FM-1488	Both
3	SH 242	Both
4	Research Forest Drive	Both
5	Woodlands Parkway	Both
6	Hardy Toll Road	Both
7	Louetta Road	Both
8	FM 1960	Both
9	Airtex Drive	Both
10	Greens Road	Both
11	West Road	Both
12	Little York	Both
13	Tidwell	Both
14	Cavalcade	Both
15	Allen Parkway	Both
27	Other exit farther south	Both



<b>Hardy Toll Road Entrances/Exits</b>		<b>Display by direction</b>
1	Other exit farther north	Both
16	FM-1488 via IH-45 N	Both
17	SH-242 via IH-45 N	Both
18	Research Forest via IH-45 N	Both
19	Woodlands Parkway via IH-45 N	Both
20	IH-45 N	Both
21	Cypresswood	Both
22	FM-1960	Both
23	Greens Road	Both
24	Aldine-Bender	Both
25	Little York	Both
26	IH-610 North Loop	Both
27	Other exit farther south	Both



If primary commute route is North or Hardy Toll Road

**How long does your trip to work on the <North Freeway / Hardy Toll Road> typically take under different conditions?**

Please describe your experiences for the portion of your trip on the freeway, not including time spent getting to and from the freeway.

At your usual time on a day with typical congestion: \_\_\_\_\_ minutes

At your usual time on a day with heavy congestion: \_\_\_\_\_ minutes

When there is little or no congestion (e.g. early Sunday morning): \_\_\_\_\_ minutes

Numeric text entry 1-999.

Validate that typical time <= congested time.

Validate that freeflow time <= typical time.

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If travels to a primary workplace (commute\_freq <= 6)

### Please indicate where your primary workplace is located.

This question is asked to help us understand where travelers frequently experience congestion. Your information will be protected. Please click here to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

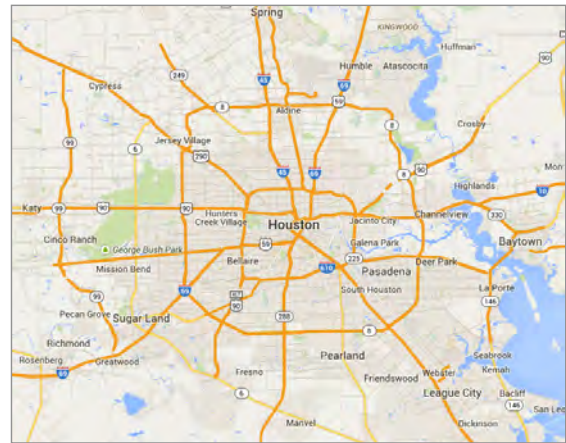
To locate by address, please enter a *street number* or the *nearest intersection* – or you can enter a business name.

- Example: 1200 McKinney St, Houston, TX
- Example: McKinney St and Caroline St, Houston, TX
- Example: Houston Center, Houston, TX

<if locate by map>

#### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.



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If employed

### How often do you need to drive to familiar or unfamiliar places around town for your job during your workday?

Familiar work-related destinations may include regular meetings, regular customers on a sales route, or any work-related destinations that you regularly visit or feel comfortable finding without directions. This does not include commuting to your primary workplace.

Unfamiliar work-related destinations may include infrequent or new meetings, sales calls to new customers, deliveries, or other places you rarely visit or need directions or navigation assistance to find.

	One or more times/ day	A few times/ week	About once/ week	A few times/ month	About once/ month	Less than once/ month	Never	Not Applicable
<u>Familiar</u> locations (e.g. regular meetings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> locations (e.g. deliveries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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All respondents

**How often do you travel on the North Freeway and Hardy Toll Road in the study area for personal trips to familiar locations?**

For example, trips to **familiar** locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend's house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

**Familiar personal trips on the North Freeway**

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

**Familiar personal trips on the Hardy Toll Road**

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

Link the words "study area" to pop-up reminder of corridor definition

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Show page if North familiar freq is not never OR Hardy familiar freq is not never or n/a (nworkfreq\_fam\_north <=6 OR nworkfreq\_fam\_hardy <=6)

### How do you typically travel on the North Freeway or Hardy Toll Road when going to familiar destinations?

	Almost always	Frequently (a few times/week)	Sometimes (a few times/month)	Rarely (less than once/month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit (bus/light rail)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “familiar” to pop-up reminder of familiar personal destination definition (from previous slide)

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All respondents

**How often do you travel on the North Freeway and Hardy Toll Road in the study area for personal trips to unfamiliar locations?**

For example, trips to unfamiliar locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.

**Unfamiliar personal trips on the North Freeway**

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

**Unfamiliar personal trips on the Hardy Toll Road**

- One or more times/ day
- A few times/ week
- About once/ week
- A few times/ month
- About once/ month
- Less than once/ month
- Never
- Not applicable

Link the words “study area” to pop-up reminder of corridor definition

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Show page if North UNFAMILIAR freq is not never OR Hardy UNFAMILIAR freq is not never or n/a  
(nworkfreq\_unfam\_north <=6 OR nworkfreq\_unfam\_hardy <=6)

### How do you typically travel on the North Freeway or Hardy Toll Road when going to unfamiliar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit (bus/light rail)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “unfamiliar” to pop-up reminder of unfamiliar personal destination definition (from previous slide)

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**If you would like to provide any comments about your travel experiences on the North Freeway or Hardy Toll Road in the North Houston study area, please share them below.**

*Optional text box entry*



## **Thank you for your answers so far!**

The next few questions are about your familiarity with and use of communication devices and traveler information resources.

Traveler information resources may include TV or radio reports, electronic message signs on highways, websites, apps, alerts, telephone information services or other information sources that the traveling public can access to help plan trips in the region.

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**In addition to your smartphone, which of the following communication and in-vehicle technologies do you own and regularly use for any purpose?**

Please select all that apply.

- Desktop computer with Internet access
- Laptop computer with Internet access
- Tablet computer (e.g. Apple iPad, Google Nexus 9) with Internet access
- Cell phone that is NOT web enabled
- Landline phone
- Toll transponder (e.g. TxTag or EZ Tag) in your vehicle
- Built-in (factory/dealer installed) GPS or navigation device in your vehicle
- Portable GPS or navigation device (e.g. Garmin, TomTom)
- Other, please specify: \_\_\_\_\_
- None of the above

Randomize (with "Other" and "None" anchored at the bottom)

Previous

Next



**In general, how often do you check the following sources for traveler information when planning trips to familiar destinations in the greater Houston area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom



**In general, how often do you check the following sources for traveler information when planning trips to unfamiliar destinations in the greater Houston area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom



If uses web 1+ days/week for familiar and/or unfamiliar trips

**What websites do you typically check for traveler information before a trip?**

Please select all that apply.

- Any Texas DOT website (e.g., www.drivetexas.org)
- Houston TranStar
- Google Maps
- Bing Maps
- MapQuest
- Traffic.com
- Here.com
- TV or Radio station websites
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

Previous

Next





If uses apps 1+ days/week for familiar and/or unfamiliar trips

**What smartphone or tablet apps do you typically check for traveler information before a trip?**

Please select all that apply.

- Houston TranStar
- Google Maps/Navigation
- Waze
- INRIX
- [if smartphone=Apple] Apple iPhone Maps
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

Previous

Next



If uses phone 1+ days/week for familiar and/or unfamiliar trips

**What telephone numbers do you typically check for traveler information before a trip?**

Please select all that apply.

- Texas DOT (1-800-452-9292)
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

Previous

Next



If uses "other" source 1+ days/week for familiar and/or unfamiliar trips

**What other information sources do you typically check for traveler information before a trip?**

Please enter text below.

*Text box entry – optional for respondent*

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Next



If uses any info for familiar trips (infosources\_familiar are not "never" for all options)

**What kind of information do you typically look for when you are planning trips to familiar destinations in the greater Houston area?**

Please select all that apply.

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

Previous

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If uses info for unfamiliar trips (infosources\_unfamiliar are not “never” for all options)

**What kind of information do you typically look for when you are planning trips to unfamiliar destinations in the greater Houston area?**

Please select all that apply.

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with “Other” anchored at the bottom

Previous

Next



If `infosource_familiar` is not "Never" for all options

How often do you change your travel plans to familiar destinations if you learn about congestion on your typical route?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Previous

Next



If infosource\_unfamiliar is not "Never" for all options

**How often do you change your travel plans to unfamiliar destinations if you learn about congestion on your typical route?**

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Previous

Next



If infosources\_familiar OR infosources\_unfamiliar are not "never" for all options (i.e., ONLY skip page if both familiar and unfamiliar are "never" (or null) for all options)

### In general, how satisfied are you with the following aspects of the traveler information you receive?

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Travel time or speed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction duration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Directions or alternate route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Previous

Next





If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**For the travel information you receive, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
Information sources I use are easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I receive is reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use reduces the stress of my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information helps me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use does NOT reduce the amount of time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall the information I receive is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements



If never uses info (infosource\_fam and infosource\_unfam are "never" for all options)

### Can you tell us why you do not use information for your trips in the greater Houston area?

Please select all that apply.

- The information does not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with most or all of the greater Houston area and do not need directions
- I am familiar with traffic conditions/travel times for most or all of the routes I generally use
- I do not know where to find information
- I do not have time to look for information
- Accessing information is difficult or inconvenient
- The information is not detailed enough
- No information is available for my routes or destinations
- Other, please specify: \_\_\_\_\_

Randomize statements

Previous

Next



Thank you for your responses so far – you are almost done!  
The last few questions are about you and your household to ensure that we have a representative sample of travelers in the Houston area.

**Please tell us about yourself.**

Gender

Education

[Previous](#) [Next](#)



**gender**

1. Male
2. Female

**education**

1. Less than high school
2. High school graduate/GED
3. Some college
4. Vocational/technical training
5. Associates degree
6. Bachelors degree
7. Graduate degree (MA, PhD)
8. Professional degree (MBA, JD, MD)



Please tell us about your household.

**How many adults (other than yourself) live in your household?**

- 0 (I am the only adult)
- 1 other adult
- 2 other adults
- 3 other adults
- 4 other adults
- 5 or more other adults

**How many children live in your household?**

- 0 (no children)
- 1 child
- 2 children
- 3 children
- 4 children
- 5 or more children

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Next



Please tell us about your current home (the residence where you live the majority of the time).

**How long have you lived in your current residence?**

- Less than one year
- 1-2 years
- 2-5 years
- 5-10 years
- 10-20 years
- More than 20 years

**Do you own or rent your home?**

- Own
- Rent
- Provided by job
- Other

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## Where is your home located?

This helps us understand where you frequently travel and ensures that we have a representative sample from the Houston area. The details of your information will be protected. Please [click here](#) to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

To locate by address, please enter a *street number* or the *nearest intersection*.

- Example: 1200 McKinney St, Houston, TX
- Example: McKinney St and Caroline St, Houston, TX

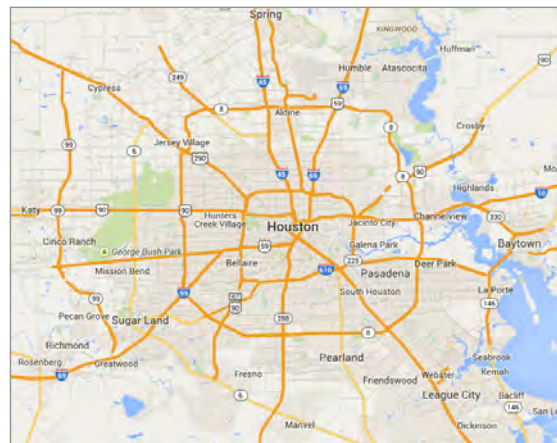
<if locate by map>

### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.

Previous

Next



**In 2014, what was your household's total annual income (from all sources) before taxes or other deductions from pay?**

This information is only used to ensure that we have a representative sample of Houston residents. Please [click here](#) to view the privacy policy.

- Under \$10,000
- \$10,000-\$24,999
- \$25,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000-\$199,999
- \$200,000-\$249,999
- \$250,000 or more
- Prefer not to answer

Previous

Next





**Please enter your email address below.**

We will only use this address to provide information about this study. We will also send you information regarding how to receive your \$100 cash payment after you complete all parts of the study.

You will only be contacted for this study and your information will never be shared or sold. Please click here to view the privacy policy.

Email address: \_\_\_\_\_ [verify valid format]

Previous

Finish



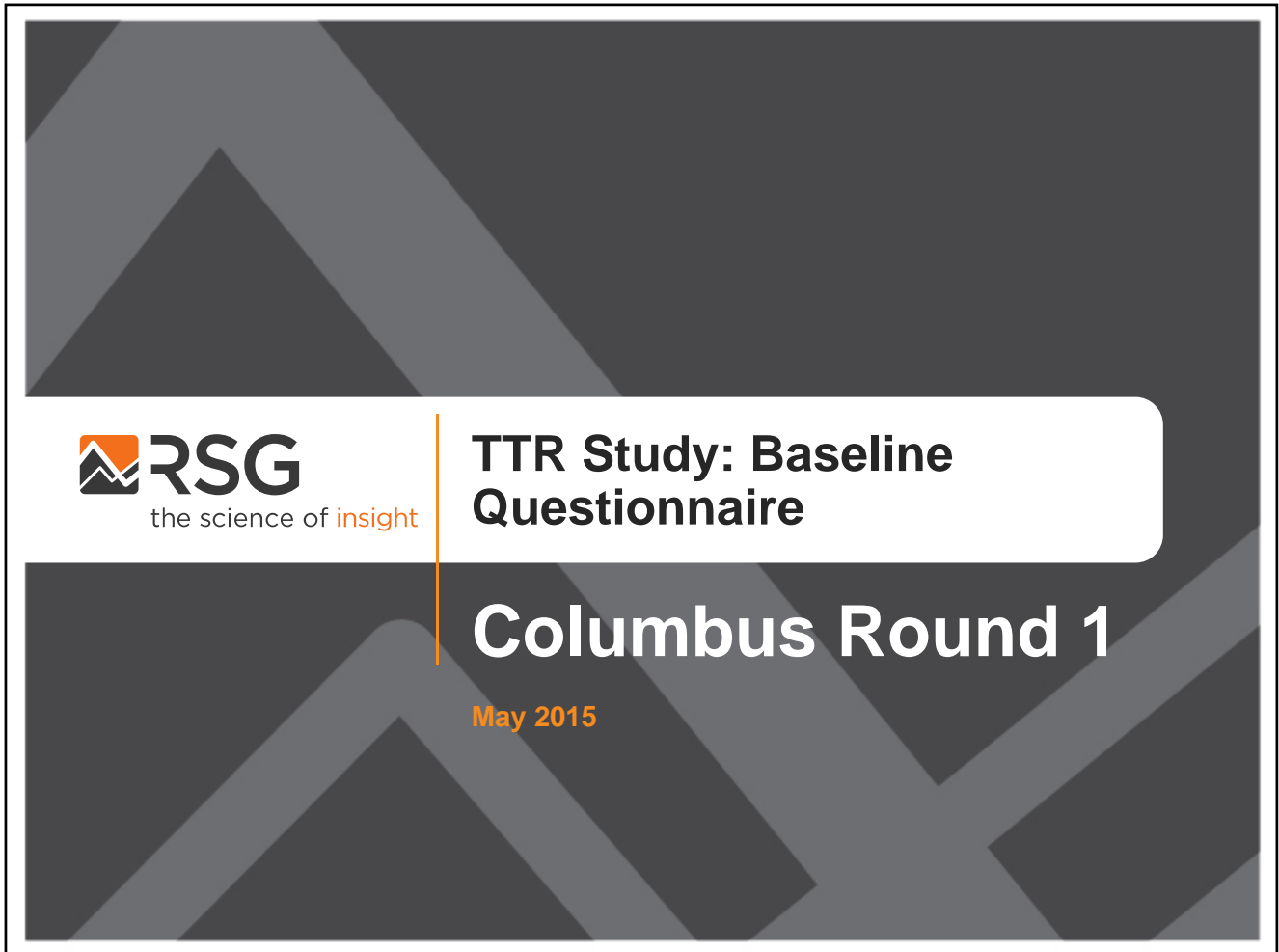
**Thank you! Your responses have been successfully submitted.**

In a few days, we will contact you with more information about participating in the North Houston Transportation Study.

In the meantime, please email [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu) if you have any questions or comments.



**APPENDIX D. NORTH COLUMBUS TRANSPORTATION STUDY BASELINE SURVEY**



## **Baseline survey design goals/ considerations for reviewers**

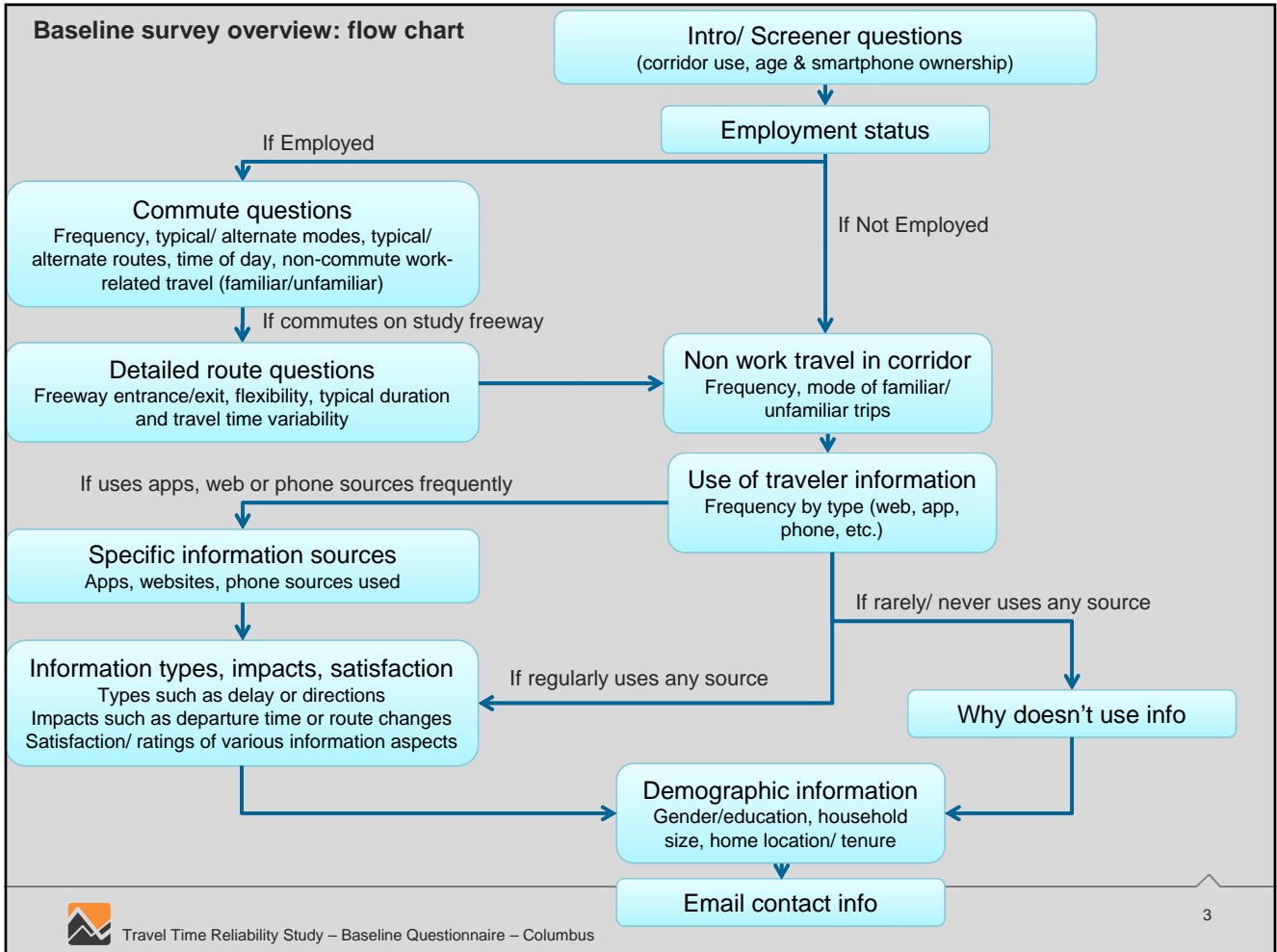
### **What are the primary goals of this survey?**

- Screen regular travelers to determine who is qualified for this study
- Collect information about typical commuting behavior and non-work travel behavior in the corridor, including mode, route, and flexibility (ability to choose alternate times/routes/modes)
- Establish a baseline awareness of, comfort with and use of traveler information resources (including what sources they currently use, what kind of information they look for, and how it affects their travel choices)
- Collect basic demographic information to assess how travel behavior and information use vary for different types of corridor users
- Collect email address for continued study administration

### **The survey aims to balance the need for detail with the goal of minimizing respondent burden.**

- This survey includes many detailed questions to provide extra context for the final analysis.
- Some survey questions ask for more detail as a way of reducing ambiguity and improving data quality.
  - For example, if a person uses travel apps once a month, they may be unsure of whether to answer yes or no about whether they typically use apps. Also, people who only use apps once/month may be significantly different than those who use apps daily.
- Some survey topics are broken into several smaller/ simpler questions to reduce ambiguity or make the questions easier to understand, and/or to improve data quality.
  - For example, rather than asking for open-ended route descriptions, the survey prompts respondents with route suggestions (e.g. I-71 or other) and then provides a list of entrances or exits in the corridor to choose from. This data is typically cleaner and more complete than open-ended descriptions.
- Some FAQs and survey questions intentionally use general language to try and avoid accidentally biasing how participants respond.
  - For example, information about who qualifies for the study says “regular” freeway users qualify, but does not specify how many days per week are required as this may encourage some people to simply provide an answer that allows them to continue.





## Baseline questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study



Password Entry Page



The image shows a digital interface for a password entry page. At the top, a banner features a photograph of the North Columbus skyline with a river in the foreground. Below the photo, the text "NORTH COLUMBUS" is written in large white letters, with "TRANSPORTATION STUDY" in smaller blue letters underneath. To the left of this text is a teal map of Ohio with a white car icon and a star. Below the map and text, the word "WELCOME" is displayed. A white input field labeled "Password" and a blue "Begin" button are positioned below the text. At the bottom of the banner, there are three links: "Contact us", "Study FAQs", and "Privacy Policy".

# NORTH COLUMBUS

TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#) [Study FAQs](#) [Privacy Policy](#)



## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Columbus area drivers who regularly use I-71 and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Columbus Study Corridor.

- What is the North Columbus Study Corridor?

The North Columbus Study Corridor includes about 25 miles of I-71 and other roads between U.S. Route 36 and downtown Columbus.

- How do I participate in this study?

This study involves four steps:

STEP 1: Complete an initial survey about your typical experiences in the North Columbus Study Corridor. This survey will take about 15 minutes to complete. To start this survey, use the unique password you received on your postcard to log into the secure survey website: <https://surveyrsg.com/northcolumbus>

STEP 2: Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

STEP 3: Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

STEP 4: Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a **\$50 Amazon.com gift card!** In appreciation of the contribution participants will make during all the steps in the study, this final gift card is a higher amount than originally advertised on the invitation postcard.





## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Columbus area invited to participate, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How was I selected to participate?

Invited participants were randomly selected from all residential addresses in the North Columbus study area.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Ohio Department of Transportation (ODOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and ODOT.



## **Resource Systems Group, Inc. Privacy Statement**

### **SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

### **PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

### **ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

### **THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com)



## **Welcome and thank you for your participation!**

The purpose of this study is to better understand Columbus area residents' experiences while traveling on I-71 and other freeways in the greater Columbus area. The U.S. Department of Transportation wants to understand the decisions you make to handle traffic congestion and also wants your opinions on how to improve travel conditions.

You are one of a small number of travelers invited to take part in the study, so your responses will have a significant impact. Thank you again for your participation.

Your privacy will be protected. Please click here to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com) with any questions or concerns.

**Please click "Next" to continue!**

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## Definition and description of the North Columbus Study Corridor

For this study, the North Columbus Corridor includes:

- About 25 miles of I-71 between U.S. Route 36 and downtown Columbus
- Other local/secondary roads near I-71

**Please click “Next” to continue.**

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### Tips for completing this survey

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.

### Now, let’s get started!

To begin the study, you may wish to review the study information in the FAQs. Please check the box below to confirm that you would like to continue.

- By checking this box, I confirm that I have read the study information and agree to participate.

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**In a typical week, about how often do you drive on I-71 in the study area on weekdays?**

What is the North Columbus Transportation Study area?

[popup that repeats the study area definition from the “corridor” page]

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

Terminate if less than 3 weekdays per week

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## How old are you?

This information will only be used to help us understand how well survey participants represent all travelers in the study area.

- Under 18 **[terminate if selected]**
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75–84
- 85 or older

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## What kind of smartphone do you own?

For the next part of this study (after this survey is complete), you will be asked to log information about your daily trips in the study area on your smartphone. Information about the type of smartphone you own will help us provide you with the correct resources to complete the study.

- Apple iPhone
- Android smartphone
  - [Click here to view examples of types of Android phones](#)
- Other type of smartphone (e.g., Windows phone, Blackberry, etc.) **[terminate if selected]**
- I'm not sure **[terminate if selected]**
- I do not own a smartphone **[terminate if selected]**

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Popup examples from previous slide

Examples of Android smartphones:

- Samsung Galaxy
- DROID RAZR
- HTC One
- Google Nexus



Terminate if under 18, doesn't have an iPhone or Android, or travels less than 3 weekdays/week on the study freeway

### **Thank you for your answers.**

Unfortunately, we cannot ask you to continue as this study requires participants who:

- Regularly drive on I-71 in the study area;
- Are age 18 or older; and
- Own smartphones on which they can install and operate the mobile application for the second part of the study.

Thank you again for your interest! Please email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com) if you have any questions or comments.



### What is your primary employment status?

- Employed full-time
- Employed part-time
- Self-employed (full-time or part-time)
- Student, employed full-time
- Student, employed part-time
- Student, not employed
- Homemaker
- Retired
- Not currently employed

If not employed, skip to non-work travel questions

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If employed (employment <= 5)

Thank you for your answers so far! The next few questions are about your work and typical work travel.

**How often do you commute to your primary workplace in a typical week?**

- 6-7 days/week
- 5 days/week
- 4 days/week
- 3 days/week
- 2 days/week
- 1 day/week
- Never – I typically telecommute/ work from home
- N/A – no primary workplace (I commute to multiple locations/job sites)

If commute\_freq is “Never” or “N/A”, skip to drivejob (questions on non-commute work-related trips)

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If travels to a primary workplace (commute\_freq <= 6)

**Please describe your typical commute to work.**

Please describe how you travel to work most often. We understand your commute may vary.

Approximately what time do you typically start work?

 ▼

Approximately what time of day do you typically finish work?

 ▼

Do you always work the same days?

 ▼

What is the primary way you typically travel to work?

 ▼

Do you typically use I-71 as part of your primary route to work?

 ▼

**[if route=other]** What is your typical route to work? \_\_\_\_\_

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**work\_start, work\_end**

1. Between 6:00-10:00 AM
2. Between 10:00 AM-3:00 PM
3. Between 3:00-7:00 PM
4. Between 7:00 PM-6:00 AM
5. It varies

**work\_vary**

1. Yes, I always work the same days
2. No, my schedule can vary from week to week

**commute\_mode**

1. Drive alone
2. Carpool
3. Vanpool
4. Public transit
5. Other

**commute\_route**

1. I typically use I-71 to get to work
3. No, I typically use another route to get to work



If travels to a primary workplace (commute\_freq <= 6)

### How often do you commute to work another way?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hide row that was selected as primary commute\_mode

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If travels to a primary workplace (commute\_freq <= 6)

### How often do you use alternate routes to get to work?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
[if not selected] I-71	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SR 315 (Olentangy Freeway)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I-270 / I-670	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
U.S. 23 (High Street)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OH Route 3 (State St/ Westerville Rd/ Cleveland Ave)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If "other" is selected "frequently" or "sometimes"

### Optional: What other routes do you use to get to work?

Optional text box entry

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If typically uses I-71 for primary commute route.

**Please describe your typical commute to work on I-71.**

- What direction do you travel on your way to work?  ▼
- Where do you typically get ON the freeway?  ▼
- What time do you typically get ON the freeway?  ▼
- Where do you typically get OFF the freeway?  ▼
- What time do you typically get OFF the freeway?  ▼
- How much flexibility do you have in your arrival time at work?  ▼



**direction**

1. Southbound (towards downtown Columbus)
2. Northbound (away from downtown Columbus)

**loc\_on**

- List of I-71 entrances
- Filter by direction
- (See next slides)

**time\_on**

- List of 15-minute intervals
- No filtering, show entire list, but start with 6am at top

**loc\_off**

- List of I-71 entrances
- Filter by direction and entrance location (so can't select the same exit or an exit "behind" entrance)  
(i.e., if direction = 1, then only show loc\_off > loc\_on; if direction = 2, only show loc\_off < loc\_on)

**time\_off**

- List of 15-minute intervals
- No filtering (same as time\_on)

**arrival\_flex**

1. I always arrive at work at the same time
2. My arrival time can vary up to 15 minutes
3. My arrival time can vary up to 30 minutes
4. My arrival time can vary up to 45 minutes
5. My arrival time can vary by an hour or more

Exit 121 (Polaris Pkwy) missed in the original design. It is a major exit, so it was added while the survey was in-field (4/22/15, 1pm GMT). People who answered this question after that time saw the new values. People who answered the survey before that time saw the old values (Polaris was not an option)

I-71 Exits			
Old Value	New Value		Display by direction
1	1	Other exit farther north	Both
2	2	Exit 131 US 36 / SR 37 - Delaware / Sunbury	Both
	3	Exit 121 Polaris Parkway / Gemini Place	Both
3	4	Exit 119 I-270 - Dayton / Wheeling	Both
4	5	Exit 117 SR 161 (Dublin-Granville Road)	Both
5	6	Exit 116 Morse Road / Sinclair Road	Both
6	7	Exit 115 Cooke Road	Both
7	8	Exit 114 North Broadway	Both
8	9	Exit 113 Weber Road	Both
9	10	Exit 112 Hudson Street	Both
10	11	Exit 111 17th Avenue	Both
11	12	Exit 110B 11th Avenue	Both
12	13	Exit 110A Fifth Avenue	Southbound only
13	14	Exit 109A I-670 - Airport / Dayton / Leonard Ave	Both
14	15	Exit 109B Downtown / Spring Street	Southbound only
15	16	Exit 108B US 40 (Broad Street)	Both
16	17	Exit 108A Main Street	Southbound only
17	18	Exit 107 I-70	Both
		Exit 100B US 23 North (Fourth Street) / US 33	
18	19	(Livingston Avenue)	Both
19	20	Other exit farther south	Both



If primary commute route is I-71

### How long does your trip to work on I-71 typically take under different conditions?

Please describe your experiences for the portion of your trip on the freeway, not including time spent getting to and from the freeway.

At your usual time on a day with typical congestion: \_\_\_\_\_ minutes

At your usual time on a day with heavy congestion: \_\_\_\_\_ minutes

When there is little or no congestion (e.g. early Sunday morning): \_\_\_\_\_ minutes

Numeric text entry 1-999.

Validate that typical time  $\leq$  congested time.

Validate that freeflow time  $\leq$  typical time.

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If travels to a primary workplace (commute\_freq <= 6)

### Please indicate where your primary workplace is located.

This question is asked to help us understand where travelers frequently experience congestion. Your information will be protected. Please click here to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

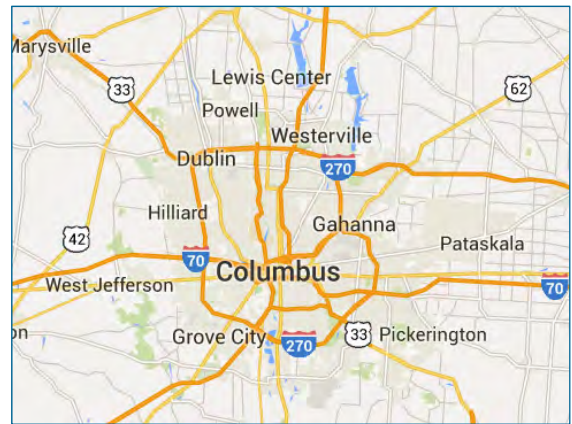
To locate by address, please enter a *street number* or the *nearest intersection* – or you can enter a business name.

- Example: 90 West Broad St, Columbus, OH
- Example: West Broad St and South Front St, Columbus, OH
- Example: Columbus City Hall, Columbus, OH

<if locate by map>

#### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.



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If employed

### How often do you need to drive to familiar or unfamiliar places around town for your job during your workday?

Familiar work-related destinations may include regular meetings, regular customers on a sales route, or any work-related destinations that you regularly visit or feel comfortable finding without directions. This does not include commuting to your primary workplace.

Unfamiliar work-related destinations may include infrequent or new meetings, sales calls to new customers, deliveries, or other places you rarely visit or need directions or navigation assistance to find.

	One or more times/ day	A few times/ week	About once/ week	A few times/ month	About once/ month	Less than once/ month	Never	Not Applicable
<u>Familiar</u> locations (e.g. regular meetings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> locations (e.g. deliveries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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All respondents

**How often do you travel on I-71 in the study area for personal trips to familiar locations?**

For example, trips to familiar locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend's house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words "study area" to pop-up reminder of corridor definition

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Show page if I-71 familiar freq is not never or n/a (nworkfreq\_fam <=6)

### How do you typically travel on I-71 when going to familiar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “familiar” to pop-up reminder of familiar personal destination definition (from previous slide)

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All respondents

**How often do you travel on I-71 in the study area for personal trips to unfamiliar locations?**

For example, trips to unfamiliar locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words “study area” to pop-up reminder of corridor definition

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Show page if I-71 UNFAMILIAR freq is not never or n/a (nworkfreq\_unfam <=6)

### How do you typically travel on I-71 when going to unfamiliar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “unfamiliar” to pop-up reminder of unfamiliar personal destination definition (from previous slide)

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**Optional:** If you would like to provide any comments about your travel experiences on I-71 in the North Columbus study area, please share them below.

*Optional text box entry*



## **Thank you for your answers so far!**

The next few questions are about your familiarity with and use of communication devices and traveler information resources.

Traveler information resources may include TV or radio reports, electronic message signs on highways, websites, apps, alerts, telephone information services or other information sources that the traveling public can access to help plan trips in the region.

**Please click “Next” to continue.**

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**In addition to your smartphone, which of the following communication and in-vehicle technologies do you own and regularly use for any purpose?**

*Please select all that apply.*

- Desktop computer with Internet access
- Laptop computer with Internet access
- Tablet computer (e.g. Apple iPad, Google Nexus 9) with Internet access
- Cell phone that is NOT web enabled
- Landline phone
- Toll transponder (e.g. E-ZPass) in your vehicle
- Built-in (factory/dealer installed) GPS or navigation device in your vehicle
- Portable GPS or navigation device (e.g. Garmin, TomTom)
- Other, please specify: \_\_\_\_\_
- None of the above

Randomize (with "Other" and "None" anchored at the bottom)

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**In general, how often do you check the following sources for traveler information when planning trips to familiar destinations in the greater Columbus area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom



**In general, how often do you check the following sources for traveler information when planning trips to unfamiliar destinations in the greater Columbus area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom





If uses web 1+ days/week for familiar and/or unfamiliar trips

**What websites do you typically check for traveler information before a trip?**

*Please select all that apply.*

- Ohgo.com
- Buckeye Traffic
- Google Maps
- Bing Maps
- MapQuest
- Traffic.com
- Here.com
- TV or Radio station websites
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses apps 1+ days/week for familiar and/or unfamiliar trips

**What smartphone or tablet apps do you typically check for traveler information before a trip?**

*Please select all that apply.*

- Google Maps/Navigation
- Waze
- INRIX
- [if smartphone=Apple] Apple iPhone Maps
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses "other" source 1+ days/week for familiar and/or unfamiliar trips

**Optional: What other information sources do you typically check for traveler information before a trip?**

Please enter text below.

*Text box entry – maybe make optional for respondent*

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If uses any info for familiar trips (infosources\_familiar are not "never" for all options)

**What kind of information do you typically look for when you are planning trips to familiar destinations in the greater Columbus area?**

*Please select all that apply.*

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses info for unfamiliar trips (infosources\_unfamiliar are not “never” for all options)

**What kind of information do you typically look for when you are planning trips to unfamiliar destinations in the greater Columbus area?**

*Please select all that apply.*

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with “Other” anchored at the bottom

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If `infosource_familiar` is not "Never" for all options

How often do you change your travel plans to familiar destinations if you learn about congestion on your typical route?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If `infosource_unfamiliar` is not "Never" for all options

How often do you change your travel plans to unfamiliar destinations if you learn about congestion on your typical route?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**In general, how satisfied are you with the following aspects of the traveler information you receive?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Travel time or speed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction duration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Directions or alternate route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements





If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**For the travel information you check, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
Information sources I use are easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I receive is reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use reduces the stress of my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information helps me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use does NOT reduce the amount of time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall the information I receive is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Previous

Next



If never uses info (infosource\_fam and infosource\_unfam are "never" for all options)

**Can you tell us why you do not use information for your trips in the greater Columbus area?**

*Please select all that apply.*

- The information does not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with most or all of the greater Columbus area and do not need directions
- I am familiar with traffic conditions/travel times for most or all of the routes I generally use
- I do not know where to find information
- I do not have time to look for information
- Accessing information is difficult or inconvenient
- The information is not detailed enough
- No information is available for my routes or destinations
- Other, please specify: \_\_\_\_\_

Randomize statements

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Next



Thank you for your responses so far – you are almost done!  
The last few questions are about you and your household to ensure that we have a representative sample of travelers in the Columbus area.

**Please tell us about yourself.**

Gender  ▼

Education  ▼

[Previous](#) [Next](#)



**gender**

1. Male
2. Female

**education**

1. Less than high school
2. High school graduate/GED
3. Some college
4. Vocational/technical training
5. Associates degree
6. Bachelors degree
7. Graduate degree (MA, PhD)
8. Professional degree (MBA, JD, MD)



Please tell us about your household.

**How many adults (other than yourself) live in your household?**

- 0 (I am the only adult)
- 1 other adult
- 2 other adults
- 3 other adults
- 4 other adults
- 5 or more other adults

**How many children live in your household?**

- 0 (no children)
- 1 child
- 2 children
- 3 children
- 4 children
- 5 or more children

Previous

Next



Please tell us about your current home (the residence where you received the invitation to the study or where you live the majority of the time).

**How long have you lived in your current residence?**

- Less than one year
- 1-2 years
- 2-5 years
- 5-10 years
- 10-20 years
- More than 20 years

**Do you own or rent your home?**

- Own
- Rent
- Provided by job
- Other

Previous

Next



## Where is your home located?

This helps us understand where you frequently travel and ensures that we have a representative sample from the Columbus area. The details of your information will be protected. Please [click here](#) to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

To locate by address, please enter a *street number* or the *nearest intersection*.

- Example: 90 West Broad St, Columbus, OH
- Example: West Broad St and South Front St, Columbus, OH

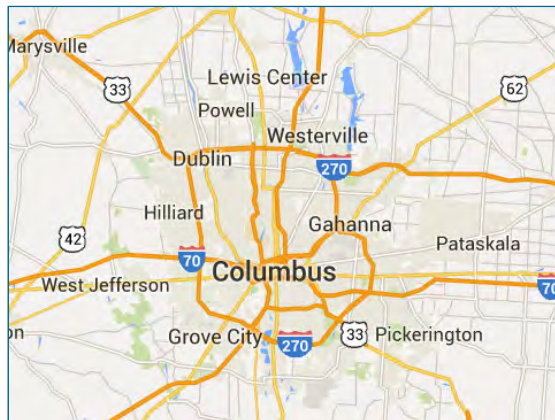
<if locate by map>

### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.

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Next



**In 2014, what was your household's total annual income (from all sources) before taxes or other deductions from pay?**

This information is only used to ensure that we have a representative sample of Columbus residents. Please [click here](#) to view the privacy policy.

- Under \$10,000
- \$10,000-\$24,999
- \$25,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000-\$199,999
- \$200,000-\$249,999
- \$250,000 or more
- Prefer not to answer

Previous

Next





**Please enter your email address below.**

We will only use this address to provide information about this study. We will also send the \$25 Amazon.com gift card via email after you complete all parts of the study.

You will only be contacted for this study and your information will never be shared or sold. Please click [here](#) to view the privacy policy.

Email address: \_\_\_\_\_ [verify valid format]

Previous

Finish



**Thank you! Your responses have been successfully submitted.**

In a few days, we will contact you with more information about participating in the North Columbus Transportation Study.

In the meantime, please email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com) if you have any questions or comments.





## TTR Study: Baseline Questionnaire

# Columbus Round 3

Sept 2015

## **Baseline survey design goals/ considerations for reviewers**

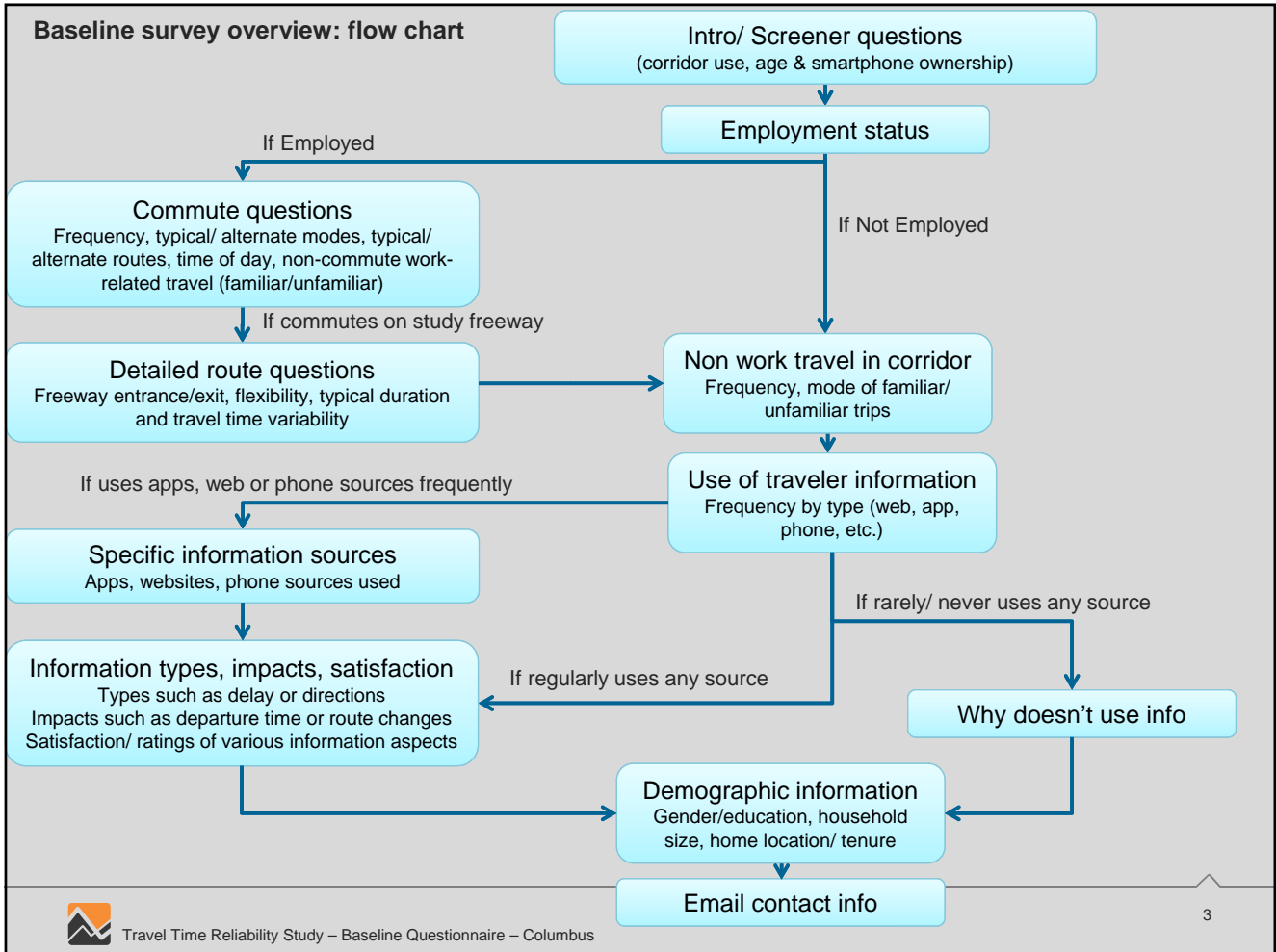
### **What are the primary goals of this survey?**

- Screen regular travelers to determine who is qualified for this study
- Collect information about typical commuting behavior and non-work travel behavior in the corridor, including mode, route, and flexibility (ability to choose alternate times/routes/modes)
- Establish a baseline awareness of, comfort with and use of traveler information resources (including what sources they currently use, what kind of information they look for, and how it affects their travel choices)
- Collect basic demographic information to assess how travel behavior and information use vary for different types of corridor users
- Collect email address for continued study administration

### **The survey aims to balance the need for detail with the goal of minimizing respondent burden.**

- This survey includes many detailed questions to provide extra context for the final analysis.
- Some survey questions ask for more detail as a way of reducing ambiguity and improving data quality.
  - For example, if a person uses travel apps once a month, they may be unsure of whether to answer yes or no about whether they typically use apps. Also, people who only use apps once/month may be significantly different than those who use apps daily.
- Some survey topics are broken into several smaller/ simpler questions to reduce ambiguity or make the questions easier to understand, and/or to improve data quality.
  - For example, rather than asking for open-ended route descriptions, the survey prompts respondents with route suggestions (e.g. I-71 or other) and then provides a list of entrances or exits in the corridor to choose from. This data is typically cleaner and more complete than open-ended descriptions.
- Some FAQs and survey questions intentionally use general language to try and avoid accidentally biasing how participants respond.
  - For example, information about who qualifies for the study says “regular” freeway users qualify, but does not specify how many days per week are required as this may encourage some people to simply provide an answer that allows them to continue.





## Baseline questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study

### Notable differences from Round 1

- Participants were recruited through advertisements and social media
- Participants began the survey “anonymously” and were only assigned a password after completing (for use during the other study tasks)
- The incentive offering changed, and survey instructions and text related to the incentive were updated accordingly.



Password Entry Page



The image shows a digital interface for a password entry page. At the top, a photograph of the Columbus, Ohio skyline is reflected in a body of water. Below the photo, the text "NORTH COLUMBUS" is written in large white letters, with "TRANSPORTATION STUDY" in smaller blue letters underneath. To the left of this text is a teal outline of the state of Ohio with a white car icon and a star. Below the title, the word "WELCOME" is centered. A white input field labeled "Password" is followed by a blue "Begin" button. At the bottom of the interface, there are three links: "Contact us", "Study FAQs", and "Privacy Policy".

# NORTH COLUMBUS

TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#) [Study FAQs](#) [Privacy Policy](#)



## Frequently Asked Questions

### Study Overview

- **What is the purpose of this study?**

The purpose of this study is to understand the experiences of Columbus area drivers who regularly use I-71 and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Columbus Study Corridor.

- **What is the North Columbus Study Corridor?**

The North Columbus Study Corridor includes about 25 miles of I-71 and other roads between U.S. Route 36 and downtown Columbus.

- **How do I participate in this study?**

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the North Columbus Study Corridor. This survey will take about 15 minutes to complete. To start this survey, simply visit the secure survey website:

<https://surveyrsg.com/northcolumbus>

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- **What will I get for participating?**

After completing all parts of the study including the exit survey, qualified participants will be entered into a drawing for an iPad Air 2 64 GB (worth \$600)! No purchase is necessary to enter, and odds of winning are expected to be about 1 in 20. Winners will be responsible for any applicable taxes.



## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Columbus area who is participating, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our [privacy policy](#) or [contact us](#).

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Ohio Department of Transportation (ODOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and ODOT.

## **Resource Systems Group, Inc. Privacy Statement**

### **SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

### **PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

### **ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

### **THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu)



## **Welcome and thank you for your participation!**

The purpose of this study is to better understand Columbus area residents' experiences while traveling on I-71 and other freeways in the greater Columbus area. The U.S. Department of Transportation wants to understand the decisions you make to handle traffic congestion and also wants your opinions on how to improve travel conditions.

You are one of a small number of travelers participating in the study, so your responses will have a significant impact. Thank you again for your participation.

Your privacy will be protected. Please click [here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [columbusstudy@ttmail.tamu.edu](mailto:columbusstudy@ttmail.tamu.edu) with any questions or concerns.

**Please click "Next" to continue!**

Next



## Definition and description of the North Columbus Study Corridor

For this study, the North Columbus Corridor includes:

- About 25 miles of I-71 between U.S. Route 36 and downtown Columbus
- Other local/secondary roads near I-71

**Please click “Next” to continue.**

Previous

Next



### Tips for completing this survey

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.

### Now, let’s get started!

To begin the study, you may wish to review the study information in the FAQs. Please check the box below to confirm that you would like to continue.

- By checking this box, I confirm that I have read the study information and agree to participate.

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**In a typical week, about how often do you drive on I-71 in the study area on weekdays?**

What is the North Columbus Transportation Study area?

[popup that repeats the study area definition from the “corridor” page]

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

Terminate if less than 3 weekdays per week

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## How old are you?

This information will only be used to help us understand how well survey participants represent all travelers in the study area.

- Under 18 **[terminate if selected]**
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75–84
- 85 or older

Previous

Next





## What kind of smartphone do you own?

For the next part of this study (after this survey is complete), you will be asked to log information about your daily trips in the study area on your smartphone. Information about the type of smartphone you own will help us provide you with the correct resources to complete the study.

- Apple iPhone
- Android smartphone
  - [Click here to view examples of types of Android phones](#)
- Other type of smartphone (e.g., Windows phone, Blackberry, etc.) **[terminate if selected]**
- I'm not sure **[terminate if selected]**
- I do not own a smartphone **[terminate if selected]**

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Next



Popup examples from previous slide

Examples of Android smartphones:

- Samsung Galaxy
- DROID RAZR
- HTC One
- Google Nexus



Terminate if under 18, doesn't have an iPhone or Android, or travels less than 3 weekdays/week on the study freeway

### **Thank you for your answers.**

Unfortunately, we cannot ask you to continue as this study requires participants who:

- Regularly drive on I-71 in the study area;
- Are age 18 or older; and
- Own smartphones on which they can install and operate the mobile application for the second part of the study.

Thank you again for your interest! Please email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu) if you have any questions or comments.



### What is your primary employment status?

- Employed full-time
- Employed part-time
- Self-employed (full-time or part-time)
- Student, employed full-time
- Student, employed part-time
- Student, not employed
- Homemaker
- Retired
- Not currently employed

If not employed, skip to non-work travel questions

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Next



If employed (employment <= 5)

Thank you for your answers so far! The next few questions are about your work and typical work travel.

**How often do you commute to your primary workplace in a typical week?**

- 6-7 days/week
- 5 days/week
- 4 days/week
- 3 days/week
- 2 days/week
- 1 day/week
- Never – I typically telecommute/ work from home
- N/A – no primary workplace (I commute to multiple locations/job sites)

If commute\_freq is “Never” or “N/A”, skip to drivejob (questions on non-commute work-related trips)

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If travels to a primary workplace (commute\_freq <= 6)

**Please describe your typical commute to work.**

Please describe how you travel to work most often. We understand your commute may vary.

Approximately what time do you typically start work?

Approximately what time of day do you typically finish work?

Do you always work the same days?

What is the primary way you typically travel to work?

Do you typically use I-71 as part of your primary route to work?

**[if route=other]** What is your typical route to work? \_\_\_\_\_

**work\_start, work\_end**

1. Between 6:00-10:00 AM
2. Between 10:00 AM-3:00 PM
3. Between 3:00-7:00 PM
4. Between 7:00 PM-6:00 AM
5. It varies

**work\_vary**

1. Yes, I always work the same days
2. No, my schedule can vary from week to week

**commute\_mode**

1. Drive alone
2. Carpool
3. Vanpool
4. Public transit
5. Other

**commute\_route**

1. I typically use I-71 to get to work
3. No, I typically use another route to get to work



If travels to a primary workplace (commute\_freq <= 6)

### How often do you commute to work another way?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hide row that was selected as primary commute\_mode

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If travels to a primary workplace (commute\_freq <= 6)

### How often do you use alternate routes to get to work?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
[if not selected] I-71	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SR 315 (Olentangy Freeway)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I-270 / I-670	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
U.S. 23 (High Street)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OH Route 3 (State St/ Westerville Rd/ Cleveland Ave)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If "other" is selected "frequently" or "sometimes"

### Optional: What other routes do you use to get to work?

Optional text box entry

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If typically uses I-71 for primary commute route.

**Please describe your typical commute to work on I-71.**

- What direction do you travel on your way to work?  ▼
- Where do you typically get ON the freeway?  ▼
- What time do you typically get ON the freeway?  ▼
- Where do you typically get OFF the freeway?  ▼
- What time do you typically get OFF the freeway?  ▼
- How much flexibility do you have in your arrival time at work?  ▼



**direction**

1. Southbound (towards downtown Columbus)
2. Northbound (away from downtown Columbus)

**loc\_on**

- List of I-71 entrances
- Filter by direction
- (See next slides)

**time\_on**

- List of 15-minute intervals
- No filtering, show entire list, but start with 6am at top

**loc\_off**

- List of I-71 entrances
- Filter by direction and entrance location (so can't select the same exit or an exit "behind" entrance)  
(i.e., if direction = 1, then only show loc\_off > loc\_on; if direction = 2, only show loc\_off < loc\_on)

**time\_off**

- List of 15-minute intervals
- No filtering (same as time\_on)

**arrival\_flex**

1. I always arrive at work at the same time
2. My arrival time can vary up to 15 minutes
3. My arrival time can vary up to 30 minutes
4. My arrival time can vary up to 45 minutes
5. My arrival time can vary by an hour or more

Value	I-71 Exits	Display by direction
1	Other exit farther north	Both
2	Exit 131 US 36 / SR 37 - Delaware / Sunbury	Both
3	Exit 121 Polaris Parkway / Gemini Place	Both
4	Exit 119 I-270 - Dayton / Wheeling	Both
5	Exit 117 SR 161 (Dublin-Granville Road)	Both
6	Exit 116 Morse Road / Sinclair Road	Both
7	Exit 115 Cooke Road	Both
8	Exit 114 North Broadway	Both
9	Exit 113 Weber Road	Both
10	Exit 112 Hudson Street	Both
11	Exit 111 17th Avenue	Both
12	Exit 110B 11th Avenue	Both
13	Exit 110A Fifth Avenue	Southbound only
14	Exit 109A I-670 - Airport / Dayton / Leonard Ave	Both
15	Exit 109B Downtown / Spring Street	Southbound only
16	Exit 108B US 40 (Broad Street)	Both
17	Exit 108A Main Street	Southbound only
18	Exit 107 I-70	Both
19	Exit 100B US 23 North (Fourth Street) / US 33 (Livingston Avenue)	Both
20	Other exit farther south	Both



If primary commute route is I-71

### How long does your trip to work on I-71 typically take under different conditions?

Please describe your experiences for the portion of your trip on the freeway, not including time spent getting to and from the freeway.

At your usual time on a day with typical congestion: \_\_\_\_\_ minutes

At your usual time on a day with heavy congestion: \_\_\_\_\_ minutes

When there is little or no congestion (e.g. early Sunday morning): \_\_\_\_\_ minutes

Numeric text entry 1-999.

Validate that typical time  $\leq$  congested time.

Validate that freeflow time  $\leq$  typical time.

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If travels to a primary workplace (commute\_freq <= 6)

### Please indicate where your primary workplace is located.

This question is asked to help us understand where travelers frequently experience congestion. Your information will be protected. Please click here to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

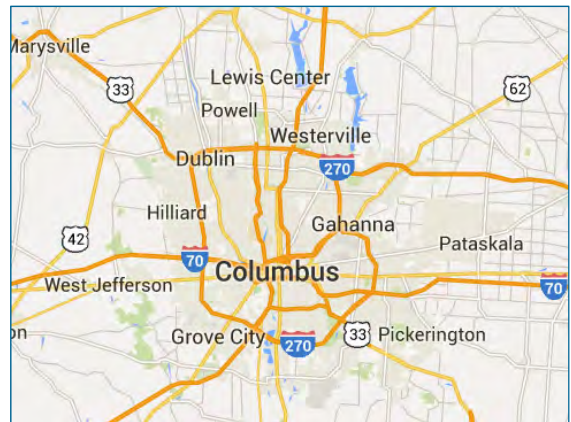
To locate by address, please enter a *street number* or the *nearest intersection* – or you can enter a business name.

- Example: 90 West Broad St, Columbus, OH
- Example: West Broad St and South Front St, Columbus, OH
- Example: Columbus City Hall, Columbus, OH

<if locate by map>

#### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.



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If employed

### How often do you need to drive to familiar or unfamiliar places around town for your job during your workday?

Familiar work-related destinations may include regular meetings, regular customers on a sales route, or any work-related destinations that you regularly visit or feel comfortable finding without directions. This does not include commuting to your primary workplace.

Unfamiliar work-related destinations may include infrequent or new meetings, sales calls to new customers, deliveries, or other places you rarely visit or need directions or navigation assistance to find.

	One or more times/ day	A few times/ week	About once/ week	A few times/ month	About once/ month	Less than once/ month	Never	Not Applicable
<u>Familiar</u> locations (e.g. regular meetings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> locations (e.g. deliveries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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All respondents

**How often do you travel on I-71 in the study area for personal trips to familiar locations?**

For example, trips to familiar locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend's house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words "study area" to pop-up reminder of corridor definition

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Show page if I-71 familiar freq is not never or n/a (nworkfreq\_fam <=6)

### How do you typically travel on I-71 when going to familiar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “familiar” to pop-up reminder of familiar personal destination definition (from previous slide)

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All respondents

**How often do you travel on I-71 in the study area for personal trips to unfamiliar locations?**

For example, trips to unfamiliar locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words “study area” to pop-up reminder of corridor definition

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Show page if I-71 UNFAMILIAR freq is not never or n/a (nworkfreq\_unfam <=6)

### How do you typically travel on I-71 when going to unfamiliar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “unfamiliar” to pop-up reminder of unfamiliar personal destination definition (from previous slide)

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**Optional:** If you would like to provide any comments about your travel experiences on I-71 in the North Columbus study area, please share them below.

*Optional text box entry*



## **Thank you for your answers so far!**

The next few questions are about your familiarity with and use of communication devices and traveler information resources.

Traveler information resources may include TV or radio reports, electronic message signs on highways, websites, apps, alerts, telephone information services or other information sources that the traveling public can access to help plan trips in the region.

**Please click “Next” to continue.**

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**In addition to your smartphone, which of the following communication and in-vehicle technologies do you own and regularly use for any purpose?**

*Please select all that apply.*

- Desktop computer with Internet access
- Laptop computer with Internet access
- Tablet computer (e.g. Apple iPad, Google Nexus 9) with Internet access
- Cell phone that is NOT web enabled
- Landline phone
- Toll transponder (e.g. E-ZPass) in your vehicle
- Built-in (factory/dealer installed) GPS or navigation device in your vehicle
- Portable GPS or navigation device (e.g. Garmin, TomTom)
- Other, please specify: \_\_\_\_\_
- None of the above

Randomize (with "Other" and "None" anchored at the bottom)

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**In general, how often do you check the following sources for traveler information when planning trips to familiar destinations in the greater Columbus area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom

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**In general, how often do you check the following sources for traveler information when planning trips to unfamiliar destinations in the greater Columbus area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom





If uses web 1+ days/week for familiar and/or unfamiliar trips

**What websites do you typically check for traveler information before a trip?**

*Please select all that apply.*

- Ohgo.com
- Buckeye Traffic
- Google Maps
- Bing Maps
- MapQuest
- Traffic.com
- Here.com
- TV or Radio station websites
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses apps 1+ days/week for familiar and/or unfamiliar trips

**What smartphone or tablet apps do you typically check for traveler information before a trip?**

*Please select all that apply.*

- Google Maps/Navigation
- Waze
- INRIX
- [if smartphone=Apple] Apple iPhone Maps
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses "other" source 1+ days/week for familiar and/or unfamiliar trips

**Optional: What other information sources do you typically check for traveler information before a trip?**

Please enter text below.

*Text box entry – maybe make optional for respondent*

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If uses any info for familiar trips (infosources\_familiar are not "never" for all options)

**What kind of information do you typically look for when you are planning trips to familiar destinations in the greater Columbus area?**

*Please select all that apply.*

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses info for unfamiliar trips (infosources\_unfamiliar are not “never” for all options)

**What kind of information do you typically look for when you are planning trips to unfamiliar destinations in the greater Columbus area?**

*Please select all that apply.*

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with “Other” anchored at the bottom

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If `infosource_familiar` is not "Never" for all options

How often do you change your travel plans to familiar destinations if you learn about congestion on your typical route?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosource\_unfamiliar is not "Never" for all options

**How often do you change your travel plans to unfamiliar destinations if you learn about congestion on your typical route?**

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

### In general, how satisfied are you with the following aspects of the traveler information you receive?

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Travel time or speed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction duration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Directions or alternate route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**For the travel information you receive, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
Information sources I use are easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I receive is reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use reduces the stress of my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information helps me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use does NOT reduce the amount of time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall the information I receive is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements



If never uses info (infosource\_fam and infosource\_unfam are "never" for all options)

### Can you tell us why you do not use information for your trips in the greater Columbus area?

*Please select all that apply.*

- The information does not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with most or all of the greater Columbus area and do not need directions
- I am familiar with traffic conditions/travel times for most or all of the routes I generally use
- I do not know where to find information
- I do not have time to look for information
- Accessing information is difficult or inconvenient
- The information is not detailed enough
- No information is available for my routes or destinations
- Other, please specify: \_\_\_\_\_

Randomize statements

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Thank you for your responses so far – you are almost done!  
The last few questions are about you and your household to ensure that we have a representative sample of travelers in the Columbus area.

**Please tell us about yourself.**

Gender  ▼

Education  ▼

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**gender**

1. Male
2. Female

**education**

1. Less than high school
2. High school graduate/GED
3. Some college
4. Vocational/technical training
5. Associates degree
6. Bachelors degree
7. Graduate degree (MA, PhD)
8. Professional degree (MBA, JD, MD)



Please tell us about your household.

**How many adults (other than yourself) live in your household?**

- 0 (I am the only adult)
- 1 other adult
- 2 other adults
- 3 other adults
- 4 other adults
- 5 or more other adults

**How many children live in your household?**

- 0 (no children)
- 1 child
- 2 children
- 3 children
- 4 children
- 5 or more children

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Please tell us about your current home (the residence where you live the majority of the time).

**How long have you lived in your current residence?**

- Less than one year
- 1-2 years
- 2-5 years
- 5-10 years
- 10-20 years
- More than 20 years

**Do you own or rent your home?**

- Own
- Rent
- Provided by job
- Other

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## Where is your home located?

This helps us understand where you frequently travel and ensures that we have a representative sample from the Columbus area. The details of your information will be protected. Please [click here](#) to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

To locate by address, please enter a *street number* or the *nearest intersection*.

- Example: 90 West Broad St, Columbus, OH
- Example: West Broad St and South Front St, Columbus, OH

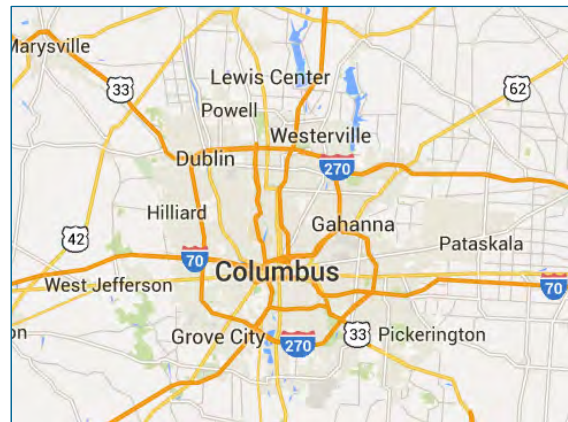
<if locate by map>

### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.

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**In 2014, what was your household's total annual income (from all sources) before taxes or other deductions from pay?**

This information is only used to ensure that we have a representative sample of Columbus residents. Please [click here](#) to view the privacy policy.

- Under \$10,000
- \$10,000-\$24,999
- \$25,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000-\$199,999
- \$200,000-\$249,999
- \$250,000 or more
- Prefer not to answer

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**Please enter your email address below.**

We will only use this address to provide information about this study. We will also automatically enter you in the prize drawing for an iPad Air (a \$600 value) after you complete all parts of the study. Prize winners will be notified by email.

You will only be contacted for this study and your information will never be shared or sold. Please click here to view the privacy policy.

Email address: \_\_\_\_\_ [\[verify valid format\]](#)

Previous

Finish



**Thank you! Your responses have been successfully submitted.**

In a few days, we will contact you with more information about participating in the North Columbus Transportation Study.

In the meantime, please email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu) if you have any questions or comments.





## TTR Study: Baseline Questionnaire

# Columbus Round 4

February 2016

## **Baseline survey design goals/ considerations for reviewers**

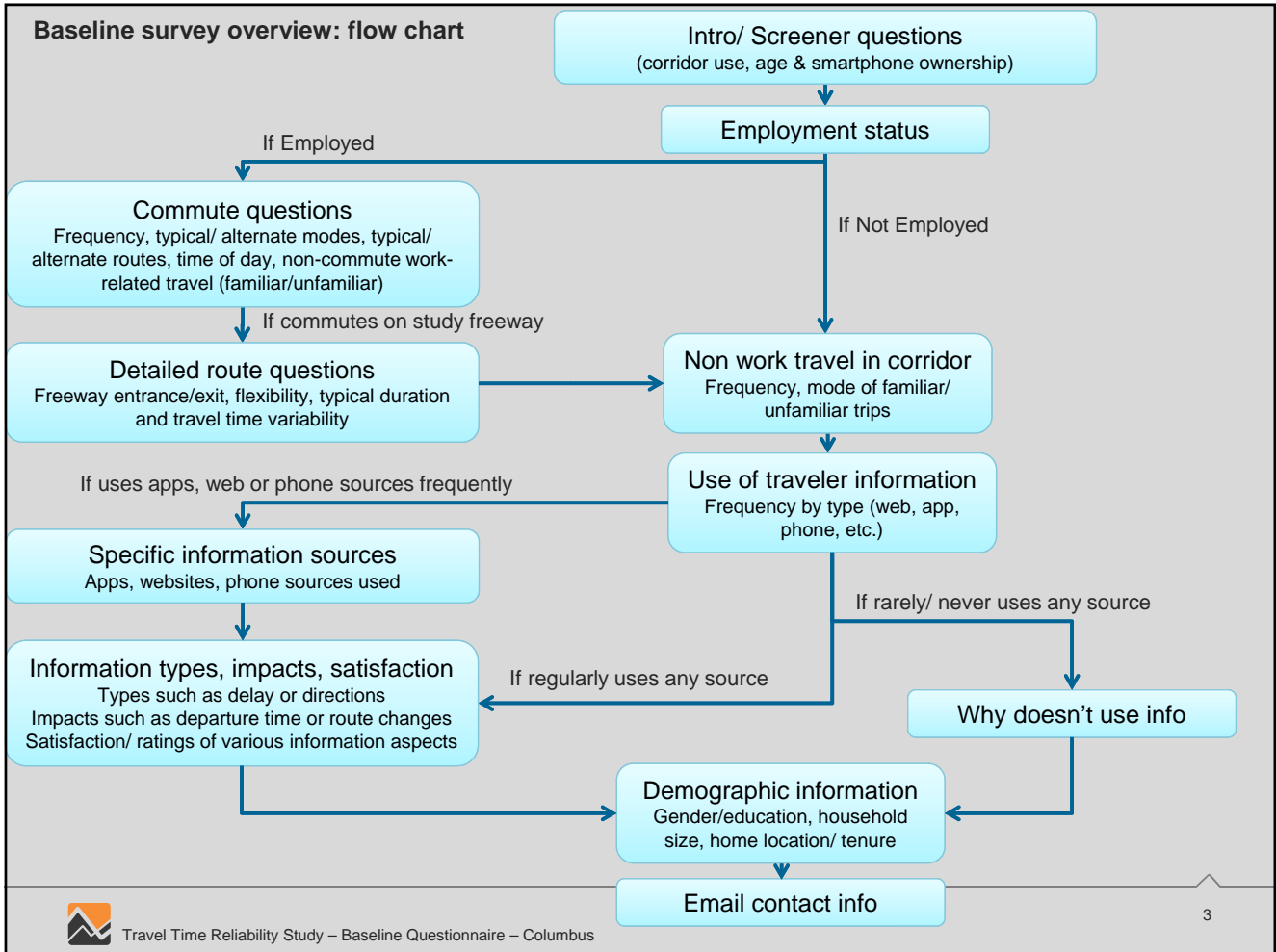
### **What are the primary goals of this survey?**

- Screen regular travelers to determine who is qualified for this study
- Collect information about typical commuting behavior and non-work travel behavior in the corridor, including mode, route, and flexibility (ability to choose alternate times/routes/modes)
- Establish a baseline awareness of, comfort with and use of traveler information resources (including what sources they currently use, what kind of information they look for, and how it affects their travel choices)
- Collect basic demographic information to assess how travel behavior and information use vary for different types of corridor users
- Collect email address for continued study administration

### **The survey aims to balance the need for detail with the goal of minimizing respondent burden.**

- This survey includes many detailed questions to provide extra context for the final analysis.
- Some survey questions ask for more detail as a way of reducing ambiguity and improving data quality.
  - For example, if a person uses travel apps once a month, they may be unsure of whether to answer yes or no about whether they typically use apps. Also, people who only use apps once/month may be significantly different than those who use apps daily.
- Some survey topics are broken into several smaller/ simpler questions to reduce ambiguity or make the questions easier to understand, and/or to improve data quality.
  - For example, rather than asking for open-ended route descriptions, the survey prompts respondents with route suggestions (e.g. I-71 or other) and then provides a list of entrances or exits in the corridor to choose from. This data is typically cleaner and more complete than open-ended descriptions.
- Some FAQs and survey questions intentionally use general language to try and avoid accidentally biasing how participants respond.
  - For example, information about who qualifies for the study says “regular” freeway users qualify, but does not specify how many days per week are required as this may encourage some people to simply provide an answer that allows them to continue.





## Baseline questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study

### Notable differences from Rounds 1 & 3

- Participants were recruited through advertisements and social media
- Participants began the survey “anonymously” and were only assigned a password after completing (for use during the other study tasks)
- The incentive offering changed, and survey instructions and text related to the incentive were updated accordingly.



Password Entry Page



The image shows a digital interface for a password entry page. At the top, a banner features a photograph of the North Columbus skyline with a river in the foreground. Below the photo, the text "NORTH COLUMBUS" is written in large white letters, and "TRANSPORTATION STUDY" is in smaller blue letters. To the left of this text is a teal map of Ohio with a white car icon and a star. Below the title, the word "WELCOME" is displayed. A white input field labeled "Password" is followed by a blue "Begin" button. At the bottom of the banner, there are three links: "Contact us", "Study FAQs", and "Privacy Policy".

# NORTH COLUMBUS

TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#) [Study FAQs](#) [Privacy Policy](#)



## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Columbus area drivers who regularly use I-71 and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Columbus Study Corridor.

- What is the North Columbus Study Corridor?

The North Columbus Study Corridor includes about 25 miles of I-71 and other roads between U.S. Route 36 and downtown Columbus.

- How do I participate in this study?

This study involves four steps:

STEP 1: Complete an initial survey about your typical experiences in the North Columbus Study Corridor. This survey will take about 15 minutes to complete. To start this survey, simply visit the secure survey website:

<https://surveyrsg.com/northcolumbus>

STEP 2: Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

STEP 3: Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

STEP 4: Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a \$100 check from the Battelle Memorial Institute as thanks for your participation.



## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Columbus area who is participating, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our [privacy policy](#) or [contact us](#).

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Ohio Department of Transportation (ODOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and ODOT.

**Resource Systems Group, Inc. Privacy Statement**

**SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

**PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

**ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

**THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu)



## **Welcome and thank you for your participation!**

The purpose of this study is to better understand Columbus area residents' experiences while traveling on I-71 and other freeways in the greater Columbus area. The U.S. Department of Transportation wants to understand the decisions you make to handle traffic congestion and also wants your opinions on how to improve travel conditions.

You are one of a small number of travelers participating in the study, so your responses will have a significant impact. Thank you again for your participation.

Your privacy will be protected. Please [click here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [columbusstudy@ttmail.tamu.edu](mailto:columbusstudy@ttmail.tamu.edu) with any questions or concerns.

**Please click "Next" to continue!**

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## Definition and description of the North Columbus Study Corridor

For this study, the North Columbus Corridor includes:

- About 25 miles of I-71 between U.S. Route 36 and downtown Columbus
- Other local/secondary roads near I-71

**Please click “Next” to continue.**

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### Tips for completing this survey

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.

### Now, let’s get started!

To begin the study, you may wish to review the study information in the FAQs. Please check the box below to confirm that you would like to continue.

- By checking this box, I confirm that I have read the study information and agree to participate.

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**In a typical week, about how often do you drive on I-71 in the study area on weekdays?**

What is the North Columbus Transportation Study area?

[popup that repeats the study area definition from the “corridor” page]

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

Terminate if less than 3 weekdays per week

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## How old are you?

This information will only be used to help us understand how well survey participants represent all travelers in the study area.

- Under 18 **[terminate if selected]**
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75–84
- 85 or older

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## What kind of smartphone do you own?

For the next part of this study (after this survey is complete), you will be asked to log information about your daily trips in the study area on your smartphone. Information about the type of smartphone you own will help us provide you with the correct resources to complete the study.

- Apple iPhone
- Android smartphone
  - [Click here to view examples of types of Android phones](#)
- Other type of smartphone (e.g., Windows phone, Blackberry, etc.) **[terminate if selected]**
- I'm not sure **[terminate if selected]**
- I do not own a smartphone **[terminate if selected]**

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Popup examples from previous slide

Examples of Android smartphones:

- Samsung Galaxy
- DROID RAZR
- HTC One
- Google Nexus



Terminate if under 18, doesn't have an iPhone or Android, or travels less than 3 weekdays/week on the study freeway

### **Thank you for your answers.**

Unfortunately, we cannot ask you to continue as this study requires participants who:

- Regularly drive on I-71 in the study area;
- Are age 18 or older; and
- Own smartphones on which they can install and operate the mobile application for the second part of the study.

Thank you again for your interest! Please email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu) if you have any questions or comments.



### What is your primary employment status?

- Employed full-time
- Employed part-time
- Self-employed (full-time or part-time)
- Student, employed full-time
- Student, employed part-time
- Student, not employed
- Homemaker
- Retired
- Not currently employed

If not employed, skip to non-work travel questions

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If employed (employment <= 5)

Thank you for your answers so far! The next few questions are about your work and typical work travel.

**How often do you commute to your primary workplace in a typical week?**

- 6-7 days/week
- 5 days/week
- 4 days/week
- 3 days/week
- 2 days/week
- 1 day/week
- Never – I typically telecommute/ work from home
- N/A – no primary workplace (I commute to multiple locations/job sites)

If commute\_freq is “Never” or “N/A”, skip to drivejob (questions on non-commute work-related trips)

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If travels to a primary workplace (commute\_freq <= 6)

**Please describe your typical commute to work.**

Please describe how you travel to work most often. We understand your commute may vary.

Approximately what time do you typically start work?

 ▼

Approximately what time of day do you typically finish work?

 ▼

Do you always work the same days?

 ▼

What is the primary way you typically travel to work?

 ▼

Do you typically use I-71 as part of your primary route to work?

 ▼

**[if route=other]** What is your typical route to work? \_\_\_\_\_

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**work\_start, work\_end**

1. Between 6:00-10:00 AM
2. Between 10:00 AM-3:00 PM
3. Between 3:00-7:00 PM
4. Between 7:00 PM-6:00 AM
5. It varies

**work\_vary**

1. Yes, I always work the same days
2. No, my schedule can vary from week to week

**commute\_mode**

1. Drive alone
2. Carpool
3. Vanpool
4. Public transit
5. Other

**commute\_route**

1. I typically use I-71 to get to work
3. No, I typically use another route to get to work



If travels to a primary workplace (commute\_freq <= 6)

### How often do you commute to work another way?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hide row that was selected as primary commute\_mode

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If travels to a primary workplace (commute\_freq <= 6)

### How often do you use alternate routes to get to work?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
[if not selected] I-71	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SR 315 (Olentangy Freeway)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I-270 / I-670	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
U.S. 23 (High Street)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OH Route 3 (State St/ Westerville Rd/ Cleveland Ave)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If "other" is selected "frequently" or "sometimes"

### Optional: What other routes do you use to get to work?

Optional text box entry

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If typically uses I-71 for primary commute route.

**Please describe your typical commute to work on I-71.**

- What direction do you travel on your way to work?  ▼
- Where do you typically get ON the freeway?  ▼
- What time do you typically get ON the freeway?  ▼
- Where do you typically get OFF the freeway?  ▼
- What time do you typically get OFF the freeway?  ▼
- How much flexibility do you have in your arrival time at work?  ▼



**direction**

1. Southbound (towards downtown Columbus)
2. Northbound (away from downtown Columbus)

**loc\_on**

- List of I-71 entrances
- **Filter by direction**
- (See next slides)

**time\_on**

- List of 15-minute intervals
- **No filtering, show entire list, but start with 6am at top**

**loc\_off**

- List of I-71 entrances
- **Filter by direction and entrance location (so can't select the same exit or an exit "behind" entrance)**  
(i.e., if direction = 1, then only show loc\_off > loc\_on; if direction = 2, only show loc\_off < loc\_on)

**time\_off**

- List of 15-minute intervals
- **No filtering (same as time\_on)**

**arrival\_flex**

1. I always arrive at work at the same time
2. My arrival time can vary up to 15 minutes
3. My arrival time can vary up to 30 minutes
4. My arrival time can vary up to 45 minutes
5. My arrival time can vary by an hour or more

Value	I-71 Exits	Display by direction
1	Other exit farther north	Both
2	Exit 131 US 36 / SR 37 - Delaware / Sunbury	Both
3	Exit 121 Polaris Parkway / Gemini Place	Both
4	Exit 119 I-270 - Dayton / Wheeling	Both
5	Exit 117 SR 161 (Dublin-Granville Road)	Both
6	Exit 116 Morse Road / Sinclair Road	Both
7	Exit 115 Cooke Road	Both
8	Exit 114 North Broadway	Both
9	Exit 113 Weber Road	Both
10	Exit 112 Hudson Street	Both
11	Exit 111 17th Avenue	Both
12	Exit 110B 11th Avenue	Both
13	Exit 110A Fifth Avenue	Southbound only
14	Exit 109A I-670 - Airport / Dayton / Leonard Ave	Both
15	Exit 109B Downtown / Spring Street	Southbound only
16	Exit 108B US 40 (Broad Street)	Both
17	Exit 108A Main Street	Southbound only
18	Exit 107 I-70	Both
19	Exit 100B US 23 North (Fourth Street) / US 33 (Livingston Avenue)	Both
20	Other exit farther south	Both



If primary commute route is I-71

### How long does your trip to work on I-71 typically take under different conditions?

Please describe your experiences for the portion of your trip on the freeway, not including time spent getting to and from the freeway.

At your usual time on a day with typical congestion: \_\_\_\_\_ minutes

At your usual time on a day with heavy congestion: \_\_\_\_\_ minutes

When there is little or no congestion (e.g. early Sunday morning): \_\_\_\_\_ minutes

Numeric text entry 1-999.

Validate that typical time <= congested time.

Validate that freeflow time <= typical time.

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If travels to a primary workplace (commute\_freq <= 6)

### Please indicate where your primary workplace is located.

This question is asked to help us understand where travelers frequently experience congestion. Your information will be protected. Please click here to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

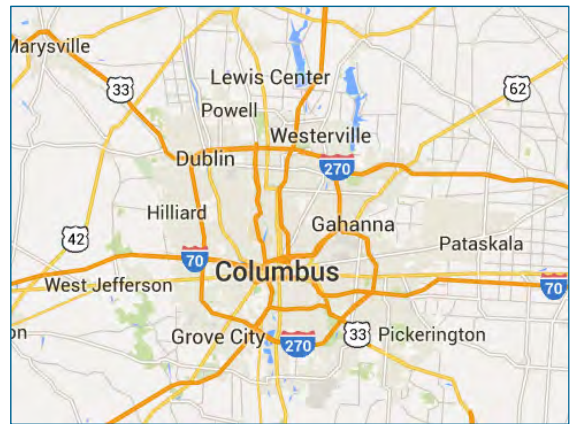
To locate by address, please enter a *street number* or the *nearest intersection* – or you can enter a business name.

- Example: 90 West Broad St, Columbus, OH
- Example: West Broad St and South Front St, Columbus, OH
- Example: Columbus City Hall, Columbus, OH

<if locate by map>

#### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.



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If employed

### How often do you need to drive to familiar or unfamiliar places around town for your job during your workday?

Familiar work-related destinations may include regular meetings, regular customers on a sales route, or any work-related destinations that you regularly visit or feel comfortable finding without directions. This does not include commuting to your primary workplace.

Unfamiliar work-related destinations may include infrequent or new meetings, sales calls to new customers, deliveries, or other places you rarely visit or need directions or navigation assistance to find.

	One or more times/ day	A few times/ week	About once/ week	A few times/ month	About once/ month	Less than once/ month	Never	Not Applicable
<u>Familiar</u> locations (e.g. regular meetings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> locations (e.g. deliveries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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All respondents

**How often do you travel on I-71 in the study area for personal trips to familiar locations?**

For example, trips to familiar locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend's house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words "study area" to pop-up reminder of corridor definition

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Show page if I-71 familiar freq is not never or n/a (nworkfreq\_fam <=6)

### How do you typically travel on I-71 when going to familiar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “familiar” to pop-up reminder of familiar personal destination definition (from previous slide)

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All respondents

**How often do you travel on I-71 in the study area for personal trips to unfamiliar locations?**

For example, trips to unfamiliar locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words “study area” to pop-up reminder of corridor definition

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Show page if I-71 UNFAMILIAR freq is not never or n/a (nworkfreq\_unfam <=6)

### How do you typically travel on I-71 when going to unfamiliar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “unfamiliar” to pop-up reminder of unfamiliar personal destination definition (from previous slide)

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**Optional:** If you would like to provide any comments about your travel experiences on I-71 in the North Columbus study area, please share them below.

*Optional text box entry*



## **Thank you for your answers so far!**

The next few questions are about your familiarity with and use of communication devices and traveler information resources.

Traveler information resources may include TV or radio reports, electronic message signs on highways, websites, apps, alerts, telephone information services or other information sources that the traveling public can access to help plan trips in the region.

**Please click “Next” to continue.**

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**In addition to your smartphone, which of the following communication and in-vehicle technologies do you own and regularly use for any purpose?**

*Please select all that apply.*

- Desktop computer with Internet access
- Laptop computer with Internet access
- Tablet computer (e.g. Apple iPad, Google Nexus 9) with Internet access
- Cell phone that is NOT web enabled
- Landline phone
- Toll transponder (e.g. E-ZPass) in your vehicle
- Built-in (factory/dealer installed) GPS or navigation device in your vehicle
- Portable GPS or navigation device (e.g. Garmin, TomTom)
- Other, please specify: \_\_\_\_\_
- None of the above

Randomize (with "Other" and "None" anchored at the bottom)

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**In general, how often do you check the following sources for traveler information when planning trips to familiar destinations in the greater Columbus area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom



**In general, how often do you check the following sources for traveler information when planning trips to unfamiliar destinations in the greater Columbus area?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom

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If uses web 1+ days/week for familiar and/or unfamiliar trips

**What websites do you typically check for traveler information before a trip?**

*Please select all that apply.*

- Ohgo.com
- Buckeye Traffic
- Google Maps
- Bing Maps
- MapQuest
- Traffic.com
- Here.com
- TV or Radio station websites
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses apps 1+ days/week for familiar and/or unfamiliar trips

**What smartphone or tablet apps do you typically check for traveler information before a trip?**

*Please select all that apply.*

- Google Maps/Navigation
- Waze
- INRIX
- [if smartphone=Apple] Apple iPhone Maps
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses "other" source 1+ days/week for familiar and/or unfamiliar trips

**Optional: What other information sources do you typically check for traveler information before a trip?**

Please enter text below.

*Text box entry – maybe make optional for respondent*

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If uses any info for familiar trips (infosources\_familiar are not "never" for all options)

**What kind of information do you typically look for when you are planning trips to familiar destinations in the greater Columbus area?**

*Please select all that apply.*

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses info for unfamiliar trips (infosources\_unfamiliar are not “never” for all options)

**What kind of information do you typically look for when you are planning trips to unfamiliar destinations in the greater Columbus area?**

*Please select all that apply.*

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with “Other” anchored at the bottom

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If infosource\_familiar is not "Never" for all options

How often do you change your travel plans to **familiar** destinations if you learn about congestion on your typical route?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosource\_unfamiliar is not "Never" for all options

How often do you change your travel plans to unfamiliar destinations if you learn about congestion on your typical route?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

### In general, how satisfied are you with the following aspects of the traveler information you receive?

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Travel time or speed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction duration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Directions or alternate route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**For the travel information you receive, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
Information sources I use are easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I receive is reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use reduces the stress of my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information helps me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use does NOT reduce the amount of time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall the information I receive is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements



If never uses info (infosource\_fam and infosource\_unfam are "never" for all options)

### Can you tell us why you do not use information for your trips in the greater Columbus area?

*Please select all that apply.*

- The information does not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with most or all of the greater Columbus area and do not need directions
- I am familiar with traffic conditions/travel times for most or all of the routes I generally use
- I do not know where to find information
- I do not have time to look for information
- Accessing information is difficult or inconvenient
- The information is not detailed enough
- No information is available for my routes or destinations
- Other, please specify: \_\_\_\_\_

Randomize statements

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Thank you for your responses so far – you are almost done!  
The last few questions are about you and your household to ensure that we have a representative sample of travelers in the Columbus area.

**Please tell us about yourself.**

Gender  ▼

Education  ▼

[Previous](#) [Next](#)



**gender**

1. Male
2. Female

**education**

1. Less than high school
2. High school graduate/GED
3. Some college
4. Vocational/technical training
5. Associates degree
6. Bachelors degree
7. Graduate degree (MA, PhD)
8. Professional degree (MBA, JD, MD)



Please tell us about your household.

**How many adults (other than yourself) live in your household?**

- 0 (I am the only adult)
- 1 other adult
- 2 other adults
- 3 other adults
- 4 other adults
- 5 or more other adults

**How many children live in your household?**

- 0 (no children)
- 1 child
- 2 children
- 3 children
- 4 children
- 5 or more children

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Please tell us about your current home (the residence where you live the majority of the time).

**How long have you lived in your current residence?**

- Less than one year
- 1-2 years
- 2-5 years
- 5-10 years
- 10-20 years
- More than 20 years

**Do you own or rent your home?**

- Own
- Rent
- Provided by job
- Other

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## Where is your home located?

This helps us understand where you frequently travel and ensures that we have a representative sample from the Columbus area. The details of your information will be protected. Please [click here](#) to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

To locate by address, please enter a *street number* or the *nearest intersection*.

- Example: 90 West Broad St, Columbus, OH
- Example: West Broad St and South Front St, Columbus, OH

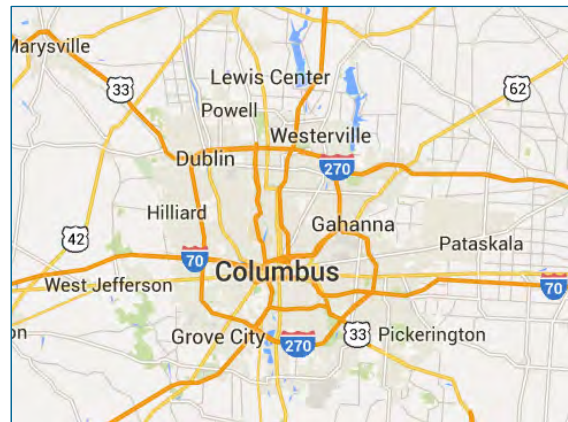
<if locate by map>

### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.

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**In 2015, what was your household's total annual income (from all sources) before taxes or other deductions from pay?**

This information is only used to ensure that we have a representative sample of Columbus residents. Please [click here](#) to view the privacy policy.

- Under \$10,000
- \$10,000-\$24,999
- \$25,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000-\$199,999
- \$200,000-\$249,999
- \$250,000 or more
- Prefer not to answer

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**Please enter your email address below.**

We will only use this address to provide information about this study. We will also send you information about how to receive your \$100 check after you complete all parts of the study. You will only be contacted for this study and your information will never be shared or sold. Please click here to view the privacy policy.

Email address: \_\_\_\_\_ [\[verify valid format\]](#)

Previous

Finish



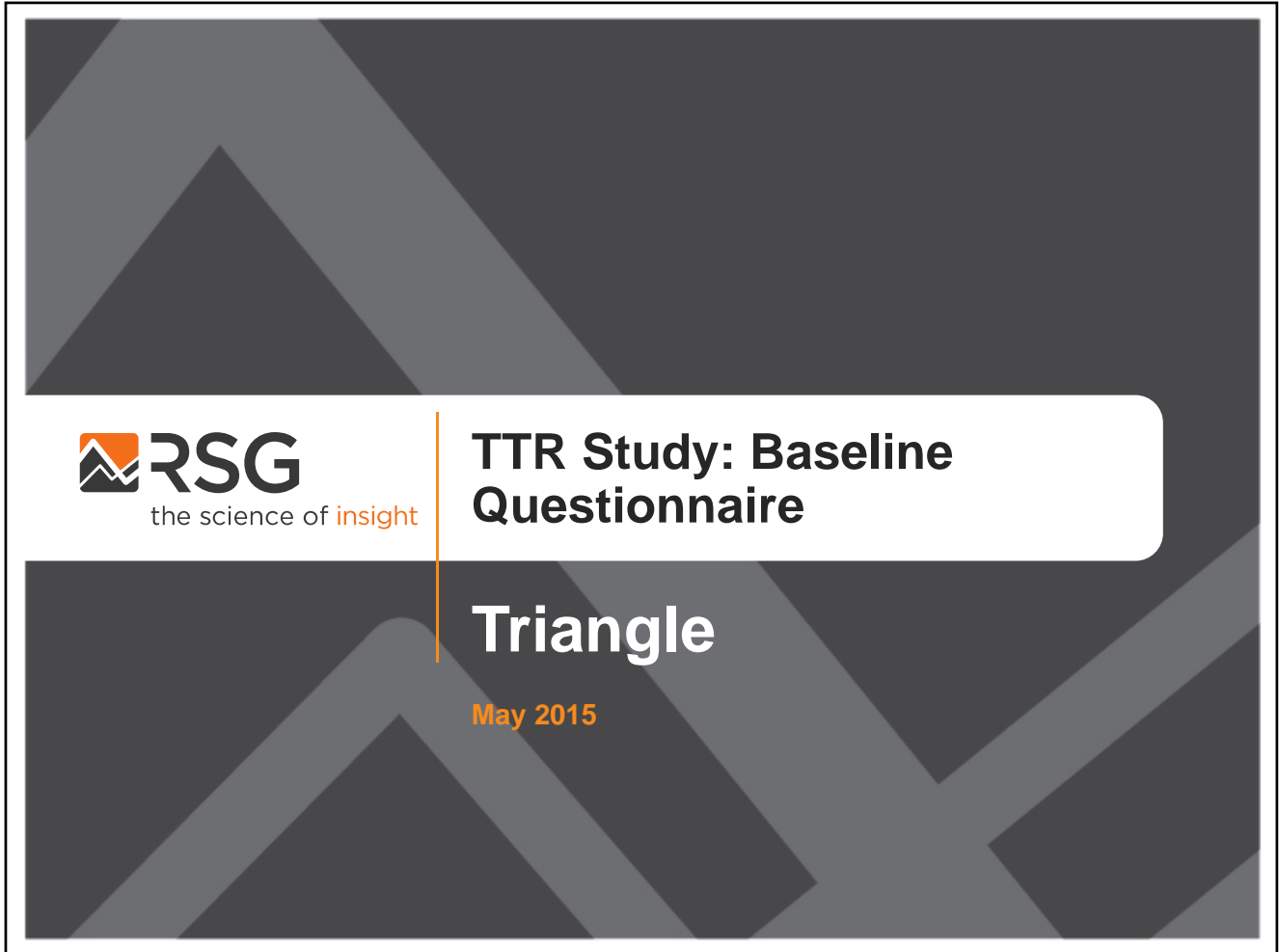
**Thank you! Your responses have been successfully submitted.**

In a few days, we will contact you with more information about participating in the North Columbus Transportation Study.

In the meantime, please email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu) if you have any questions or comments.



**APPENDIX E. TRIANGLE TRANSPORTATION STUDY BASELINE SURVEY**



## **Baseline survey design goals/ considerations for reviewers**

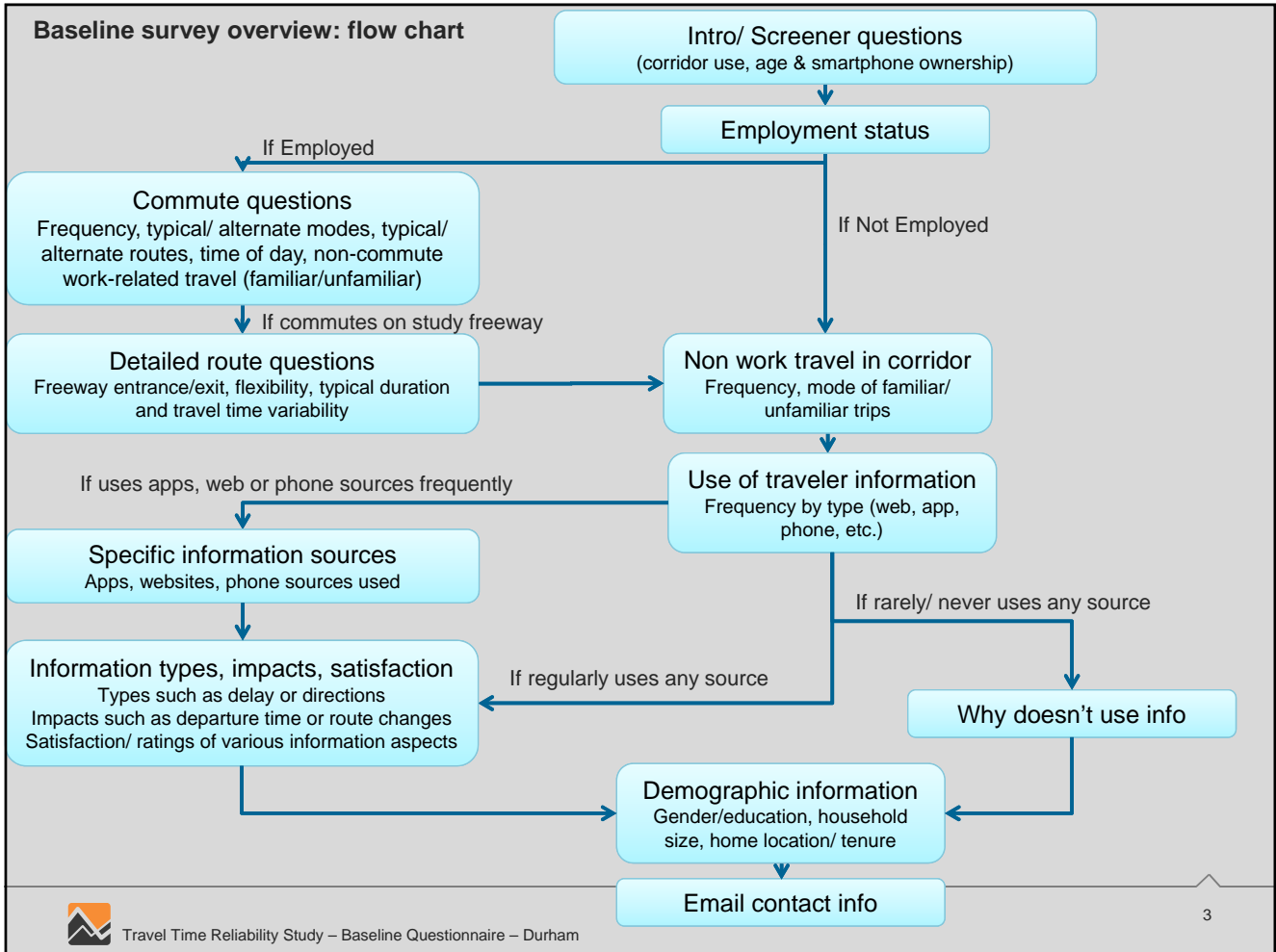
### **What are the primary goals of this survey?**

- Screen regular travelers to determine who is qualified for this study
- Collect information about typical commuting behavior and non-work travel behavior in the corridor, including mode, route, and flexibility (ability to choose alternate times/routes/modes)
- Establish a baseline awareness of, comfort with and use of traveler information resources (including what sources they currently use, what kind of information they look for, and how it affects their travel choices)
- Collect basic demographic information to assess how travel behavior and information use vary for different types of corridor users
- Collect email address for continued study administration

### **The survey aims to balance the need for detail with the goal of minimizing respondent burden.**

- This survey includes many detailed questions to provide extra context for the final analysis.
- Some survey questions ask for more detail as a way of reducing ambiguity and improving data quality.
  - For example, if a person uses travel apps once a month, they may be unsure of whether to answer yes or no about whether they typically use apps. Also, people who only use apps once/month may be significantly different than those who use apps daily.
- Some survey topics are broken into several smaller/ simpler questions to reduce ambiguity or make the questions easier to understand, and/or to improve data quality.
  - For example, rather than asking for open-ended route descriptions, the survey prompts respondents with route suggestions (e.g. I-40 or other) and then provides a list of entrances or exits in the corridor to choose from. This data is typically cleaner and more complete than open-ended descriptions.
- Some FAQs and survey questions intentionally use general language to try and avoid accidentally biasing how participants respond.
  - For example, information about who qualifies for the study says “regular” freeway users qualify, but does not specify how many days per week are required as this may encourage some people to simply provide an answer that allows them to continue.





## Baseline questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person's typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)
- Text written in **red** indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study





# TRIANGLE

## TRANSPORTATION STUDY

WELCOME

**Begin**

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[Study FAQs](#)

[Privacy Policy](#)

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**DCHC**  
Metropolitan Planning Organization  
Planning Tomorrow Today

## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Triangle region drivers who regularly use I-40 and other nearby roads between Durham, Chapel Hill and Raleigh. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the Triangle Study Corridor.

- What is the Triangle Study Corridor?

The Triangle Study Corridor includes about 25 miles of I-40 and other roads between U.S. Route 1 in Raleigh and U.S. Route 15-501 in Durham.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the Triangle Study Corridor. This survey will take about 15 minutes to complete. To start this survey, use the unique password you received on your postcard to log into the secure survey website: <https://surveyrsg.com/trianglenc>

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a **\$50 Amazon.com gift card!** In appreciation of the contribution participants will make during all the steps in the study, this final gift card is a higher amount than originally advertised on the invitation postcard.



Travel Time Reliability Study – Baseline Questionnaire – Durham



## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Triangle region invited to participate, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How was I selected to participate?

Invited participants were randomly selected from all residential addresses in the Triangle study area.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and DCHC.

## **Resource Systems Group, Inc. Privacy Statement**

### **SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

### **PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

### **ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

### **THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com)



## **Welcome and thank you for your participation!**

The purpose of this study is to better understand local residents' experiences while traveling on I-40 and other freeways in the Triangle region. The U.S. Department of Transportation wants to understand the decisions you make to handle traffic congestion and also wants your opinions on how to improve travel conditions.

You are one of a small number of travelers invited to take part in the study, so your responses will have a significant impact.

Your privacy will be protected. Please click here to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com) with any questions or concerns.

**Please click "Next" to continue!**

Next



## Definition and description of the Triangle Study Corridor

For this study, the Triangle Corridor includes:

- About 25 miles of I-40 between U.S. 1 in Raleigh and U.S. 15-501 in Durham
- Other local/secondary roads near I-40

**Please click “Next” to continue.**

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Next



### Tips for completing this survey

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.

### Now, let’s get started!

To begin the study, you may wish to review the study information in the FAQs. Please check the box below to confirm that you would like to continue.

- By checking this box, I confirm that I have read the study information and agree to participate.

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**In a typical week, about how often do you drive on I-40 in the study area on weekdays?**

What is the Triangle Transportation Study area?

[popup that repeats the study area definition from the “corridor” page]

- 5 weekdays/week
- 4 weekdays/week
- 3 weekdays/week
- 2 weekdays/week
- 1 weekday/week
- Weekends only
- Less than weekly
- Never
- N/A (I do not drive or do not have a vehicle)

Terminate if less than 3 weekdays per week

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## How old are you?

This information will only be used to help us understand how well survey participants represent all travelers in the study area.

- Under 18 **[terminate if selected]**
- 18–24
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 75–84
- 85 or older

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## What kind of smartphone do you own?

For the second part of this study, you will be asked to log information about your daily trips in the study area on your smartphone. Information about the type of smartphone you own will help us provide you with the correct resources to complete the study.

- Apple iPhone
- Android smartphone
  - [Click here to view examples of types of Android phones](#)
- Other type of smartphone (e.g., Windows phone, Blackberry, etc.) **[terminate if selected]**
- I'm not sure **[terminate if selected]**
- I do not own a smartphone **[terminate if selected]**

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Popup examples from previous slide

Examples of Android smartphones:

- Samsung Galaxy
- DROID RAZR
- HTC One
- Google Nexus



Terminate if under 18, doesn't have an iPhone or Android, or travels less than 3 weekdays/week on the study freeway

### **Thank you for your answers.**

Unfortunately, we cannot ask you to continue as this study requires participants who:

- Regularly drive on I-40 in the study area;
- Are age 18 or older; and
- Own smartphones on which they can install and operate the mobile application for the second part of the study.

Thank you again for your interest! Please email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com) if you have any questions or comments.



### What is your primary employment status?

- Employed full-time
- Employed part-time
- Self-employed (full-time or part-time)
- Student, employed full-time
- Student, employed part-time
- Student, not employed
- Homemaker
- Retired
- Not currently employed

If not employed, skip to non-work travel questions

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If employed (employment <= 5)

Thank you for your answers so far! The next few questions are about your work and typical work travel.

**How often do you commute to your primary workplace in a typical week?**

- 6-7 days/week
- 5 days/week
- 4 days/week
- 3 days/week
- 2 days/week
- 1 day/week
- Never – I typically telecommute/ work from home
- N/A – no primary workplace (I commute to multiple locations/job sites)

If commute\_freq is “Never” or “N/A”, skip to drivejob (questions on non-commute work-related trips)

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If travels to a primary workplace (commute\_freq <= 6)

**Please describe your typical commute to work.**

Please describe how you travel to work most often. We understand your commute may vary.

Approximately what time do you typically start work?

 ▼

Approximately what time of day do you typically finish work?

 ▼

Do you always work the same days?

 ▼

What is the primary way you typically travel to work?

 ▼

Do you typically use I-40 as part of your primary route to work?

 ▼

**[if route=other]** What is your typical route to work? \_\_\_\_\_

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**work\_start, work\_end**

1. Between 6:00-10:00 AM
2. Between 10:00 AM-3:00 PM
3. Between 3:00-7:00 PM
4. Between 7:00 PM-6:00 AM
5. It varies

**work\_vary**

1. Yes, I always work the same days
2. No, my schedule can vary from week to week

**commute\_mode**

1. Drive alone
2. Carpool
3. Vanpool
4. Public transit
5. Other

**commute\_route**

1. I typically use I-40 to get to work
3. No, I typically use another route to get to work



If travels to a primary workplace (commute\_freq <= 6)

### How often do you commute to work another way?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hide row that was selected as primary commute\_mode

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If travels to a primary workplace (commute\_freq <= 6)

### How often do you use alternate routes to get to work?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
[if not selected] I-40	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NC 54	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I-540 (Northern Wake Expressway)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
U.S. 70	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Durham Freeway (NC 147)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If "other" is selected "frequently" or "sometimes"

### Optional: What other routes do you use to get to work?

*Optional text box entry*

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If typically uses I-40 for primary commute route.

**Please describe your typical commute to work on I-40.**

- What direction do you travel on your way to work?  ▼
- Where do you typically get ON the freeway?  ▼
- What time do you typically get ON the freeway?  ▼
- Where do you typically get OFF the freeway?  ▼
- What time do you typically get OFF the freeway?  ▼
- How much flexibility do you have in your arrival time at work?  ▼



**direction**

1. Eastbound (towards Raleigh)
2. Westbound (towards Durham or Chapel Hill)

**loc\_on**

- List of I-40 entrances
- **Filter by direction**
- (See next slides)

**time\_on**

- List of 15-minute intervals
- No filtering, show entire list, but start with 6am at top

**loc\_off**

- List of I-40 entrances
- **Filter by direction and entrance location (so can't select the same exit or an exit "behind" entrance)**  
(i.e., if direction = 1, then only show loc\_off > loc\_on; if direction = 2, only show loc\_off < loc\_on)

**time\_off**

- List of 15-minute intervals
- No filtering (same as time\_on)

**arrival\_flex**

1. I always arrive at work at the same time
2. My arrival time can vary up to 15 minutes
3. My arrival time can vary up to 30 minutes
4. My arrival time can vary up to 45 minutes
5. My arrival time can vary by an hour or more

<b>I-40 Exits</b>		<b>Display by direction</b>
1	Other exit further west	Both
2	Exit 270A US 15 / US 501 South – Chapel Hill	Both
3	Exit 270B US 15 / US 501 North – Durham	Both
4	Exit 273 NC 54 – Chapel Hill, Durham	Eastbound only
5	Exit 273A NC 54 West – Chapel Hill	Westbound only
6	Exit 273B NC 54 East – Durham	Westbound only
7	Exit 274 NC 751 – Durham / Jordan Lake	Both
8	Exit 276 Fayetteville Road – Southpoint	Both
9	Exit 278 NC 55 to NC 54 – Apex / Durham	Both
10	Exit 279A NC 147 South (Triangle Expressway) – Sanford / RTP	Both
11	Exit 279B NC 147 North (Durham Freeway) – Downtown Durham / RTP	Both
12	Exit 280 Davis Drive	Both
13	Exit 281 Miami Boulevard	Both
14	Exit 282 Page Road – North Raleigh / NC 540 West	Both
15	Exit 283 I-540 East / NC 540 West – North Raleigh – to US 1 / US 70	Eastbound only
16	Exit 283A East I-540 to US 70	Westbound only
17	Exit 283B West NC 540 to NC 55	Westbound only
18	Exit 284 Airport Boulevard – RDU International Airport	Westbound only
19	Exit 284A Airport Boulevard West	Eastbound only
20	Exit 284B Airport Boulevard East – RDU International Airport	Eastbound only
21	Exit 285 Aviation Parkway – Morrisville / RDU International Airport	Westbound only
22	Exit 285 Morrisville / Aviation Parkway	Eastbound only
23	Exit 287 Harrison Avenue – Cary	Both
24	Exit 289 Wade Avenue / to I-440 / to US 1 North	Eastbound only
25	Exit 289 Wade Avenue – Downtown Raleigh / to I-440 / to US 1 North	Westbound only
26	Exit 290 NC 54 – Cary	Both
27	Exit 291 Cary Towne Boulevard	Both
28	Exit 293A US 1 South / US 64 West – Cary / Asheboro	Both
29	Exit 293B I-440 East / US 1 North – Raleigh / Wake Forest / Beltline	Both
30	Other exit further east	Both

If primary commute route is I-40

### How long does your trip to work on I-40 typically take under different conditions?

Please describe your experiences for the portion of your trip on the freeway, not including time spent getting to and from the freeway.

At your usual time on a day with typical congestion: \_\_\_\_\_ minutes

At your usual time on a day with heavy congestion: \_\_\_\_\_ minutes

When there is little or no congestion (e.g. early Sunday morning): \_\_\_\_\_ minutes

Numeric text entry 1-999.

Validate that typical time  $\leq$  congested time.

Validate that freeflow time  $\leq$  typical time.

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If travels to a primary workplace (commute\_freq <= 6)

## Please indicate where your primary workplace is located.

This question is asked to help us understand where travelers frequently experience congestion. Your information will be protected. Please click here to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

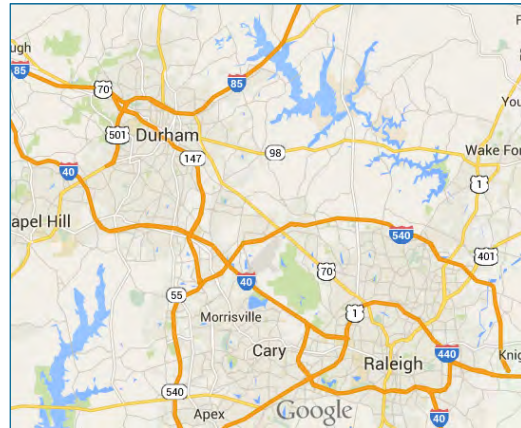
To locate by address, please enter a *street number* or the *nearest intersection* – or you can enter a business name.

- Example: 3040 E Cornwallis Rd, Durham, NC
- Example: South Salisbury St and West Lenoir St, Raleigh, NC
- Example: Research Triangle Park, Durham, NC

<if locate by map>

### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.



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If employed

### How often do you need to drive to familiar or unfamiliar places around town for your job during your workday?

Familiar work-related destinations may include regular meetings, regular customers on a sales route, or any work-related destinations that you regularly visit or feel comfortable finding without directions. This does not include commuting to your primary workplace.

Unfamiliar work-related destinations may include infrequent or new meetings, sales calls to new customers, deliveries, or other places you rarely visit or need directions or navigation assistance to find.

	One or more times/ day	A few times/ week	About once/ week	A few times/ month	About once/ month	Less than once/ month	Never	Not Applicable
<u>Familiar</u> locations (e.g. regular meetings)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> locations (e.g. deliveries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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All respondents

**How often do you travel on I-40 in the study area for personal trips to familiar locations?**

For example, trips to familiar locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend's house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words "study area" to pop-up reminder of corridor definition

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Show page if I-40 familiar freq is not never or n/a (nworkfreq\_fam <=6)

### How do you typically travel on I-40 when going to familiar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “familiar” to pop-up reminder of familiar personal destination definition (from previous slide)

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All respondents

**How often do you travel on I-40 in the study area for personal trips to unfamiliar locations?**

For example, trips to unfamiliar locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.

- One or more times per day
- A few times per week
- About once per week
- A few times per month
- About once per month
- Less than once per month
- Never
- Not applicable

Link the words “study area” to pop-up reminder of corridor definition

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Show page if I-40 UNFAMILIAR freq is not never or n/a (nworkfreq\_unfam <=6)

### How do you typically travel on I-40 when going to unfamiliar destinations?

	Almost always	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never
Drive alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vanpool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link the word “unfamiliar” to pop-up reminder of unfamiliar personal destination definition (from previous slide)

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***Optional:*** If you would like to provide any comments about your travel experiences on I-40 in the Triangle study area, please share them below.

*Optional text box entry*



## **Thank you for your answers so far!**

The next few questions are about your familiarity with and use of communication devices and traveler information resources.

Traveler information resources may include TV or radio reports, electronic message signs on highways, websites, apps, alerts, telephone information services or other information sources that the traveling public can access to help plan trips in the region.

**Please click “Next” to continue.**

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**In addition to your smartphone, which of the following communication and in-vehicle technologies do you own and regularly use for any purpose?**

*Please select all that apply.*

- Desktop computer with Internet access
- Laptop computer with Internet access
- Tablet computer (e.g. Apple iPad, Google Nexus 9) with Internet access
- Cell phone that is NOT web enabled
- Landline phone
- Toll transponder (e.g. NC Quick Pass) in your vehicle
- Built-in (factory/dealer installed) GPS or navigation device in your vehicle
- Portable GPS or navigation device (e.g. Garmin, TomTom)
- Other, please specify: \_\_\_\_\_
- None of the above

Randomize (with "Other" and "None" anchored at the bottom)

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**In general, how often do you check the following sources for traveler information when planning trips to familiar destinations in the Triangle region?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom

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**In general, how often do you check the following sources for traveler information when planning trips to unfamiliar destinations in the Triangle region?**

	Once/ day or more	A few days/ week	About one day per week	A few times/ month	Rarely (less than once/ month)	Never
Websites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smartphone or tablet apps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telephone information services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Built-in GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if owns] Portable GPS or navigation device	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize with "Other" anchored at the bottom





If uses web 1+ days/week for familiar and/or unfamiliar trips

**What websites do you typically check for traveler information before a trip?**

*Please select all that apply.*

- NCDOT Traveler Information Management System
- Google Maps
- Bing Maps
- MapQuest
- Traffic.com
- Here.com
- TV or Radio station websites
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses apps 1+ days/week for familiar and/or unfamiliar trips

**What smartphone or tablet apps do you typically check for traveler information before a trip?**

*Please select all that apply.*

- Google Maps/Navigation
- Waze
- INRIX
- [if smartphone=Apple] Apple iPhone Maps
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses phone 1+ days/week for familiar and/or unfamiliar trips

**What telephone numbers do you typically check for traveler information before a trip?**

*Please select all that apply.*

- 511 (NCDOT traffic information line)
- Other, please specify: \_\_\_\_\_

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If uses "other" source 1+ days/week for familiar and/or unfamiliar trips

**Optional: What other information sources do you typically check for traveler information before a trip?**

Please enter text below.

*Text box entry – maybe make optional for respondent*

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If uses any info for familiar trips (infosources\_familiar are not "never" for all options)

**What kind of information do you typically look for when you are planning trips to familiar destinations in the Triangle region?**

Please select all that apply.

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with "Other" anchored at the bottom

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If uses info for unfamiliar trips (infosources\_unfamiliar are not “never” for all options)

**What kind of information do you typically look for when you are planning trips to unfamiliar destinations in the Triangle region?**

Please select all that apply.

- Directions to my destination
- Alternate routes to my destination
- Travel time to my destination
- Locations of general congestion
- Amount of delay from general congestion
- Location of traffic incidents or construction
- Duration of traffic incidents
- Travel speeds along my route
- Other, please specify: \_\_\_\_\_

Randomize with “Other” anchored at the bottom

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If `infosource_familiar` is not "Never" for all options

How often do you change your travel plans to familiar destinations if you learn about congestion on your typical route?

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If `infosource_unfamiliar` is not "Never" for all options

**How often do you change your travel plans to unfamiliar destinations if you learn about congestion on your typical route?**

	Frequently (a few times/ week)	Sometimes (a few times/ month)	Rarely (less than once/ month)	Never	Not Applicable
Start my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Start my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Make minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely change my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cancel trip or postpone to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decide to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

### In general, how satisfied are you with the following aspects of the travel and trip-planning information you receive?

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Travel time or speed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incident or construction duration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Directions or alternate route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If infosources\_familiar OR infosources\_unfamiliar are not “never” for all options (i.e., ONLY skip page if both familiar and unfamiliar are “never” (or null) for all options)

**For the travel and trip-planning information you check, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
Information sources I use are easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I receive is reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use reduces the stress of my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information helps me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information I use does NOT reduce the amount of time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall the information I receive is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements



If never uses info (infosource\_fam and infosource\_unfam are "never" for all options)

### Can you tell us why you do not use information for your trips in the Triangle region?

*Please select all that apply.*

- The information does not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with most or all of the Triangle region and do not need directions
- I am familiar with traffic conditions/travel times for most or all of the routes I generally use
- I do not know where to find information
- I do not have time to look for information
- Accessing information is difficult or inconvenient
- The information is not detailed enough
- No information is available for my routes or destinations
- Other, please specify: \_\_\_\_\_

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Thank you for your responses so far – you are almost done!  
The last few questions are about you and your household to ensure that we have a representative sample of travelers in the Triangle region.

**Please tell us about yourself.**

Gender  ▼

Education  ▼

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**gender**

1. Male
2. Female

**education**

1. Less than high school
2. High school graduate/GED
3. Some college
4. Vocational/technical training
5. Associates degree
6. Bachelors degree
7. Graduate degree (MA, PhD)
8. Professional degree (MBA, JD, MD)



Please tell us about your household.

**How many adults (other than yourself) live in your household?**

- 0 (I am the only adult)
- 1 other adult
- 2 other adults
- 3 other adults
- 4 other adults
- 5 or more other adults

**How many children live in your household?**

- 0 (no children)
- 1 child
- 2 children
- 3 children
- 4 children
- 5 or more children

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Please tell us about your current home (the residence where you received the invitation to the study or where you live the majority of the time).

**How long have you lived in your current residence?**

- Less than one year
- 1-2 years
- 2-5 years
- 5-10 years
- 10-20 years
- More than 20 years

**Do you own or rent your home?**

- Own
- Rent
- Provided by job
- Other

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## Where is your home located?

This helps us understand where you frequently travel and ensures that we have a representative sample from the Triangle region. The details of your information will be protected. Please [click here](#) to view our privacy policy.

<two buttons/ options>

Locate by address

Locate on the map

<if locate by address>

To locate by address, please enter a *street number* or the *nearest intersection*.

- Example: 3040 E Cornwallis Rd, Durham, NC
- Example: South Salisbury St and West Lenoir St, Raleigh, NC

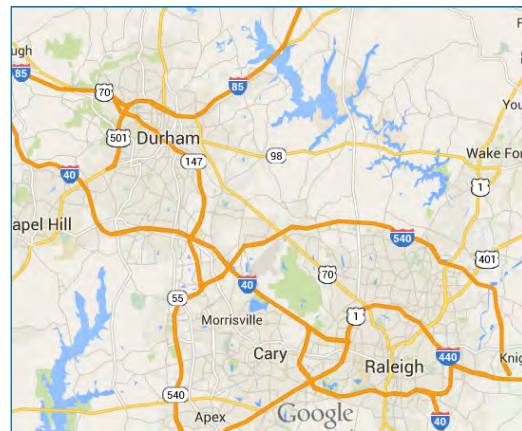
<if locate by map>

### Map instructions

1. Click on the map to zoom in.
2. When zoomed in close enough, clicking the map will place a 'marker.'
3. Continue clicking until you have located the correct place.

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**In 2014, what was your household's total annual income (from all sources) before taxes or other deductions from pay?**

This information is only used to ensure that we have a representative sample of Triangle region residents. Please [click here](#) to view the privacy policy.

- Under \$10,000
- \$10,000-\$24,999
- \$25,000-\$34,999
- \$35,000-\$49,999
- \$50,000-\$74,999
- \$75,000-\$99,999
- \$100,000-\$149,999
- \$150,000-\$199,999
- \$200,000-\$249,999
- \$250,000 or more
- Prefer not to answer

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**Please enter your email address below.**

We will only use this address to provide information about this study. We will also send the Amazon.com gift card via email after you complete all parts of the study. In appreciation of your contribution during the next parts of study, we are increasing the value of this final gift card to \$50.

You will only be contacted for this study and your information will never be shared or sold. Please click here to view the privacy policy.

Email address: \_\_\_\_\_ [verify valid format]

Previous

Finish



**Thank you! Your responses have been successfully submitted!**

In a few days, we will contact you with more information about participating in the Triangle Transportation Study.

In the meantime, please email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com) if you have any questions or comments.





## APPENDIX F. PHASE 1 TRAVEL DIARY QUESTIONS

**1. What mode or modes did you use for this trip? (Select all that apply)**

- Personal vehicle (drove alone)
- Carpool / vanpool (drove or rode with others)
- Public Transit (bus/light rail)
- Other (e.g., bicycled/walked)

**2. Did the nature of this trip necessitate arrival at a specific time?**

- Yes
- No

**3. What kind of road did you use for the majority of this trip?**

- Freeway
- Surface streets
- Tollway
- HOV facility

**4. How would you describe this trip?**

- Familiar trip / familiar time (I know the route and am traveling at my usual time).
- Familiar trip / unfamiliar time (I know the route but am traveling at a different time than usual).
- Unfamiliar trip (I do not know the route and/or I don't typically go to this location).

**5. What, if any resources did you use to obtain information to plan your trip? (If you used more than one resource, select the resource that provided you with the most information.)**

- Smartphone or tablet apps
- Real-time traffic website
- MapQuest, Google Maps, Bing Maps
- TV
- Radio
- 511
- Built-in GPS or Navigation Device
- Portable GPS or Navigation Device
- Other
- I did not use any resource to plan this trip. **GO TO END OF DIARY ENTRY**

**6. Did the information you received from this resource alter your trip plans?**

- Yes **GO TO QUESTION 7**
- No **GO TO END OF DIARY ENTRY**

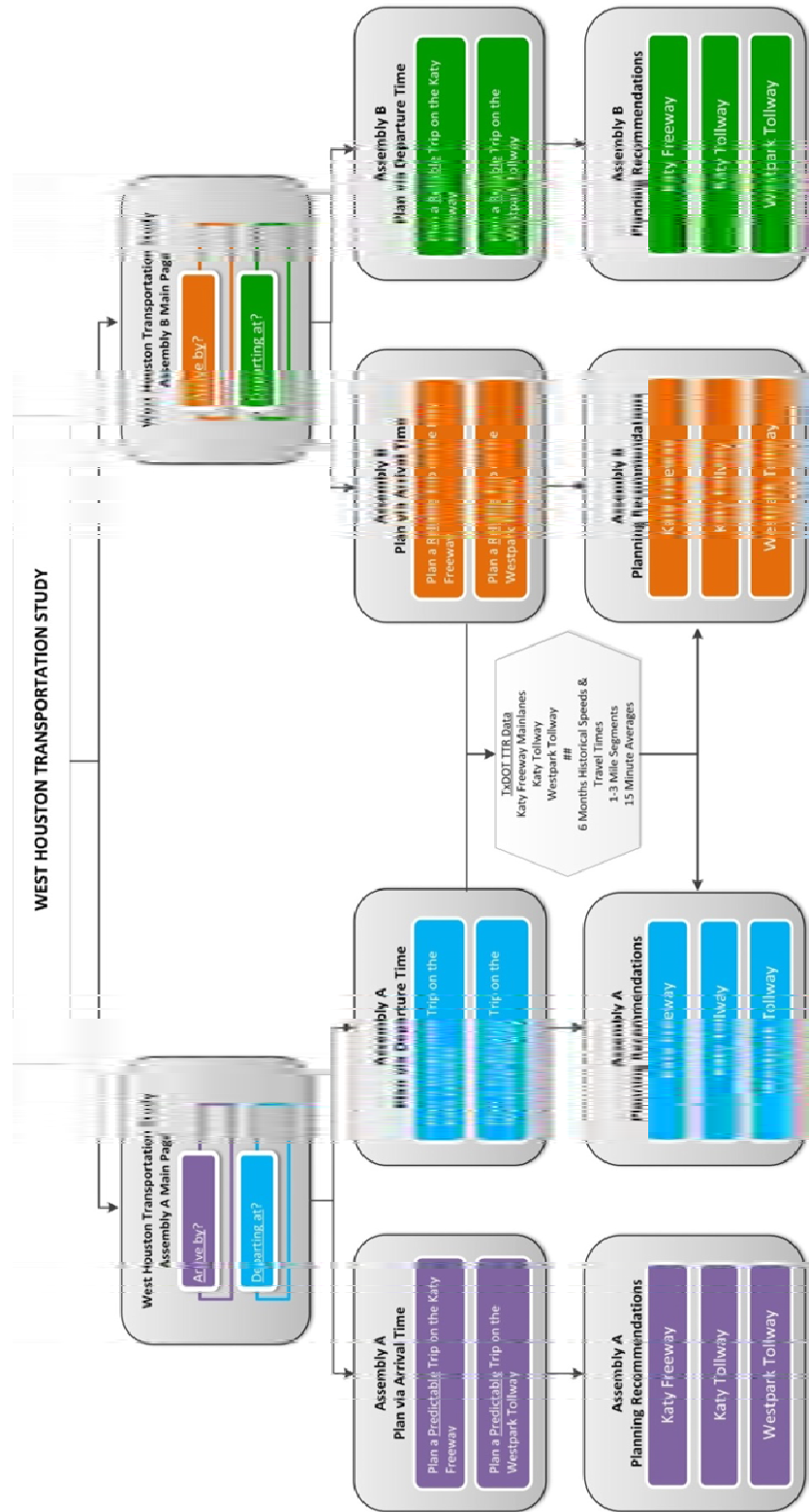
**7. How did you change your planned trip (select all that apply)?**

- I left at a different time
- I took a different route
- I changed my mode of travel

**THANK YOU FOR COMPLETING THE DIARY ENTRY.**



# APPENDIX G. WEST HOUSTON TRANSPORTATION STUDY WEBSITE CONCEPT



# WEST HOUSTON TRANSPORTATION STUDY

Arrive by?

Departing at?



# WEST HOUSTON TRANSPORTATION STUDY

Arrive by?

Departing at?

### Plan a Predictable Trip on the Katy Freeway

Where are you starting from?

•Katy Freeway Entrance Selection

Where are you going?

•Katy Freeway Exit Selection

Arrive by?

•AA:AA AM/PM

### Plan a Predictable Trip on the Katy Tollway

Where are you starting from?

•Katy Tollway Entrance Selection

Where are you going?

•Katy Tollway Exit Selection

Arrive by?

•AA:AA AM/PM

### Plan a Predictable Trip on the Westpark Tollway

Where are you starting from?

•Westpark Tollway Entrance Selection

Where are you going?

•Westpark Tollway Exit Selection

Arrive by?

•AA:AA AM/PM

For your trip on the Katy Freeway:



- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

For your trip on the Katy Tollway:



- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

For your trip on the Westpark Tollway:



- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

Reliability Data Needs

- Recommended departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- Majority of the time: 95<sup>th</sup> Percentile Travel Time
- Estimate travel time: Average Travel Time
- Extra time: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)

### Plan a Predictable Trip on the Katy Freeway

Where are you starting from?

• Katy Freeway Entrance Selection

Where are you going?

• Katy Freeway Exit Selection

Departing at?

• DD:DD AM/PM

### Plan a Predictable Trip on the Katy Tollway

Where are you starting from?

• Katy Tollway Entrance Selection

Where are you going?

• Katy Tollway Exit Selection

Departing at?

• DD:DD AM/PM

### Plan a Predictable Trip on the Westpark Tollway

Where are you starting from?

• Westpark Tollway Entrance Selection

Where are you going?

• Westpark Tollway Exit Selection

Departing at?

• DD:DD AM/PM

For your trip on the Katy Freeway:



- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

For your trip on the Katy Tollway:



- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

For your trip on the Westpark Tollway:



- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

### Plan a Reliable Trip on the Katy Freeway

Where are you starting from?

•Katy Freeway Entrance Selection

Where are you going?

•Katy Freeway Exit Selection

What time do you want to get there?

•AA:AA AM/PM

### Plan a Reliable Trip on the Katy Tollway

Where are you starting from?

•Katy Tollway Entrance Selection

Where are you going?

•Katy Tollway Exit Selection

What time do you want to get there?

•AA:AA AM/PM

### Plan a Reliable Trip on the Westpark Tollway

Where are you starting from?

•Westpark Tollway Entrance Selection

Where are you going?

•Westpark Tollway Exit Selection

What time do you want to get there?

•AA:AA AM/PM

For your trip on the Katy Freeway:

- Your approximate travel time will be XX minutes.
- A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your trip will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

For your trip on the Katy Tollway:

- Your approximate travel time will be XX minutes.
- A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your trip will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

For your trip on the Westpark Tollway:

- Your approximate travel time will be XX minutes.
- A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your trip will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

### Plan a Reliable Trip on the Katy Freeway

Where are you starting from?

•Katy Freeway Entrance Selection

Where are you going?

•Katy Freeway Exit Selection

What time will you start your trip?

•DD:DD AM/PM

### Plan a Reliable Trip on the Katy Tollway

Where are you starting from?

•Katy Tollway Entrance Selection

Where are you going?

•Katy Tollway Exit Selection

What time will you start your trip?

•DD:DD AM/PM

### Plan a Reliable Trip on the Westpark Tollway

Where are you starting from?

•Westpark Tollway Entrance Selection

Where are you going?

•Westpark Tollway Exit Selection

What time will you start your trip?

•DD:DD AM/PM



For your trip on the Katy Freeway:

- Your approximate travel time will be XX minutes.
- Use a recommended cushion of XX minutes if you start your trip at DD:DD AM/PM.
- Most of the time, your trip will take XX minutes or less.
- You will get there by AA:AA AM/PM.

For your trip on the Katy Tollway:

- Your approximate travel time will be XX minutes.
- Use a recommended cushion of XX minutes if you start your trip at DD:DD AM/PM.
- Most of the time, your trip will take XX minutes or less.
- You will get there by AA:AA AM/PM.

For your trip on the Westpark Tollway:

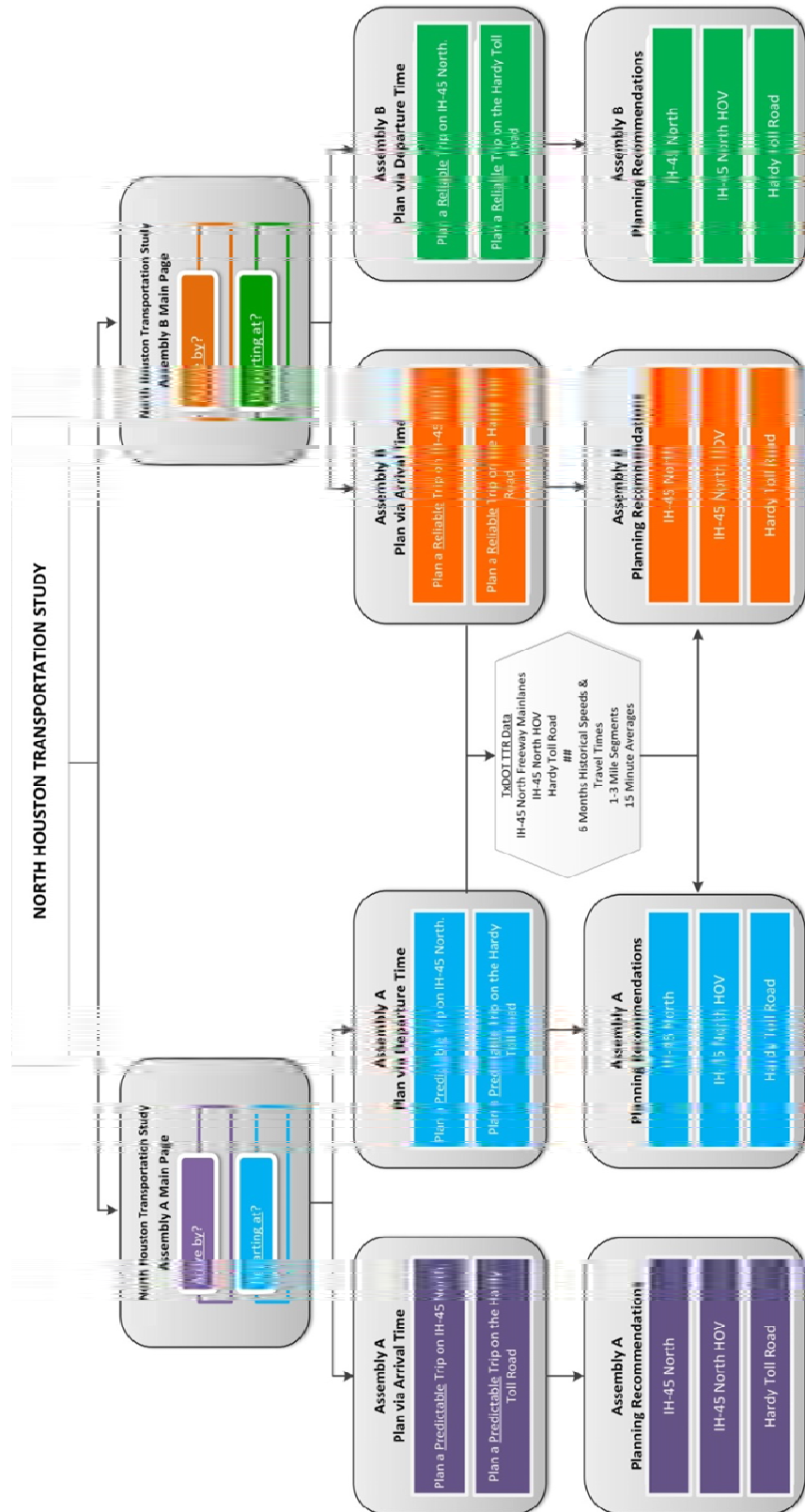
- Your approximate travel time will be XX minutes.
- Use a recommended cushion of XX minutes if you start your trip at DD:DD AM/PM.
- Most of the time, your trip will take XX minutes or less.
- You will get there by AA:AA AM/PM.

### Reliability Data Needs

- recommended departure time / suggested departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- majority of the time / most of the time: 95<sup>th</sup> Percentile Travel Time
- estimated travel time / approximate travel time: Average Travel Time
- extra time / recommended cushion: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)



## APPENDIX H. NORTH HOUSTON TRANSPORTATION STUDY WEBSITE CONCEPT



# NORTH HOUSTON TRANSPORTATION STUDY

Arrive by?

Departing at?

# NORTH HOUSTON TRANSPORTATION STUDY

Arrive by?

Departing at?

Plan a Predictable Trip on IH-45 North

Where are you starting from?

•IH-45 North Freeway Entrance Selection

Where are you going?

•IH-45 North Freeway Exit Selection

Arrive by?

•AA:AA AM/PM

Plan a Predictable Trip on IH-45 North HOV

Where are you starting from?

•IH-45 North HOV Entrance Selection

Where are you going?

•IH-45 North HOV Exit Selection

Arrive by?

•AA:AA AM/PM

Plan a Predictable Trip on the Hardy Toll Road

Where are you starting from?

•Hardy Toll Road Entrance Selection

Where are you going?

•Hardy Toll Road Exit Selection

Arrive by?

•AA:AA AM/PM

For your trip on IH-45 North:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

For your trip on the IH-45 North HOV:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

For your trip on the Hardy Toll Road:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

Reliability Data Needs

- Recommended departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- Majority of the time: 95<sup>th</sup> Percentile Travel Time
- Estimate travel time: Average Travel Time
- Extra time: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)

### Plan a Predictable Trip on IH-45 North

Where are you starting from?

•IH-45 North Freeway Entrance Selection

Where are you going?

•IH-45 North Freeway Exit Selection

Departing at?

•DD:DD AM/PM

### Plan a Predictable Trip on IH-45 North HOV

Where are you starting from?

•IH-45 North HOV Entrance Selection

Where are you going?

•IH-45 North HOV Exit Selection

Departing at?

•DD:DD AM/PM

### Plan a Predictable Trip on the Hardy Toll Road

Where are you starting from?

•Hardy Toll Road Entrance Selection

Where are you going?

•Hard Toll Road Exit Selection

Departing at?

•DD:DD AM/PM



**North Houston Transportation Study**

**ASSEMBLY A (Departure)**

For your trip on IH-45 North:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

For your trip on the IH-45 North HOV:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

For your trip on the Hardy Toll Road:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

### Plan a Reliable Trip on IH-45 North

Where are you starting from?

•IH-45 North Freeway Entrance Selection

Where are you going?

•IH-45 North Freeway Exit Selection

What time do you want to get there?

•AA:AA AM/PM

### Plan a Reliable Trip on IH-45 North HOV

Where are you starting from?

•IH-45 North HOV Entrance Selection

Where are you going?

•IH-45 North HOV Exit Selection

What time do you want to get there?

•AA:AA AM/PM

### Plan a Reliable Trip on the Hardy Toll Road

Where are you starting from?

•Hardy Toll Road Entrance Selection

Where are you going?

•Hardy Toll Road Exit Selection

What time do you want to get there?

•AA:AA AM/PM

For your trip on IH-45  
North:

- Your approximate travel time will be XX minutes. A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your trip will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

For your trip on the IH-45  
North HOV:

- Your approximate travel time will be XX minutes. A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your trip will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

For your trip on the Hardy  
Toll Road:

- Your approximate travel time will be XX minutes. A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your trip will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

### Plan a Reliable Trip on IH-45 North

Where are you starting from?

•IH-45 North Freeway Entrance Selection

Where are you going?

•IH-45 North Freeway Exit Selection

What time will you start your trip?

•DD:DD AM/PM

### Plan a Reliable Trip on IH-45 North HOV

Where are you starting from?

•IH-45 North HOV Entrance Selection

Where are you going?

•IH-45 North HOV Exit Selection

What time will you start your trip?

•DD:DD AM/PM

### Plan a Reliable Trip on the Hardy Toll Road

Where are you starting from?

•Hardy Toll Road Entrance Selection

Where are you going?

•Hardy Toll Road Exit Selection

What time will you start your trip?

•DD:DD AM/PM

For your trip on IH-45 North:

- Your approximate travel time will be XX minutes.
- Use a recommended cushion of
- XX minutes if you start you trip at DD:DD AM/PM.
- Most of the time, your trip will take XX minutes or less.
- You will get there by AA:AA AM/PM.

For your trip on IH-45 North HOV:

- Your approximate travel time will be XX minutes.
- Use a recommended cushion of
- XX minutes if you start you trip at DD:DD AM/PM.
- Most of the time, your trip will take XX minutes or less.
- You will get there by AA:AA AM/PM.

For your trip on the Hardy Toll Road:

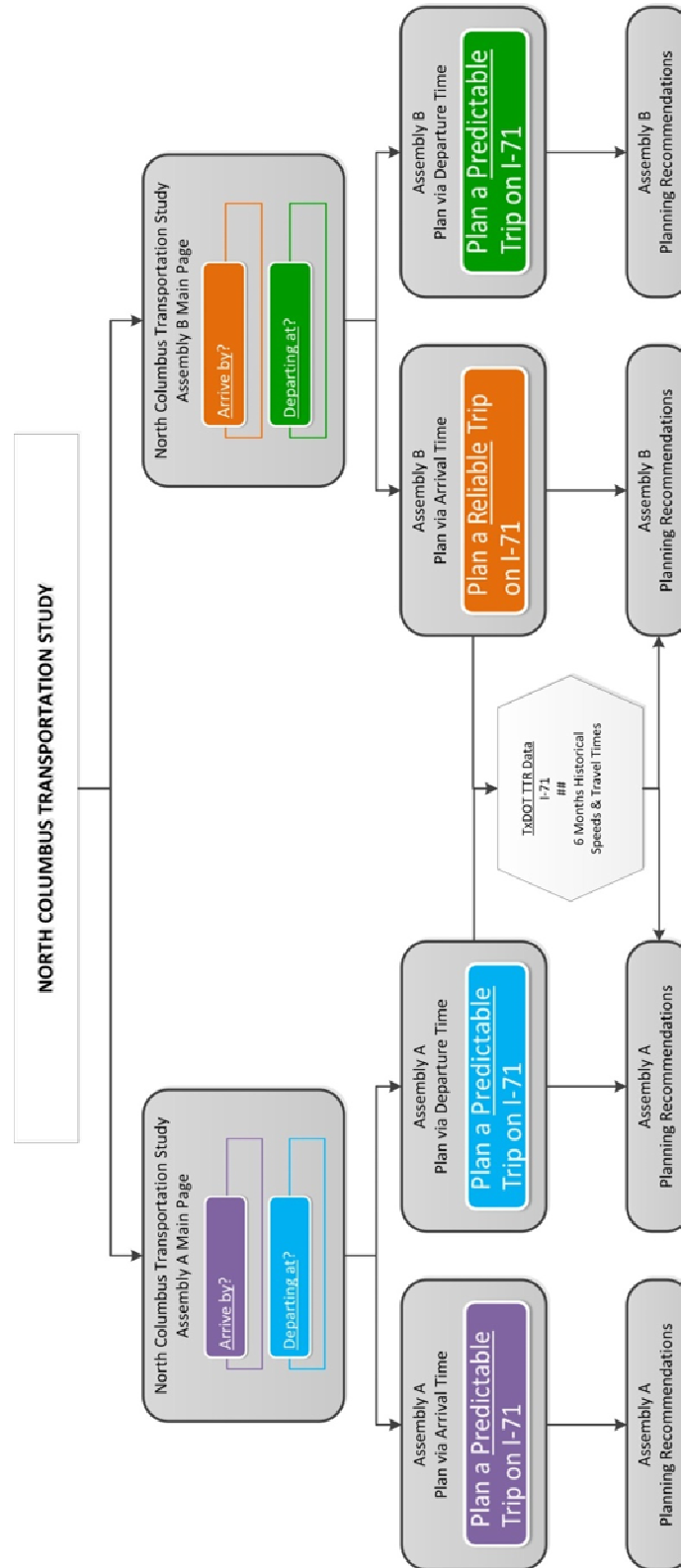
- Your approximate travel time will be XX minutes.
- Use a recommended cushion of
- XX minutes if you start you trip at DD:DD AM/PM.
- Most of the time, your trip will take XX minutes or less.
- You will get there by AA:AA AM/PM.

### Reliability Data Needs

- recommended departure time / suggested departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- majority of the time / most of the time: 95<sup>th</sup> Percentile Travel Time
- estimated travel time / approximate travel time: Average Travel Time
- extra time / recommended cushion: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)



# APPENDIX I. NORTH COLUMBUS TRANSPORTATION STUDY WEBSITE CONCEPT



# NORTH COLUMBUS TRANSPORTATION STUDY

Arrive by?

Departing at?



# NORTH COLUMBUS TRANSPORTATION STUDY

Arrive by?

Departing at?

Plan a Predictable Trip on I-71

Where are you starting from?

- I-71 Entrance Selection

Where are you going?

- I-71 Exit Selection

Arrive by?

- AA:AA AM/PM

For your trip on I-71:



- Your estimated travel time will be XX minutes,.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

Reliability Data Needs

- Recommended departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- Majority of the time: 95<sup>th</sup> Percentile Travel Time
- Estimate travel time: Average Travel Time
- Extra time: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)

Plan a Predictable Trip on I-71

Where are you starting from?

- I-71 Entrance Selection

Where are you going?

- I-71 Exit Selection

Departing at?

- DD:DD AM/PM

For your trip on I-71:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

Plan a Reliable Trip on I-71

Where are you starting from?

- I-71 Entrance Selection

Where are you going?

- I-71 Exit Selection

What time do you want to get there?

- AA:AA AM/PM

For your trip on I-71:

- Yur approximate travel time will be XX minutes.
- A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your trip will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

## Plan a Reliable Trip on I-71

Where are you starting from?

- I-71 Entrance Selection

Where are you going?

- I-71 Exit Selection

What time will you start your trip?

- DD:DD AM/PM

### For your trip on I-71:



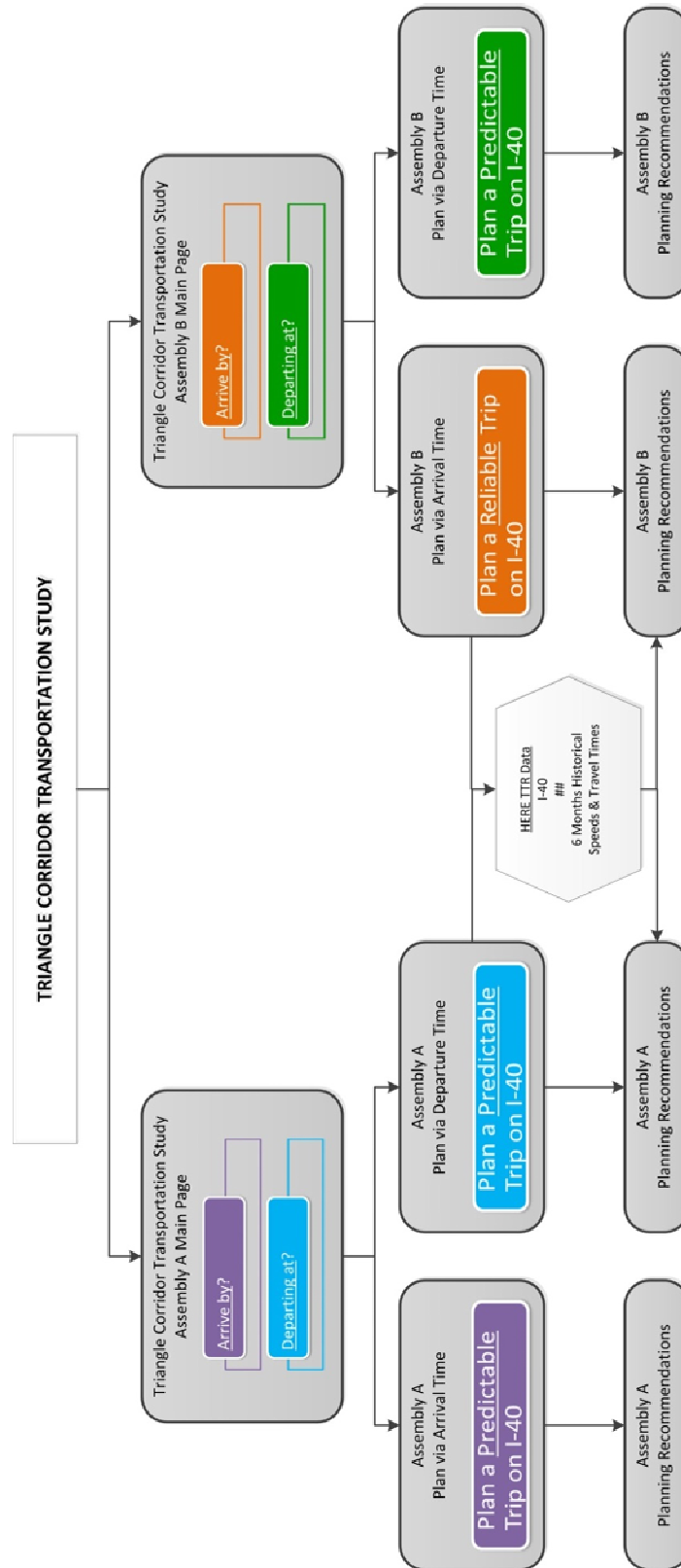
- Your approximate travel time will be XX minutes.
- Use a recommended cushion of XX minutes if you start you trip at DD:DD AM/PM.
- Most of the time, your trip will take XX minutes or less.
- You will get there by AA:AA AM/PM.

### Reliability Data Needs

- recommended departure time / suggested departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- majority of the time / most of the time: 95<sup>th</sup> Percentile Travel Time
- estimated travel time / approximate travel time: Average Travel Time
- extra time / recommended cushion: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)



# APPENDIX J. TRIANGLE TRANSPORTATION STUDY WEBSITE CONCEPT



# TRIANGLE TRANSPORTATION STUDY

Arrive by?

Departing at?



# TRIANGLE TRANSPORTATION STUDY

Arrive by?

Departing at?

Plan a Predictable Trip on I-40

Where are you starting from?

- I-40 Entrance Selection

Where are you going?

- I-40 Exit Selection

Arrive by?

- AA:AA AM/PM

For your trip on I-40:

- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time to arrive by AA:AA AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- Your recommended departure time is DD:DD AM/PM.

Reliability Data Needs

- Recommended departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- Majority of the time: 95<sup>th</sup> Percentile Travel Time
- Estimate travel time: Average Travel Time
- Extra time: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)

Plan a Predictable Trip on I-40

Where are you starting from?

- I-40 Entrance Selection

Where are you going?

- I-40 Exit Selection

Departing at?

- DD:DD AM/PM

For your trip on I-40:



- Your estimated travel time will be XX minutes.
- Plan YY minutes of extra time if you are departing at DD:DD AM/PM.
- The majority of the time, your trip will take XX minutes or less.
- You will arrive by AA:AA AM/PM at your destination.

Plan a Reliable Trip on I-40

Where are you starting from?

- I-40 Entrance Selection

Where are you going?

- I-40 Exit Selection

What time do you want to get there?

- AA:AA AM/PM

For your trip on I-40:

- Your approximate travel time will be XX minutes.  
A recommended cushion of YY minutes will get you there by AA:AA AM/PM.
- Most of the time, your tripp will take XX minutes or less.
- Your suggested departure time is DD:DD AM/PM.

Plan a Reliable Trip on I-40

Where are you starting from?

- I-40 Entrance Selection

Where are you going?

- I-40 Exit Selection

What time will you start your trip?

- DD:DD AM/PM

For your trip on I-40:

- Your approximate travel time will be XX minutes.  
Use a recommended cushion of XX minutes if you start you trip at DD:DD AM/PM.
- Most of the time, your tripp will take XX minutes or less.
- You will get there by AA:AA AM/PM.

**Reliability Data Needs**

- recommended departure time / suggested departure time: Arrival Time – 95<sup>th</sup> Percentile Travel Time
- majority of the time / most of the time: 95<sup>th</sup> Percentile Travel Time
- estimated travel time / approximate travel time: Average Travel Time
- extra time / recommended cushion: Buffer Time (95<sup>th</sup> Percentile Travel Time – Average Travel Time)



## APPENDIX K. PHASE 2 TRAVEL DIARY QUESTIONS

1. **What mode or modes did you use for this trip? (Select all that apply)**
  - Personal vehicle (drove alone)
  - Carpool / vanpool (drove or rode with others)
  - Public Transit (bus/light rail)
  - Other (e.g., bicycled/walked)
  
2. **Did the nature of this trip necessitate arrival at a specific time?**
  - Yes
  - No
  
3. **What kind of road did you use for the majority of this trip?**
  - Freeway
  - Surface streets
  - Tollway
  - HOV facility
  
4. **How would you describe this trip?**
  - Familiar trip / familiar time (I know the route and am traveling at my usual time).
  - Familiar trip / unfamiliar time (I know the route but am traveling at a different time than usual).
  - Unfamiliar trip (I do not know the route and/or I don't typically go to this location).
  
5. **Did you use the Transportation Study resource provided to you to obtain information to plan your trip?**
  - Yes **GO TO QUESTION 6**
  - No **GO TO QUESTION 8**
  
6. **Did the information you received from the Transportation Study resource alter your trip plans?**
  - Yes **GO TO QUESTION 7**
  - No **GO TO QUESTION 8**
  
7. **How did you change your planned trip (select all that apply)?**
  - I left at a different time
  - I took a different route
  - I changed my mode of travel
  - GO TO QUESTION 9**
  
8. **Why didn't you alter your trip plans (select all that apply)?**
  - I couldn't change my departure time.
  - There was no good alternate route for my trip.
  - There was no good alternate mode for my trip.
  - I didn't believe the information.
  - I did not understand the information.
  - Other

**9. What, if any other resources did you use to obtain information to plan your trip? (If you used more than one resource, select the resource that provided you with the most information.)**

Smartphone or tablet apps

Real-time traffic website

MapQuest, Google Maps, Bing Maps

TV

Radio

511

Built-in GPS or Navigation Device

Portable GPS or Navigation Device

Other

I did not use any resource to plan this trip.



**APPENDIX L. WEST HOUSTON EXIT SURVEY QUESTIONS**

**RSG**  
the science of insight

**TTR Study: Exit  
Questionnaire**

**West Houston – Rounds 1 & 2**

May 2015

### **Exit survey design goals/ considerations for reviewers**

The primary purposes of the Exit Survey (following Phase 2 of the trip diaries when participants were provided with TTR information) is to collect information about if and how respondents used the TTR information they were provided and how they perceived that information. This includes information about:

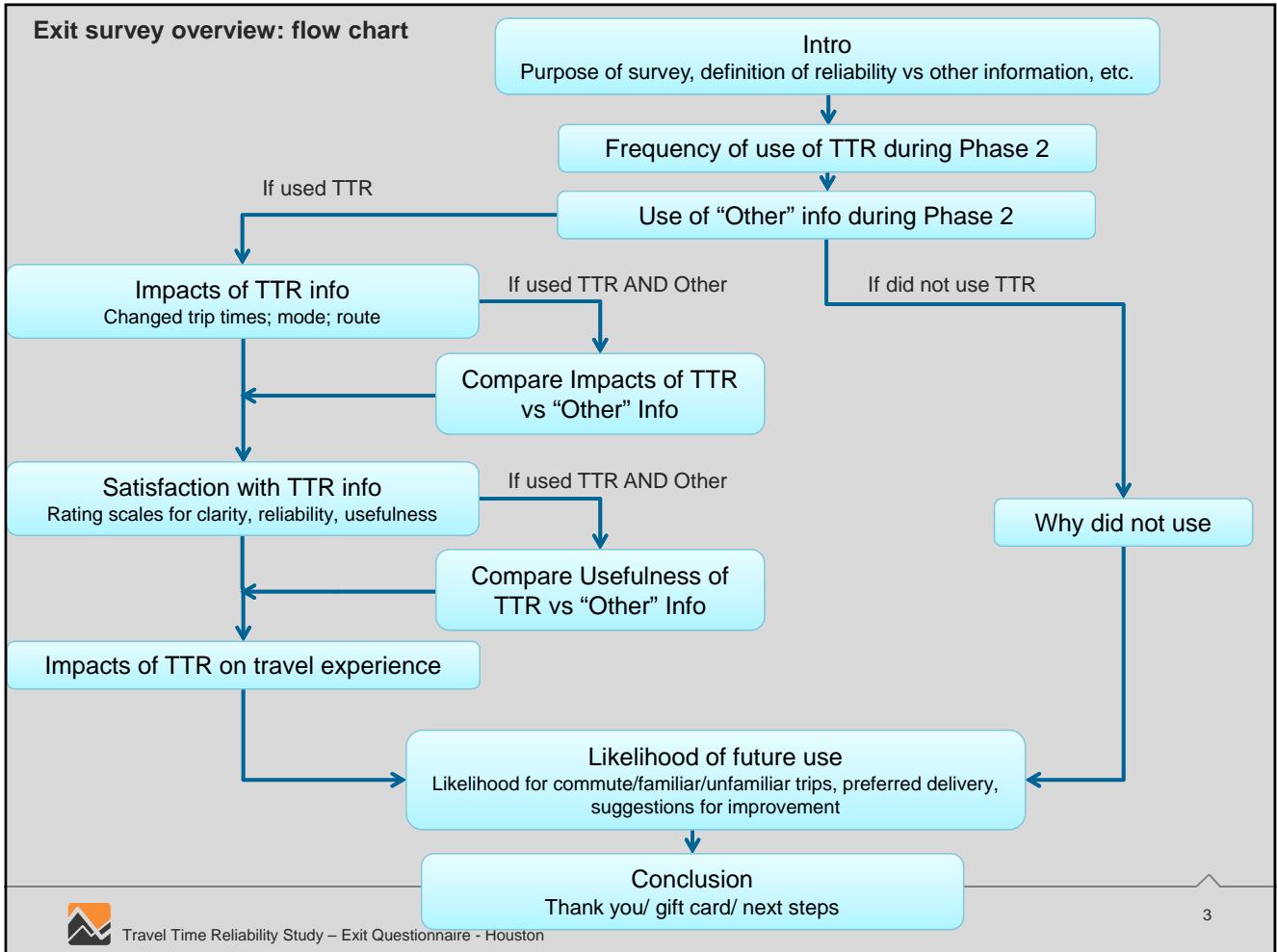
- **How often** participants used the TTR information for different kinds of trips
- What kind of impacts the TTR information had on **behavior** (if any) (e.g., changes in departure time, route, mode choice)
- How **satisfied** participants were with various aspects of the information (e.g., clarity, ease of access, trustworthiness, overall usefulness)
- What kind of impacts the TTR had on **trip experience** (if any) (e.g., reduced stress, congestion avoidance, shorter trip, overall trip satisfaction)
- Perceptions of what might make the information **more useful** for different kinds of trips or in an unfamiliar city (or what might make participants likely to use the information in the future)

### **When relevant, questions in the exit survey are designed to match similar questions from the baseline survey as closely as possible.**

This is intended to allow for “before” and “after” comparisons, or more specifically comparisons of how respondents typically used and perceived “other” types of information before the study versus how they typically used and perceived the TTR information during the second phase of the study. Questions from the baseline that are similar to questions in this exit survey include:

- infosource familiar/unfamiliar (baseline, slides 40-41) == ttruse\_freq familiar/ unfamiliar (exit, slide 5)
- change familiar/unfamiliar (baseline, slides 48-49) == ttr\_change familiar/unfamiliar (exit, slides 18-19)
- infosat (baseline, slide 50) == ttr\_infosat (exit, slide 22)
- infoopinion (baseline, slide 51) == ttr\_infoopinion (exit, slides 23-24)
- ynoinfo (baseline, slide 52) == ttr\_ynoinfo (exit, slide 26)

Other exit survey questions focus specifically on aspects and opinions of the TTR info and do not have comparable baseline questions.



## Exit questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g., who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)

### Notable differences between Rounds 1 & 2

- Round 1 offered a \$25 gift card; Round 2 offered a \$50 gift card plus entry into a grand prize drawing

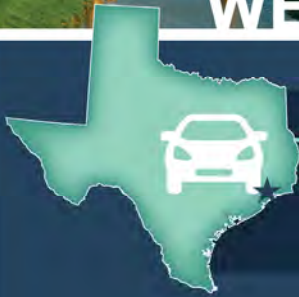


Password Entry Page



# WEST HOUSTON

## TRANSPORTATION STUDY



WELCOME

Begin

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## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Houston area drivers who regularly use the Katy Freeway, Westpark Tollway and other roads west of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the West Houston Study Corridor.

- What is the West Houston Study Corridor?

The West Houston Study Corridor includes about 25 miles of the Katy Freeway (I-10), the Westpark Tollway, and other roads between Grand Parkway/ Highway 99 in Katy, TX and downtown Houston.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the West Houston Study Corridor. This survey will take about 15 minutes to complete. To start this survey, use the unique password you received on your postcard to log into the secure survey website: <https://surveyrsg.com/westhouston>

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a **\$50 Amazon.com gift card!** In appreciation of the extended timeline and the contributions participants have made throughout the study, this thank you gift is a higher amount than was originally advertised on your postcards.

Additionally, all participants who complete the study will automatically be entered into a drawing for a **Grand Prize – an additional \$500 from Amazon!** No purchase is necessary to win, and odds of winning are expected to be about 1 in 200. The winner is responsible for any applicable taxes. *(Round 2 text)*

## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Houston area invited to participate, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How was I selected to participate?

Invited participants were randomly selected from all residential addresses in the West Houston study area.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Texas Department of Transportation (TxDOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and TxDOT.



**Resource Systems Group, Inc. Privacy Statement**

**SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

**PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

**ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

**THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.





**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com)



## Welcome back!

Thank you for your recent participation in the smartphone app portion of the West Houston Transportation Study.

This final survey is the last step to complete the study. The purpose of this survey is to help us understand how your travel experiences may have changed when you were provided with the customized Transportation Study Resource during the last two weeks of the study.

As one of a small number of Houston travelers completing this study, your input in this final survey is important. Your feedback will help the study sponsors and other agencies provide better transportation information and services in the region. Also, once you complete this final survey, you will receive your \$50 Amazon.com gift card!

Your privacy will be protected. Please click [here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com) with any questions or concerns. Thank you again for your continued participation!

Please click "Next" to continue.

Next



## Definition and description of traveler information resources in this study

Throughout this study we have asked you about several different types of traveler information. In this final survey, we are specifically asking about two different types of information:

- **Transportation Study Resource:** The customized trip-planning information you were provided in the last two weeks of the study. This resource provided average historical travel time information for the study corridor.
- **Other traveler information resources:** Any other type of information you may have used before or during the study, including:
  - Other types of trip-planning resources, such as directions or travel times from Google Maps
  - Real-time travel information, such as radio reports of current congestion or traffic app notifications of collisions or other potential roadway hazards

Please click “Next” to continue.

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### **Tips for completing this survey**

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.
- A few key terms and concepts are used throughout this survey (different types of information and familiar or unfamiliar trips). You can click on the links throughout the survey to see a reminder of their definitions.

**Now, let’s get started!**

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**During the last two weeks of this study, how often did you check the Transportation Study Resource for traveler information when planning familiar or unfamiliar trips on the Katy Freeway or Westpark Tollway?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
Familiar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of Transportation Study Resource (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline (see next page)

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Pop-up definitions for “familiar” and “unfamiliar” trips (same as baseline)

**Familiar:**

For example, trips to **familiar** locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend’s house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

**Unfamiliar:**

For example, trips to **unfamiliar** locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.



**During the last two weeks of this study, how often did you check other traveler information resources when planning familiar or unfamiliar trips on the Katy Freeway or Westpark Tollway?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
<u>Familiar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for familiar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for familiar trips on the Katy Freeway or Westpark Tollway during the last two weeks of this study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Familiar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for unfamiliar trips

Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for unfamiliar trips on the Katy Freeway or Westpark Tollway during the last two weeks of the study?

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Unfamiliar trip definitions/ examples – same as in baseline

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

Please continue thinking about the last two weeks that you participated in the study.

**Compared to information from the other traveler information resources,  
how much impact did information from Transportation Study Resource  
have on your travel plans?**

Travel information from **the Transportation Study Resource** had:

- A lot more impact** than other information
- Slightly more impact** than other information
- About the same impact** as other information
- Slightly less impact** than other information
- A lot less impact** than other information

Show pop-up definitions of [Transportation Study Resource](#) and [Other resources](#) (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
The Transportation Study Resource was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource was reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information from the Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the information I received from the Transportation Study Resource was useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
In general, information from the Transportation Study Resource helped me reduce my travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, information from the Transportation Study Resource helped me avoid congestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource reduced the stress of my trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource helped me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

**Compared to information from the other traveler information resources,  
how useful was the information from the Transportation Study Resource  
for you?**

Travel information from the **Transportation Study Resource** was:

- A lot more useful** than other information
- Slightly more useful** than other information
- About as equally useful** as other information
- Slightly less useful** than other information
- A lot less useful** than other information

Show pop-up definitions of Transportation Study Resource and Other resources (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**In general, how satisfied were you with the information you received from the Transportation Study Resource?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Estimated/ approximate travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extra time/ recommended cushion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommended/ suggested departure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total travel time estimate for most/ majority of the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**Overall, how satisfied were you with your trips on the Katy Freeway or Westpark Tollway during the last two weeks of the study period?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Trips made while using the Transportation Study Resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>[if used other sources]</b> Trips made while using another travel information resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips made when I did not use any travel information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If never used info (ttrinfo\_freq\_fam=never AND ttrinfo\_freq\_unfam=never)

**Can you tell us why you did not use the Transportation Study Resource for your trips during the study?**

Please select all that apply.

- The information did not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with traffic conditions/travel times on the Katy Freeway/ Westpark Tollway
- I did not have time to check the information
- Accessing information was difficult or inconvenient
- The information was not detailed enough
- The information was not available for my entire route
- The information was difficult to understand
- I prefer the other types of traveler information I normally use
- I never use any types of traveler information
- Other, please specify: \_\_\_\_\_

Randomize statements

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Ask everyone

How likely are you to use travel information resources (like the Transportation Study Resource) for the following types of trips in the future?

	Very unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely	Not Applicable
Commuting trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Familiar</b> personal trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Unfamiliar</b> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips in an unfamiliar city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Show pop-up for Familiar/ Unfamiliar trip definitions/ examples – same as in baseline

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**If you plan to use travel information for trips in the future, how do you prefer to receive this information?**

Please select all that apply.

- Through a smartphone app
- On a website
- Through a phone number (e.g. 511)
- Through email or text message alerts
- Other, please specify: \_\_\_\_\_
- I do not plan to travel information in the future

Randomize statements – anchor “Other” and “do not plan to use” at bottom

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**Optional: Do you have any suggestions for improving travel information, other types of traveler information, or travel experiences on the Katy Freeway or Westpark Tollway?**

*Optional text box entry*

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**Would you be willing to participate in future studies conducted by the U.S. Department of Transportation, Texas Department of Transportation, or other study sponsors?**

An important part of improving the transportation system is gathering feedback from residents such as yourself. If you say “Yes” you may be contacted in the future to invite you to another study, but your response does not impact your participation in this study.

- Yes
- No

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**Thank you! Your responses have been successfully submitted.**

Congratulations, you have completed the West Houston Transportation Study!

You will receive your \$50 Amazon gift card through email within two business weeks. The Grand Prize winner will also be notified by email.


In the meantime, please email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com) if you have any questions or comments.

Thank you again for helping to improve traveler information resources and transportation in the Houston region!





APPENDIX M. NORTH HOUSTON EXIT SURVEY QUESTIONS

 **RSG**  
the science of insight

**TTR Study: Exit  
Questionnaire**

**North Houston Round 3**

October 2015

### **Exit survey design goals/ considerations for reviewers**

The primary purposes of the Exit Survey (following Phase 2 of the trip diaries when participants were provided with TTR information) is to collect information about if and how respondents used the TTR information they were provided and how they perceived that information. This includes information about:

- **How often** participants used the TTR information for different kinds of trips
- What kind of impacts the TTR information had on **behavior** (if any) (e.g., changes in departure time, route, mode choice)
- How **satisfied** participants were with various aspects of the information (e.g., clarity, ease of access, trustworthiness, overall usefulness)
- What kind of impacts the TTR had on **trip experience** (if any) (e.g., reduced stress, congestion avoidance, shorter trip, overall trip satisfaction)
- Perceptions of what might make the information **more useful** for different kinds of trips or in an unfamiliar city (or what might make participants likely to use the information in the future)

### **When relevant, questions in the exit survey are designed to match similar questions from the baseline survey as closely as possible.**

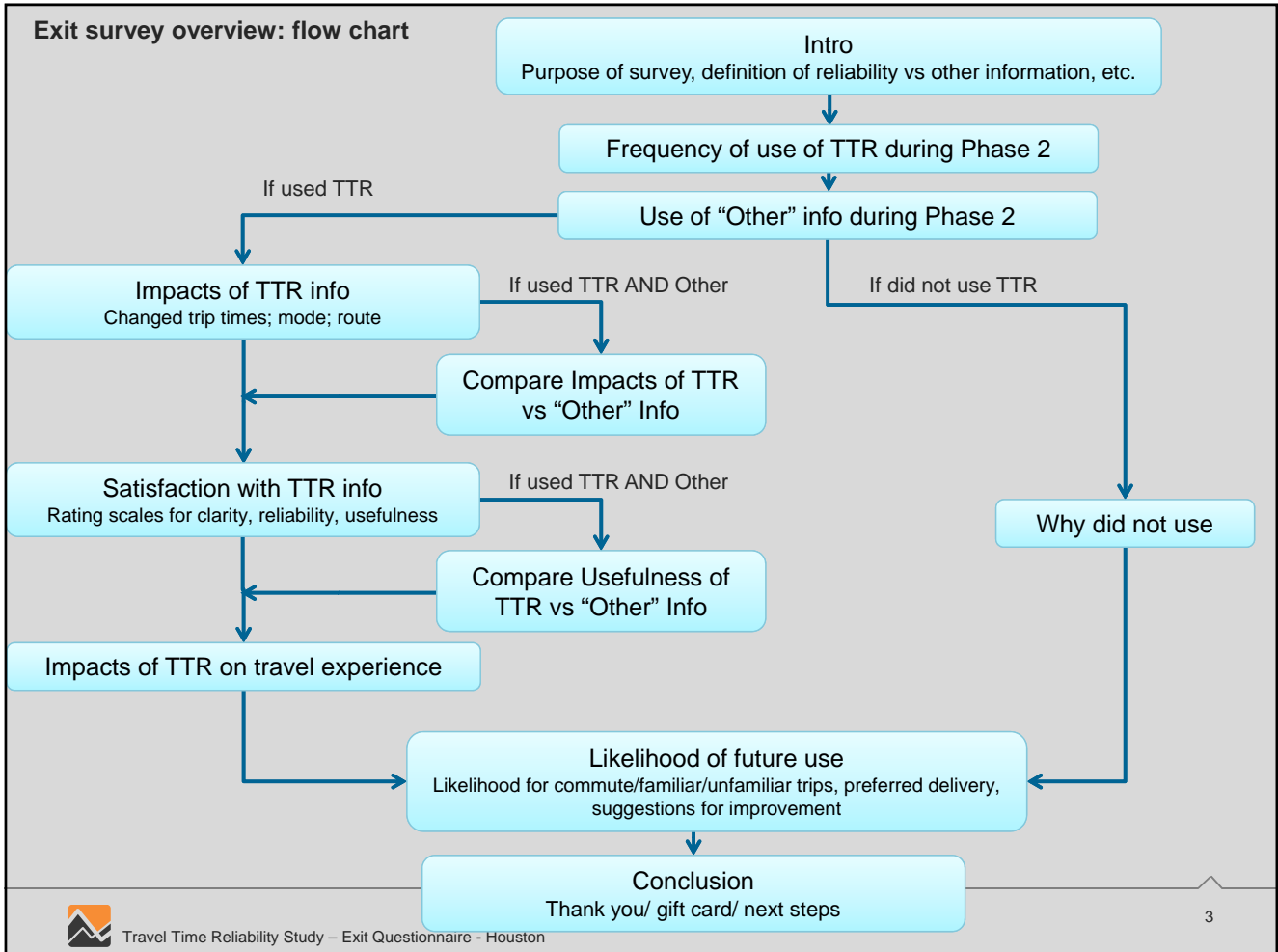
This is intended to allow for “before” and “after” comparisons, or more specifically comparisons of how respondents typically used and perceived “other” types of information before the study versus how they typically used and perceived the TTR information during the second phase of the study. Questions from the baseline that are similar to questions in this exit survey include:

- infosource familiar/unfamiliar (baseline, slides 40-41) == ttruse\_freq familiar/ unfamiliar (exit, slide 5)
- change familiar/unfamiliar (baseline, slides 48-49) == ttr\_change familiar/unfamiliar (exit, slides 18-19)
- infosat (baseline, slide 50) == ttr\_infosat (exit, slide 22)
- Infoopinion (baseline, slide 51) == ttr\_infoopinion (exit, slides 23-24)
- ynoinfo (baseline, slide 52) == ttr\_ynoinfo (exit, slide 26)

Other exit survey questions focus specifically on aspects and opinions of the TTR info and do not have comparable baseline questions.



**Exit survey overview: flow chart**



## Exit questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

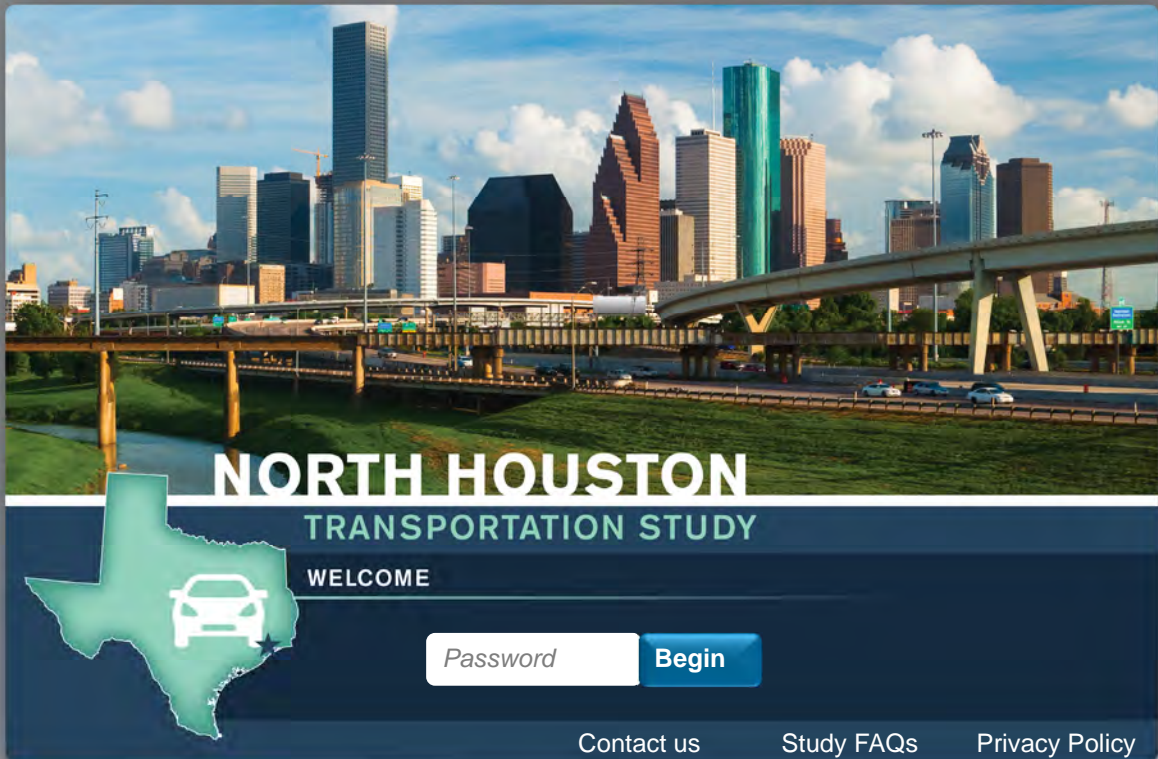
- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)

### Notable Differences from Round 1

- All corridor references changed from West Houston to North Houston
  - All freeway-related questions changed from Katy Freeway to North Freeway
  - All toll road-related questions changed from Westpark Tollway to Hardy Toll Road
- The incentive offered changed; all relevant survey text and instructions were updated



Password Entry Page



The image shows a digital welcome page for the North Houston Transportation Study. The background features a city skyline with various skyscrapers and a highway interchange. The text 'NORTH HOUSTON' is prominently displayed in white, with 'TRANSPORTATION STUDY' below it in a smaller, teal font. Underneath, the word 'WELCOME' is written in white. To the left of the text is a teal outline of the state of Texas with a white car icon inside. Below the text is a password entry field with a white background and a blue 'Begin' button. At the bottom of the page, there are three links: 'Contact us', 'Study FAQs', and 'Privacy Policy'.

# NORTH HOUSTON

## TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#)

[Study FAQs](#)

[Privacy Policy](#)

SPONSORED BY



## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Houston area drivers who regularly use the North Freeway, Hardy Toll Road, and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Houston Study Corridor.

- What is the North Houston Study Corridor?

The North Houston Study Corridor includes about 35 miles of the North Freeway (IH-45N), the Hardy Toll Road, and other roads between Conroe and downtown Houston.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the North Houston Study Corridor. This survey will take about 15 minutes to complete. To start this survey, simply visit the secure survey website:  
<https://surveyrsg.com/northhouston>.

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive **\$100 in cash!**

## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Houston area who is participating, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Texas Department of Transportation (TxDOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and TxDOT.



## **Resource Systems Group, Inc. Privacy Statement**

### **SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

### **PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

### **ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

### **THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu)



Thank you for your recent participation in the smartphone app portion of the North Houston Transportation Study.

This final survey is the last step to complete the study. The purpose of this survey is to help us understand how your travel experiences may have changed when you were provided with the customized Transportation Study Resource during the last two weeks of the study.

As one of a small number of Houston travelers completing this study, your input in this final survey is important. Your feedback will help the study sponsors and other agencies provide better transportation information and services in the region. Also, once you complete this final survey, you will receive \$100 cash!

Your privacy will be protected. Please click [here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu) with any questions or concerns. Thank you again for your continued participation!

Please click "Next" to continue.

Next





## Definition and description of traveler information resources in this study

Throughout this study we have asked you about several different types of traveler information. In this final survey, we are specifically asking about two different types of information:

- **Transportation Study Resource:** The customized trip-planning information you were provided in the last two weeks of the study. This resource provided average historical travel time information for the study corridor.
- **Other traveler information resources:** Any other type of information you may have used before or during the study, including:
  - Other types of trip-planning resources, such as directions or travel times from Google Maps
  - Real-time travel information, such as radio reports of current congestion or traffic app notifications of collisions or other potential roadway hazards

Please click “Next” to continue.

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### **Tips for completing this survey**

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.
- A few key terms and concepts are used throughout this survey (different types of information and familiar or unfamiliar trips). You can click on the links throughout the survey to see a reminder of their definitions.

**Now, let’s get started!**

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**During the last two weeks of this study, how often did you check the Transportation Study Resource for traveler information when planning familiar or unfamiliar trips on the North Freeway or Hardy Toll Road?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
Familiar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of Transportation Study Resource (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline (see next page)

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Pop-up definitions for “familiar” and “unfamiliar” trips (same as baseline)

**Familiar:**

For example, trips to **familiar** locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend’s house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

**Unfamiliar:**

For example, trips to **unfamiliar** locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.



**During the last two weeks of this study, how often did you check other traveler information resources when planning familiar or unfamiliar trips on the North Freeway or Hardy Toll Road?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
<u>Familiar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline



If used TTR study resource at all for familiar trips

Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for familiar trips on the North Freeway or Hardy Toll Road during the last two weeks of this study?

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Familiar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for unfamiliar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for unfamiliar trips on the North Freeway or Hardy Toll Road during the last two weeks of the study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Unfamiliar trip definitions/ examples – same as in baseline

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

Please continue thinking about the last two weeks that you participated in the study.

**Compared to information from the other traveler information resources,  
how much impact did information from Transportation Study Resource  
have on your travel plans?**

Travel information from **the Transportation Study Resource** had:

- A lot more impact** than other information
- Slightly more impact** than other information
- About the same impact** as other information
- Slightly less impact** than other information
- A lot less impact** than other information

Show pop-up definitions of [Transportation Study Resource](#) and [Other resources](#) (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
The Transportation Study Resource was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource was reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information from the Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the information I received from the Transportation Study Resource was useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
In general, information from the Transportation Study Resource helped me reduce my travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, information from the Transportation Study Resource helped me avoid congestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource reduced the stress of my trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource helped me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

**Compared to information from the other traveler information resources,  
how useful was the information from the Transportation Study Resource  
for you?**

Travel information from the **Transportation Study Resource** was:

- A lot more useful** than other information
- Slightly more useful** than other information
- About as equally useful** as other information
- Slightly less useful** than other information
- A lot less useful** than other information

Show pop-up definitions of Transportation Study Resource and Other resources (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**In general, how satisfied were you with the information you received from the Transportation Study Resource?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Estimated/ approximate travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extra time/ recommended cushion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommended/ suggested departure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total travel time estimate for most/ majority of the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**Overall, how satisfied were you with your trips on the North Freeway or Hardy Toll Road during the last two weeks of the study period?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Trips made while using the Transportation Study Resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>[if used other sources]</b> Trips made while using another travel information resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips made when I did not use any travel information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If never used info (ttrinfo\_freq\_fam=never AND ttrinfo\_freq\_unfam=never)

**Can you tell us why you did not use the Transportation Study Resource for your trips during the study?**

Please select all that apply.

- The information did not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with traffic conditions/travel times on the North Freeway/ Hardy Toll Road
- I did not have time to check the information
- Accessing information was difficult or inconvenient
- The information was not detailed enough
- The information was not available for my entire route
- The information was difficult to understand
- I prefer the other types of traveler information I normally use
- I never use any types of traveler information
- Other, please specify: \_\_\_\_\_

Randomize statements

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Ask everyone

How likely are you to use travel information resources (like the Transportation Study Resource) for the following types of trips in the future?

	Very unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely	Not Applicable
Commuting trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Familiar</b> personal trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Unfamiliar</b> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips in an unfamiliar city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Show pop-up for Familiar/ Unfamiliar trip definitions/ examples – same as in baseline

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**If you plan to use travel information for trips in the future, how do you prefer to receive this information?**

Please select all that apply.

- Through a smartphone app
- On a website
- Through a phone number (e.g. 511)
- Through email or text message alerts
- Other, please specify: \_\_\_\_\_
- I do not plan to travel information in the future

Randomize statements – anchor “Other” and “do not plan to use” at bottom

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**Optional: Do you have any suggestions for improving travel information, other types of traveler information, or travel experiences on the North Freeway or Hardy Toll Road?**

*Optional text box entry*

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**Would you be willing to participate in future studies conducted by the U.S. Department of Transportation, Texas Department of Transportation, or other study sponsors?**

An important part of improving the transportation system is gathering feedback from residents such as yourself. If you say “Yes” you may be contacted in the future to invite you to another study, but your response does not impact your participation in this study.

- Yes
- No

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**Thank you! Your responses have been successfully submitted.**

Congratulations, you have completed the North Houston Transportation Study!

We will provide information in a separate email with instructions on how to receive your \$100 cash.

In the meantime, please email [houstonstudy@tti.tamu.edu](mailto:houstonstudy@tti.tamu.edu) if you have any questions or comments.

Thank you again for helping to improve traveler information resources and transportation in the Houston region!





APPENDIX N. NORTH COLUMBUS EXIT SURVEY QUESTIONS



### **Exit survey design goals/ considerations for reviewers**

The primary purposes of the Exit Survey (following Phase 2 of the trip diaries when participants were provided with TTR information) is to collect information about if and how respondents used the TTR information they were provided and how they perceived that information. This includes information about:

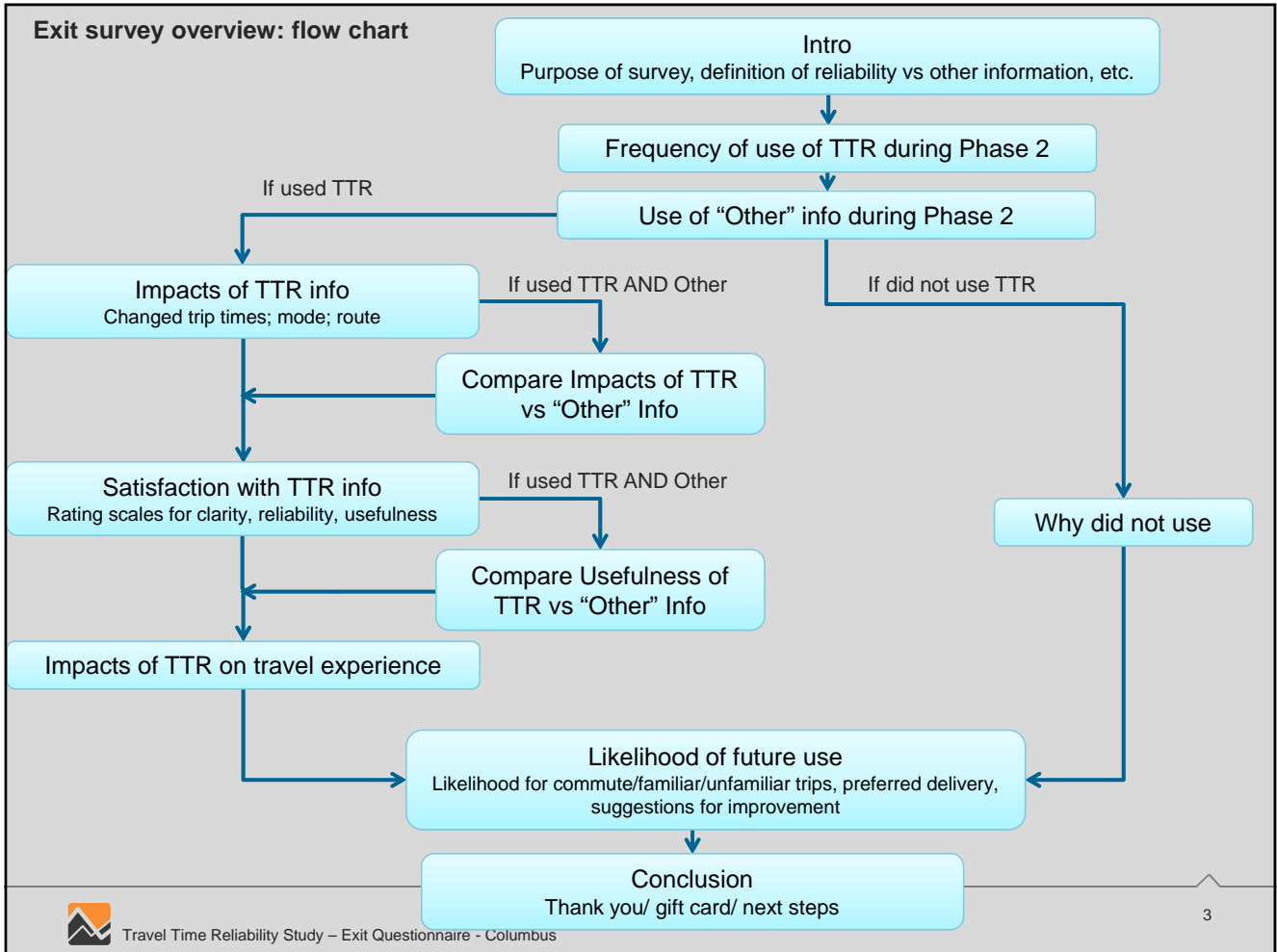
- **How often** participants used the TTR information for different kinds of trips
- What kind of impacts the TTR information had on **behavior** (if any) (e.g., changes in departure time, route, mode choice)
- How **satisfied** participants were with various aspects of the information (e.g., clarity, ease of access, trustworthiness, overall usefulness)
- What kind of impacts the TTR had on **trip experience** (if any) (e.g., reduced stress, congestion avoidance, shorter trip, overall trip satisfaction)
- Perceptions of what might make the information **more useful** for different kinds of trips or in an unfamiliar city (or what might make participants likely to use the information in the future)

### **When relevant, questions in the exit survey are designed to match similar questions from the baseline survey as closely as possible.**

This is intended to allow for “before” and “after” comparisons, or more specifically comparisons of how respondents typically used and perceived “other” types of information before the study versus how they typically used and perceived the TTR information during the second phase of the study. Questions from the baseline that are similar to questions in this exit survey include:

- infosource familiar/unfamiliar (baseline, slides 40-41) == ttruse\_freq familiar/ unfamiliar (exit, slide 5)
- change familiar/unfamiliar (baseline, slides 48-49) == ttr\_change familiar/unfamiliar (exit, slides 18-19)
- infosat (baseline, slide 50) == ttr\_infosat (exit, slide 22)
- Infoopinion (baseline, slide 51) == ttr\_infoopinion (exit, slides 23-24)
- ynoinfo (baseline, slide 52) == ttr\_ynoinfo (exit, slide 26)

Other exit survey questions focus specifically on aspects and opinions of the TTR info and do not have comparable baseline questions.



## Exit questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)





Password Entry Page



The image shows a digital interface for a password entry page. At the top, a banner features a photograph of the Columbus, Ohio skyline reflected in a river. Below the photo, the text "NORTH COLUMBUS" is written in large white letters, with "TRANSPORTATION STUDY" in smaller blue letters underneath. To the left of this text is a teal outline of the state of Ohio containing a white car icon. Below the main title, the word "WELCOME" is displayed in white. A white input field labeled "Password" is followed by a blue "Begin" button. At the bottom of the banner, there are three links: "Contact us", "Study FAQs", and "Privacy Policy".

# NORTH COLUMBUS

TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#) [Study FAQs](#) [Privacy Policy](#)



## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Columbus area drivers who regularly use I-71 and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Columbus Study Corridor.

- What is the North Columbus Study Corridor?

The North Columbus Study Corridor includes about 25 miles of I-71 and other roads between U.S. Route 36 and downtown Columbus.

- How do I participate in this study?

This study involves four steps:

STEP 1: Complete an initial survey about your typical experiences in the North Columbus Study Corridor. This survey will take about 15 minutes to complete. To start this survey, use the unique password you received on your postcard to log into the secure survey website: <https://surveyrsg.com/northcolumbus>

STEP 2: Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

STEP 3: Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

STEP 4: Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a **\$50 Amazon.com gift card!** In appreciation of the contribution participants will make during all the steps in the study, this final gift card is a higher amount than originally advertised on the invitation postcard.



## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Columbus area invited to participate, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How was I selected to participate?

Invited participants were randomly selected from all residential addresses in the North Columbus study area.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Ohio Department of Transportation (ODOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and ODOT.



**Resource Systems Group, Inc. Privacy Statement**

**SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

**PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

**ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

**THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com)



Thank you for your recent participation in the smartphone app portion of the North Columbus Transportation Study.

This final survey is the last step to complete the study. The purpose of this survey is to help us understand how your travel experiences may have changed when you were provided with the customized Transportation Study Resource during the last two weeks of the study.

As one of a small number of Columbus travelers completing this study, your input in this final survey is important. Your feedback will help the study sponsors and other agencies provide better transportation information and services in the region. Also, once you complete this final survey, you will receive your \$50 Amazon.com gift card!

Your privacy will be protected. Please click [here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com) with any questions or concerns. Thank you again for your continued participation!

Please click "Next" to continue.

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## Definition and description of traveler information resources in this study

Throughout this study we have asked you about several different types of traveler information. In this final survey, we are specifically asking about two different types of information:

- **Transportation Study Resource:** The customized trip-planning information you were provided in the last two weeks of the study. This resource provided average historical travel time information for the study corridor.
- **Other traveler information resources:** Any other type of information you may have used before or during the study, including:
  - Other types of trip-planning resources, such as directions or travel times from Google Maps
  - Real-time travel information, such as radio reports of current congestion or traffic app notifications of collisions or other potential roadway hazards

Please click “Next” to continue.

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### **Tips for completing this survey**

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.
- A few key terms and concepts are used throughout this survey (different types of information and familiar or unfamiliar trips). You can click on the links throughout the survey to see a reminder of their definitions.

**Now, let’s get started!**

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**During the last two weeks of this study, how often did you check the Transportation Study Resource for traveler information when planning familiar or unfamiliar trips on I-71?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
Familiar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of Transportation Study Resource (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline (see next page)

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Pop-up definitions for “familiar” and “unfamiliar” trips (same as baseline)

**Familiar:**

For example, trips to **familiar** locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend’s house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

**Unfamiliar:**

For example, trips to **unfamiliar** locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.



**During the last two weeks of this study, how often did you check other traveler information resources when planning familiar or unfamiliar trips on I-71?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
<u>Familiar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for familiar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for familiar trips on I-71 during the last two weeks of this study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Familiar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for unfamiliar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for unfamiliar trips on I-71 during the last two weeks of the study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Unfamiliar trip definitions/ examples – same as in baseline

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

Please continue thinking about the last two weeks that you participated in the study.

**Compared to information from the other traveler information resources,  
how much impact did information from Transportation Study Resource  
have on your travel plans?**

Travel information from **the Transportation Study Resource** had:

- A lot more impact** than other information
- Slightly more impact** than other information
- About the same impact** as other information
- Slightly less impact** than other information
- A lot less impact** than other information

Show pop-up definitions of [Transportation Study Resource](#) and [Other resources](#) (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
The Transportation Study Resource was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource was reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information from the Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the information I received from the Transportation Study Resource was useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
In general, information from the Transportation Study Resource helped me reduce my travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, information from the Transportation Study Resource helped me avoid congestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource reduced the stress of my trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource helped me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

**Compared to information from the other traveler information resources,  
how useful was the information from the Transportation Study Resource  
for you?**

Travel information from the **Transportation Study Resource** was:

- A lot more useful** than other information
- Slightly more useful** than other information
- About as equally useful** as other information
- Slightly less useful** than other information
- A lot less useful** than other information

Show pop-up definitions of Transportation Study Resource and Other resources (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**In general, how satisfied were you with the information you received from the Transportation Study Resource?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Estimated/ approximate travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extra time/ recommended cushion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommended/ suggested departure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total travel time estimate for most/ majority of the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**Overall, how satisfied were you with your trips on I-71 during the last two weeks of the study period?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Trips made while using the Transportation Study Resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>[if used other sources]</b> Trips made while using another travel information resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips made when I did not use any travel information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If never used info (ttrinfo\_freq\_fam=never AND ttrinfo\_freq\_unfam=never)

**Can you tell us why you did not use the Transportation Study Resource for your trips during the study?**

Please select all that apply.

- The information did not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with traffic conditions/travel times on I-71
- I did not have time to check the information
- Accessing information was difficult or inconvenient
- The information was not detailed enough
- The information was not available for my entire route
- The information was difficult to understand
- I prefer the other types of traveler information I normally use
- I never use any types of traveler information
- Other, please specify: \_\_\_\_\_

Randomize statements

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Ask everyone

How likely are you to use travel information resources (like the Transportation Study Resource) for the following types of trips in the future?

	Very unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely	Not Applicable
Commuting trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Familiar</b> personal trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Unfamiliar</b> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips in an unfamiliar city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Show pop-up for Familiar/ Unfamiliar trip definitions/ examples – same as in baseline

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**If you plan to travel information for trips in the future, how do you prefer to receive this information?**

Please select all that apply.

- Through a smartphone app
- On a website
- Through a phone number (e.g. 511)
- Through email or text message alerts
- Other, please specify: \_\_\_\_\_
- I do not plan to use travel information in the future

Randomize statements – anchor “Other” and “do not plan to use” at bottom

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**Optional: Do you have any suggestions for travel information, other types of traveler information, or travel experiences on I-71?**

*Optional text box entry*

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**Would you be willing to participate in future studies conducted by the U.S. Department of Transportation, Ohio Department of Transportation, or other study sponsors?**

An important part of improving the transportation system is gathering feedback from residents such as yourself. If you say “Yes” you may be contacted in the future to invite you to another study, but your response does not impact your participation in this study.

- Yes
- No

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**Thank you! Your responses have been successfully submitted.**

Congratulations, you have completed the North Columbus Transportation Study!

You will receive your \$50 Amazon gift card through email within two business weeks.

In the meantime, please email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com) if you have any questions or comments.

Thank you again for helping to improve traveler information resources and transportation in the Columbus region!







## TTR Study: Exit Questionnaire

# Columbus Round 3

October 2015

### **Exit survey design goals/ considerations for reviewers**

The primary purposes of the Exit Survey (following Phase 2 of the trip diaries when participants were provided with TTR information) is to collect information about if and how respondents used the TTR information they were provided and how they perceived that information. This includes information about:

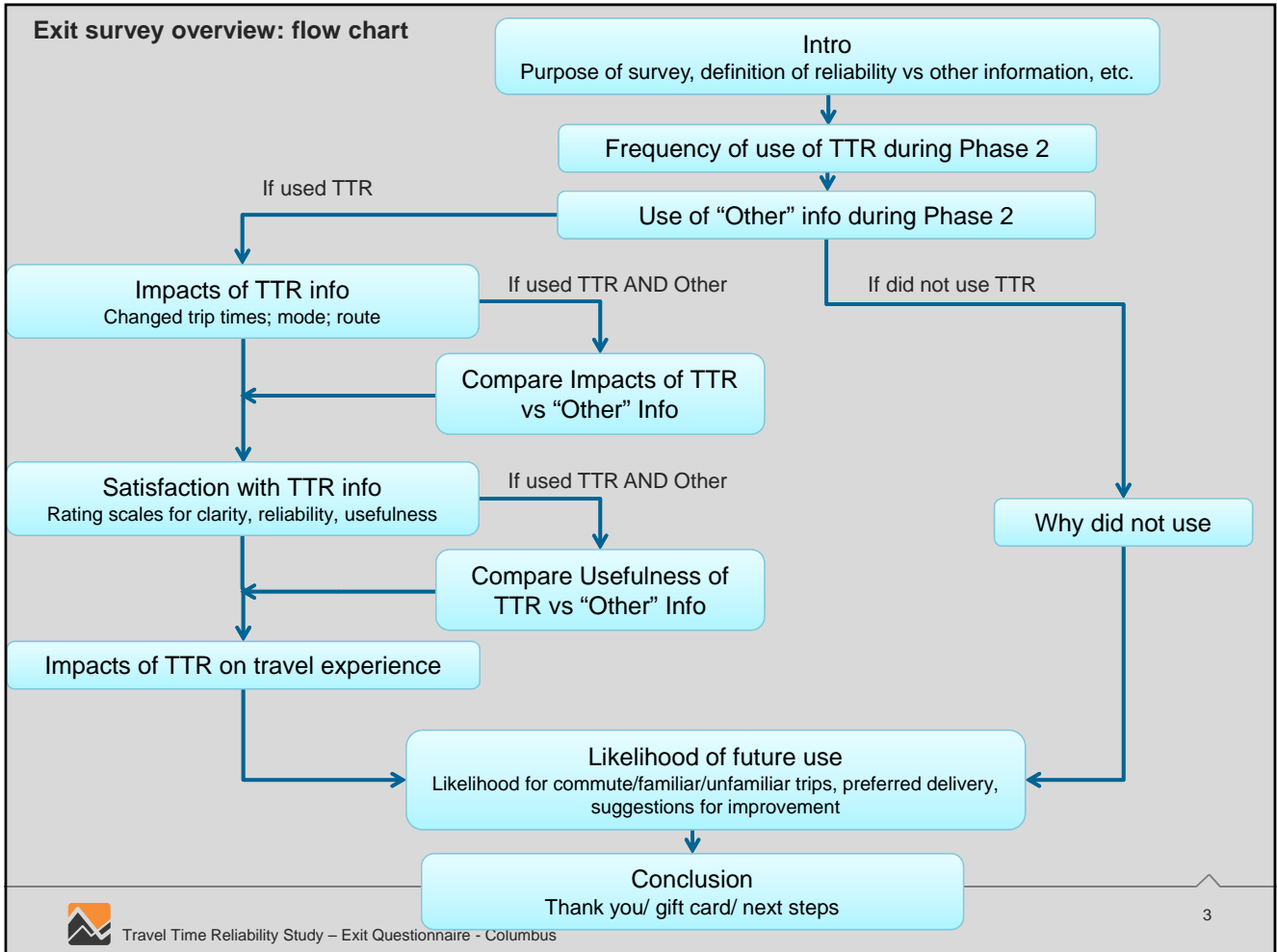
- **How often** participants used the TTR information for different kinds of trips
- What kind of impacts the TTR information had on **behavior** (if any) (e.g., changes in departure time, route, mode choice)
- How **satisfied** participants were with various aspects of the information (e.g., clarity, ease of access, trustworthiness, overall usefulness)
- What kind of impacts the TTR had on **trip experience** (if any) (e.g., reduced stress, congestion avoidance, shorter trip, overall trip satisfaction)
- Perceptions of what might make the information **more useful** for different kinds of trips or in an unfamiliar city (or what might make participants likely to use the information in the future)

### **When relevant, questions in the exit survey are designed to match similar questions from the baseline survey as closely as possible.**

This is intended to allow for “before” and “after” comparisons, or more specifically comparisons of how respondents typically used and perceived “other” types of information before the study versus how they typically used and perceived the TTR information during the second phase of the study. Questions from the baseline that are similar to questions in this exit survey include:

- infosource familiar/unfamiliar (baseline, slides 40-41) == ttruse\_freq familiar/ unfamiliar (exit, slide 5)
- change familiar/unfamiliar (baseline, slides 48-49) == ttr\_change familiar/unfamiliar (exit, slides 18-19)
- infosat (baseline, slide 50) == ttr\_infosat (exit, slide 22)
- Infoopinion (baseline, slide 51) == ttr\_infoopinion (exit, slides 23-24)
- ynoinfo (baseline, slide 52) == ttr\_ynoinfo (exit, slide 26)

Other exit survey questions focus specifically on aspects and opinions of the TTR info and do not have comparable baseline questions.



## Exit questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)

### Notable differences from Round 1

- The incentive offering changed, and survey instructions and text related to the incentive were updated accordingly.



Password Entry Page



The image shows a digital interface for a password entry page. At the top, a banner features a photograph of a city skyline with a river in the foreground. Overlaid on the bottom left of the banner is a teal map of Ohio with a white car icon and a star. The text "NORTH COLUMBUS" is prominently displayed in white, with "TRANSPORTATION STUDY" in teal below it. Underneath, the word "WELCOME" is written in white. A white input field labeled "Password" and a blue "Begin" button are positioned in the center. At the bottom of the banner, three links are listed: "Contact us", "Study FAQs", and "Privacy Policy".

# NORTH COLUMBUS

TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#)

[Study FAQs](#)

[Privacy Policy](#)

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## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Columbus area drivers who regularly use I-71 and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Columbus Study Corridor.

- What is the North Columbus Study Corridor?

The North Columbus Study Corridor includes about 25 miles of I-71 and other roads between U.S. Route 36 and downtown Columbus.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the North Columbus Study Corridor. This survey will take about 15 minutes to complete. To start this survey, simply visit the secure survey website:

<https://surveyrsg.com/northcolumbus>

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will be entered into a drawing for an iPad Air 2 64 GB (worth \$600)! No purchase is necessary to enter, and odds of winning are expected to be about 1 in 20. Winners will be responsible for any applicable taxes.





## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Columbus area who is participating, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Ohio Department of Transportation (ODOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and ODOT.

## **Resource Systems Group, Inc. Privacy Statement**

### **SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

### **PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

### **ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

### **THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu)



Thank you for your recent participation in the smartphone app portion of the North Columbus Transportation Study.

This final survey is the last step to complete the study. The purpose of this survey is to help us understand how your travel experiences may have changed when you were provided with the customized Transportation Study Resource during the last two weeks of the study.

As one of a small number of Columbus travelers completing this study, your input in this final survey is important. Your feedback will help the study sponsors and other agencies provide better transportation information and services in the region. Also, once you complete this final survey, you will be entered into the drawing for an Apple iPad Air (valued at \$600)!

Your privacy will be protected. Please click here to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [columbusstudy@ttmail.tamu.edu](mailto:columbusstudy@ttmail.tamu.edu) with any questions or concerns. Thank you again for your continued participation!

Please click "Next" to continue.

Next



## Definition and description of traveler information resources in this study

Throughout this study we have asked you about several different types of traveler information. In this final survey, we are specifically asking about two different types of information:

- **Transportation Study Resource:** The customized trip-planning information you were provided in the last two weeks of the study. This resource provided average historical travel time information for the study corridor.
- **Other traveler information resources:** Any other type of information you may have used before or during the study, including:
  - Other types of trip-planning resources, such as directions or travel times from Google Maps
  - Real-time travel information, such as radio reports of current congestion or traffic app notifications of collisions or other potential roadway hazards

Please click “Next” to continue.

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### **Tips for completing this survey**

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.
- A few key terms and concepts are used throughout this survey (different types of information and familiar or unfamiliar trips). You can click on the links throughout the survey to see a reminder of their definitions.

**Now, let’s get started!**

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**During the last two weeks of this study, how often did you check the Transportation Study Resource for traveler information when planning familiar or unfamiliar trips on I-71?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
Familiar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of Transportation Study Resource (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline (see next page)

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Pop-up definitions for “familiar” and “unfamiliar” trips (same as baseline)

**Familiar:**

For example, trips to **familiar** locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend’s house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

**Unfamiliar:**

For example, trips to **unfamiliar** locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.





**During the last two weeks of this study, how often did you check other traveler information resources when planning familiar or unfamiliar trips on I-71?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
<u>Familiar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for familiar trips

Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for familiar trips on I-71 during the last two weeks of this study?

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Familiar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for unfamiliar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for unfamiliar trips on I-71 during the last two weeks of the study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Unfamiliar trip definitions/ examples – same as in baseline

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

Please continue thinking about the last two weeks that you participated in the study.

**Compared to information from the other traveler information resources,  
how much impact did information from Transportation Study Resource  
have on your travel plans?**

Travel information from **the Transportation Study Resource** had:

- A lot more impact** than other information
- Slightly more impact** than other information
- About the same impact** as other information
- Slightly less impact** than other information
- A lot less impact** than other information

Show pop-up definitions of [Transportation Study Resource](#) and [Other resources](#) (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
The Transportation Study Resource was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource was reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information from the Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the information I received from the Transportation Study Resource was useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
In general, information from the Transportation Study Resource helped me reduce my travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, information from the Transportation Study Resource helped me avoid congestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource reduced the stress of my trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource helped me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

**Compared to information from the other traveler information resources,  
how useful was the information from the Transportation Study Resource  
for you?**

Travel information from the **Transportation Study Resource** was:

- A lot more useful** than other information
- Slightly more useful** than other information
- About as equally useful** as other information
- Slightly less useful** than other information
- A lot less useful** than other information

Show pop-up definitions of Transportation Study Resource and Other resources (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**In general, how satisfied were you with the information you received from the Transportation Study Resource?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Estimated/ approximate travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extra time/ recommended cushion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommended/ suggested departure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total travel time estimate for most/ majority of the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**Overall, how satisfied were you with your trips on I-71 during the last two weeks of the study period?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Trips made while using the Transportation Study Resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>[if used other sources]</b> Trips made while using another travel information resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips made when I did not use any travel information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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If never used info (ttrinfo\_freq\_fam=never AND ttrinfo\_freq\_unfam=never)

**Can you tell us why you did not use the Transportation Study Resource for your trips during the study?**

Please select all that apply.

- The information did not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with traffic conditions/travel times on I-71
- I did not have time to check the information
- Accessing information was difficult or inconvenient
- The information was not detailed enough
- The information was not available for my entire route
- The information was difficult to understand
- I prefer the other types of traveler information I normally use
- I never use any types of traveler information
- Other, please specify: \_\_\_\_\_

Randomize statements

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Ask everyone

How likely are you to use travel information resources (like the Transportation Study Resource) for the following types of trips in the future?

	Very unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely	Not Applicable
Commuting trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Familiar</b> personal trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Unfamiliar</b> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips in an unfamiliar city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Show pop-up for Familiar/ Unfamiliar trip definitions/ examples – same as in baseline

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**If you plan to use travel information for trips in the future, how do you prefer to receive this information?**

Please select all that apply.

- Through a smartphone app
- On a website
- Through a phone number (e.g. 511)
- Through email or text message alerts
- Other, please specify: \_\_\_\_\_
- I do not plan to use travel information in the future

Randomize statements – anchor “Other” and “do not plan to use” at bottom

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**Optional: Do you have any suggestions for improving travel information, other types of traveler information, or travel experiences on I-71?**

*Optional text box entry*

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**Would you be willing to participate in future studies conducted by the U.S. Department of Transportation, Ohio Department of Transportation, or other study sponsors?**

An important part of improving the transportation system is gathering feedback from residents such as yourself. If you say “Yes” you may be contacted in the future to invite you to another study, but your response does not impact your participation in this study.

- Yes
- No

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**Thank you! Your responses have been successfully submitted.**

Congratulations, you have completed the North Columbus Transportation Study!

You have automatically been entered into the drawing for an iPad. Winners will be notified via email after all participants have completed this final survey (by the end of December).

In the meantime, please email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu) if you have any questions or comments.

Thank you again for helping to improve traveler information resources and transportation in the Columbus region!









## TTR Study: Exit Questionnaire

# Columbus Round 4

February 2016

### **Exit survey design goals/ considerations for reviewers**

The primary purposes of the Exit Survey (following Phase 2 of the trip diaries when participants were provided with TTR information) is to collect information about if and how respondents used the TTR information they were provided and how they perceived that information. This includes information about:

- **How often** participants used the TTR information for different kinds of trips
- What kind of impacts the TTR information had on **behavior** (if any) (e.g., changes in departure time, route, mode choice)
- How **satisfied** participants were with various aspects of the information (e.g., clarity, ease of access, trustworthiness, overall usefulness)
- What kind of impacts the TTR had on **trip experience** (if any) (e.g., reduced stress, congestion avoidance, shorter trip, overall trip satisfaction)
- Perceptions of what might make the information **more useful** for different kinds of trips or in an unfamiliar city (or what might make participants likely to use the information in the future)

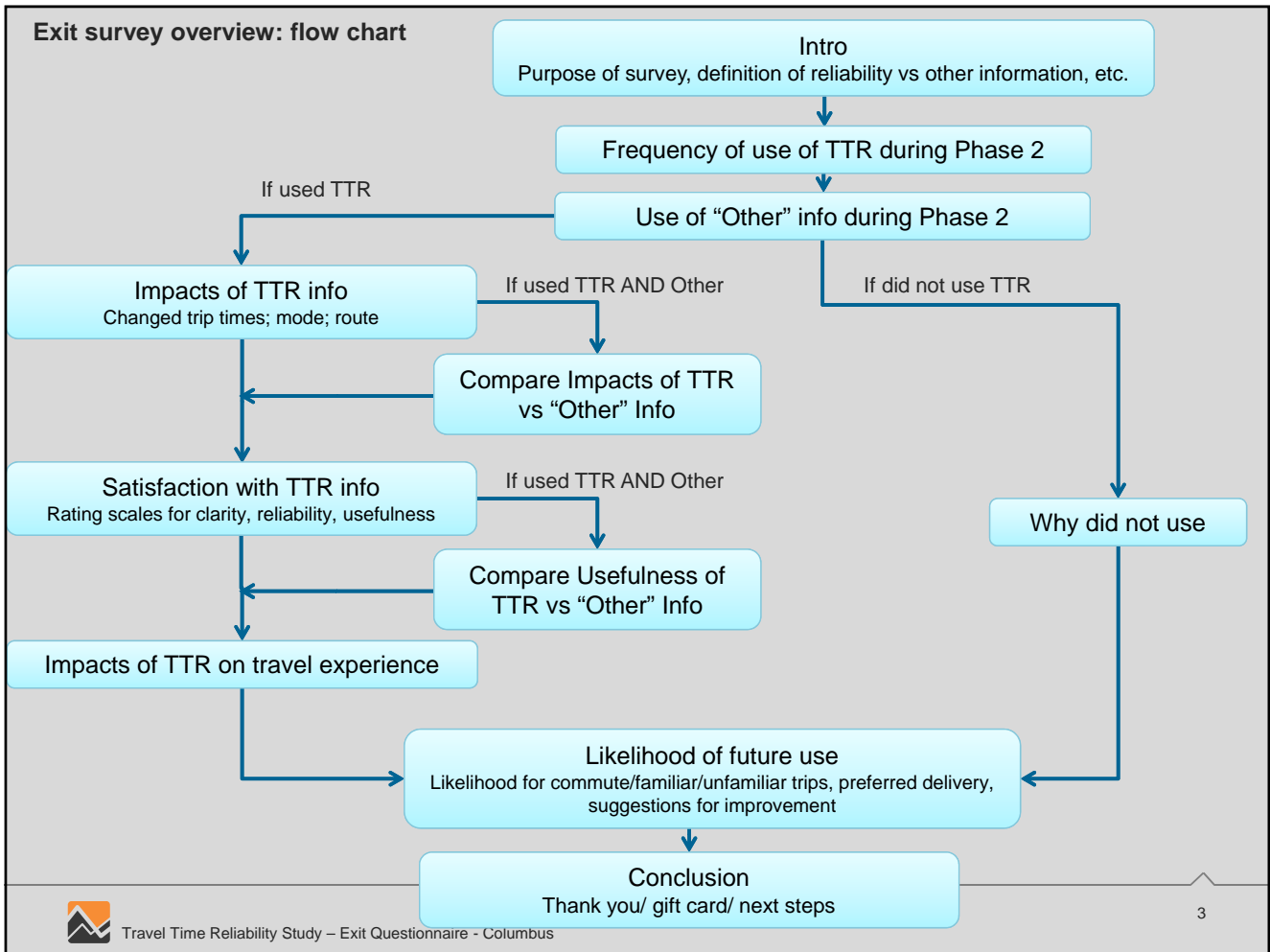
### **When relevant, questions in the exit survey are designed to match similar questions from the baseline survey as closely as possible.**

This is intended to allow for “before” and “after” comparisons, or more specifically comparisons of how respondents typically used and perceived “other” types of information before the study versus how they typically used and perceived the TTR information during the second phase of the study. Questions from the baseline that are similar to questions in this exit survey include:

- infosource familiar/unfamiliar (baseline, slides 40-41) == ttruse\_freq familiar/ unfamiliar (exit, slide 5)
- change familiar/unfamiliar (baseline, slides 48-49) == ttr\_change familiar/unfamiliar (exit, slides 18-19)
- infosat (baseline, slide 50) == ttr\_infosat (exit, slide 22)
- Infoopinion (baseline, slide 51) == ttr\_infoopinion (exit, slides 23-24)
- ynoinfo (baseline, slide 52) == ttr\_ynoinfo (exit, slide 26)

Other exit survey questions focus specifically on aspects and opinions of the TTR info and do not have comparable baseline questions.

**Exit survey overview: flow chart**



## Exit questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)

### Notable differences from Round 1

- The incentive offering changed, and survey instructions and text related to the incentive were updated accordingly.



Password Entry Page



The image shows a digital banner for the North Columbus Transportation Study. The background is a photograph of a city skyline with several skyscrapers, including a prominent white tower with a spire, reflected in a body of water. The text 'NORTH COLUMBUS' is written in large white letters, with 'TRANSPORTATION STUDY' in smaller blue letters below it. To the left of the text is a teal outline of the state of Ohio with a white car icon and a star. Below the text, the word 'WELCOME' is written in white. There is a white input field labeled 'Password' and a blue 'Begin' button. At the bottom, there are three links: 'Contact us', 'Study FAQs', and 'Privacy Policy'.

**NORTH COLUMBUS**  
TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#) [Study FAQs](#) [Privacy Policy](#)



## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Columbus area drivers who regularly use I-71 and other roads north of the city. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the North Columbus Study Corridor.

- What is the North Columbus Study Corridor?

The North Columbus Study Corridor includes about 25 miles of I-71 and other roads between U.S. Route 36 and downtown Columbus.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the North Columbus Study Corridor. This survey will take about 15 minutes to complete. To start this survey, simply visit the secure survey website:

<https://surveyrsg.com/northcolumbus>

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a \$100 check from the Battelle Memorial Institute as thanks for your participation.



## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Columbus area who is participating, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with the Ohio Department of Transportation (ODOT). Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and ODOT.



## **Resource Systems Group, Inc. Privacy Statement**

### **SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

### **PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

### **ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

### **THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.





**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu)



Thank you for your recent participation in the smartphone app portion of the North Columbus Transportation Study.

This final survey is the last step to complete the study. The purpose of this survey is to help us understand how your travel experiences may have changed when you were provided with the customized Transportation Study Resource during the last two weeks of the study.

As one of a small number of Columbus travelers completing this study, your input in this final survey is important. Your feedback will help the study sponsors and other agencies provide better transportation information and services in the region. Also, once you complete this final survey, you will receive a \$100 check from Battelle Memorial Institute as thanks for your participation!

Your privacy will be protected. Please click [here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [columbusstudy@ttmail.tamu.edu](mailto:columbusstudy@ttmail.tamu.edu) with any questions or concerns. Thank you again for your continued participation!

Please click “Next” to continue.

Next



## Definition and description of traveler information resources in this study

Throughout this study we have asked you about several different types of traveler information. In this final survey, we are specifically asking about two different types of information:

- **Transportation Study Resource:** The customized trip-planning information you were provided in the last two weeks of the study. This resource provided average historical travel time information for the study corridor.
- **Other traveler information resources:** Any other type of information you may have used before or during the study, including:
  - Other types of trip-planning resources, such as directions or travel times from Google Maps
  - Real-time travel information, such as radio reports of current congestion or traffic app notifications of collisions or other potential roadway hazards

Please click “Next” to continue.

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### **Tips for completing this survey**

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.
- A few key terms and concepts are used throughout this survey (different types of information and familiar or unfamiliar trips). You can click on the links throughout the survey to see a reminder of their definitions.

**Now, let’s get started!**

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**During the last two weeks of this study, how often did you check the Transportation Study Resource for traveler information when planning familiar or unfamiliar trips on I-71?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
Familiar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of Transportation Study Resource (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline (see next page)

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Pop-up definitions for “familiar” and “unfamiliar” trips (same as baseline)

**Familiar:**

For example, trips to **familiar** locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend’s house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

**Unfamiliar:**

For example, trips to **unfamiliar** locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.



**During the last two weeks of this study, how often did you check other traveler information resources when planning familiar or unfamiliar trips on I-71?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
<u>Familiar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for familiar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for familiar trips on I-71 during the last two weeks of this study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Familiar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for unfamiliar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for unfamiliar trips on I-71 during the last two weeks of the study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Unfamiliar trip definitions/ examples – same as in baseline

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

Please continue thinking about the last two weeks that you participated in the study.

**Compared to information from the other traveler information resources,  
how much impact did information from Transportation Study Resource  
have on your travel plans?**

Travel information from **the Transportation Study Resource** had:

- A lot more impact** than other information
- Slightly more impact** than other information
- About the same impact** as other information
- Slightly less impact** than other information
- A lot less impact** than other information

Show pop-up definitions of [Transportation Study Resource](#) and [Other resources](#) (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
The Transportation Study Resource was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource was reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information from the Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the information I received from the Transportation Study Resource was useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
In general, information from the Transportation Study Resource helped me reduce my travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, information from the Transportation Study Resource helped me avoid congestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource reduced the stress of my trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource helped me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

**Compared to information from the other traveler information resources, how useful was the information from the Transportation Study Resource for you?**

Travel information from the **Transportation Study Resource** was:

- A lot more useful** than other information
- Slightly more useful** than other information
- About as equally useful** as other information
- Slightly less useful** than other information
- A lot less useful** than other information

Show pop-up definitions of Transportation Study Resource and Other resources (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**In general, how satisfied were you with the information you received from the Transportation Study Resource?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Estimated/ approximate travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extra time/ recommended cushion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommended/ suggested departure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total travel time estimate for most/ majority of the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**Overall, how satisfied were you with your trips on I-71 during the last two weeks of the study period?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Trips made while using the Transportation Study Resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
[if used other sources] Trips made while using another travel information resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips made when I did not use any travel information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If never used info (ttrinfo\_freq\_fam=never AND ttrinfo\_freq\_unfam=never)

**Can you tell us why you did not use the Transportation Study Resource for your trips during the study?**

Please select all that apply.

- The information did not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with traffic conditions/travel times on I-71
- I did not have time to check the information
- Accessing information was difficult or inconvenient
- The information was not detailed enough
- The information was not available for my entire route
- The information was difficult to understand
- I prefer the other types of traveler information I normally use
- I never use any types of traveler information
- Other, please specify: \_\_\_\_\_

Randomize statements

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Ask everyone

How likely are you to use travel information resources (like the Transportation Study Resource) for the following types of trips in the future?

	Very unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely	Not Applicable
Commuting trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Familiar</b> personal trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Unfamiliar</b> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips in an unfamiliar city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Show pop-up for Familiar/ Unfamiliar trip definitions/ examples – same as in baseline

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**If you plan to use travel information for trips in the future, how do you prefer to receive this information?**

Please select all that apply.

- Through a smartphone app
- On a website
- Through a phone number (e.g. 511)
- Through email or text message alerts
- Other, please specify: \_\_\_\_\_
- I do not plan to use travel information in the future

Randomize statements – anchor “Other” and “do not plan to use” at bottom

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**Optional: Do you have any suggestions for improving travel information, other types of traveler information, or travel experiences on I-71?**

*Optional text box entry*

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**Would you be willing to participate in future studies conducted by the U.S. Department of Transportation, Ohio Department of Transportation, or other study sponsors?**

An important part of improving the transportation system is gathering feedback from residents such as yourself. If you say “Yes” you may be contacted in the future to invite you to another study, but your response does not impact your participation in this study.

- Yes
- No

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You're almost done! This last question is to confirm how you would like to receive your \$100 check as thanks for your participation.

**Please provide the address where you would like your check to be mailed.**

Please make sure to include the mail recipient's name and full mailing address (name, street address, city, state, and zip code).

*Optional text box entry*

This information will only be used to send your check. If you prefer not to receive your check by mail, you may pick it up in person at Battelle's main office:

Battelle Memorial Institute  
505 King Ave.  
Columbus, OH 43201

Please allow three weeks for payment processing.

Click "Next" to submit your responses and complete the study.

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**Thank you! Your responses have been successfully submitted.**

Congratulations, you have completed the North Columbus Transportation Study!

Your check will be mailed to the address you provided on the previous page, or will be available at Battelle's main office (505 King Ave.) within three weeks if you did not provide an address.

In the meantime, please email [columbusstudy@ttimail.tamu.edu](mailto:columbusstudy@ttimail.tamu.edu) if you have any questions or comments.

Thank you again for helping to improve traveler information resources and transportation in the Columbus region!



APPENDIX O. TRIANGLE EXIT SURVEY QUESTIONS



### **Exit survey design goals/ considerations for reviewers**

The primary purposes of the Exit Survey (following Phase 2 of the trip diaries when participants were provided with TTR information) is to collect information about if and how respondents used the TTR information they were provided and how they perceived that information. This includes information about:

- **How often** participants used the TTR information for different kinds of trips
- What kind of impacts the TTR information had on **behavior** (if any) (e.g., changes in departure time, route, mode choice)
- How **satisfied** participants were with various aspects of the information (e.g., clarity, ease of access, trustworthiness, overall usefulness)
- What kind of impacts the TTR had on **trip experience** (if any) (e.g., reduced stress, congestion avoidance, shorter trip, overall trip satisfaction)
- Perceptions of what might make the information **more useful** for different kinds of trips or in an unfamiliar city (or what might make participants likely to use the information in the future)

### **When relevant, questions in the exit survey are designed to match similar questions from the baseline survey as closely as possible.**

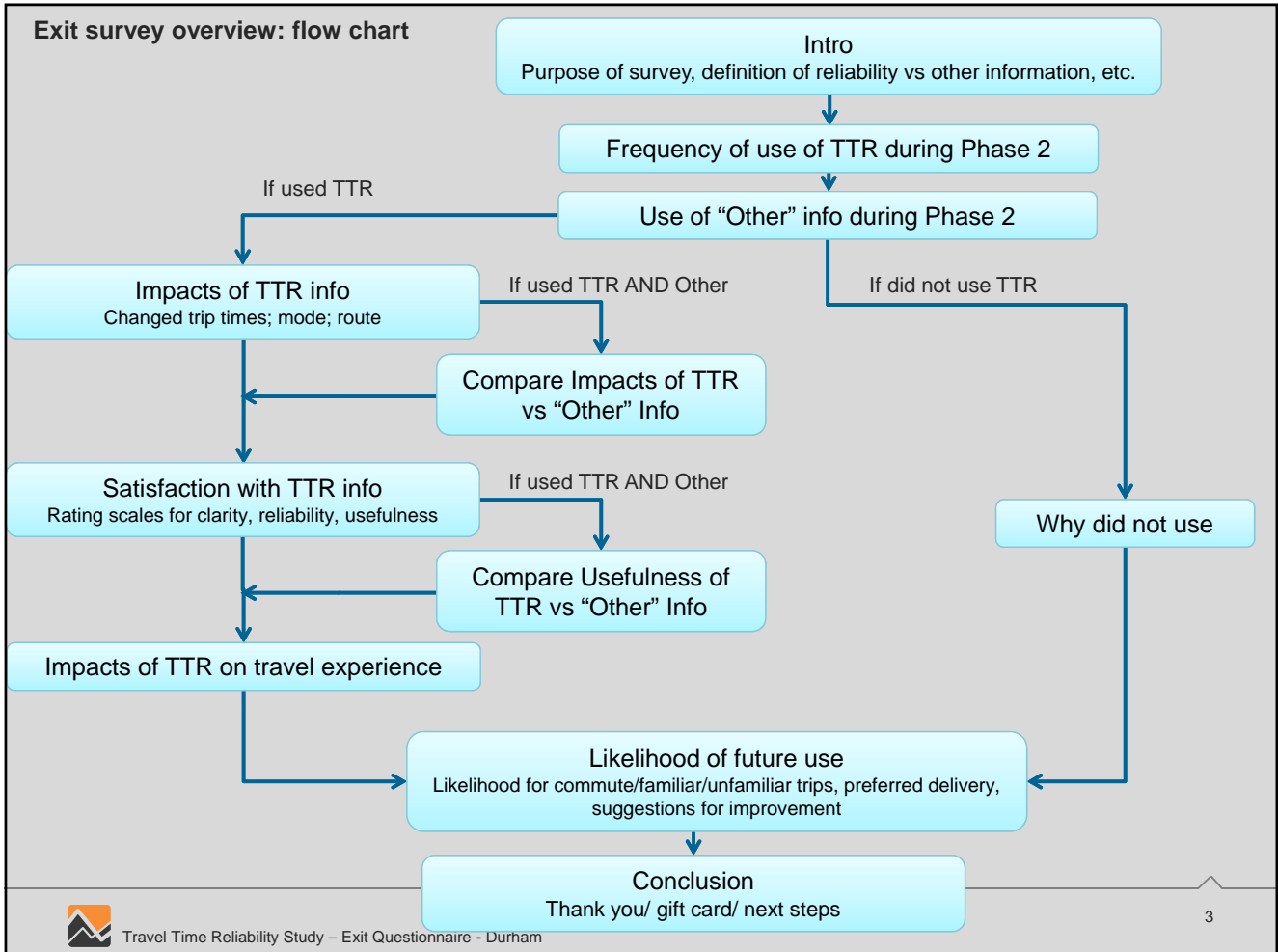
This is intended to allow for “before” and “after” comparisons, or more specifically comparisons of how respondents typically used and perceived “other” types of information before the study versus how they typically used and perceived the TTR information during the second phase of the study. Questions from the baseline that are similar to questions in this exit survey include:

- infosource familiar/unfamiliar (baseline, slides 40-41) == ttruse\_freq familiar/ unfamiliar (exit, slide 5)
- change familiar/unfamiliar (baseline, slides 48-49) == ttr\_change familiar/unfamiliar (exit, slides 18-19)
- infosat (baseline, slide 50) == ttr\_infosat (exit, slide 22)
- Infoopinion (baseline, slide 51) == ttr\_infoopinion (exit, slides 23-24)
- ynoinfo (baseline, slide 52) == ttr\_ynoinfo (exit, slide 26)

Other exit survey questions focus specifically on aspects and opinions of the TTR info and do not have comparable baseline questions.



**Exit survey overview: flow chart**




## Exit questionnaire formatting overview

This document is designed to show question wording, answer choices, and survey flow logic.

A few tips and notes to keep in mind while reviewing this document:

- Each slide represents one page in the survey. Typically there is one question per page, though in some cases a few simple questions may be asked of respondents on a single page.
- In the comments section below each slide, each question or page name is shown between [ ] square brackets (e.g., [intro]) – use these page names to help provide feedback for the survey
- The comments section below each slide may also show additional notes or shorter lists of answer options
- Slides with a gray background (such as this one) include notes, instructions for programming the survey, or longer lists of answer choices, but are not shown to survey respondents. We try to “over provide” this information for reviewer convenience.
- Text written in red indicates survey logic (e.g. who should see which questions) and other notes for the programmers, and are not shown to survey respondents
- Hyperlinks for pop-up descriptions, survey information pages, etc. are only active during the conduct of the study
- Text between < > angle brackets indicate information displayed dynamically for each respondent (e.g., a person’s typical trip purpose)
- Exact layout and formatting are not displayed. Layout is approximate (for example, showing different question types and order of multiple questions on one page). However, it is not possible to display exact formatting in this document (for example, on some slides text is smaller in order to show all the questions and survey logic on one page)





# TRIANGLE TRANSPORTATION STUDY

WELCOME

[Begin](#)

[Contact us](#) [Study FAQs](#) [Privacy Policy](#)



## Frequently Asked Questions

### Study Overview

- What is the purpose of this study?

The purpose of this study is to understand the experiences of Triangle region drivers who regularly use I-40 and other nearby roads between Durham, Chapel Hill and Raleigh. We want to understand your experiences with busy travel conditions, including whether you use information to plan your trips and the decisions you make about how best to handle traffic congestion in the Triangle Study Corridor.

- What is the Triangle Study Corridor?

The Triangle Study Corridor includes about 25 miles of I-40 and other roads between U.S. Route 1 in Raleigh and U.S. Route 15-501 in Durham.

- How do I participate in this study?

This study involves four steps:

**STEP 1:** Complete an initial survey about your typical experiences in the Triangle Study Corridor. This survey will take about 15 minutes to complete. To start this survey, use the unique password you received on your postcard to log into the secure survey website: <https://surveyrsg.com/trianglenc>

**STEP 2:** Install the study's mobile app on your smartphone to log your trips and complete daily mini-surveys about your travel in the corridor. After completing the initial survey, instructions on how to download and install this mobile app will be emailed to you. This part of the study will last 1-2 weeks and will involve less than 5 minutes of time per day.

**STEP 3:** Continue using the mobile app and completing mini-surveys with access to customized trip planning resources. After the second part of the study is over, you will be given access to information about travel times on your routes in the corridor. Otherwise this part of the study is similar to Step 2, including using the mobile app to log your trips and completing daily mini-surveys for 1-2 weeks.

**STEP 4:** Complete an exit survey about your experiences. After completing Steps 2 and 3, you will receive an email with a link to take the exit survey. This survey will take about 15 minutes to complete.

To qualify for this study, participants must be regular drivers in the study corridor, age 18 or older, and must own and use an iPhone or an Android phone in order to install the mobile application and complete Steps 2 and 3.

- What will I get for participating?

After completing all parts of the study including the exit survey, qualified participants will receive a **\$50 Amazon.com gift card!** In appreciation of the contribution participants will make during all the steps in the study, this final gift card is a higher amount than originally advertised on the invitation postcard.



## Frequently Asked Questions

### General Information

- Why should I participate?

As one of a small number of travelers in the Triangle region invited to participate, your response represents the views of many other travelers. We can better understand how to improve your travel experiences by understanding how travelers like you use the transportation system.

- How was I selected to participate?

Invited participants were randomly selected from all residential addresses in the Triangle study area.

- How are my privacy and personal information protected?

All of your responses during this study are strictly confidential and will only be analyzed with responses from all other study participants. Your contact information and other identifying information will not be linked to your responses in any analysis or reports and will be destroyed at the conclusion of the study. All information is stored in a secure database that will only be accessed by the study administrators.

When you use the mobile application to log your trips, GPS data about where and when your vehicle travels will be captured automatically. However, to protect the privacy of your home, work, and other destinations, the first and last 30 seconds of each trip will be deleted.

For more information about how we protect our privacy, please view our privacy policy or contact us.

- What if I change my mind about participating?

This study is completely voluntary, and you may choose to stop participating at any time. If you decide not to participate or to stop participating, there will be no effect on your relationship with the study sponsors and partners or the study administrators.

- Who do I contact if I have questions or need help during the study?

For help on how to complete the surveys or for general questions or feedback about the study, email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com).

If you have questions or concerns about the study, you may also contact the Principal Investigator, Beverly Kuhn, at (979) 862-3558 or [b-kuhn@tamu.edu](mailto:b-kuhn@tamu.edu).

For questions about your rights as a participant or concerns about the research, you may contact the Texas A&M University Human Subjects Protection Program at (979) 458-4067 or [irb@tamu.edu](mailto:irb@tamu.edu).

- Who is sponsoring this study?

This study is sponsored by the U.S. Department of Transportation (US DOT) in partnership with Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), Battelle Memorial Institute, Texas A&M Transportation Institute (TTI), and RSG are conducting the study on behalf of the US DOT and DCHC.

**Resource Systems Group, Inc. Privacy Statement**

**SUMMARY**

© Resource Systems Group, Inc. 2015 is conducting this study for the U.S. Department of Transportation (US DOT) in collaboration with Battelle Memorial Institute and Texas A&M Transportation Institute (TTI).

Resource Systems Group (RSG) will never sell, trade or otherwise share any personal information collected in its surveys with any third party.

RSG will never spam you, advertise to you or otherwise contact you outside of this survey without your explicit and direct permission.

Any and all information collected during this survey will only be presented to RSG's clients as part of an aggregate sample. At no time will individual responses be connected to survey takers' personal information.

During the study, we need your name and contact information in order to reach you, but at the conclusion of the study, this information will be destroyed. Your survey responses will never be sold or shared.

**PRIVACY STATEMENT IN DEPTH**

We are committed to your privacy and we take it very seriously. This statement is intended to provide you with information and understanding about how Resource Systems Group (RSG) collects and safeguards personal information that is used as part of the firm's market research studies.

**ABOUT RSG'S MARKET RESEARCH WORK**

RSG conducts market research on behalf of both public and private sector clients using Internet, stand-alone computer, and other data collection means. Ultimately, this research allows our clients to provide you with better products and services that you use on a daily basis. These products and services range from large infrastructure, like rail service and highways, to consumer products, like magazines and cell phones.

**THE INFORMATION WE COLLECT AND WHAT WE DO WITH IT**

Through independently commissioned surveys, RSG may collect information such as your email address, home or work location, and a variety of demographic information (e.g., gender, age, household income) that will allow us to qualify you for a current survey, tailor survey questions, or ensure we have collected a sample that provides representation across a variety of characteristics. Once you are qualified to participate in a survey, you may be asked to provide additional demographic data, express opinions, and register preferences. The information gathered is aggregated, analyzed, and summarized on behalf of RSG's clients. This information is always presented to clients in summary fashion and never contains any personally identifiable information. Participation in these surveys is completely voluntary, and you therefore have a choice whether or not to disclose this information requested.



**INFORMATION COLLECTED TO MAKE YOUR SURVEY EXPERIENCE MORE PLEASANT**

During the course of our surveys, we may passively collect information about your Internet browser and computer settings that makes your survey experience more pleasant. In addition to making your survey experience better, we use this information, which does not identify individual users, to analyze trends, to administer the site, and to track users' movements around the site.

**CHANGING OR DELETING PERSONAL INFORMATION**

If your personal information changes, if you no longer desire to participate in this study, or if you have inquiries or complaints, please contact us via email at [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com).

**SECURITY**

We follow generally accepted industry standards to protect the personal information submitted to us, both during transmission and once we receive it. No method of transmission over the Internet, or method of electronic storage, is 100% secure, however. Therefore, while we strive to use commercially acceptable means to protect your personal information, we cannot guarantee its absolute security.

**CHANGES IN THIS PRIVACY STATEMENT**

RSG reserves the right to change its privacy policy. These changes will be posted clearly on the firm's websites and other places we deem appropriate so that you are aware of what information we collect, how we use it, and under what circumstances, if any, we disclose it.

**LEGAL DISCLAIMER**

We reserve the right to disclose your personally identifiable information as required by law, and when we believe that disclosure is necessary to protect our rights and/or to comply with a judicial proceeding, court order, or legal process served on our website.

**CONTACT US**

If you have any questions or suggestions regarding our privacy policy, please contact us at:  
Resource Systems Group, Inc.  
41 North Rio Grande St, Suite 106  
Salt Lake City, UT 84101  
Email: [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com)



## Welcome back!

Thank you for your recent participation in the smartphone app portion of the Triangle Transportation Study.

This final survey is the last step to complete the study. The purpose of this survey is to help us understand how your travel experiences may have changed when you were provided with the customized Transportation Study Resource during the last two weeks of the study.

As one of a small number of Triangle area travelers completing this study, your input in this final survey is important. Your feedback will help the study sponsors and other agencies provide better transportation information and services in the region. Also, once you complete this final survey, you will receive your \$50 Amazon.com gift card!

Your privacy will be protected. Please click [here](#) to view the privacy policy, or refer to the links at the bottom of the page for more information. You may also email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com) with any questions or concerns. Thank you again for your continued participation!

Please click "Next" to continue.

Next





## Definition and description of traveler information resources in this study

Throughout this study we have asked you about several different types of traveler information. In this final survey, we are specifically asking about two different types of information:

- **Transportation Study Resource:** The customized trip-planning information you were provided in the last two weeks of the study. This resource provided average historical travel time information for the study corridor.
- **Other traveler information resources:** Any other type of information you may have used before or during the study, including:
  - Other types of trip-planning resources, such as directions or travel times from Google Maps
  - Real-time travel information, such as radio reports of current congestion or traffic app notifications of collisions or other potential roadway hazards

Please click “Next” to continue.

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### **Tips for completing this survey**

- To proceed through the survey and ensure that your responses are saved, please click the “Previous” and “Next” buttons at the bottom of the page. Do not use your browser’s “back” and “forward” buttons as this may take you out of the survey without saving your answers.
- If you need to pause and come back later in the middle of the survey, your responses will be saved automatically and you will be able to continue from where you stopped.
- This survey may be completed on a mobile device (a smartphone or tablet computer) as well as a laptop or desktop computer.
- A few key terms and concepts are used throughout this survey (different types of information and familiar or unfamiliar trips). You can click on the links throughout the survey to see a reminder of their definitions.

**Now, let’s get started!**

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**During the last two weeks of this study, how often did you check the Transportation Study Resource for traveler information when planning familiar or unfamiliar trips on I-40?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
Familiar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfamiliar trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of Transportation Study Resource (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline (see next page)

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Pop-up definitions for “familiar” and “unfamiliar” trips (same as baseline)

**Familiar:**

For example, trips to **familiar** locations might include grocery shopping, regular errands (e.g. to the bank or the dentist), taking your kids to school, going to a friend’s house, going to the gym, or any other personal destinations you regularly visit or feel comfortable finding without directions.

**Unfamiliar:**

For example, trips to **unfamiliar** locations might include new or infrequent errands (e.g. to the airport or to a new doctor), trips to a new restaurant, infrequent trips to a recreational destination (e.g. a concert hall), or other destinations you rarely visit or need directions or navigation assistance to find.



**During the last two weeks of this study, how often did you check other traveler information resources when planning familiar or unfamiliar trips on I-40?**

	More than once/ day	Once/ day	A few days/ week	About one day per week	Never
<u>Familiar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Unfamiliar</u> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-ups for Familiar and Unfamiliar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for familiar trips

Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for familiar trips on I-40 during the last two weeks of this study?

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Familiar trip definitions/ examples – same as in baseline

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If used TTR study resource at all for unfamiliar trips

**Based on what you learned from the Transportation Study Resource, how often did you change your travel plans for unfamiliar trips on I-40 during the last two weeks of the study?**

	Frequently (almost every day)	Sometimes (a few times/ week)	Rarely (once/ week or less)	Did this, but based on other info	Never did this	Not applicable
Started my trip earlier	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Started my trip later	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made minor changes to my route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to a toll road	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completely changed my planned route	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changed to public transit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canceled trip or postponed to a later day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to telecommute	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Show pop-up definition of other types of information (see infodefinition page)

Show pop-up for Unfamiliar trip definitions/ examples – same as in baseline

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

Please continue thinking about the last two weeks that you participated in the study.

**Compared to information from the other traveler information resources,  
how much impact did information from Transportation Study Resource  
have on your travel plans?**

Travel information from **the Transportation Study Resource** had:

- A lot more impact** than other information
- Slightly more impact** than other information
- About the same impact** as other information
- Slightly less impact** than other information
- A lot less impact** than other information

Show pop-up definitions of [Transportation Study Resource](#) and [Other resources](#) (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
The Transportation Study Resource was easy to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource was reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The information from the Transportation Study Resource did NOT reduce the amount of travel time I plan for my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, the information I received from the Transportation Study Resource was useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Randomize statements](#)

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If uses TTR more than never for either unfamiliar or familiar trips

**For the information you received from the Transportation Study Resource, how strongly do you agree or disagree with the following statements?**

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not Applicable
In general, information from the Transportation Study Resource helped me reduce my travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, information from the Transportation Study Resource helped me avoid congestion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource reduced the stress of my trip	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information from the Transportation Study Resource helped me plan my trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If (ttr\_infreq\_familiar > never OR ttr\_infreq\_unfamiliar > never)  
AND (othinfo\_freq\_familiar > never OR othinfo\_freq\_unfamiliar > never)

**Compared to information from the other traveler information resources, how useful was the information from the Transportation Study Resource for you?**

Travel information from the **Transportation Study Resource** was:

- A lot more useful** than other information
- Slightly more useful** than other information
- About as equally useful** as other information
- Slightly less useful** than other information
- A lot less useful** than other information

Show pop-up definitions of Transportation Study Resource and Other resources (see infodefinition page)

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If uses TTR more than never for either unfamiliar or familiar trips

**In general, how satisfied were you with the information you received from the Transportation Study Resource?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Estimated/ approximate travel time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extra time/ recommended cushion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recommended/ suggested departure time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total travel time estimate for most/ majority of the time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

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If uses TTR more than never for either unfamiliar or familiar trips

**Overall, how satisfied were you with your trips on I-40 during the last two weeks of the study period?**

	Very Dissatisfied	Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Satisfied	Very Satisfied	Not Applicable
Trips made while using the Transportation Study Resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>[if used other sources]</b> Trips made while using another travel information resource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips made when I did not use any travel information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Previous

Next



If never used info (ttrinfo\_freq\_fam=never AND ttrinfo\_freq\_unfam=never)

**Can you tell us why you did not use the Transportation Study Resource for your trips during the study?**

Please select all that apply.

- The information did not seem reliable
- My schedule is generally flexible (I do not need to arrive at my destinations at a specific time)
- I am familiar with traffic conditions/travel times on I-40
- I did not have time to check the information
- Accessing information was difficult or inconvenient
- The information was not detailed enough
- The information was not available for my entire route
- The information was difficult to understand
- I prefer the other types of traveler information I normally use
- I never use any types of traveler information
- Other, please specify: \_\_\_\_\_

Randomize statements

Previous

Next



Ask everyone

How likely are you to use travel information resources (like the Transportation Study Resource) for the following types of trips in the future?

	Very unlikely	Unlikely	Somewhat Unlikely	Neutral	Somewhat Likely	Likely	Very Likely	Not Applicable
Commuting trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Familiar</b> personal trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Unfamiliar</b> trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trips in an unfamiliar city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Randomize statements

Show pop-up for Familiar/ Unfamiliar trip definitions/ examples – same as in baseline

Previous

Next



**If you plan to travel information for trips in the future, how do you prefer to receive this information?**

Please select all that apply.

- Through a smartphone app
- On a website
- Through a phone number (e.g. 511)
- Through email or text message alerts
- Other, please specify: \_\_\_\_\_
- I do not plan to use travel information in the future

Randomize statements – anchor “Other” and “do not plan to use” at bottom

Previous

Next





**Optional: Do you have any suggestions for travel information, other types of traveler information, or travel experiences on I-40?**

*Optional text box entry*

Previous

Next



**Would you be willing to participate in future studies conducted by the U.S. Department of Transportation, Durham-Chapel Hill-Carrboro Metropolitan Planning Organization, or other study sponsors?**

An important part of improving the transportation system is gathering feedback from residents such as yourself. If you say “Yes” you may be contacted in the future to invite you to another study, but your response does not impact your participation in this study.

- Yes
- No

Previous

Next



**Thank you! Your responses have been successfully submitted.**

Congratulations, you have completed the Triangle Transportation Study!

You will receive your \$50 Amazon gift card through email within two business weeks.

In the meantime, please email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com) if you have any questions or comments.

Thank you again for helping to improve traveler information resources and transportation in the Triangle region!





# APPENDIX P. WEST HOUSTON TRANSPORTATION STUDY RECRUITMENT MATERIALS



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**WEST HOUSTON**  
TRANSPORTATION STUDY

P.O. Box 9774  
College Station, TX 77842

**You're invited to participate in the  
West Houston Transportation Study!**

The U.S. Department of Transportation is studying the experiences of regular drivers in the Houston area and is seeking your feedback! The study will involve an initial survey, a series of mini-surveys completed on your smartphone over one month, and a final survey.

**Start the initial survey now!** Simply log into the secure website:  
<https://surveysrg.com/westhouston>

Your password is:

This study is optional; however, your input will help regional agencies prioritize improvements to the transportation system. Additionally, qualifying participants who complete every step will receive a **\$25 Amazon.com gift card** as thanks!



**For more information**, please visit the survey website or email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com).

*This study is being conducted by Battelle Memorial Institute, Texas A&M Transportation Institute, and Resource Systems Group, Inc. on behalf of the U.S. Department of Transportation.*

**REMINDER** You can still participate!

**WEST HOUSTON**  
TRANSPORTATION STUDY

Help improve travel in  
the Greater Houston area

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**WEST HOUSTON**  
TRANSPORTATION STUDY

P.O. Box 9774  
College Station, TX 77842

**There's still time to participate in the  
West Houston Transportation Study!**

We recently mailed you an invitation to participate in the West Houston Transportation Study. If you have already taken the initial survey, **thank you!** If not, we encourage you to participate now:

Log into the secure website:  
<https://surveyrsg.com/westhouston>

Your password is:

Your valuable input will help regional agencies prioritize improvements to the transportation system. Qualifying participants who complete every step will receive a **\$25 Amazon.com gift card** as thanks!

**For more information,** please visit the survey website or email [westhouston@rsgsurvey.com](mailto:westhouston@rsgsurvey.com).

*This study is being conducted by Battelle Memorial Institute, Texas A&M Transportation Institute, and Resource Systems Group, Inc. on behalf of the U.S. Department of Transportation.*

## APPENDIX Q. NORTH HOUSTON TRANSPORTATION STUDY RECRUITMENT MATERIALS



### Help the U.S. Department of Transportation improve your commute!

The U.S. Department of Transportation (US DOT) is conducting a study about traveler experiences on I-45 North and the Hardy Toll Road in order to better understand how busy traffic conditions affect commuters and other travelers in the North Houston Study Corridor. This study seeks to understand if and how travelers use traffic and traveler information resources to plan their trips and handle traffic congestion in the study area. Participation and feedback is very important to help US DOT and local agencies understand how to provide useful information and improve travelers' experiences on the highway.

### Who can participate?

If you regularly travel on I-45 in the North Houston Study Corridor and own an Android smartphone or Apple iPhone, you may qualify for a study about travel conditions and traveler information resources in the region. The North Houston Study Corridor includes approximately 35 miles of I-45 N between FM-1488 and Allen Parkway in downtown Houston. Participants who qualify and complete all parts of the study will receive up to \$100 cash as a token of our appreciation for your time and feedback!

### How do I participate?

If you are interested in participating, please email the study team at [HoustonStudy@ttimail.tamu.edu](mailto:HoustonStudy@ttimail.tamu.edu) to find out if you qualify and to sign up for the study.

Once you are signed up for the study, you will receive a link to an initial survey about your typical travel experiences in the North Houston Study Area. After completing this initial survey, you will receive instructions to install the study's mobile application on your smartphone. You will use this app to report and answer a few questions about your trips in the study corridor for approximately a four-week travel period. During the second half of the travel period, study administrators will provide customized travel planning resources you can use to help plan your trips in the corridor. After the travel period is complete, you will complete a brief final survey evaluating the study experiences and information resources.

### Who is conducting the study?

This study is sponsored by the US DOT and is being administered by Battelle Memorial Institute, Texas A&M Transportation Institute, and Resource Systems Group, Inc. This study team is committed to protecting the privacy of participant information.

### Contact us today to sign up for this important study!

The study will only be conducted for a limited time, so please contact us soon! Please also share this study information with your friends and neighbors who may be interested in participating and providing feedback about travel experiences on I-45 in the North Houston Study Corridor.





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The U.S. Department of Transportation is studying the experiences of regular drivers in the #Houston area and is seeking your feedback! The study will involve an initial survey, a series of mini-surveys completed on your smartphone over one month, and a final survey.

If you qualify for the study and choose to participate, your input will help regional agencies prioritize improvements to the transportation system. Additionally, qualifying participants who complete every step will earn up to \$100 in cash.

<http://tti.tamu.edu/.../houston-area-drivers-send-us-your-fe.../>



### Houston Area Drivers—Send Us Your Feedback! — Texas A&M Transportation Institute

The U.S. Department of Transportation is studying the experiences of regular drivers in the Houston area and is seeking your feedback! The study will involve...

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# APPENDIX R. NORTH COLUMBUS TRANSPORTATION STUDY RECRUITMENT MATERIALS



## NORTH COLUMBUS TRANSPORTATION STUDY

P.O. Box 9774  
College Station, TX 77842

**You're invited to participate in the  
North Columbus Transportation Study!**

The U.S. Department of Transportation is studying the experiences of regular drivers in the Columbus area and is seeking your feedback! The study will involve an initial survey, a series of mini-surveys completed on your smartphone over one month, and a final survey.

Start the initial survey now! Simply log into the secure website:  
**<https://surveyrsg.com/northcolumbus>**

**Your password is:**

This study is optional; however, your input will help regional agencies prioritize improvements to the transportation system. Additionally, qualifying participants who complete every step will receive a **\$25 Amazon.com gift card** as thanks!



**For more information**, please visit the survey website or email **[northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com)**.

*This study is being conducted by Battelle Memorial Institute, Texas A&M Transportation Institute, and Resource Systems Group, Inc. on behalf of the U.S. Department of Transportation.*

 **REMINDER** You can still participate!



# NORTH COLUMBUS TRANSPORTATION STUDY

## Help improve travel in the Greater Columbus area

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### NORTH COLUMBUS TRANSPORTATION STUDY

P.O. Box 9774  
College Station, TX 77842

**There's still time to participate in the North Columbus  
Transportation Study!**

We recently mailed you an invitation to participate in the North Columbus Transportation Study. If you have already taken the initial survey, thank you! If not, we encourage you to participate now.

Log into the secure website: <https://surveysrg.com/northcolumbus>

Your password is:

Your valuable input will help regional agencies prioritize improvements to the transportation system. Qualifying participants who complete every step will receive a **\$25 Amazon.com gift card** as thanks!



**For more information**, please visit the survey website or email [northcolumbus@rsgsurvey.com](mailto:northcolumbus@rsgsurvey.com).

*This study is being conducted by Battelle Memorial Institute, Texas A&M Transportation Institute, and Resource Systems Group, Inc. on behalf of the U.S. Department of Transportation.*



# APPENDIX S. TRIANGLE TRANSPORTATION STUDY RECRUITMENT MATERIALS



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P.O. Box 9774  
College Station, TX 77842

**You're invited to participate in the Triangle Transportation Study!**

The U.S. Department of Transportation is studying the experiences of regular drivers in the Triangle area and is seeking your feedback! The study will involve an initial survey, a series of mini-surveys completed on your smartphone over one month, and a final survey.

Start the initial survey now! Simply log into the secure website:  
<https://surveyrsg.com/trianglenc>

Your password is:

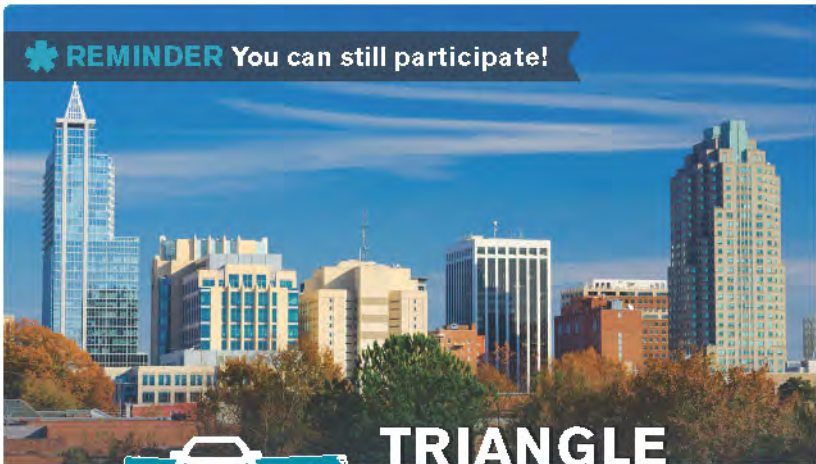
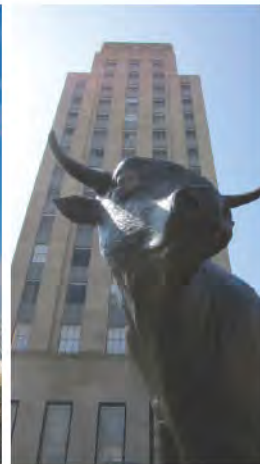
This study is optional; however, your input will help regional agencies prioritize improvements to the transportation system. Additionally, qualifying participants who complete every step will receive a **\$25 Amazon.com gift card** as thanks!



**For more information**, please visit the survey website or email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com).


*This study is being conducted by Battelle Memorial Institute, Texas A&M Transportation Institute, and Resource Systems Group, Inc. on behalf of the U.S. Department of Transportation.*

 **REMINDER** You can still participate!

**TRIANGLE**  
TRANSPORTATION STUDY

**Help improve travel  
in the Triangle area**




**TRIANGLE**  
TRANSPORTATION STUDY



P.O. Box 9774  
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**There's still time to participate in the  
Triangle Transportation Study!**

We recently mailed you an invitation to participate in the Triangle Transportation Study. If you have already taken the initial survey, thank you! If not, we encourage you to participate now.

Log into the secure website: <https://surveyrsg.com/trianglenc>

Your password is:

Your valuable input will help regional agencies prioritize improvements to the transportation system. Qualifying participants who complete every step will receive a **\$25 Amazon.com gift card** as thanks!

 **For more information**, please visit the survey website or email [trianglenc@rsgsurvey.com](mailto:trianglenc@rsgsurvey.com).

*This study is being conducted by Battelle Memorial Institute, Texas A&M Transportation Institute, and Resource Systems Group, Inc. on behalf of the U.S. Department of Transportation.*

## APPENDIX T. STATISTICAL MODEL RESULTS

For each of the detailed statistical model tables contained in this appendix, results are shown from a logistic regression fit with a positive response (usually the aggregate of several positive response categories) or an ordered set of responses (higher to lower) as a function of the dissemination method (called Treatment\_Mode) and lexicon (called Treatment\_Assembly), as well as covariates for a number of demographic and traveler characteristics.

In the tabular results, the first column provides the parameter in the model, followed by the particular level of the parameter, the degrees of freedom (DF), the estimate, its standard error, and a P-Value. If the P-Value is less than or equal to 0.05, it is bolded, meaning that factor level is considered to be significant compared to its reference condition. The reference conditions are not shown in the tables – for each variable they are:

- Location – Triangle
- Treatment\_Assembly – Assembly B
- Treatment\_Mode – Web access
- Gender – Male
- Education – Less than college
- Income – Under \$50,000
- Age – Under 25
- Employment – Not full time

The average distance traveled parameter is continuous, while the peak hour and weekday parameters are percentages, and the Phase2\_Count is a count. For these variables, the estimate represents a slope – the magnitude of change in the response for a one unit change in the variable.

The odds ratios reported in Chapter 9 can be derived from these tables. For instance, the results for the likelihood of participants checking TTR information for familiar trips is modeled in Table 46.

The odds ratio estimate for the 511 access respondents can be found as:

$$\text{Exp (Intercept + Treatment_Mode 511 access)} = \text{Exp} (-0.15 + -0.76) = 0.40$$

The odds ratio estimate for the Web app access respondents can be found as:

$$\text{Exp (Intercept + Treatment_Mode App access)} = \text{Exp} (-0.15 + -0.22) = 0.68$$

The odds ratio for the comparison of 511 access respondents to Web app respondents is simply the ratio of the odds ratios =  $0.40/0.68 = 0.58$ . This value of 0.58 is what is reported in Section 9.2.3, Figure 25, for the survey question.

### Frequency of Checking TTR Information during Study – Familiar Trips

The logistic regression model was fit with the probability a respondent selected a category of checking resources at least once per week compared to reporting never checking them.

**Table 46. Model results – information usage for familiar trips.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	-0.15	0.76	0.84
<b>Location</b>	Columbus	1	0.75	0.28	<b>0.01</b>
<b>Location</b>	Houston	1	0.39	0.27	0.15
<b>Treatment_Assembly</b>	Assembly A	1	-0.13	0.18	0.49
<b>Treatment_Mode</b>	511 access	1	-0.76	0.23	<b>0.00</b>
<b>Treatment_Mode</b>	App access	1	-0.22	0.24	0.36
<b>Gender</b>	Female	1	-0.10	0.19	0.61
<b>Education</b>	Bachelor degree	1	-0.48	0.26	0.06
<b>Education</b>	Graduate/Professional degree	1	-0.51	0.28	0.07
<b>Income</b>	\$100,000 or more	1	0.01	0.32	0.97
<b>Income</b>	\$50,000-\$99,999	1	0.09	0.32	0.78
<b>Age</b>	25-44	1	0.06	0.37	0.86
<b>Age</b>	45-64	1	0.75	0.40	0.06
<b>Age</b>	65 or older	1	-0.15	0.68	0.82
<b>Employment</b>	Full-time employed	1	0.64	0.28	<b>0.02</b>
<b>Average_Distance</b>		1	0.00	0.01	0.49
<b>Peak_Hour</b>		1	0.01	0.00	0.11
<b>Weekday</b>		1	0.00	0.01	0.69
<b>Phase2_Count</b>		1	0.02	0.01	0.09



## Frequency of Checking TTR Information during Study – Unfamiliar Trips

The logistic regression model was fit with the probability a respondent selected a category of checking resources at least once per week compared to reporting never checking them.

**Table 47. Model results – information usage for unfamiliar trips.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	3.64	0.76	<0.005
<b>Location</b>	Columbus	1	-0.15	0.24	0.53
<b>Location</b>	Houston	1	0.00	0.24	0.99
<b>Treatment_Assembly</b>	Assembly A	1	0.20	0.15	0.19
<b>Treatment_Mode</b>	511 access	1	-0.55	0.19	<b>&lt;0.005</b>
<b>Treatment_Mode</b>	App access	1	-0.15	0.19	0.44
<b>Gender</b>	Female	1	-0.05	0.16	0.73
<b>Education</b>	Bachelor degree	1	-0.11	0.20	0.59
<b>Education</b>	Graduate/Professional degree	1	-0.01	0.22	0.97
<b>Income</b>	\$100,000 or more	1	0.09	0.27	0.74
<b>Income</b>	\$50,000-\$99,999	1	0.34	0.27	0.22
<b>Age</b>	25-44	1	-0.65	0.35	0.06
<b>Age</b>	45-64	1	-0.66	0.36	0.07
<b>Age</b>	65 or older	1	-0.78	0.65	0.23
<b>Employment</b>	Full-time employed	1	0.17	0.26	0.50
<b>Average_Distance</b>		1	-0.01	0.00	0.14
<b>Peak_Hour</b>		1	-0.01	0.00	<b>0.01</b>
<b>Weekday</b>		1	-0.03	0.01	<b>0.00</b>
<b>Phase2_Count</b>		1	0.00	0.01	0.94

### Frequency of Changing the Plan due to TTR Information for Familiar Trips

The logistic regression model was fit with the probability a respondent selected at least one of the eight possible trip change options as a result of TTR information compared to reporting never making a trip change or only doing so with other than because of TTR information.

**Table 48. Model results – behavior change for familiar trips.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	1.96	0.85	0.02
<b>Location</b>	Columbus	1	-0.05	0.29	0.86
<b>Location</b>	Houston	1	0.73	0.30	<b>0.02</b>
<b>Treatment_Assembly</b>	Assembly A	1	0.43	0.18	<b>0.02</b>
<b>Treatment_Mode</b>	511 access	1	-0.49	0.23	<b>0.03</b>
<b>Treatment_Mode</b>	App access	1	-0.02	0.22	0.91
<b>Gender</b>	Female	1	0.00	0.18	0.98
<b>Education</b>	Bachelor degree	1	-0.62	0.24	<b>0.01</b>
<b>Education</b>	Graduate/Professional degree	1	-0.98	0.27	<b>0.00</b>
<b>Income</b>	\$100,000 or more	1	0.06	0.32	0.86
<b>Income</b>	\$50,000-\$99,999	1	0.31	0.33	0.34
<b>Age</b>	25-44	1	-0.01	0.43	0.99
<b>Age</b>	45-64	1	0.14	0.44	0.76
<b>Age</b>	65 or older	1	-0.22	0.81	0.78
<b>Employment</b>	Full-time employed	1	0.22	0.33	0.50
<b>Average_Distance</b>		1	0.00	0.00	0.66
<b>Peak_Hour</b>		1	-0.01	0.00	0.10
<b>Weekday</b>		1	-0.01	0.01	0.08
<b>Phase2_Count</b>		1	-0.03	0.01	<b>0.01</b>

## Frequency of Changing the Plan due to TTR Information for Unfamiliar Trips

The logistic regression model was fit with the probability a respondent selected at least one of the eight possible trip change options as a result of TTR information compared to reporting never making a trip change or only doing so with other than because of TTR information.

**Table 49. Model results – behavior change for unfamiliar trips.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	2.17	0.95	0.02
<b>Location</b>	Columbus	1	-0.20	0.35	0.57
<b>Location</b>	Houston	1	0.62	0.36	0.09
<b>Treatment_Assembly</b>	Assembly A	1	-0.05	0.23	0.83
<b>Treatment_Mode</b>	511 access	1	-0.14	0.29	0.63
<b>Treatment_Mode</b>	App access	1	0.13	0.27	0.62
<b>Gender</b>	Female	1	0.01	0.23	0.95
<b>Education</b>	Bachelor degree	1	-0.65	0.30	<b>0.03</b>
<b>Education</b>	Graduate/Professional degree	1	-0.77	0.33	<b>0.02</b>
<b>Income</b>	\$100,000 or more	1	-0.15	0.39	0.70
<b>Income</b>	\$50,000-\$99,999	1	0.10	0.40	0.80
<b>Age</b>	25-44	1	-0.08	0.47	0.86
<b>Age</b>	45-64	1	0.01	0.49	0.99
<b>Age</b>	65 or older	1	-0.47	0.90	0.60
<b>Employment</b>	Full-time employed	1	-0.03	0.38	0.94
<b>Average_Distance</b>		1	0.01	0.01	0.13
<b>Peak_Hour</b>		1	-0.01	0.00	0.08
<b>Weekday</b>		1	-0.01	0.01	0.29
<b>Phase2_Count</b>		1	-0.05	0.02	<b>0.00</b>

### TTR Ratings Statement 1: The Transportation Study Resource was Easy to Understand

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants' agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 50. Model results – travel time reliability ease of understanding.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
Intercept	1	1	2.46	0.88	0.01
Intercept	2	1	2.86	0.89	0.00
Location	Columbus	1	0.52	0.30	0.08
Location	Houston	1	-0.06	0.30	0.83
Treatment_Assembly	Assembly A	1	-0.25	0.18	0.18
Treatment_Mode	511 access	1	-0.58	0.23	<b>0.01</b>
Treatment_Mode	App access	1	-0.17	0.23	0.45
Gender	Female	1	-0.05	0.19	0.77
Education	Bachelor degree	1	-0.24	0.25	0.33
Education	Graduate/Professional degree	1	-0.28	0.28	0.31
Income	\$100,000 or more	1	0.27	0.31	0.39
Income	\$50,000-\$99,999	1	0.76	0.32	<b>0.02</b>
Age	25-44	1	-0.30	0.44	0.49
Age	45-64	1	0.09	0.45	0.84
Age	65 or older	1	-0.33	0.78	0.68
Employment	Full-time employed	1	0.37	0.32	0.24
Average_Distance		1	-0.01	0.00	0.06
Peak_Hour		1	0.00	0.00	0.86
Weekday		1	-0.01	0.01	0.17
Phase2_Count		1	-0.02	0.01	0.14

**TTR Ratings Statement 2: Information from the Transportation Study Resource was Reliable**

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants' agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 51. Model results – travel time reliability rating: reliability.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	1.55	0.76	0.04
<b>Intercept</b>		2	2.62	0.76	0.00
<b>Location</b>	Columbus	1	0.05	0.27	0.86
<b>Location</b>	Houston	1	-0.51	0.28	0.06
<b>Treatment_Assembly</b>	Assembly A	1	0.19	0.17	0.26
<b>Treatment_Mode</b>	511 access	1	-0.05	0.21	0.80
<b>Treatment_Mode</b>	App access	1	0.00	0.20	0.98
<b>Gender</b>	Female	1	-0.15	0.17	0.39
<b>Education</b>	Bachelor degree	1	0.00	0.22	0.99
<b>Education</b>	Graduate/Professional degree	1	-0.49	0.24	<b>0.04</b>
<b>Income</b>	\$100,000 or more	1	-0.40	0.30	0.19
<b>Income</b>	\$50,000-\$99,999	1	-0.18	0.31	0.56
<b>Age</b>	25-44	1	-0.37	0.41	0.38
<b>Age</b>	45-64	1	-0.22	0.42	0.61
<b>Age</b>	65 or older	1	0.29	0.81	0.72
<b>Employment</b>	Full-time employed	1	0.33	0.29	0.26
<b>Average_Distance</b>		1	0.00	0.00	0.38
<b>Peak_Hour</b>		1	0.00	0.00	0.23
<b>Weekday</b>		1	0.00	0.01	0.72
<b>Phase2_Count</b>		1	-0.03	0.01	<b>0.04</b>

**TTR Ratings Statement 3: The Information from the Transportation Study Resource did NOT Reduce the Amount of Travel Time I Plan for my Trips**

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants’ disagreement (rather than agreement) with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 52. Model results – travel time reliability rating: did NOT reduce planned travel time.**

Parameter		DF	Estimate	Standard Error	P-Value
<b>Intercept</b>	1	1	0.06	0.77	0.94
<b>Intercept</b>	2	1	1.27	0.77	0.10
<b>Location</b>	Columbus	1	0.08	0.32	0.79
<b>Location</b>	Houston	1	0.07	0.33	0.83
<b>Treatment_Assembly</b>	Assembly A	1	0.09	0.19	0.65
<b>Treatment_Mode</b>	511 access	1	-0.19	0.25	0.43
<b>Treatment_Mode</b>	App access	1	0.28	0.22	0.21
<b>Gender</b>	Female	1	-0.17	0.20	0.39
<b>Education</b>	Bachelor degree	1	-0.45	0.24	0.06
<b>Education</b>	Graduate/ Professional degree	1	-0.68	0.28	<b>0.01</b>
<b>Income</b>	\$100,000 or more	1	-0.06	0.31	0.84
<b>Income</b>	\$50,000-\$99,999	1	-0.02	0.31	0.94
<b>Age</b>	25-44	1	-0.16	0.39	0.68
<b>Age</b>	45-64	1	-0.63	0.41	0.13
<b>Age</b>	65 or older	1	-0.59	0.86	0.49
<b>Employment</b>	Full-time employed	1	-0.08	0.31	0.81
<b>Average_Distance</b>		1	0.00	0.01	0.81
<b>Peak_Hour</b>		1	0.00	0.00	0.40
<b>Weekday</b>		1	-0.01	0.01	0.22
<b>Phase2_Count</b>		1	-0.05	0.02	<b>0.00</b>

**TTR Ratings Statement 4: Overall, the Information I Received from the Transportation Study Resource was Useful**

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants’ agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 53. Model results – travel time reliability rating: information useful.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	2.08	0.73	0.00
<b>Intercept</b>		2	2.76	0.74	0.00
<b>Location</b>	Columbus	1	0.04	0.26	0.87
<b>Location</b>	Houston	1	-0.14	0.27	0.59
<b>Treatment_Assembly</b>	Assembly A	1	-0.24	0.16	0.13
<b>Treatment_Mode</b>	511 access	1	-0.53	0.20	<b>0.01</b>
<b>Treatment_Mode</b>	App access	1	0.12	0.19	0.52
<b>Gender</b>	Female	1	0.03	0.16	0.86
<b>Education</b>	Bachelor degree	1	-0.44	0.21	<b>0.04</b>
<b>Education</b>	Graduate/Professional degree	1	-0.76	0.24	<b>0.00</b>
<b>Income</b>	\$100,000 or more	1	-0.25	0.28	0.38
<b>Income</b>	\$50,000-\$99,999	1	0.20	0.29	0.48
<b>Age</b>	25-44	1	-0.66	0.39	0.09
<b>Age</b>	45-64	1	-0.43	0.40	0.28
<b>Age</b>	65 or older	1	-0.10	0.71	0.88
<b>Employment</b>	Full-time employed	1	0.57	0.28	<b>0.04</b>
<b>Average_Distance</b>		1	0.00	0.00	0.65
<b>Peak_Hour</b>		1	0.00	0.00	0.21
<b>Weekday</b>		1	-0.01	0.01	0.44
<b>Phase2_Count</b>		1	-0.04	0.01	<b>0.00</b>

**TTR Ratings Statement 5: In General, Information from the Transportation Study Resource Helped me Reduce my Travel Time**

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants’ agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 54. Model results – travel time reliability rating: information helped reduce travel time.**

Parameter		DF	Estimate	Standard Error	P-Value
<b>Intercept</b>	1	1	0.60	0.69	0.39
<b>Intercept</b>	2	1	1.72	0.69	0.01
<b>Location</b>	Columbus	1	-0.16	0.27	0.55
<b>Location</b>	Houston	1	-0.11	0.27	0.70
<b>Treatment_Assembly</b>	Assembly A	1	-0.02	0.16	0.91
<b>Treatment_Mode</b>	511 access	1	-0.08	0.21	0.70
<b>Treatment_Mode</b>	App access	1	0.42	0.19	<b>0.03</b>
<b>Gender</b>	Female	1	-0.23	0.17	0.17
<b>Education</b>	Bachelor degree	1	-0.43	0.21	<b>0.04</b>
<b>Education</b>	Graduate/Professional degree	1	-0.69	0.24	<b>0.00</b>
<b>Income</b>	\$100,000 or more	1	-0.47	0.27	0.09
<b>Income</b>	\$50,000-\$99,999	1	-0.20	0.27	0.46
<b>Age</b>	25-44	1	-0.11	0.35	0.75
<b>Age</b>	45-64	1	-0.12	0.37	0.74
<b>Age</b>	65 or older	1	-0.14	0.71	0.85
<b>Employment</b>	Full-time employed	1	0.16	0.28	0.55
<b>Average_Distance</b>		1	0.00	0.00	0.87
<b>Peak_Hour</b>		1	0.00	0.00	0.13
<b>Weekday</b>		1	0.00	0.01	0.54
<b>Phase2_Count</b>		1	-0.04	0.01	<b>0.00</b>



**TTR Ratings Statement 6: In General, Information from the Transportation Study Resource Helped me Avoid Congestion**

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants’ agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 55. Model results – travel time reliability rating: helped to avoid congestion.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>	1	1	0.42	0.69	0.54
<b>Intercept</b>	2	1	1.26	0.69	0.07
<b>Location</b>	Columbus	1	-0.07	0.26	0.80
<b>Location</b>	Houston	1	0.02	0.27	0.93
<b>Treatment_Assembly</b>	Assembly A	1	0.01	0.16	0.93
<b>Treatment_Mode</b>	511 access	1	0.03	0.20	0.89
<b>Treatment_Mode</b>	App access	1	0.38	0.19	<b>0.05</b>
<b>Gender</b>	Female	1	-0.07	0.16	0.68
<b>Education</b>	Bachelor degree	1	-0.33	0.20	0.11
<b>Education</b>	Graduate/Professional degree	1	-0.39	0.23	0.09
<b>Income</b>	\$100,000 or more	1	-0.26	0.27	0.34
<b>Income</b>	\$50,000-\$99,999	1	0.06	0.28	0.82
<b>Age</b>	25-44	1	-0.22	0.35	0.53
<b>Age</b>	45-64	1	-0.16	0.36	0.66
<b>Age</b>	65 or older	1	0.25	0.69	0.71
<b>Employment</b>	Full-time employed	1	0.18	0.27	0.52
<b>Average_Distance</b>		1	0.00	0.00	0.74
<b>Peak_Hour</b>		1	-0.01	0.00	<b>0.00</b>
<b>Weekday</b>		1	0.00	0.01	0.68
<b>Phase2_Count</b>		1	-0.02	0.01	0.06

**TTR Ratings Statement 7: Information from the Transportation Study Resource Reduced the Stress of my Trip**

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants’ agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 56. Model results – travel time reliability rating: helped to reduce stress.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	-0.26	0.67	0.70
<b>Intercept</b>		2	1.21	0.68	0.07
<b>Location</b>	Columbus	1	0.23	0.25	0.37
<b>Location</b>	Houston	1	-0.06	0.26	0.81
<b>Treatment_Assembly</b>	Assembly A	1	-0.18	0.16	0.25
<b>Treatment_Mode</b>	511 access	1	-0.17	0.20	0.37
<b>Treatment_Mode</b>	App access	1	0.04	0.19	0.83
<b>Gender</b>	Female	1	-0.09	0.16	0.59
<b>Education</b>	Bachelor degree	1	-0.18	0.20	0.36
<b>Education</b>	Graduate/Professional degree	1	-0.49	0.23	<b>0.03</b>
<b>Income</b>	\$100,000 or more	1	-0.40	0.26	0.13
<b>Income</b>	\$50,000-\$99,999	1	0.10	0.27	0.70
<b>Age</b>	25-44	1	0.20	0.35	0.57
<b>Age</b>	45-64	1	0.19	0.36	0.60
<b>Age</b>	65 or older	1	0.53	0.68	0.44
<b>Employment</b>	Full-time employed	1	0.12	0.27	0.66
<b>Average_Distance</b>		1	0.00	0.00	0.55
<b>Peak_Hour</b>		1	-0.01	0.00	<b>0.00</b>
<b>Weekday</b>		1	0.00	0.01	0.84
<b>Phase2_Count</b>		1	-0.03	0.01	<b>0.02</b>

**TTR Ratings Statement 8: Information from the Transportation Study Resource Helped me Plan my Trips**

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants’ agreement with the statement and to account for exogenous factors regarding demographic and trip characteristics.

**Table 57. Model results – travel time reliability rating: helped me to plan trips.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>	1	1	0.34	0.69	0.62
<b>Intercept</b>	2	1	1.18	0.69	0.09
<b>Location</b>	Columbus	1	0.06	0.26	0.81
<b>Location</b>	Houston	1	0.12	0.26	0.66
<b>Treatment_Assembly</b>	Assembly A	1	0.02	0.16	0.90
<b>Treatment_Mode</b>	511 access	1	-0.52	0.20	<b>0.01</b>
<b>Treatment_Mode</b>	App access	1	0.07	0.19	0.70
<b>Gender</b>	Female	1	0.06	0.16	0.72
<b>Education</b>	Bachelor degree	1	-0.40	0.20	<b>0.05</b>
<b>Education</b>	Graduate/Professional degree	1	-0.41	0.23	0.07
<b>Income</b>	\$100,000 or more	1	-0.34	0.27	0.21
<b>Income</b>	\$50,000-\$99,999	1	0.32	0.28	0.24
<b>Age</b>	25-44	1	-0.17	0.36	0.64
<b>Age</b>	45-64	1	0.07	0.37	0.85
<b>Age</b>	65 or older	1	-0.14	0.70	0.85
<b>Employment</b>	Full-time employed	1	0.65	0.28	<b>0.02</b>
<b>Average_Distance</b>		1	0.00	0.00	0.66
<b>Peak_Hour</b>		1	-0.01	0.00	<b>0.02</b>
<b>Weekday</b>		1	0.00	0.01	0.65
<b>Phase2_Count</b>		1	-0.03	0.01	<b>0.01</b>

### Satisfaction with Estimated/Approximate Travel Time

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants' satisfaction with the trip experience and to account for exogenous factors regarding demographic and trip characteristics.

**Table 58. Model results – satisfaction with estimated travel time.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	1.70	0.79	0.03
<b>Intercept</b>		2	2.66	0.79	0.00
<b>Location</b>	Columbus	1	0.56	0.27	<b>0.04</b>
<b>Location</b>	Houston	1	-0.26	0.27	0.33
<b>Treatment_Assembly</b>	Assembly A	1	-0.31	0.17	0.07
<b>Treatment_Mode</b>	511 access	1	-0.27	0.21	0.20
<b>Treatment_Mode</b>	App access	1	0.05	0.20	0.80
<b>Gender</b>	Female	1	0.08	0.17	0.64
<b>Education</b>	Bachelor degree	1	0.34	0.22	0.12
<b>Education</b>	Graduate/Professional degree	1	0.04	0.24	0.86
<b>Income</b>	\$100,000 or more	1	-0.27	0.30	0.36
<b>Income</b>	\$50,000-\$99,999	1	0.32	0.31	0.30
<b>Age</b>	25-44	1	-0.67	0.43	0.12
<b>Age</b>	45-64	1	-0.59	0.44	0.17
<b>Age</b>	65 or older	1	-0.16	0.82	0.85
<b>Employment</b>	Full-time employed	1	0.25	0.30	0.40
<b>Average_Distance</b>		1	0.00	0.00	0.82
<b>Peak_Hour</b>		1	0.00	0.00	0.32
<b>Weekday</b>		1	0.00	0.01	0.55
<b>Phase2_Count</b>		1	-0.01	0.01	0.29

### Satisfaction with Extra Time/Recommended Cushion

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants' satisfaction with the trip experience and to account for exogenous factors regarding demographic and trip characteristics.

**Table 59. Model results – satisfaction with the extra time/recommended cushion from travel time reliability.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>	1	1	1.55	0.73	0.03
<b>Intercept</b>	2	1	2.98	0.74	<0.005
<b>Location</b>	Columbus	1	0.11	0.26	0.66
<b>Location</b>	Houston	1	-0.24	0.27	0.38
<b>Treatment_Assembly</b>	Assembly A	1	-0.29	0.16	0.07
<b>Treatment_Mode</b>	511 access	1	-0.27	0.20	0.18
<b>Treatment_Mode</b>	App access	1	-0.03	0.19	0.88
<b>Gender</b>	Female	1	0.16	0.17	0.33
<b>Education</b>	Bachelor degree	1	-0.17	0.21	0.42
<b>Education</b>	Graduate/Professional degree	1	-0.38	0.24	0.11
<b>Income</b>	\$100,000 or more	1	-0.29	0.28	0.30
<b>Income</b>	\$50,000-\$99,999	1	0.25	0.29	0.39
<b>Age</b>	25-44	1	-0.26	0.38	0.49
<b>Age</b>	45-64	1	-0.16	0.39	0.68
<b>Age</b>	65 or older	1	-0.04	0.72	0.95
<b>Employment</b>	Full-time employed	1	0.05	0.28	0.87
<b>Average_Distance</b>		1	0.00	0.00	0.42
<b>Peak_Hour</b>		1	0.00	0.00	0.47
<b>Weekday</b>		1	0.00	0.01	0.58
<b>Phase2_Count</b>		1	-0.02	0.01	0.21

## Satisfaction with Recommended/Suggested Departure Time

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants' satisfaction with the trip experience and to account for exogenous factors regarding demographic and trip characteristics.

**Table 60. Model results – satisfaction with the recommended departure time.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>	1	1	1.25	0.72	0.08
<b>Intercept</b>	2	1	2.71	0.73	0.00
<b>Location</b>	Columbus	1	0.04	0.27	0.89
<b>Location</b>	Houston	1	-0.13	0.27	0.64
<b>Treatment_Assembly</b>	Assembly A	1	-0.24	0.16	0.15
<b>Treatment_Mode</b>	511 access	1	-0.51	0.20	<b>0.01</b>
<b>Treatment_Mode</b>	App access	1	-0.12	0.20	0.53
<b>Gender</b>	Female	1	0.03	0.17	0.87
<b>Education</b>	Bachelor degree	1	-0.24	0.21	0.25
<b>Education</b>	Graduate/Professional degree	1	-0.38	0.24	0.11
<b>Income</b>	\$100,000 or more	1	-0.19	0.28	0.50
<b>Income</b>	\$50,000-\$99,999	1	0.37	0.29	0.20
<b>Age</b>	25-44	1	-0.52	0.38	0.18
<b>Age</b>	45-64	1	-0.64	0.39	0.10
<b>Age</b>	65 or older	1	-0.97	0.70	0.17
<b>Employment</b>	Full-time employed	1	0.30	0.28	0.28
<b>Average_Distance</b>		1	0.00	0.00	0.77
<b>Peak_Hour</b>		1	-0.01	0.00	<b>0.01</b>
<b>Weekday</b>		1	0.00	0.01	0.70
<b>Phase2_Count</b>		1	-0.02	0.01	0.17

### Satisfaction with Total Travel Time Estimate for Most/Majority of the Time

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants' satisfaction with the trip experience and to account for exogenous factors regarding demographic and trip characteristics.

**Table 61. Model results – satisfaction with total travel time.**

Parameter	Level	DF	Estimate	Standard Error	P-Value
<b>Intercept</b>	1	1	0.74	0.74	0.31
<b>Intercept</b>	2	1	1.81	0.74	0.01
<b>Location</b>	Columbus	1	0.38	0.27	0.16
<b>Location</b>	Houston	1	-0.31	0.27	0.25
<b>Treatment_Assembly</b>	Assembly A	1	-0.12	0.17	0.48
<b>Treatment_Mode</b>	511 access	1	-0.17	0.20	0.39
<b>Treatment_Mode</b>	App access	1	0.23	0.20	0.25
<b>Gender</b>	Female	1	0.24	0.17	0.16
<b>Education</b>	Bachelor degree	1	0.11	0.22	0.61
<b>Education</b>	Graduate/Professional degree	1	0.01	0.24	0.97
<b>Income</b>	\$100,000 or more	1	-0.28	0.28	0.33
<b>Income</b>	\$50,000-\$99,999	1	0.40	0.30	0.18
<b>Age</b>	25-44	1	-0.31	0.39	0.43
<b>Age</b>	45-64	1	-0.17	0.40	0.67
<b>Age</b>	65 or older	1	0.00	0.76	1.00
<b>Employment</b>	Full-time employed	1	0.15	0.29	0.59
<b>Average_Distance</b>		1	0.00	0.00	0.34
<b>Peak_Hour</b>		1	-0.01	0.00	0.08
<b>Weekday</b>		1	0.00	0.01	0.67
<b>Phase2_Count</b>		1	-0.02	0.01	0.17

## Satisfaction with Trips while Using the Transportation Study Resource

Ordinal logistic regression modeling was applied to quantify the impacts of lexicon and information channel in participants' satisfaction with the trip experience and to account for exogenous factors regarding demographic and trip characteristics.

**Table 62. Model results – satisfaction on the trips with travel time reliability resources.**

Parameter		DF	Estimate	Standard Error	P-Value
<b>Intercept</b>		1	2.90	0.82	0.00
<b>Intercept</b>		2	4.24	0.83	<0.005
<b>Location</b>	Columbus	1	0.07	0.28	0.80
<b>Location</b>	Houston	1	-0.65	0.28	<b>0.02</b>
<b>Treatment_Assembly</b>	Assembly A	1	-0.15	0.17	0.37
<b>Treatment_Mode</b>	511 access	1	-0.07	0.21	0.74
<b>Treatment_Mode</b>	App access	1	0.14	0.20	0.49
<b>Gender</b>	Female	1	0.01	0.17	0.96
<b>Education</b>	Bachelor degree	1	-0.07	0.23	0.76
<b>Education</b>	Graduate/Professional degree	1	-0.51	0.25	<b>0.04</b>
<b>Income</b>	\$100,000 or more	1	-0.08	0.30	0.79
<b>Income</b>	\$50,000-\$99,999	1	0.17	0.31	0.59
<b>Age</b>	25-44	1	-0.49	0.43	0.26
<b>Age</b>	45-64	1	-0.33	0.44	0.45
<b>Age</b>	65 or older	1	-1.44	0.73	<b>0.05</b>
<b>Employment</b>	Full-time employed	1	0.11	0.31	0.72
<b>Average_Distance</b>		1	-0.01	0.00	<b>0.03</b>
<b>Peak_Hour</b>		1	-0.01	0.00	<b>0.01</b>
<b>Weekday</b>		1	-0.01	0.01	0.44
<b>Phase2_Count</b>		1	-0.02	0.01	0.07







U.S. Department of Transportation  
**Federal Highway Administration**

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Office of Operations (HOP)  
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