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Intercity Travel in Northeastern Rural Regions of the U.S.

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Neely, Lee, Sentoff

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Prepared by:

Sean Neely, Graduate Research Assistant

Brian H. Y. Lee, Assistant Professor, Transportation Research Center & School of Engineering

Karen Sentoff, Research Specialist, Transportation Research Center

Transportation Research Center
Farrell Hall
210 Colchester Ave
Burlington, VT 05405

Phone: (802) 656-1312
Website: http://www.uvm.edu/trc

Table of Contents

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Disclaimer

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1. Introduction

Much research exists on intercity travel behavior between large metropolitan centers. There is an opportunity for more research on travel from less populated areas to large metropolitan ones. When planning a trip from Northern New England to major cities in the Northeast, there are often several transportation options to consider. This work considers the relationship between information access and attitudes about transportation options for this type of travel, using automobile, intercity bus, and passenger rail. The report explores relationships between access to information and attitudes about traveling from Northern New England to major cities in the Northeast United States by automobile, intercity bus and passenger rail, taking into account gender, education level, and age group.

The primary research question is: What can we learn about the relationship between access to trip planning information, and people's attitudes about traveling from Northern New England to major cities in the Northeast by automobile, bus, and passenger rail?

Study Objective: The primary objective of this research is to examine the intersections between access to information, personal technology use, and intercity travel where public ground transportation is a viable option.

Study Goals:

- First, little is known about intercity travel behavior outside of travel between major metropolitan areas; this work considers travel originating from Northern New England (Vermont, New Hampshire, Main, and Massachusetts - excluding the Boston-Cambridge-Quincy Metropolitan Statistical Area) and going to Boston, New York, Philadelphia, and Washington, DC.
- Second, there has been limited research on the role that access to information, about travel options, could play in the trip-making decision process of intercity travelers. This study explores that role and provides a dataset that can be used to further examine the relationship between information, technology, and intercity travel behavior.
- Third, this research incorporates attitudinal and behavioral components, captured from the survey data. This can be used for future research considering the travel demand analysis process.
- Fourth, this work included developing a multimodal network dataset covering the study region. The dataset can be used for future research examining multimodal accessibility from throughout the study region, to large metropolitan areas.

Section 2 of this report will introduce and describe the survey instrument and survey sample from the Intercity Travel, Information, and Technology Survey Questionnaire, a primary component of the research described in this report. Section 3 of this report presents the preliminary analysis of the survey data, describing significant differences in responses identified between the control and test groups of the survey respondents. Differences are presented overall, and broken down by gender, education level, and age group, for each section of the survey. Changes in attitudes about mode choice, identified during the course of the survey, are also presented. Section 4 of this report describes a multimodal network dataset that was assembled for the study region as part of this project. Section 5 of this report discusses future research opportunities, based on the results of the work presented here.

2. Intercity Travel, Information, and Technology Survey Questionnaire

Resource Systems Group (RSG) conducted a travel survey on behalf of the University of Vermont's Transportation Research Center (UVM TRC) and the New England Transportation Institute (NETI) in 2014. This survey concerned trips from Northern New England to four major cities in the Northeast: Boston, New York City, Philadelphia, and Washington DC. Surveying took place from May 1 through May 16. Respondents were recruited via email by Research Now, an online research firm based in Plano, Texas, and directed to RSG's survey platform.

2.1. Survey Instrument

The survey had questions on actual trips taken, a hypothetical trip to New York City, and attitudes about traveling by automobile, intercity bus, and passenger rail. There were a total of 98 questions plus a home zip code question that determined respondent eligibility for inclusion in the survey. At approximately halfway through the survey, the respondents were split into two groups. The test group had access to an intercity travel planning web tool, designed with this survey. The tool had scheduling options for traveling to New York City by intercity bus and rail. The control group did not have access to the planning tool. There were five questions, specific to the travel planning web tool, that only members of the test group, but not members of the control group, were asked. The survey instrument can be found in Appendix A.

The travel survey sampling protocol relied on respondent panels from Research Now to recruit residence from four New England states: Maine, New Hampshire, Vermont, and Massachusetts, outside of the Boston metropolitan area [Boston-Cambridge-Quincy Metropolitan Statistical Area (MSA)]. The survey was developed by the UVM TRC, NETI, and RSG. The intercity travel planning web tool was developed by RSG. A total of 2,560 valid survey responses were collected.

The survey was organized into four parts:

Part 1: Recent intercity travel trips and general travel preferences

Section 1-A: Questions about recent trips

Section 1-B: Questions about the survey respondent's most recent trip to Boston, New York City, Philadelphia, or Washington DC

Section 1-C: General travel and communication questions about the survey respondent and their household

Part 2: Travel preferences

Part 3: An imaginary situation

Part 4: Other information about the survey respondent and their household

Part 1 of the survey asked 13 questions about recent intercity travel trips and general travel preferences. For many questions, respondents were able to select all relevant answers from a list. For example, selecting which modes of transportation they have used for recent trips. Other questions allowed respondents to choose a relevant frequency or quantity (e.g., the number of trips to each city in the last twelve months, or the number of people and licensed drivers living in their household).

Part 2 included what is known in the Theory of Planned Behavior (TPB) as an elicitation. A list of 35 statements about intercity travel preferences was provided, many regarding a specific utility or disutility pertaining to a certain mode. Respondents were asked to select how much they agree or disagree with each statement on a Likert scale from 1 (completely agree) to 7 (completely disagree). Statements were randomized for each respondent, and shown ten at a time.

Part 3 presented a fictional scenario, in which someone has asked the respondent to travel from their home to Manhattan, in New York City (NYC), for an important appointment during the following month, and the respondent has decided to go. They would stay one night at a hotel and travel alone. The host would pay for the hotel costs, but not for travel. The respondent would be responsible for all costs of gas, parking, or any fares. The respondent was asked to assume that, for one reason or another, they had already decided that they would not take any part of the trip by plane. They would then need to choose between taking the entire trip by car (whether or not it was their own vehicle) and taking at least part of the trip by intercity bus or train.

All respondents were asked to select what mode(s) of transportation they thought were available to them for this trip to NYC, how likely they would choose to take a bus or train for a trip like this to NYC, and whether learning that no WiFi or electrical outlets were available on the bus or train would make them less likely to choose a bus or a train for this trip.

At this point, respondents were randomly selected to be in the control group or the test group. Random bias was checked to select an even split within each state of residence. The test group was then provided a link to review an intercity travel planning web tool related to their imaginary trip to NYC. The website showed respondents scheduling options from their home location to Times Square, New York City, by combinations of bus and rail. After having reviewed the web tool, respondents were asked to close the web tool and proceed with the remainder of the survey. The control group did not have access to the web planning tool. The test group was then provided with four statements about travel options and information availability, and asked to select how much they agree or disagree with each statement on a similar Likert scale as earlier. Next, both groups were asked to continue imagining the trip to NYC, and were given another series of 35 statements about attitudes related to intercity travel, to select their level of agreement on the same scale.

Respondents were then asked how likely they were, on the seven-point Likert scale, to choose a bus or train for a trip to NYC the next month, like the one described in the imaginary situation. For test group members who gave a different level of likeliness to take the train or bus to NYC, than they had earlier, they were asked to comment on the reasons why, and were provided an open-ended comment field. Respondents were then asked how seriously they would consider taking a bus or train to NYC, in real life.

Part 4 included five questions about what personal technology devices respondents own, and their demographics: age group, gender, level of education, and annual household income level.

A data dictionary showing all questions and response options for the survey questionnaire is available in Appendix B.

2.2. Survey Sample

The figure below (Figure 1) shows the study area, made up of zip code locations for survey respondents, and the four destination cities.

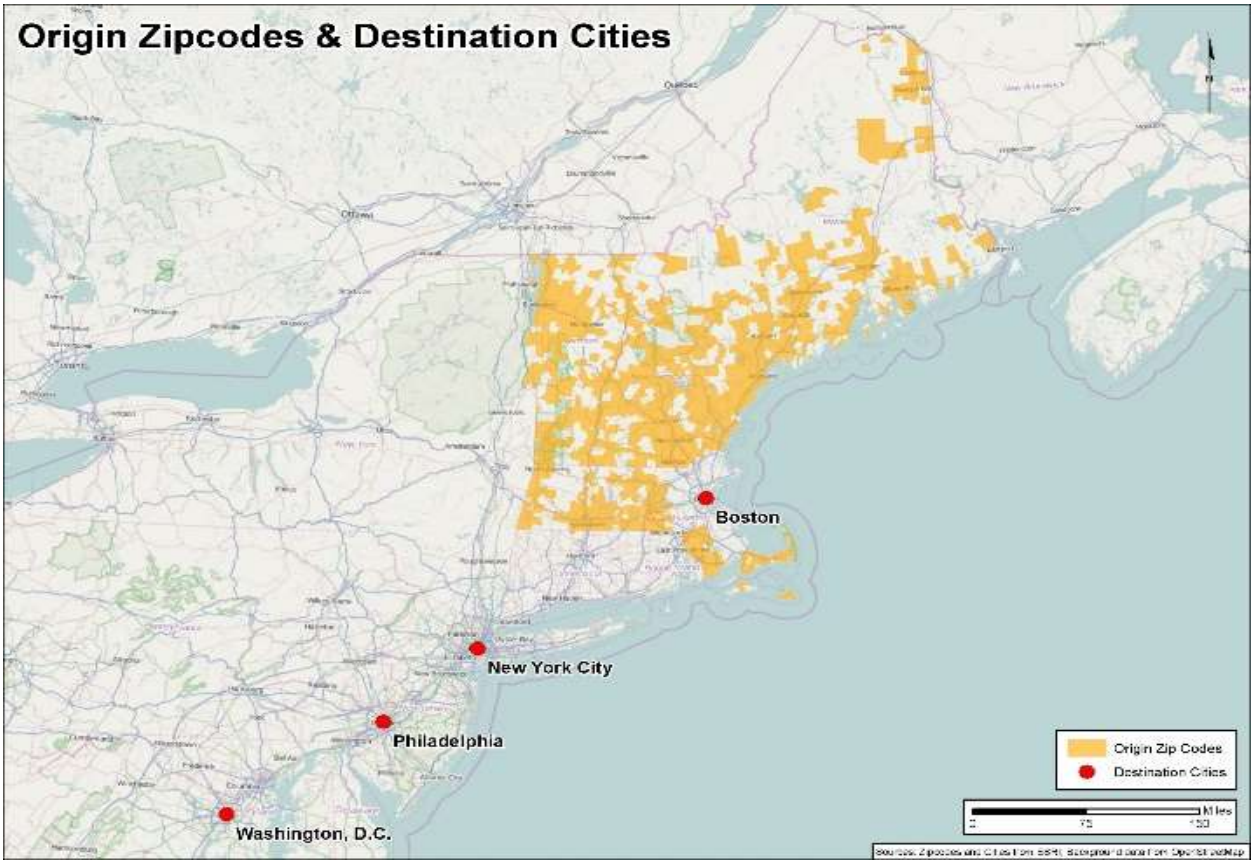

Figure 1. Survey Sample: Home (Origin) Zip Codes & Destination Cities

Table 1 and Figure 2 below show the number of respondents from each state, for both the control and test groups. Massachusetts had the highest number of respondents, followed by New Hampshire, Maine, and Vermont, respectively.

Table 1 Responses by State and Control/Test Groups

Residence	Control	Test
ME	260	261
NH	363	364
VT	187	188
MA	468	469

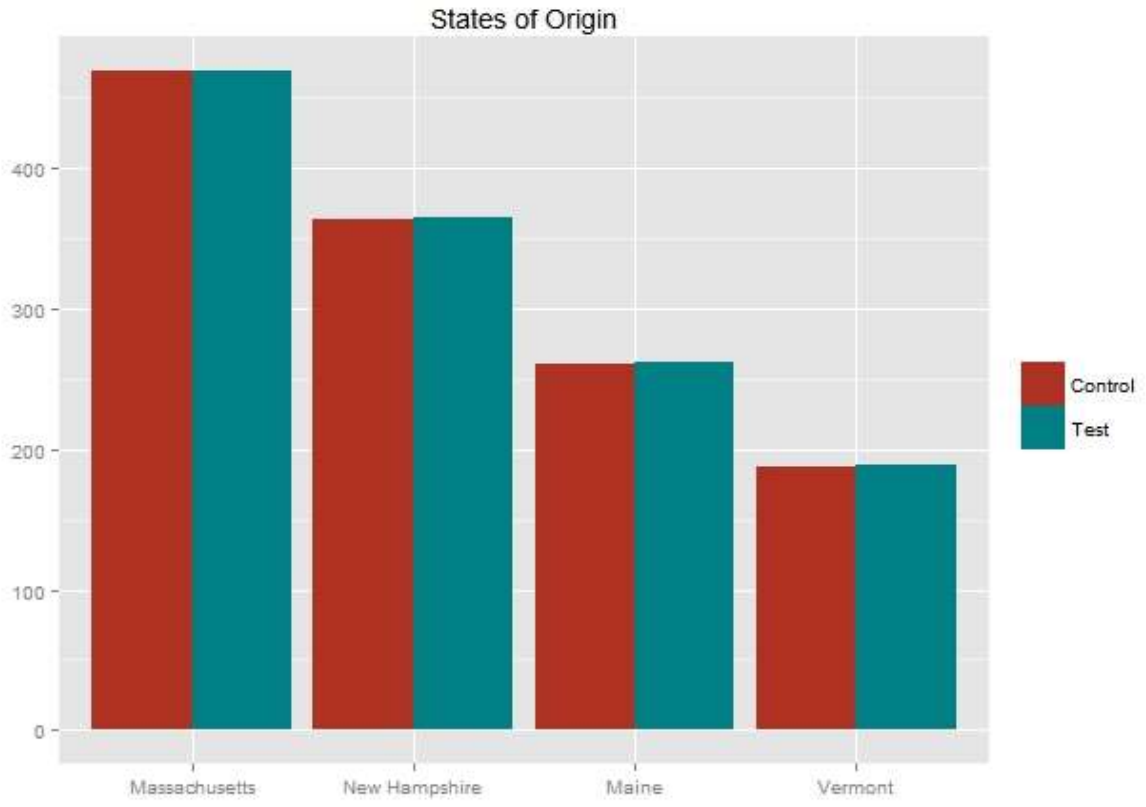

Figure 2. Responses by State and Control/Test Groups

Differences between control and test groups were examined by each age category except for ages 18-24, 75-84, and 85 or older, based on the respective sample sizes shown in

Table 2 and Figure 3 below. The distribution of ages between the control and test groups were not all the same, with marked differences for ages 45-54 and 65-74. The test group had more respondents in the 45-54 group, while the control group had more respondents in the 65-74 group.

Table 2 Responses by Age and Control/Test Groups

Age	Control	Test
18-24	30	35
25-34	176	183
35-44	178	198
45-54	263	300
55-64	353	342
65-74	236	195
75-84	36	28
85 or older	6	1

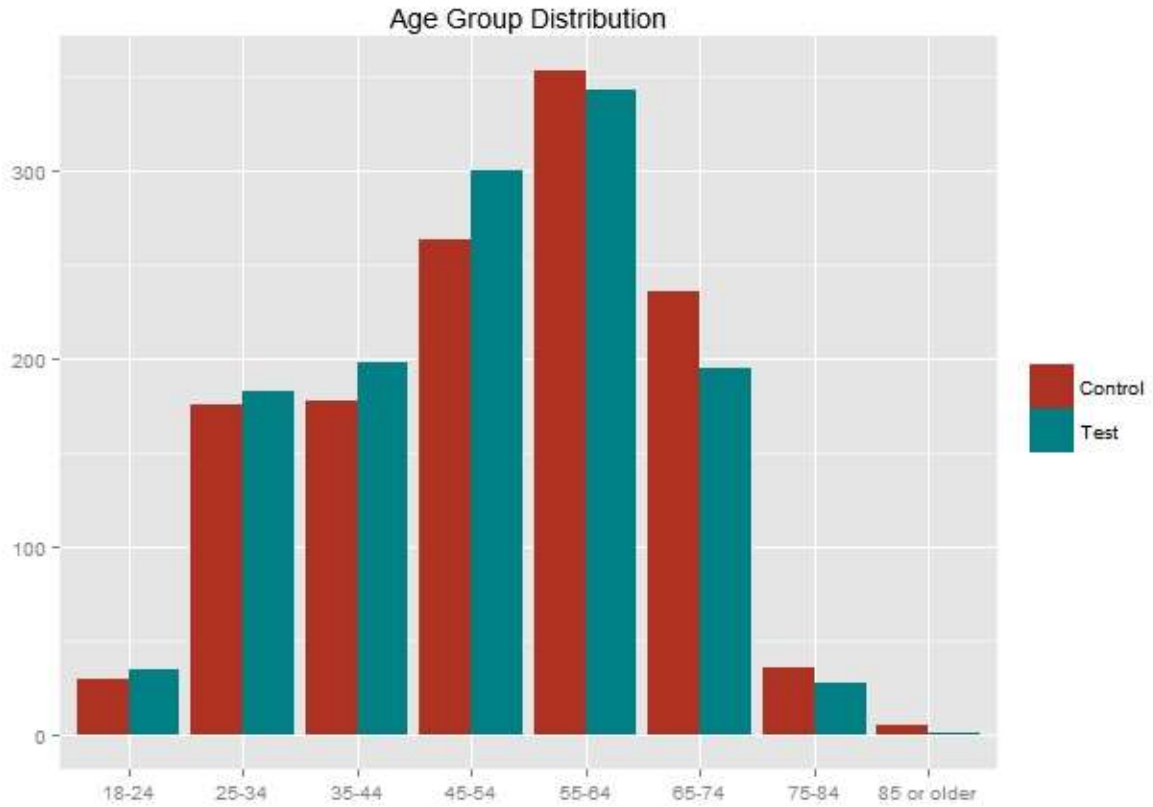

Figure 3. Responses by Age and Control/Test Groups

Differences between control and test groups were examined by each education category, grouping the first two into one, as "High school or less", based on the respective sample sizes shown in Table 3 and Figure 4 below. The distribution of education levels between the control and test groups were not all the same. There were more respondents with graduate or professional degrees in the test group, and more with associate degrees or some college, no degree, in the control group.

Table 3 Responses by Education and Control/Test Groups

	Education	Control	Test
1	Less than high school diploma	7	8
2	High school diploma or equivalen	124	126
3	Some college, no degree	240	215
4	Associate degree	137	104
5	Bachelor's degree	423	440
6	Graduate or professional degree	347	389

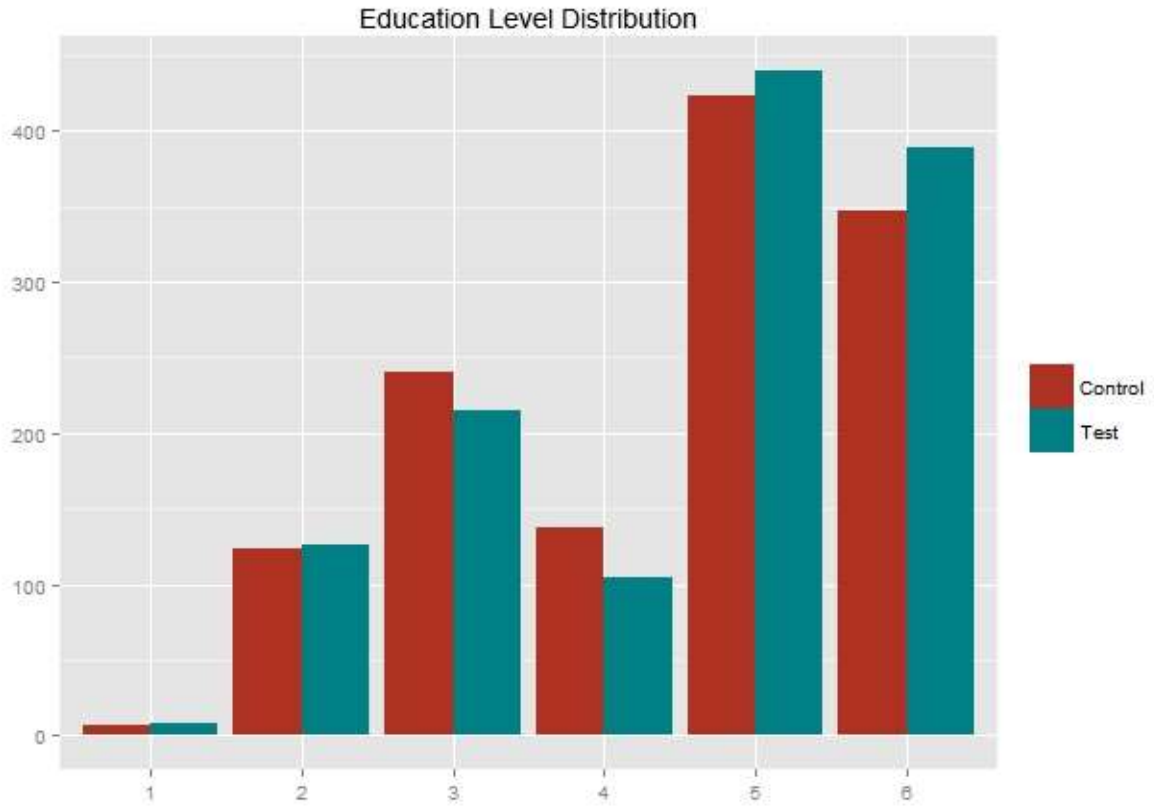

Figure 4. Responses by Education and Control/Test Groups

In addition to the information obtained from the survey data, several additional attributes were added, using available data and geographic information systems (GIS), for each zip code. These attributes included demographic information, land use, distances to destination cities, distances to the nearest urbanized areas within a metropolitan area, and distances to airports, rail stations, and bus stations of different sizes and types.

3. Preliminary Analysis

The survey data was first validated prior to analysis. Data validation included checking for the number of responses for each question, missing values, unique values, assessing the frequency distributions of the data set, and screening the amount of time taken to complete the survey, for each respondent. The survey data descriptive summary can be found in Appendix C.

The survey response data was analyzed, using the R statistical package, for overall differences in responses between the control and test groups. Differences in responses between the control and test groups were also examined by gender, age group, and education level. The responses were tested for differences using the Wilcoxan rank sum test, which does not assume a normal distribution, and compares the median between the two groups. Survey questions that showed a p-value of 0.1 or less, from the Wilcoxan rank sum tests, were flagged for review. The p-value threshold of 0.1 was chosen to be more inclusive, at this stage of analysis, than would have resulted from a more traditional p-value of 0.05.

3.1. Part 1: Recent Intercity Travel Trips and General Travel Preferences

3.1.1. Testing for Overall Differences

Table 4 below shows significant differences overall in the responses provided by the control and test groups, based on the results of the Wilcoxan rank sum tests.

Table 4 Statistical Differences between the Control and Test Groups

Survey Question		
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	
1	How many times have you visited one of the following cities in the past 12 months?	
	Visits to Boston in past year	
	Visits to New York in past year	
	Visits to Philadelphia in past year	
	Visits to Washington DC in past year	
2	What mode(s) of transportation have you used for your trip(s) to each city in the past twelve months?	
	Boston: Personal Auto/Car	○

Survey Question		
Significance:	**** 0.0001	*** 0.001	** 0.01	* 0.05	○ 0.1
	Boston: Rental Car (including car share) or borrowed car	
	Boston: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)	
	Boston: Intercity rail (e.g., Amtrak)	
	Boston: Airplane	
	Boston: Other	
	New York City: Personal Auto/Car	
	New York City: Rental Car (including car share) or borrowed car	
	New York City: Intercity Bus (e.g., Greyhound, Peter Pan, Megabus)	
	New York City: Intercity Rail (e.g., Amtrak)	
	New York City: Airplane	
	New York City: Other	
	Philadelphia: Personal Auto/Car	
	Philadelphia: Rental Car (including car share) or borrowed car	
	Philadelphia: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)	
	Philadelphia: Intercity rail (e.g., Amtrak)	
	Philadelphia: Airplane	
	Philadelphia: Other	
	Washington DC: Personal Auto/Car	
	Washington DC: Rental Car (including car share) or borrowed car	
	Washington DC: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)	
	Washington DC: Intercity rail (e.g., Amtrak)	
	Washington DC: Airplane	
	Washington DC: Other	
3	3. *[If intercity bus or intercity rail selected for ANY city]* How do you usually get information about routes and schedules for bus or rail trips?	
	Use pamphlets or other printed material	
	Ask a friend or family member	○
	Visit the station	
	Call the bus or rail company	
	Search the internet	
	Use smart phone or tablet apps	
	Other, please specify	
4	*[if # of cities visited > 1]* Which city did you visit most recently?	
5	*[Skip if frequency to # cities visited = 1]* What mode(s) of transportation did you use for your MOST RECENT trip to <recent city>?	
	Personal auto/car	
	Rental car (including car share) or a borrowed car	
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)	
	Mode(s) used on most recent trip -Intercity rail (e.g., Amtrak)	
	Airplane	
	Other, please specify	
6	What was the purpose of your most recent trip to <recent city>?	
	Leisure/vacation	
	Visit friends	
	Business	○
	Family event	

Survey Question		
Significance:	**** 0.0001	*** 0.001	** 0.01	* 0.05	○ 0.1
	Other, please specify	
7	How many people travelled with you on your most recent trip to <recent city>?	
	Other adults (18 and over) on most recent trip	
	Children (under 18) on most recent trip	
8	*[if bus, rail, or plane trip]* How did you plan this trip and book your tickets?	
	Went to the airline, bus, or train website	
	Went to a travel website (e.g., Expedia.com, Kayak.com)	
	Called the airline, bus company, or train line	
	Through a travel agency	
	A friend or family member booked it for me	
	Other, please specify	
9	How many nights did you stay for your most recent trip to < recent city >?	
10	How many registered vehicles (in working order) are available to your household?	○
11	Do you have a driver's license?	
12	How many people live in your household? How many of you are licensed drivers?	
	# of adults in HH (18 and over)	○
	# of adults in HH: Licensed drivers	
	# of children in HH (under 18)	**
	# of children in HH: Licensed drivers	
13	How do you access the internet? *Please select all that apply.*	
	Internet service at home	*
	Internet service at school	
	Internet service at work	
	Public internet service (e.g., at the library, community center)	*
	Mobile device with a cellular data plan (e.g., smart phone, enabled tablet)	
	Other, please specify	

There are three statements shown to have differences, between the control and test groups, with a p-value of 0.05 or less. One of these statements shows a difference between these two groups with a p-value of 0.01. This statement indicates that members of the test group were more likely to have indicated there being more than one child (under 18 years old) in the household. The other two statements show a difference in response between those in the control and test groups at the traditional level of significance, with a p-value of 0.05. Both of these statements are related to how respondents access the internet. The first of these statements indicates that more respondents from the control group, than from the test group, selected having internet access at home. The second of these statements indicates that more respondents from the test group selected accessing the internet from public internet service (e.g., at the library, community center).

3.1.2. Testing by Gender

Table 5 below shows significant differences, in response tendencies between control and test groups by gender, based on the results of the Wilcoxan rank sum tests.

Table 5 Statistical Differences by Gender between the Control and Test Groups

Survey Question										**Gender**	
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○	0.1	**F**	**M**
1	How many times have you visited one of the following cities in the past 12 mo?											
	Visits to Boston in past year											
	Visits to New York in past year											
	Visits to Philadelphia in past year											
	Visits to Washington DC in past year											
2	What mode(s) of transportation have you used for your trip(s) to each city in the past twelve months?											
	Boston: Personal Auto/Car											
	Boston: Rental Car (including car share) or borrowed car											
	Boston: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)											
	Boston: Intercity rail (e.g., Amtrak)											
	Boston: Airplane											**
	Boston: Other											
	New York City: Personal Auto/Car											
	New York City: Rental Car (including car share) or borrowed car											
	New York City: Intercity Bus (e.g., Greyhound, Peter Pan, Megabus)											
	New York City: Intercity Rail (e.g., Amtrak)											
	New York City: Airplane											
	New York City: Other											
	Philadelphia: Personal Auto/Car											
	Philadelphia: Rental Car (including car share) or borrowed car											
	Philadelphia: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)											
	Philadelphia: Intercity rail (e.g., Amtrak)											
	Philadelphia: Airplane											
	Philadelphia: Other										○	
	Washington DC: Personal Auto/Car											
	Washington DC: Rental Car (including car share) or borrowed car											
	Washington DC: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)											
	Washington DC: Intercity rail (e.g., Amtrak)											
	Washington DC: Airplane											
	Washington DC: Other											*
3	3. *[If intercity bus or intercity rail selected for ANY city]* How do you usually get information about routes and schedules for bus or rail trips?											
	Use pamphlets or other printed material										○	*
	Ask a friend or family member										*	
	Visit the station											
	Call the bus or rail company											

Survey Question		Gender	
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	F	M
	Search the internet		
	Use smart phone or tablet apps		
	Other, please specify		
4	*[if # of cities visited > 1]* Which city did you visit most recently?		
5	*[Skip if frequency to # cities visited = 1]* What mode(s) of transportation did you use for your MOST RECENT trip to <recent city>?		
	Personal auto/car		
	Rental car (including car share) or a borrowed car		
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)		
	Mode(s) used on most recent trip -Intercity rail (e.g., Amtrak)		
	Airplane	*	
	Other, please specify		
6	What was the purpose of your most recent trip to <recent city>?		
	Leisure/vacation		
	Visit friends		
	Business		
	Family event		
	Other, please specify		
7	How many people travelled with you on your most recent trip to <recent city>?		
	Other adults (18 and over) on most recent trip		
	Children (under 18) on most recent trip		
8	*[if bus, rail, or plane trip]* How did you plan this trip and book your tickets?		
	Went to the airline, bus, or train website		
	Went to a travel website (e.g., Expedia.com, Kayak.com)		
	Called the airline, bus company, or train line		
	Through a travel agency		
	A friend or family member booked it for me		
	Other, please specify	○	
9	How many nights did you stay for your most recent trip to < recent city >?		
10	How many registered vehicles (in working order) are available to your household?		
11	Do you have a driver's license?		
12	How many people live in your household? How many of you are licensed drivers?		
	# of adults in HH (18 and over)	○	
	# of adults in HH: Licensed drivers		
	# of children in HH (under 18)	*	○
	# of children in HH: Licensed drivers		*
13	How do you access the internet? *Please select all that apply.*		
	Internet service at home		○
	Internet service at school		○
	Internet service at work		
	Public internet service (e.g., at the library, community center)		○
	Mobile device with a cellular data plan (e.g., smart phone, enabled tablet)		
	Other, please specify		*

Looking at differences in responses between female members of the control and test groups, there are differences shown between female respondents in control and test groups for three statements, with a p-value of 0.05, the traditional level of significance. The first of these statements indicates that more female respondents from the test group, than from the control group, usually ask a friend or family member to get information about routes or schedules for bus or rail trips. The second of these statements indicates that more female respondents from the control group, than from the test group, selected airplane as the mode of transportation used for their most recent trip to one of the study destination cities. The third of these statements indicates that more female respondents from the test group, than from the control group, were more likely to have indicated there being more than one child (under 18 years old) in the household.

Looking at differences in responses between male members of the control and test groups, there are differences shown between male respondents in control and test groups for six statements, with a p-value of 0.05 or less. The first of these statements shows a difference with a p-value of 0.01. This statement indicates that more males from the test group, than from the control group, selected taking an airplane to Boston in the past twelve months.

The remaining five statements show a difference between male respondents from the control and test groups, with a p-value of 0.05, the traditional level of significance. The first of these statements indicates that more males from the control group, than from the test group, selected 'other' as a transportation mode taken to Washington DC. The second of these statements indicates that more males from the test group, than from the control group, usually use pamphlets or other printed material to get information about routes and schedules for bus or rail trips. The third of these statements indicates that more males from the test group, than from the control group, were more likely to have indicated there being more than one licensed child in their household. The fourth and fifth of these statements indicates more males from the test group, than from the control group, selected 'other' as a way they access the internet.

3.1.3. Testing by Education Level

Table 6 below shows significant differences, in response tendencies between control and test groups by education level, based on the results of the Wilcoxan rank sum tests.

Table 6 Statistical Differences by Education Level between the Control and Test Groups

Survey Question										**Education Level**				
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	**H[1]**	**C[1]**	**A[1]**	**B[1]**	**G[1]**
1	How many times have you visited one of the following cities in the past													

[1] H = high school or less, C = some college, A = associate degree, B = bachelor's degree, G = grad./prof. degree

Survey Question		Education Level				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	H[1]	C[1]	A[1]	B[1]	G[1]
	12 months?					
	Visits to Boston in past year					
	Visits to New York in past year					
	Visits to Philadelphia in past year					
	Visits to Washington DC in past year					*
2	What mode(s) of transportation have you used for your trip(s) to each city in the past twelve months?					
	Boston: Personal Auto/Car				○	
	Boston: Rental Car (including car share) or borrowed car					
	Boston: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)				**	
	Boston: Intercity rail (e.g., Amtrak)					
	Boston: Airplane					
	Boston: Other					
	New York City: Personal Auto/Car	*			○	
	New York City: Rental Car (including car share) or borrowed car	*				
	New York City: Intercity Bus (e.g., Greyhound, Peter Pan, Megabus)					
	New York City: Intercity Rail (e.g., Amtrak)					
	New York City: Airplane					
	New York City: Other					
	Philadelphia: Personal Auto/Car					
	Philadelphia: Rental Car (including car share) or borrowed car					
	Philadelphia: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)					
	Philadelphia: Intercity rail (e.g., Amtrak)					
	Philadelphia: Airplane					
	Philadelphia: Other					
	Washington DC: Personal Auto/Car					
	Washington DC: Rental Car (including car share) or borrowed car					○
	Washington DC: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)					
	Washington DC: Intercity rail (e.g., Amtrak)					
	Washington DC: Airplane					
	Washington DC: Other					
3	3. *[If intercity bus or intercity rail selected for ANY city]* How do you usually get information about routes and schedules for bus or rail trips?					
	Use pamphlets or other printed material			○		
	Ask a friend or family member					
	Visit the station					
	Call the bus or rail company		*			*
	Search the internet			*		
	Use smart phone or tablet apps					
	Other, please specify					
4	*[if # of cities visited > 1]* Which city did you visit most recently?					
5	*[Skip if frequency to # cities visited = 1]* What mode(s) of transportation did you use for your MOST RECENT trip to <recent city>?					
	Personal auto/car				*	
	Rental car (including car share) or a borrowed car					
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)	*			**	

Survey Question		Education Level				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	H[1]	C[1]	A[1]	B[1]	G[1]
	Mode(s) used on most recent trip -Intercity rail (e.g., Amtrak)					
	Airplane		*			
	Other, please specify					*
6	What was the purpose of your most recent trip to <recent city>?					
	Leisure/vacation		○			
	Visit friends				*	
	Business					
	Family event					
	Other, please specify					
7	How many people travelled with you on your most recent trip to <recent city>?					
	Other adults (18 and over) on most recent trip					
	Children (under 18) on most recent trip					
8	*[if bus, rail, or plane trip]* How did you plan this trip and book your tickets?					
	Went to the airline, bus, or train website				○	
	Went to a travel website (e.g., Expedia.com, Kayak.com)					
	Called the airline, bus company, or train line					
	Through a travel agency					*
	A friend or family member booked it for me					
	Other, please specify				○	
9	How many nights did you stay for your most recent trip to < recent city >?				*	
10	How many registered vehicles (in working order) are available to your household?					
11	Do you have a driver's license?					
12	How many people live in your household? How many of you are licensed drivers?					
	# of adults in HH (18 and over)				*	
	# of adults in HH: Licensed drivers					
	# of children in HH (under 18)					
	# of children in HH: Licensed drivers					
13	How do you access the internet? *Please select all that apply.*					
	Internet service at home					○
	Internet service at school					
	Internet service at work			*		
	Public internet service (e.g., at the library, community center)					
	Mobile device with a cellular data plan (e.g., smart phone, enabled tablet)		○			
	Other, please specify					

Looking at differences in response between members of the control and test groups by education level, there are differences for multiple statements for each education level. There are two statements that were shown to have significant differences, with a p-value of

0.05 or less, for two education levels each. The first of these statements shows a difference, between members of the control and test groups, with a p-value of 0.05, for those with a Graduate or Professional Degree, and for those with Some College. The statement indicates that, of respondents with a Graduate or Professional Degree, more from the test group, than from the control group, usually call the bus or rail company to get information about routes and schedules for bus or rail trips. However, the statement indicates that, of respondents with Some College, more from the control group, than from the test group, usually call the bus or rail company to get information about routes and schedules for bus or rail trips. The second of these statements shows a difference, between members of the control and test groups, with a p-value of 0.01, for those with a Bachelor's Degree. It shows a difference, significant at the traditional level, with a p-value of 0.05, for those with an education level of High School or Less. This statement indicates that, of respondents with a Bachelor's Degree, more from the test group, than from the control group, used intercity bus (e.g., Greyhound, Peter Pan, Megabus) for their most recent trip to one of the destination cities. However, the statement indicated that, of respondents with an education level of High School or Less, more from the control group, than from the test group, chose intercity bus from their most recent trip to one of the destination cities.

There are two more statements indicating a significant difference, with a p-value of 0.05, the traditional level of significance, for those with an education level of High School or Less. The first of these statements indicates that, of those with this level of education, more from the test group, than from the control group, used a personal automobile for a trip to NYC in the past twelve months. The second of these statements indicates that, of those with this level of education, more from the control group, than from the test group, used a rental car (including car share) or a borrowed car, for a trip to NYC in the past twelve months.

There is one more statement indicating a significant difference, with a p-value of 0.05, for those with Some College. This statement indicates that, of those with this level of education, more from the control group, than from the test group, used an airplane on their most recent trip to one of the destination cities.

There are two statements, indicating a significant difference, with a p-value of 0.05, for respondents with an Associate Degree. The first of these statements indicates that, of those with this level of education, more from the test group, than from the control group, usually search the internet to get information about routes and schedules for bus or rail trips. The second of these statements indicates that, of those with this level of education, more from the test group, than from the control group, selected internet service at work as one way they access the internet.

There are five additional statements indicating a significant difference, with a p-value of 0.05 or less, for respondents with a Bachelor's Degree. One of these statements was shown to have a difference between those from the control and test groups, with a p-value of 0.01. This statement indicates that, of those with this level of education, more from the test group, than from the control group, used intercity bus for a trip to Boston within the past twelve months. Four more statements indicate a difference, with a p-value of 0.05, for respondents with a Bachelor's Degree, between those in the control and test groups. The

first of these statements indicates that, of those with this level of education, more from the control group, than from the test group, used a personal automobile on their most recent trip to one of the destination cities. The second of these statements indicates that, of those with this level of education, more from the control group, than from the test group, selected 'visiting friends' as the purpose of their most recent trip to one of the destination cities. The third of these statements indicates that, of those with this level of education, more from the control group, than from the test group, specified planning their most recent trip to one of the destination cities, using another method than those listed. The fourth of these statements indicated that, of those with this level of education, respondents from the test group indicated having more adults in their household, than those from the control group.

There are three additional statements indicating a significant difference, with a p-value of 0.05, for respondents with a Graduate or Professional Degree. The first of these statements indicates that, of those with this level of education, members from the control group, travelled to Washington DC more than members from the test group, in the past twelve months. The second of these statements indicates that, of those with this level of education, more from the test group, than from the control group, used a mode other than personal automobile, rental car, intercity bus, intercity rail, or airplane, for their most recent trip to one of the destination cities. The third of these statements indicates that, of those with this level of education, more from the control group, than from the test group, used a travel agency to plan their most recent trip to one of the destination cities.

3.1.4. Testing by Age Group

Table 7 below shows significant differences, in response tendencies between control and test groups by age group, based on the results of the Wilcoxan rank sum tests.

Table 7 Statistical Differences by Age Group between the Control and Test Groups

Survey Question							**Age Group**				
Significance:	**** 0.0001	*** 0.001	** 0.01	* 0.05	○ 0.1		25-34	35-44	45-54	55-64	65-75
1	How many times have you visited one of the following cities in the past 12 months?										
	Visits to Boston in past year										
	Visits to New York in past year										
	Visits to Philadelphia in past year										
	Visits to Washington DC in past year										
2	What mode(s) of transportation have you used for your trip(s) to each city in the past twelve months?										
	Boston: Personal Auto/Car										
	Boston: Rental Car (including car share) or borrowed car										
	Boston: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)									*	
	Boston: Intercity rail (e.g., Amtrak)						*				
	Boston: Airplane										

Survey Question		Age Group				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	25-34	35-44	45-54	55-64	65-75
	Boston: Other					○
	New York City: Personal Auto/Car					
	New York City: Rental Car (including car share) or borrowed car					
	New York City: Intercity Bus (e.g., Greyhound, Peter Pan, Megabus)					
	New York City: Intercity Rail (e.g., Amtrak)		○			
	New York City: Airplane					
	New York City: Other	○				
	Philadelphia: Personal Auto/Car				*	
	Philadelphia: Rental Car (including car share) or borrowed car					
	Philadelphia: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)	○				
	Philadelphia: Intercity rail (e.g., Amtrak)	○				
	Philadelphia: Airplane		*			
	Philadelphia: Other					
	Washington DC: Personal Auto/Car					
	Washington DC: Rental Car (including car share) or borrowed car					
	Washington DC: Intercity bus (e.g., Greyhound, Peter Pan, Megabus)					
	Washington DC: Intercity rail (e.g., Amtrak)					
	Washington DC: Airplane					
	Washington DC: Other					
3	3. *[If intercity bus or intercity rail selected for ANY city]* How do you usually get information about routes and schedules for bus or rail trips?					
	Use pamphlets or other printed material		*			
	Ask a friend or family member					
	Visit the station		○			
	Call the bus or rail company			*		
	Search the internet					
	Use smart phone or tablet apps			○		
	Other, please specify					
4	*[if # of cities visited > 1]* Which city did you visit most recently?					**
5	*[Skip if frequency to # cities visited = 1]* What mode(s) of transportation did you use for your MOST RECENT trip to <recent city>?					
	Personal auto/car		○		○	
	Rental car (including car share) or a borrowed car					
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)					
	Mode(s) used on most recent trip -Intercity rail (e.g., Amtrak)					**
	Airplane					
	Other, please specify					
6	What was the purpose of your most recent trip to <recent city>?					
	Leisure/vacation					
	Visit friends					
	Business				○	○
	Family event					*
	Other, please specify					
7	How many people travelled with you on your most recent trip to <recent city>?					
	Other adults (18 and over) on most recent trip					

Survey Question		Age Group				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	25-34	35-44	45-54	55-64	65-75
	Children (under 18) on most recent trip					
8	*[if bus, rail, or plane trip]* How did you plan this trip and book your tickets?					
	Went to the airline, bus, or train website					
	Went to a travel website (e.g., Expedia.com, Kayak.com)					
	Called the airline, bus company, or train line					
	Through a travel agency				*	
	A friend or family member booked it for me					
	Other, please specify					
9	How many nights did you stay for your most recent trip to < recent city >?					
10	How many registered vehicles (in working order) are available to your household?					***
11	Do you have a driver's license?					
12	How many people live in your household? How many of you are licensed drivers?					
	# of adults in HH (18 and over)					○
	# of adults in HH: Licensed drivers					○
	# of children in HH (under 18)					*
	# of children in HH: Licensed drivers					○
13	How do you access the internet? *Please select all that apply.*					
	Internet service at home			○		*
	Internet service at school					
	Internet service at work			○		
	Public internet service (e.g., at the library, community center)		○			
	Mobile device with a cellular data plan (e.g., smart phone, enabled tablet)					
	Other, please specify					

Looking at differences in response between members of the control and test groups by age group, there are differences for multiple statements for respondents ages 35-44, 55-64, and 65-74. There are no statements that were shown to have significant differences, with a p-value of 0.05 or less, the traditional level of significance, for multiple age groups.

There is only one statement indicating a difference, between control and test groups, for ages 25-34, with a p-value of 0.05. This statement indicates that, of those in this age group, more from the test group, than from the control group, took intercity rail to a recent trip to Boston.

There are two statements indicating a difference, between control and test groups, for ages 35-44, with a p-value of 0.05. The first of these statements indicates that, of those in this age group, more from the test group, than from the control group, took an airplane to Philadelphia, in the past twelve months. The second of these statements indicates that, of those in this age group, more from the control group, than from the test group, usually use

pamphlets or other printed material to get information about routes and schedules for bus or rail trips.

There is only one statement indicating a difference, between control and test groups, for ages 45-44, with a p-value of 0.05. This statement indicates that, of those in this age group, more from the control group, than from the test group, usually call the bus or rail company to get information about routes and schedules for bus or rail trips.

There are three statements indicating a difference, between control and test groups, for ages 54-65, with a p-value of 0.05. The first of these statements indicates that, of those in this age group, more from the test group, than from the control group, used intercity bus for a trip to Boston in the past twelve months. The second of these statements indicates that, of those in this age group, more from the test group, than from the control group, took a personal automobile for a trip to Philadelphia in the past twelve months. The last of these three statements indicates that, of those in this age group, more from the control group, than from the test group, used a travel agency to plan their most recent trip to one of the destination cities.

There are six statements indicating a difference, between control and test groups, for ages 65-74, with a p-value of 0.05 or less. One of these statements shows a difference with a p-value of 0.001. This statement indicates that, of those in this age group, respondents from the control group have more registered vehicles available to their household, than do respondents from the test group. Two of these statements show a difference with a p-value of 0.01. The first of these statements indicates that, of those in this age group, respondents from the control group took more trips to Boston in the past year, than did those from the test group. The second of these statements indicates that, of those in this age group, more respondents from the control group, than from the test group, took intercity rail for their most recent trip to one of the destination cities. The remaining three statements show a difference with a p-value of 0.05, the traditional level of significance. The first of these statements indicates that, of those in this age group, more from the control group, than from the test group, made their most recent trip to one of the destination cities for the purpose of a family event. The second of these statements indicates that, of those in this age group, respondents from the test group have more children in their household, than do respondents from the control group. The third of these statements indicates that, of those in this age group, more from the control group, than from the test group, access the internet from home.

3.2. Part 2: Travel Preferences

3.2.1. Testing for Overall Differences

Table 8 below shows significant differences overall, in response tendencies between control and test groups, based on the results of the Wilcoxan rank sum tests.

Table 8 Statistical Differences between the Control and Test Groups

Survey Question		
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	
14	I feel I am less dependent on cars than my parents are/were.	
15	I need to drive my car to get where I need to go.	
16	I love the freedom and independence I get from owning one or more cars.	
17	It would be hard for me to reduce my driving mileage.	
18	For me to be able to leave the driving to someone else would be desirable.	
19	It would be desirable for my household to be able to have fewer cars.	*
20	Being able to freely perform tasks, including using a laptop, tablet, or smartphone is an important reason for me to choose bus or train travel.	
21	Having reliable WiFi internet access while I travel on a bus or train is important to me.	○
22	When taking a bus or train, being able to plan my trip and buy tickets online is important to me.	
23	It would be important to me to receive email or text message updates about my bus or train trip.	
24	I find tablet or smartphone apps for travel and trip planning to be helpful.	
25	When the government tries to improve things, it never works.	
26	If everyone works together, we could improve the environment and future for the earth.	
27	People like me take the bus or the train.	○
28	I would be willing to pay more when I travel if it would help the environment.	
29	I tend to use the fastest form of transportation, regardless of cost.	
30	For me, the whole idea of being on a bus or train with other people I do not know seems uncomfortable.	
31	I enjoy being out and about and observing people.	
32	I don't mind traveling with people I do not know.	
33	Having my privacy is important to me when I travel.	
34	When I choose a home, I value having adequate space for parking two or more cars.	
36	Living in a multiple family building (e.g., apartment, condo) wouldn't give me enough privacy.	
37	I like living in a neighborhood where there is a lot going on.	
38	I am confident that if I want to, I can do things that I have never done before.	
39	I worry about crime or other disturbing behavior on buses and trains, or while walking in and around the stops/stations.	
40	It is important to me to control the radio and the air conditioning in the car.	
41	I feel really stressed when driving for a long time in congestion in and around big cities.	
42	I prefer to use the most comfortable transportation mode regardless of cost or time.	
43	Having a low-stress trip is more important than reaching my destination quickly.	
44	I get very annoyed being stuck behind a slow driver.	
45	I am usually in a hurry when I make a trip.	
46	With my schedule, minimizing time spent traveling is very important to me.	
47	I would use the bus or train more often if it were cheaper to ride.	
48	Rather than owning a car, I would prefer to borrow, share, or rent a car just for when I need it.	

There is one statement showing a difference in response, between control and test groups overall, with a p-value of 0.05. This statement indicates that more people, from the control group, disagreed that it would be desirable for their household to have fewer cars.

3.2.2. Testing by Gender

Table 9 below shows significant differences, in response tendencies between control and test groups by gender, based on the results of the Wilcoxan rank sum tests.

Table 9 Statistical Differences by Gender between the Control and Test Groups

Survey Question										**Gender**	
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○	0.1	**F**	**M**
14	I feel I am less dependent on cars than my parents are/were.											○
15	I need to drive my car to get where I need to go.											
16	I love the freedom and independence I get from owning one or more cars.											
17	It would be hard for me to reduce my driving mileage.											
18	For me to be able to leave the driving to someone else would be desirable.										*	
19	It would be desirable for my household to be able to have fewer cars.										○	
20	Being able to freely perform tasks, including using a laptop, tablet, or smartphone is an important reason for me to choose bus or train travel.											
21	Having reliable WiFi internet access while I travel on a bus or train is important to me.										○	
22	When taking a bus or train, being able to plan my trip and buy tickets online is important to me.											
23	It would be important to me to receive email or text message updates about my bus or train trip.											
24	I find tablet or smartphone apps for travel and trip planning to be helpful.											
25	When the government tries to improve things, it never works.										○	
26	If everyone works together, we could improve the environment and future for the earth.											
27	People like me take the bus or the train.										*	
28	I would be willing to pay more when I travel if it would help the environment.											○
29	I tend to use the fastest form of transportation, regardless of cost.											
30	For me, the whole idea of being on a bus or train with other people I do not know seems uncomfortable.											○
31	I enjoy being out and about and observing people.											
32	I don't mind traveling with people I do not know.											
33	Having my privacy is important to me when I travel.										*	
34	When I choose a home, I value having adequate space for parking two or more cars.											
36	Living in a multiple family building (e.g., apartment, condo) wouldn't give me enough privacy.											
37	I like living in a neighborhood where there is a lot going on.										*	
38	I am confident that if I want to, I can do things that I have never done before.											
39	I worry about crime or other disturbing behavior on buses and trains, or while										○	

Survey Question										Gender	
Significance:		****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	**F**	**M**
	walking in and around the stops/stations.											
40	It is important to me to control the radio and the air conditioning in the car.											
41	I feel really stressed when driving for a long time in congestion in and around big cities.											
42	I prefer to use the most comfortable transportation mode regardless of cost or time.										*	
43	Having a low-stress trip is more important than reaching my destination quickly.											
44	I get very annoyed being stuck behind a slow driver.											
45	I am usually in a hurry when I make a trip.											
46	With my schedule, minimizing time spent traveling is very important to me.											
47	I would use the bus or train more often if it were cheaper to ride.											
48	Rather than owning a car, I would prefer to borrow, share, or rent a car just for when I need it.											

Looking at differences in responses between members of the control and test groups by gender, there are five statements indicating a difference in response, between females from the control and test groups, with a p-value of 0.05 or less. There are no statements indicating a difference in response, between males from the control and test groups, at this level of significance.

Of the five statements indicating a difference in response, between females from the control and test groups, at the traditional level of significance, the first statement indicates that females in the sample, from the test group, agree more that for them to be able to leave the driving to someone else (e.g., a bus driver), would be desirable. The second of these statements indicates that females in the sample, from the control group, disagree more that people like them take the bus or the train. The third of these statements indicates that females in the sample, from the control group, agree more that having privacy is important to them when they travel. The fourth of these statements indicates that females in the sample, from the test group, agree more that living in a multiple family unit wouldn't give them enough privacy. The fifth of these statements indicates that more females in the sample, from the test group, agree more that they feel really stressed when driving for a long time in congestion in and around big cities.

3.2.3. Testing by Education Level

Table 10 below shows significant differences, in response tendencies between control and test groups by education level, based on the results of the Wilcoxan rank sum tests.

Table 10 Statistical Differences by Education Level between the Control and Test Groups

Survey Question		Education Level				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	H[2]	C[2]	A[2]	B[2]	G[2]
14	I feel I am less dependent on cars than my parents are/were.	*				
15	I need to drive my car to get where I need to go.					
16	I love the freedom and independence I get from owning one or more cars.					
17	It would be hard for me to reduce my driving mileage.					
18	For me to be able to leave the driving to someone else(e.g., a bus driver) would be desirable.		*			
19	It would be desirable for my household to be able to have fewer cars.		○			
20	Being able to freely perform tasks, including using a laptop, tablet, or smartphone is an important reason for me to choose bus or train travel.					
21	Having reliable WiFi internet access while I travel on a bus or train is important to me.					
22	When taking a bus or train, being able to plan my trip and buy tickets online is important to me.	*		*		
23	It would be important to me to receive email or text message updates about my bus or train trip.					
24	I find tablet or smartphone apps for travel and trip planning to be helpful.		○			
25	When the government tries to improve things, it never works.					*
26	If everyone works together, we could improve the environment and future for the earth.					
27	People like me take the bus or the train.					
28	I would be willing to pay more when I travel if it would help the environment.					
29	I tend to use the fastest form of transportation, regardless of cost.					
30	For me, the whole idea of being on a bus or train with other people I do not know seems uncomfortable.	*				
31	I enjoy being out and about and observing people.					
32	I don't mind traveling with people I do not know.	*				
33	Having my privacy is important to me when I travel.					
34	When I choose a home, I value having adequate space for parking two or more cars.				○	
35	When I choose a neighborhood to live in, I like to be able to walk to a commercial or village center.					
36	Living in a multiple family building (e.g., apartment, condo) wouldn't give me enough privacy.		*			
37	I like living in a neighborhood where there is a lot going on.					
38	I am confident that if I want to, I can do things that I have never done before.					
39	I worry about crime or other disturbing behavior on buses and trains, or while walking in and around the stops/stations.					

[2] H = high school or less, C = some college, A = associate degree, B = bachelor's degree, G = grad./prof. degree

40	It is important to me to control the radio and the air conditioning in the car.					
41	I feel really stressed when driving for a long time in congestion in and around big cities.		*	*		
42	I prefer to use the most comfortable transportation mode regardless of cost or time.					
43	Having a low-stress trip is more important than reaching my destination quickly.					
44	I get very annoyed being stuck behind a slow driver.		**	*	○	
45	I am usually in a hurry when I make a trip.	*			○	
46	With my schedule, minimizing time spent traveling is very important to me.					
47	I would use the bus or train more often if it were cheaper to ride.					
48	Rather than owning a car, I would prefer to borrow, share, or rent a car just for when I need it.					

Looking at differences in response between members of the control and test groups by education level, there are differences for multiple statements for each education level, except for Bachelor's Degree, and Graduate or Professional Degree. There are three statements that were shown to have significant differences, with a p-value of 0.05 or less, the traditional level of significance, for multiple education levels. The first of these statements indicates that, more respondents with an education level of High School or Less, or with an Associate Degree, and from the control group, agree more that when taking a bus or train, being able to plan their trip and buy tickets online is important to them. The second of these statements indicates that, more respondents with Some College, from the test group, agree more that they feel really stressed when driving for a long time in congestion in and around big cities. On the other hand, this statement also indicates that more respondents with an Associate Degree, from the control group, agree more with this statement. The third of these statements indicates that, more respondents with Some College, from the test group, agree more that they get very annoyed being stuck behind a slow driver. This difference has a p-value of 0.01. However, this statement also indicates that respondents with an Associate Degree, from the control group, agree more with this statement. This difference has a p-value of 0.05.

There are four more statements showing a difference in response, between control and test groups, for respondents with an education level of High School or Less, with a p-value of 0.05. The first of these statements indicates that, of those with this level of education, more respondents from the control group, than from the test group, disagree that they feel that they are less dependent on cars than their parents are/were. The second of these statements indicates that, of those with this level of education, more respondents from the control group, disagree that for them, the whole idea of being on a bus or train with other people they do not know seems uncomfortable. The third of these statements indicates that, for those with this level of education, more respondents from the test group, disagree that they don't mind traveling with people they do not know. The third of these statements

indicates that, for those with this level of education, more respondents from the control group, disagree that they are usually in a hurry when they make a trip.

There are two more statements showing a difference in response, between control and test groups, for respondents with Some College, with a p-value of 0.05. The first of these statements indicates that, of those with this level of education, more respondents from the test group, agree that for them to be able to leave the driving to someone else would be desirable. The second of these statements indicates that, of those with this level of education, more respondents from the test group agree that living in a multiple family building wouldn't give them enough privacy.

There are no statements showing a difference in response, between control and test groups, for respondents with a Bachelor's Degree, with a p-value of 0.05 or less.

There is one statement showing a difference in response, between control and test groups, for respondents with a Graduate or Professional Degree, with a p-value of 0.05 or less. This statement indicates that, of those with this level of education, more respondents from the control group agree that when the government tries to improve things, it never works.

3.2.4. Testing by Age Group

Table 11 below shows significant differences, in response tendencies between control and test groups by age group, based on the results of the Wilcoxan rank sum tests.

Table 11 Statistical Differences by Age Group between the Control and Test Groups

Survey Question							**Education Level**				
Significance:	**** 0.0001	*** 0.001	** 0.01	* 0.05	○ 0.1		25-34	35-44	45-54	55-64	65-75
14	I feel I am less dependent on cars than my parents are/were.						○			○	
15	I need to drive my car to get where I need to go.									*	
16	I love the freedom and independence I get from owning one or more cars.										
17	It would be hard for me to reduce my driving mileage.										
18	For me to be able to leave the driving to someone else(e.g., a bus driver) would be desirable.							**			
19	It would be desirable for my household to be able to have fewer cars.										*
20	Being able to freely perform tasks, including using a laptop, tablet, or smartphone is an important reason for me to choose bus or train travel.										
21	Having reliable WiFi internet access while I travel on a bus or train is important to me.								○		
22	When taking a bus or train, being able to plan my trip and buy tickets online is important to me.										
23	It would be important to me to receive email or text message updates about my bus or train trip.										

24	I find tablet or smartphone apps for travel and trip planning to be helpful.					
25	When the government tries to improve things, it never works.				*	
26	If everyone works together, we could improve the environment and future for the earth.					
27	People like me take the bus or the train.		○		*	
28	I would be willing to pay more when I travel if it would help the environment.		*			
29	I tend to use the fastest form of transportation, regardless of cost.					
30	For me, the whole idea of being on a bus or train with other people I do not know seems uncomfortable.					
31	I enjoy being out and about and observing people.			○		○
32	I don't mind traveling with people I do not know.					
33	Having my privacy is important to me when I travel.	○				
34	When I choose a home, I value having adequate space for parking two or more cars.	○				
35	When I choose a neighborhood to live in, I like to be able to walk to a commercial or village center.		○		○	*
36	Living in a multiple family building (e.g., apartment, condo) wouldn't give me enough privacy.					*
37	I like living in a neighborhood where there is a lot going on.					*
38	I am confident that if I want to, I can do things that I have never done before.	*				
39	I worry about crime or other disturbing behavior on buses and trains, or while walking in and around the stops/stations.					
40	It is important to me to control the radio and the air conditioning in the car.		*			
41	I feel really stressed when driving for a long time in congestion in and around big cities.	○			○	
42	I prefer to use the most comfortable transportation mode regardless of cost or time.					
43	Having a low-stress trip is more important than reaching my destination quickly.					
44	I get very annoyed being stuck behind a slow driver.					
45	I am usually in a hurry when I make a trip.					
46	With my schedule, minimizing time spent traveling is very important to me.					*
47	I would use the bus or train more often if it were cheaper to ride.	○				
48	Rather than owning a car, I would prefer to borrow, share, or rent a car just for when I need it.					

Looking at differences in response between members of the control and test groups by age group, there are differences for multiple statements for ages 35-44, 55-64, and 65-74, with a p-value of 0.05 or less.

There is one statement showing a difference in response, between control and test groups, for respondents ages 25-34, with a p-value of 0.05. This statement indicates that, of those in this age group, more respondents from the test group agree more that they are confident that if they wanted to, they can do things that they have never done before.

There is one statement showing a difference in response, between control and test groups, for respondents ages 35-44, with a p-value of 0.01. This statement indicates that, of those in this age group, more respondents from the test group agree that for them to be able to leave the driving to someone else would be desirable.

There are two statements showing a difference in response, between control and test groups, for respondents ages 35-44, with a p-value of 0.05. The first of these statements indicates that, of those in this age group, more respondents from the control group disagree that they would be willing to pay more when they travel if it would help the environment. The second of these statements indicates that, of those in this age group, more respondents from the test group agree that it is important for them to control the radio and the air conditioning in the car.

There are no statements showing a difference in response, between control and test groups, for respondents ages 45-54, with a p-value of 0.05 or less.

There are three statements showing a difference in response, between control and test groups, for respondents ages 55-64, with a p-value of 0.05. The first of these statements indicates that, of those in this age group, more respondents from the control group agree more that they need to drive their car to get where they need to go. The second of these statements indicates that, of those in this age group, more respondents from the control group agree more that when the government tries to improve things, it never works. The third of these statements indicates that, of those in this age group, more respondents from the control group disagree that people like them take the bus or the train.

There are five statements showing a difference in response, between control and test groups, for respondents ages 65-74, with a p-value of 0.05. The first of these statements indicates that, of those in this age group, more respondents from the control group disagree more that it would be desirable for their household to be able to have fewer cars. The second of these statements indicates that, of those in this age group, more respondents from the control group agree that when they choose a neighborhood to live in, they like to be able to walk to a commercial or village center. The third of these statements indicates that, of those in this age group, more respondents from the test group agree more that living in a multiple family building wouldn't give them enough privacy. The fourth of these statements indicates that, of those in this age group, more respondents from the test group disagree that they like living in a neighborhood where there is a lot going on. Finally, the last of these statements indicates that, of those in this age group, more respondents from the control group agree more that with their schedule, minimizing the time spent traveling is very important to them.

3.3. Part 3: An Imaginary Situation

3.3.1. Testing for Overall Differences

Table 12 below shows significant differences overall, in response tendencies between control and test groups, based on the results of the Wilcoxan rank sum tests.

Table 12 Statistical Differences between the Control and Test Groups

Survey Question		
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	
49	Knowing what you know right now, what mode(s) of transportation do you think are AVAILABLE to you for this trip to NYC? *Please select all that apply.*	
	Personal auto/car	
	Rental car (including car share) or a borrowed car	
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)	
	Intercity rail (e.g., Amtrack)	
	Other, please specify	
	Other, specified	
50	How likely are you to choose to take a bus or train for a trip like this to NYC next month?	
51	If you learned there would be no WiFi, and no electrical outlet on the bus or train for this trip, would that make to you less likely to choose a bus or train for this trip?	
52	There are more options than what I expected to travel to NYC by bus and train.	
53	After seeing the bus and train options for traveling to NYC, I just don't think there's a good way for me to get there by either bus or train.	
54	Having information like this on my smartphone or computer might make it easier for me to understand the kinds of bus and train services available to me.	
55	Having so many potential travel options by bus and train is confusing.	
56	When I drive long distances (like from my home area to NYC), I can get tired and stressed.	
57	I worry about the difficulty in finding a parking space at a reasonable cost when I get to NYC.	
58	I am concerned that the schedule of the bus or train only lets me travel a few times per day, and I need to be flexible.	****
59	I could deal with the limited schedules offered by a bus or train for this trip from my home to NYC.	
60	I like the idea that I might see and meet new people on a bus or train to NYC.	○
61	I don't like the idea of riding with a lot of people that I don't know on a bus or train.	
62	If I took a bus or train to NYC, I might have to be with people whose behavior I find unpleasant.	
63	I could be with other people who share my values when I take a bus or train on a trip like this.	
64	I think that taking a BUS to NYC would take a lot longer than driving.	*
65	I think that taking a TRAIN to NYC would take a lot longer than driving.	
66	Without thinking about it much, I would guess that the cost of taking the trip by BUS would be less than the cost of the car trip (including gas, tolls, and parking).	
67	Without thinking about it much, I would guess that the cost of taking the trip by TRAIN	

Survey Question		
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	
	would be less than the cost of the car trip (including gas, tolls, and parking.)	
68	It would be really important to me to minimize costs when I plan this trip to NYC next month.	
69	I really want to minimize the time I spend on the trip to NYC, even if that means more stress or higher costs.	
70	Being able to use my laptop, tablet, or smartphone when traveling makes me more interested in taking a bus or train to NYC.	*
71	I am the kind of person who would take my own car to NYC.	
72	Most people whose opinions I value would approve of my taking this trip by bus or train.	
73	My family would think that I should take this kind of trip by car or plane.	
74	My colleagues would likely think that it is strange not to go by a car or plane to NYC.	
75	When my friends go to NYC, they always take a bus or train.	
76	When my family members go to NYC, they always take a bus or train.	
77	It might be unsafe to make this trip by bus or train.	
78	The experience at the NYC bus or train station would be so unpleasant that I would try to avoid it.	
79	It would be easy for me to get the schedules for a bus or train between here and NYC, and I would understand them.	****
80	I like the idea of taking a bus or train instead of driving for this trip to NYC.	
81	I think that the most RATIONAL choice would be to take a bus or train instead of a car.	
82	I think that the most PLEASURABLE choice would be to take a bus or train instead of a car.	
83	I think that the most STRESSFUL choice would be to take a bus or train instead of a car.	
84	All other things being equal, if a bus was cheaper, but less reliable than a train, I would choose to take a bus.	
85	I am confident that if I wanted to, I could take a bus or train for such a trip to NYC next month.	
86	I would make an effort to choose a bus or train for such a trip to NYC next month.	
87	For me to take a bus or train for such a trip to NYC the next month would be impossible.	*
88	In this imaginary situation, I would plan to take a bus or train for this trip to NYC next month.	
89	I would trust the person who invited me to NYC to recommend how I should travel.	
90	I don't know all the things I NEED to do to make this trip work by bus or train.	
91	Given what you know about bus and train services to NYC, how likely are you to choose a bus or train for a trip to NYC next month (like the one described in the imaginary situation)?	
92	We noticed that you are now <more/less> likely to take the train or bus to NYC. Please tell us why you have changed your mind.	
93	Thank you for sharing your opinions about the imaginary trip to NYC. In your real life, how seriously would you consider taking a bus or train to NYC?	

There are two statements shown to have differences in answers, between the control and test groups overall, at the highest level of significance. The first of these statements indicates that there is some relationship between the planning tool and positive attitudes

about scheduling flexibility, with people who had access to the planning tool being less concerned about the frequency and flexibility of traveling by bus or train. The second of these statements indicates that more people, who did not have access to the planning tool, agreed that it would be easy to get and understand bus and train schedules from their home to NYC. That is, less people who did have access to the planning tool agreed that it would be easy to get and understand bus and train schedules from their home to NYC. There are also three statements with differences in answers, between the control and test groups overall, with p-values of 0.05, the traditional level of significance. The first of these statements indicates that more people, without access to the planning tool, agreed that taking a bus to NYC would take a lot longer than driving, than did those people with access to the planning tool. The second of these statements indicates that more people with access to the planning tool agreed that being able to use their personal technology devices when traveling makes them more interested in taking a bus or train to NYC. Finally, the third of these statements indicates that less people, who had access to the planning tool, disagreed that taking a bus or train to NYC the following month would be impossible. That is, there seems to be some relationship between having access to the planning tool, and agreeing that it would be impossible to take a bus or train for a trip to NYC in the next month.

The differences in responses discussed so far were observed between the control and test groups overall.

3.3.2. Testing by Gender

Table 13 below shows significant differences, in response tendencies between control and test groups by gender, based on the results of the Wilcoxan rank sum tests.

Table 13 Statistical Differences by Gender between the Control and Test Groups

Survey Question										**Gender**	
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	**F**	**M**
49	Knowing what you know right now, what mode(s) of transportation do you think are AVAILABLE to you for this trip to NYC? *Please select all that apply.*										
	Personal auto/car										
	Rental car (including car share) or a borrowed car										
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)										
	Intercity rail (e.g., Amtrack)										
	Other, please specify										
	Other, specified										
50	How likely are you to choose to take a bus or train for a trip like this to NYC next month?										
51	If you learned there would be no WiFi, and no electrical outlet on the bus or train for this trip, would that make to you less likely to choose a bus or train for this trip?										
52	There are more options than what I expected to travel to NYC by bus and train.										
53	After seeing the bus and train options for traveling to NYC, I just don't think there's a										

Survey Question		Gender	
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	F	M
	good way for me to get there by either bus or train.		
54	Having information like this on my smartphone or computer might make it easier for me to understand the kinds of bus and train services available to me.		
55	Having so many potential travel options by bus and train is confusing.		
56	When I drive long distances (like from my home area to NYC), I can get tired and stressed.		
57	I worry about the difficulty in finding a parking space at a reasonable cost when I get to NYC.		
58	I am concerned that the schedule of the bus or train only lets me travel a few times per day, and I need to be flexible.	****	
59	I could deal with the limited schedules offered by a bus or train for this trip from my home to NYC.	*	
60	I like the idea that I might see and meet new people on a bus or train to NYC.		
61	I don't like the idea of riding with a lot of people that I don't know on a bus or train.		
62	If I took a bus or train to NYC, I might have to be with people whose behavior I find unpleasant.		
63	I could be with other people who share my values when I take a bus or train on a trip like this.		
64	I think that taking a BUS to NYC would take a lot longer than driving.	**	
65	I think that taking a TRAIN to NYC would take a lot longer than driving.	**	
66	Without thinking about it much, I would guess that the cost of taking the trip by BUS would be less than the cost of the car trip (including gas, tolls, and parking).		
67	Without thinking about it much, I would guess that the cost of taking the trip by TRAIN would be less than the cost of the car trip (including gas, tolls, and parking.)		
68	It would be really important to me to minimize costs when I plan this trip to NYC next month.		
69	I really want to minimize the time I spend on the trip to NYC, even if that means more stress or higher costs.		*
70	Being able to use my laptop, tablet, or smartphone when traveling makes me more interested in taking a bus or train to NYC.	*	
71	I am the kind of person who would take my own car to NYC.		
72	Most people whose opinions I value would approve of my taking this trip by bus or train.		
73	My family would think that I should take this kind of trip by car or plane.		
74	My colleagues would likely think that it is strange not to go by a car or plane to NYC.		
75	When my friends go to NYC, they always take a bus or train.		
76	When my family members go to NYC, they always take a bus or train.		
77	It might be unsafe to make this trip by bus or train.		
78	The experience at the NYC bus or train station would be so unpleasant that I would try to avoid it.		*
79	It would be easy for me to get the schedules for a bus or train between here and NYC, and I would understand them.	*	***
80	I like the idea of taking a bus or train instead of driving for this trip to NYC.		
81	I think that the most RATIONAL choice would be to take a bus or train instead of a car.		○
82	I think that the most PLEASURABLE choice would be to take a bus or train instead of		

Survey Question											Gender	
Significance:		****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	F	M
	a car.											
83	I think that the most STRESSFUL choice would be to take a bus or train instead of a car.											*
84	All other things being equal, if a bus was cheaper, but less reliable than a train, I would choose to take a bus.											
85	I am confident that if I wanted to, I could take a bus or train for such a trip to NYC next month.											
86	I would make an effort to choose a bus or train for such a trip to NYC next month.											*
87	For me to take a bus or train for such a trip to NYC the next month would be impossible.											**
88	In this imaginary situation, I would plan to take a bus or train for this trip to NYC next month.											****
89	I would trust the person who invited me to NYC to recommend how I should travel.											
90	I don't know all the things I NEED to do to make this trip work by bus or train.											
91	Given what you know about bus and train services to NYC, how likely are you to choose a bus or train for a trip to NYC next month (like the one described in the imaginary situation)?											
92	We noticed that you are now <more/less> likely to take the train or bus to NYC. Please tell us why you have changed your mind.											
93	Thank you for sharing your opinions about the imaginary trip to NYC. In your real life, how seriously would you consider taking a bus or train to NYC?											

Looking at differences in responses between members of the control and test groups by gender, there are differences for many statements for each gender, but only one statement that was shown to have significant differences in levels of agreement from both females and males. This difference was shown to be more significant for males than for females, but still significant for females at the traditional level of significance. That statement indicates that, more of both females and males in the control group, than in the test group, agree that it would be easy for them to get the bus or train schedules between their home and NYC, and they would understand them. While both females and males without access to the planning tool agreed with this at the same level, and less of both females and males with access to the planning tool agreed with this, less males that had access to the tool agreed with this, than did females with access to the tool. So, there appears to be a greater relationship, for males, between having access to the planning tool, and being in less agreement that it would be easy to get, and understand, the schedules for a bus or a train to NYC. Overall though, both females and males, from both the control and test groups, tend to agree with the statement.

Earlier, there was an overall difference between control and test groups shown, for concern over frequency and flexibility, of bus or train schedules. When looking at this by gender, this difference in response tendency appears for females, at the highest level of significance, but no difference is shown for males. Females with access to the planning tool were close to neutral, while females without access to the planning tool agreed more, that

they were concerned about the flexibility of the bus or train schedule. There is a similar situation for thinking that a bus to NYC would take a lot longer than driving. More people overall, without access to the planning tool, agreed that taking a bus to NYC would take a lot longer than driving, than did those people with access to the planning tool. However, when breaking this down by gender, there is a difference shown in response to this statement for females, with a p-value of 0.01, but no difference is shown for males.

With a difference shown by a p-value of 0.01, it appears that more females, without access to the planning tool, are neutral about thinking that taking a train to NYC would take a lot longer than driving, while females with access to the tool disagreed more. No difference is seen for this statement by males in this sample, between those with and without access to the planning tool.

There are two additional survey statements showing differences in response for females, with and without access to the planning tool, having p-values of 0.05, the traditional level of significance. The first of these statements indicates that females in this sample, with access to the planning tool, agree more that they could deal with the limited schedules offered by a bus or train for the trip to NYC. The second of these statements indicates that females in this sample, with access to the planning tool, agree more, that being able to use their personal technology devices when traveling makes them more interested in taking a bus or train to NYC. This statement showed differences in response for those with and without access to the planning tool overall, but only by females, when breaking this down by gender.

There is one statement where a difference is shown, at the highest level of significance, for males in this sample, between the control and test groups. It indicates that males in the sample, without access to the planning tool, disagree more that in this imaginary situation, they would plan to take a bus or train for this trip to NYC next month. This statement showed differences in response for those with and without access to the planning tool overall, but only by males, when breaking this down by gender. Overall though, males in the sample tend to disagree with this statement.

There is one statement where a difference in response is shown for males with and without access to the planning tool, having a p-value of 0.01. It indicates that males in the sample, without access to the planning tool, disagree more that taking a bus or a train for the trip to NYC next month would be impossible.

There are four additional survey statements showing differences in response for males with and without access to the planning tool, having p-values of 0.05, the traditional level of significance. The first of these statements indicates that males in this sample, without access to the planning tool, disagree more that they really want to minimize the time spent on the trip to NYC, even if that means more stress or higher costs. The second of these statements indicates that males in this sample, without access to the planning tool, disagree more that the experience at the NYC bus or train station would be so unpleasant that they would try to avoid it. The third of these statements indicates that males in this sample, without access to the planning tool, agree more that the most stressful choice would be to

take a bus or train instead of a car. Finally, the fourth of these statements indicates that males in this sample, without access to the planning tool, agree more that they would make an effort to choose a bus or train for such a trip to NYC next month.

3.3.3. Testing by Education Level and Age Group

Next, significant differences are broken down between the control and test groups by education level and age group. Before considering the longer lists for each group, a few statements are selected that highlight some of the differences across education levels and age groups.

"I am concerned that the schedule of the bus or train only lets me travel a few times per day, and I need to be flexible."

The control group agreed more with this statement than the test group overall, for all age categories included, except for ages 65-75, and for any respondent with a post-secondary degree.

"I think that taking a BUS to NYC would take a lot longer than driving."

The control group agreed more with this statement than the test group overall, but only for those ages 25-44, with a bachelor's degree.

"It would be easy for me to get the schedules for a bus or train between here and NYC, and I would understand them."

The control group agreed more with this statement than the test group overall, but only for those ages 25-44, with a bachelor's, graduate or professional degree.

"When I drive long distances (like from my home area to NYC), I can get tired and stressed"

For respondents ages 55-64, the test group agreed with this statement more than the control group. For respondents ages 65-74, the control group agreed with this statement more than the test group.

3.3.3.1. Testing by Education Level

Table 14 below shows significant differences, in response tendencies between control and test groups by education level, based on the results of the Wilcoxan rank sum tests.

Table 14 Statistical Differences by Education Level between the Control and Test Groups

Survey Question		Education Level				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	H[3]	C[3]	A[3]	B[3]	G[3]
49	Knowing what you know right now, what mode(s) of transportation do you think are AVAILABLE to you for this trip to NYC? *Please select all that apply.*					
	Personal auto/car				*	
	Rental car (including car share) or a borrowed car					
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)					
	Intercity rail (e.g., Amtrack)					**
	Other, please specify	○				
	Other, specified					
50	How likely are you to choose to take a bus or train for a trip like this to NYC next month?					
51	If you learned there would be no WiFi, and no electrical outlet on the bus or train for this trip, would that make to you less likely to choose a bus or train for this trip?					
52	There are more options than what I expected to travel to NYC by bus and train.					
53	After seeing the bus and train options for traveling to NYC, I just don't think there's a good way for me to get there by either bus or train.					
54	Having information like this on my smartphone or computer might make it easier for me to understand the kinds of bus and train services available to me.					
55	Having so many potential travel options by bus and train is confusing.					
56	When I drive long distances (like from my home area to NYC), I can get tired and stressed.		○			
57	I worry about the difficulty in finding a parking space at a reasonable cost when I get to NYC.			*		
58	I am concerned that the schedule of the bus or train only lets me travel a few times per day, and I need to be flexible.			***	****	*
59	I could deal with the limited schedules offered by a bus or train for this trip from my home to NYC.				*	
60	I like the idea that I might see and meet new people on a bus or train to NYC.					*
61	I don't like the idea of riding with a lot of people that I don't know on a bus or train.					
62	If I took a bus or train to NYC, I might have to be with people whose behavior I find unpleasant.	○				
63	I could be with other people who share my values when I take a bus or train on a trip like this.					
64	I think that taking a BUS to NYC would take a lot longer than driving.				**	
65	I think that taking a TRAIN to NYC would take a lot longer than driving.				*	
66	Without thinking about it much, I would guess that the cost of taking the					

[3] H = high school or less, C = some college, A = associate degree, B = bachelor's degree, G = grad./prof. degree

Survey Question		Education Level				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	H[3]	C[3]	A[3]	B[3]	G[3]
	trip by BUS would be less than the cost of the car trip (including gas, tolls, and parking).					
67	Without thinking about it much, I would guess that the cost of taking the trip by TRAIN would be less than the cost of the car trip (including gas, tolls, and parking.)					
68	It would be really important to me to minimize costs when I plan this trip to NYC next month.				○	
69	I really want to minimize the time I spend on the trip to NYC, even if that means more stress or higher costs.	*				
70	Being able to use my laptop, tablet, or smartphone when traveling makes me more interested in taking a bus or train to NYC.				**	
71	I am the kind of person who would take my own car to NYC.					
72	Most people whose opinions I value would approve of my taking this trip by bus or train.			○		
73	My family would think that I should take this kind of trip by car or plane.				○	
74	My colleagues would likely think that it is strange not to go by a car or plane to NYC.	○				
75	When my friends go to NYC, they always take a bus or train.					
76	When my family members go to NYC, they always take a bus or train.		*			**
77	It might be unsafe to make this trip by bus or train.					
78	The experience at the NYC bus or train station would be so unpleasant that I would try to avoid it.					
79	It would be easy for me to get the schedules for a bus or train between here and NYC, and I would understand them.		○		*	*
80	I like the idea of taking a bus or train instead of driving for this trip to NYC.		○			
81	I think that the most RATIONAL choice would be to take a bus or train instead of a car.	*				
82	I think that the most PLEASURABLE choice would be to take a bus or train instead of a car.	*				*
83	I think that the most STRESSFUL choice would be to take a bus or train instead of a car.					*
84	All other things being equal, if a bus was cheaper, but less reliable than a train, I would choose to take a bus.	*				
85	I am confident that if I wanted to, I could take a bus or train for such a trip to NYC next month.					
86	I would make an effort to choose a bus or train for such a trip to NYC next month.	○		○		
87	For me to take a bus or train for such a trip to NYC the next month would be impossible.	***				
88	In this imaginary situation, I would plan to take a bus or train for this trip to NYC next month.					○
89	I would trust the person who invited me to NYC to recommend how I should travel.	*				
90	I don't know all the things I NEED to do to make this trip work by bus or train.			○		○
91	Given what you know about bus and train services to NYC, how likely	*		○		

Survey Question								Education Level				
Significance:	**** 0.0001	*** 0.001	** 0.01	* 0.05	○ 0.1			H[3]	C[3]	A[3]	B[3]	G[3]
	are you to choose a bus or train for a trip to NYC next month (like the one described in the imaginary situation)?											
92	We noticed that you are now <more/less> likely to take the train or bus to NYC. Please tell us why you have changed your mind.											
93	Thank you for sharing your opinions about the imaginary trip to NYC. In your real life, how seriously would you consider taking a bus or train to NYC?							○				

Looking at differences in response between members of the control and test groups by education level, there are differences for multiple statements for each education level, except for Some College, which only has a difference shown for one question. There are four statements that were shown to have significant differences, with a p-value of 0.05 or less, the traditional level of significance, for multiple education levels. One statement was shown to have significant differences in levels of agreement for three different education levels. This difference was shown to be significant at the highest level (p-value <0.0001) for those with a Bachelor's Degree. It was shown to be significant at the second highest level (p-value <0.001) for those with an Associate's Degree, and significant at the traditional level (p-value <0.05) for those with a Graduate or Professional Degree. That statement indicates that, more people with Associates, Bachelor's, Graduate or Professional Degrees in the control group, than in the test group, agree that they are concerned that the schedule of the bus or the train only lets them travel a few times per day, and they need to be more flexible. While respondents in these three education levels without access to the planning tool agree more with the statement, respondents in these three education levels with access to the planning tool are more neutral about the statement.

It appears that more respondents, with Some College, and without access to the planning tool, agree less that when their family members go to NYC, they always take a bus or train. However, it appears that more respondents, with a Graduate or Professional Degree, and with access to the planning tool, agree less with this.

It appears that more respondents, with a Bachelor's Degree or a Graduate or Professional Degree, without access to the planning tool, agree more, that it would be easy to for them to get the schedules for a bus or train between their home and NYC, and they would understand them. Overall though, respondents from these education levels, from both the control and test groups, tend to agree with the statement.

It appears that more respondents, with an education level of High School or Less, or with a Graduate or Professional Degree, and without access to the planning tool, think that the most pleasurable choice would be to take a bus or train instead of a car. While this is true for both of these education levels, the mean of responses for respondents with a Graduate or Professional Degree, with access to the planning tool, is very close to the mean of responses for respondents with an education level of High School or less. Overall, respondents from both education levels tend to agree with this statement.

With a difference shown by a p-value of 0.001, it appears that more respondents with an education level of High School or Less, and without access to the planning tool, agree more that, for them to take a bus or train for such a trip to NYC the next month would be impossible.

There are five survey statements showing differences in response, for respondents with an education level of High School or Less, with and without access to the planning tool, having p-values of 0.05, the traditional level of significance. The first of these statements indicates that respondents with this education level, without access to the planning tool, disagree more that they want to minimize the time they spend on the trip to NYC, even if that means more stress or higher costs. The second of these statements indicates that respondents with this education level, without access to the planning tool, agree more that they think the most rational choice would be to take a bus or train instead of a car. The third of these statements indicates that respondents with this education level, without access to the planning tool, disagree more that, all other things being equal, if a bus was cheaper, but less reliable than a train, they would choose to take a bus. The fourth of these statements indicates that respondents with this education level, without access to the planning tool, agree more that, in this imaginary situation, they would plan to take a bus or train for this trip to NYC next month. Finally, the fifth of these statements indicates that respondents, with an education level of High School or Less, and without access to the planning tool, are more likely to choose a bus or train for a trip to NYC next month, like the one described in the imaginary situation, given what they know about bus and train services to NYC.

There is one statement where a difference in response is shown for people with Some College, with and without access to the planning tool, having a p-value within 0.05, the traditional level of significance. The statement indicates that respondents with an Associate Degree, without access to the planning tool, agree more that they worry about the difficulty in finding a parking space at a reasonable cost when they get to NYC. Overall though, respondents with an Associate Degree, with and without access to the planning tool, agree with this.

There are two statements, where a difference is shown in response for respondents, with a Bachelor's Degree, with and without access to the planning tool, having a p-value of 0.01. The first of these statements indicates that respondents with a Bachelor's Degree, without access to the planning tool, agree more that they think that taking a bus to NYC would take a lot longer than driving. The second of these statements indicates that respondents with a Bachelor's Degree, with access to the planning tool, agree more that being able to use their laptop, tablet, or smartphone when traveling makes them more interested in taking a bus or train to NYC.

There are three additional survey statements showing differences in responses for people with a Bachelor's Degree, with and without access to the planning tool, having p-values of 0.05, the traditional level of significance. The first of these statements indicates that more respondents with a Bachelor's Degree, and without access to the planning tool, selected personal automobile as a mode of transportation they think is available to them for the trip to NYC, knowing what they knew at the time of answering the question. This question was

asked just prior to dividing the sample into the control and test groups. Overall though, respondents with a Bachelor's Degree, with and without access to the planning tool, selected personal automobile for this question. The second of these statements indicates that respondents with a Bachelor's Degree, with access to the planning tool, agree that they could deal with the limited schedules offered by a bus or a train for this trip from their home to NYC. Finally, the third of these statements indicates that respondents with a Bachelor's Degree, with access to the planning tool, agree more that they think taking a train to NYC would take a lot longer than driving. Overall though, respondents with a Bachelor's Degree, with and without access to the planning tool, agree with this statement.

There is another statement where a difference in response is shown for respondents with a Graduate or Professional Degree, having a p-value of 0.01. It indicates that more respondents with a Graduate or Professional Degree, and with access to the planning tool, selected intercity rail (e.g., Amtrak) as a mode of transportation they think is available to them for the trip to NYC, knowing what they knew at the time of answering the question. This question was asked just prior to dividing the sample into the control and test groups. Overall though, respondents with a Graduate or Professional Degree, with and without access to the planning tool, selected intercity rail for this question.

There are two other statements where a difference in response is shown for respondents with a Graduate or Professional Degree, with a p-value of 0.05, the traditional level of significance. The first of these statements indicates that more respondents with a Graduate or Professional Degree, with access to the planning tool, disagree more that they like the idea that they might see and meet new people on a bus or train to NYC. The second of these statements indicates that more respondents without access to the planning tool, agree more that they think the most stressful choice would be to take a bus or train instead of a car.

3.3.3.2. Testing by Age Group

Table 15 below shows significant differences, in response tendencies between control and test groups by age group, based on Wilcoxan rank sum tests.

Table 15 Statistical Differences by Age Group between the Control and Test Groups

Survey Question							**Age Group**				
Significance:	**** 0.0001	*** 0.001	** 0.01	* 0.05	○ 0.1		25-34	35-44	45-54	55-64	65-75
49	Knowing what you know right now, what mode(s) of transportation do you think are AVAILABLE to you for this trip to NYC? *Please select all that apply.*										
	Personal auto/car							***			
	Rental car (including car share) or a borrowed car										
	Intercity bus (e.g., Greyhound, Peter Pan, Megabus)						○				
	Intercity rail (e.g., Amtrack)									*	

Survey Question		Age Group				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	25-34	35-44	45-54	55-64	65-75
	Other, please specify					
	Other, specified					
50	How likely are you to choose to take a bus or train for a trip like this to NYC next month?					
51	If you learned there would be no WiFi, and no electrical outlet on the bus or train for this trip, would that make to you less likely to choose a bus or train for this trip?					*
52	There are more options than what I expected to travel to NYC by bus and train.					
53	After seeing the bus and train options for traveling to NYC, I just don't think there's a good way for me to get there by either bus or train.					
54	Having information like this on my smartphone or computer might make it easier for me to understand the kinds of bus and train services available to me.					
55	Having so many potential travel options by bus and train is confusing.					
56	When I drive long distances (like from my home area to NYC), I can get tired and stressed.				*	*
57	I worry about the difficulty in finding a parking space at a reasonable cost when I get to NYC.					
58	I am concerned that the schedule of the bus or train only lets me travel a few times per day, and I need to be flexible.	**	**	*	**	○
59	I could deal with the limited schedules offered by a bus or train for this trip from my home to NYC.		*		*	○
60	I like the idea that I might see and meet new people on a bus or train to NYC.					
61	I don't like the idea of riding with a lot of people that I don't know on a bus or train.				*	
62	If I took a bus or train to NYC, I might have to be with people whose behavior I find unpleasant.					
63	I could be with other people who share my values when I take a bus or train on a trip like this.					
64	I think that taking a BUS to NYC would take a lot longer than driving.	**	*			
65	I think that taking a TRAIN to NYC would take a lot longer than driving.	**				
66	Without thinking about it much, I would guess that the cost of taking the trip by BUS would be less than the cost of the car trip (including gas, tolls, and parking).					
67	Without thinking about it much, I would guess that the cost of taking the trip by TRAIN would be less than the cost of the car trip (including gas, tolls, and parking.)					
68	It would be really important to me to minimize costs when I plan this trip to NYC next month.				○	
69	I really want to minimize the time I spend on the trip to NYC, even if that means more stress or higher costs.			*		
70	Being able to use my laptop, tablet, or smartphone when traveling makes me more interested in taking a bus or train to NYC.			○		
71	I am the kind of person who would take my own car to NYC.				*	
72	Most people whose opinions I value would approve of my taking this					

Survey Question		Age Group				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	25-34	35-44	45-54	55-64	65-75
	trip by bus or train.					
73	My family would think that I should take this kind of trip by car or plane.				○	
74	My colleagues would likely think that it is strange not to go by a car or plane to NYC.					
75	When my friends go to NYC, they always take a bus or train.	○				*
76	When my family members go to NYC, they always take a bus or train.		*	○		○
77	It might be unsafe to make this trip by bus or train.					
78	The experience at the NYC bus or train station would be so unpleasant that I would try to avoid it.	○				
79	It would be easy for me to get the schedules for a bus or train between here and NYC, and I would understand them.	**	*			○
80	I like the idea of taking a bus or train instead of driving for this trip to NYC.	○			○	
81	I think that the most RATIONAL choice would be to take a bus or train instead of a car.				*	○
82	I think that the most PLEASURABLE choice would be to take a bus or train instead of a car.					○
83	I think that the most STRESSFUL choice would be to take a bus or train instead of a car.					
84	All other things being equal, if a bus was cheaper, but less reliable than a train, I would choose to take a bus.					○
85	I am confident that if I wanted to, I could take a bus or train for such a trip to NYC next month.					
86	I would make an effort to choose a bus or train for such a trip to NYC next month.					
87	For me to take a bus or train for such a trip to NYC the next month would be impossible.					**
88	In this imaginary situation, I would plan to take a bus or train for this trip to NYC next month.					***
89	I would trust the person who invited me to NYC to recommend how I should travel.				○	**
90	I don't know all the things I NEED to do to make this trip work by bus or train.					○
91	Given what you know about bus and train services to NYC, how likely are you to choose a bus or train for a trip to NYC next month (like the one described in the imaginary situation)?				○	
92	We noticed that you are now <more/less> likely to take the train or bus to NYC. Please tell us why you have changed your mind.					
93	Thank you for sharing your opinions about the imaginary trip to NYC. In your real life, how seriously would you consider taking a bus or train to NYC?					*

Looking at differences in response between members of the control and test groups by age group, there are differences for multiple statements for each age group. There are five statements that were shown to have significant differences, with a p-value of 0.05 or less,

the traditional level of significance, for multiple age levels. One statement was shown to have significant differences, with a p-value of 0.05 or less, in levels of agreement for four different education levels. This difference was shown to have a p-value of 0.01 for ages 25-34, 35-44, and 55-64, and a p-value of 0.05 for ages 45-54. This statement indicates that more people, from each age group except for ages 65-75, in the control group, are concerned that the schedule of the bus or train only lets them travel a few times per day, and they need to be flexible. While respondents in these four age groups without access to the planning tool agree more with the statement, respondents in these four age groups with access to the planning tool are more neutral about the statement.

It appears that more respondents, ages 55-64, with access to the planning tool, agree more that when they drive long distances (like from their home to NYC), they can get tired and stressed. However, it appears that more respondents, ages 65-74, without access to the planning tool, agree more with this.

It appears that, more respondents, ages 35-44, and 55-64, with access to the planning tool, agree more that they could deal with the limited schedules offered by bus or train for this trip from their home to NYC.

It appears that more respondents, ages 25-34 and 35-44, without access to the planning tool, agree more that they think that taking a bus to NYC would take a lot longer than driving.

It appears that more respondents, ages 25-34 and 35-44, without access to the planning tool, agree more that it would be easy for them to get the schedules for a bus or train between their home and NYC, and they would understand them.

There is one more statement showing differences in response, for respondents ages 25-34, with a p-value within 0.01. The statement indicates that more people, ages 25-34, without access to the planning tool, agree more that they think taking a train to NYC would take a lot longer than driving.

There is a statement showing a difference in response, for respondents ages 35-44, with and without access to the planning tool, with a p-value of 0.001, the second highest level of significance. The statement indicates that respondents, ages 35-44, without access to the planning tool, select the automobile more, as one of the modes of transportation they think are available to them, for this trip to NYC, knowing what they knew at the time of response.

With a p-value of 0.05, at the traditional level of significance, it appears that more respondents, ages 35-44, without access to the planning tool, agree less that, when their family members go to NYC, they always take a bus or train.

There is a statement showing difference in response, for ages 45-54, with and without access to the planning tool, at the traditional level of significance. It indicates that more respondents, ages 45-54, without access to the planning tool, agree less that they really want to minimize the time they spend on the trip to NYC, even if that means more stress or higher costs.

There are four more survey statements showing differences in response, for respondents ages 55-64, with and without access to the planning tool, having p-values of 0.05. The first of these statements indicates that respondents in this age group, with access to the planning tool, selected intercity rail more often, as one of the modes of transportation they think are available to them, for this trip to NYC, knowing what they knew at the time of response. The second of these statements indicates that, more respondents in this age group, with access to the planning tool, agree that they don't like the idea of riding with a lot of people they don't know on a bus or train. The third of these statements indicates that more people in this age group, with access to the planning tool, disagree that they are the kind of person who would take their own car to NYC. It appears that more respondents in this age group, without access to the planning tool, are more neutral about this statement. Finally, the last of these four statements indicates that more respondents in this age group, with access to the planning tool, agree more that they think the most rational choice would be to take the bus or train instead of a car. However, respondents in this age group, with and without access to the planning tool, agree with this statement.

There is a statement, with a p-value of 0.001, indicating that more respondents ages 65-74, without access to the planning tool disagree that in this imaginary situation, they would plan to take a bus or train for this trip to NYC in the next month.

There are two statements, where a difference is shown in response for ages 65-74, with and without access to the planning tool, having a p-value of 0.01. The first of these statements indicates that respondents in this age group, without access to the planning tool, agree more that for them to take a bus or train for such a trip to NYC the next month would be impossible. The second of these statements indicates that respondents in this age group without access to the planning tool, agree more that they would trust the person who invited them to NYC to recommend how they should travel.

There are three more statements, where a difference is shown in response for ages 65-74, with and without access to the planning tool, at the traditional level of significance. The first of these statements indicates that more respondents in this age group, without access to the tool, agree more that if they learned there would be no WiFi, and no electrical outlet on the bus or train for this trip, it would make them less likely to choose a bus or train for this trip. Overall all though, respondents in this age group, with and without access to the planning tool, agree with this statement. The second of these statements indicates that more respondents in this age group, with access to the planning tool, disagree more that, when their friends go to NYC, they always take a bus or train. Respondents in this age group, without access to the planning tool, are more neutral about this statement. The third of these statements indicates that respondents in this age group, without access to the planning tool, are more likely to consider taking a bus or a train to NYC.

3.4. Part 4: Other Information about the Respondents and Their Household

3.4.1. Testing for Overall Differences

Table 16 below shows significant differences overall, in response tendencies between control and test groups, based on the results of the Wilcoxan rank sum tests.

Table 16 Statistical Differences between the Control and Test Groups

Survey Question		
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	
94	Which of the following do you own? *Please select all that apply.*	
	Owns desktop computer	○
	Owns laptop	
	Owns smartphone	
	Owns tablet	
	Owns standalone GPS navigation device	
	Owns none of the listed devices	
95	What is your age?	**
96	What is your gender?	
97	What is your highest completed level of education?	*
98	What is your annual household income? If you are unsure of the answer, please give your best estimate.	

There are two statements shown to have significant differences in answers, between the control and test groups overall, with p-values of 0.05 or less. The first of these statements shows a difference in response, between control and test groups, with a p-value of 0.01. This statement indicates that, overall, respondents from the control group are older than respondents from the test group. The second of these statements shows a difference in response, between control and test groups, with a p-value of 0.05. This statement indicates that, overall, respondents from the test group have a higher education than those from the control group.

3.4.2. Testing by Gender

Table 17 below shows significant differences, in response tendencies between control and test groups by gender, based on the results of the Wilcoxan rank sum tests.

Table 17 Statistical Differences by Gender between the Control and Test Groups

Survey Question			**Gender**	
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1		**F**	**M**

Survey Question										Gender	
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	F	M
94	Which of the following do you own? *Please select all that apply.*										
	Owns desktop computer										
	Owns laptop										
	Owns smartphone										
	Owns tablet										
	Owns standalone GPS navigation device										
	Owns none of the listed devices										
95	What is your age?									○	
96	What is your gender?										
97	What is your highest completed level of education?									*	
98	What is your annual household income? If you are unsure of the answer, please give your best estimate.										

There is only one statement shown to have a significant difference in answers, between females from the control and test groups, with a p-value of 0.05. There are no statements shown to have a significant difference in answers, between males from the control and test groups. The statement showing a difference, between females from the control and test groups, indicates that females from the test group have a higher education than females from the control group. This difference is not seen between males from the control and test groups.

3.4.3. Testing by Education Level

Table 18 below shows significant differences, in response tendencies between control and test groups by education level, based on the results of the Wilcoxan rank sum tests.

Table 18 Statistical Differences by Education Level between the Control and Test Groups

Survey Question										Education Level				
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	H[4]	C[4]	A[4]	B[4]	G[4]
94	Which of the following do you own? *Please select all that apply.*													
	Owns desktop computer													
	Owns laptop										*			
	Owns smartphone													
	Owns tablet											*		
	Owns standalone GPS navigation device													*
	Owns none of the listed devices													

[4] H = high school or less, C = some college, A = associate degree, B = bachelor's degree, G = grad./prof. degree

Survey Question										Education Level				
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	H[4]	C[4]	A[4]	B[4]	G[4]
95	What is your age?									**		**		
96	What is your gender?													
97	What is your highest completed level of education?													
98	What is your annual household income? If you are unsure of the answer, please give your best estimate.													

Looking at differences in response between members of the control and test groups by education level, there are differences for multiple statements for only one education level, those with an Associate Degree. There is one statement shown to have significant differences, with a p-value of 0.05 or less, the traditional level of significance, for multiple education levels. This statement indicates that, of those with an education level of High School or Less, or Associate Degree, respondents from the control group are older than respondents from the test group.

There is one statement showing a difference in response, between control and test groups, for respondents with Some College, with a p-value of 0.05 or less. This statement indicates that, of those with this level of education, more respondents from the test group own a laptop.

There is one more statement showing a difference in response, between the control and test groups, for respondents with an Associate Degree, with a p-value of 0.05 or less. This statement indicates that, of those with this level of education, more respondents from the control group own a tablet.

There are no statements showing a difference in response, between control and test groups, for respondents with a Bachelor's degree, with a p-value of 0.05 or less.

There is one statement showing a difference in response, between the control and test groups, for respondents with a Graduate or Professional Degree, with a p-value of 0.05 or less. This statement indicates that, of those with this level of education, more respondents from the control group own a standalone GPS navigation device.

3.4.4. Testing by Age Group

Table 19 below shows significant differences, in response tendencies between control and test groups by age group, based on the results of the Wilcoxan rank sum tests.

Table 19 Statistical Differences by Age Group between the Control and Test Groups

Survey Question										Age Group				
Significance:	****	0.0001	***	0.001	**	0.01	*	0.05	○ 0.1	25-34	35-44	45-54	55-64	65-75

Survey Question		Age Group				
Significance:	**** 0.0001 *** 0.001 ** 0.01 * 0.05 ○ 0.1	25-34	35-44	45-54	55-64	65-75
94	Which of the following do you own? *Please select all that apply.*					
	Owns desktop computer					
	Owns laptop					
	Owns smartphone					
	Owns tablet		○			
	Owns standalone GPS navigation device		○		*	*
	Owns none of the listed devices					
95	What is your age?					
96	What is your gender?					*
97	What is your highest completed level of education?					○
98	What is your annual household income? If you are unsure of the answer, please give your best estimate.					○

Looking at differences in response between members of the control and test groups by age group, there are differences for multiple statements for only one age group, 65-74, with a p-value of 0.05 or less. One of these statements was shown to have significant differences, for multiple age levels. This statement indicates that for those age 55-64, more respondents from the control group own a standalone GPS navigation device. However, this statement also indicates that for those age 65-74, more respondents from the test group own a standalone GPS navigation device.

The other statement showing a difference in response, for ages 65-74, between respondents from the control and test groups, indicates that the ratio of male to female respondents is larger in the test group than in the control group.

3.5. Changes in Mode Preference

Survey respondents were asked about their likelihood to choose a bus or a train for the imaginary trip to NYC, both at the beginning and end of Part 3, which covered this imaginary trip. Forty-three percent of respondents changed attitudes about choosing a bus or train for a trip to NYC. In Table 20 below, it is shown that more people, who did have access to the tool, were becoming more likely to choose a bus or a train, while more people, who did not have access to the tool, were becoming less likely to choose a bus or a train.

Table 20 Changes in Mode Preference by the Control and Test Groups

	Control	Test
1) More Likely	297	353
2) No Change	740	715
3) Less Likely	241	214

4. Multimodal Network Dataset for Study Region

In parallel to the work exploring and analyzing the survey data, a multimodal network dataset was created for the Northeast United States, which includes the survey data study area. Detailed information and metadata for the compilation of the network dataset is located in Appendix D. The dataset includes the road network, intercity rail network, and commercial service passenger airline network for New England states, plus New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and Washington, DC. Intercity bus is not represented in the current version of this multimodal dataset. The research team reached out to multiple intercity bus operators, but the data was not available. Creating and adding intercity bus network data to the network dataset is anticipated for future work. The network was compiled using the Caliper TransCAD 6.0 software system and finalized in TransCAD 7.0. Network data includes geometric nodes and links, in addition to route scheduling frequency, and travel times between nodes. This network dataset is more comprehensive than typical data from a Geographic Information System (GIS), which usually includes geometry and attributes in tabular form. The network dataset can be used for analysis related to travel time, passenger service frequency, and accessibility to geographic areas using multiple modes.

The road network portion came from the Environmental Systems Research Institute (Esri) road network dataset included with ArcGIS 10.1 desktop GIS software. The rail network data was compiled from General Transit Feed Specification (GTFS) data for each operator. GTFS evolved from the original Google Transit Feed Specification - a uniform formatting protocol developed to improve access to transit data - making transit data more readily accessible to the public by agencies and developers. Many transit agencies have adopted the formatting framework for their transportation networks, making the geographic and scheduling data available through exchanges or agency portals. GTFS data relevant to the region of study was acquired directly from the agencies when available. These agencies included passenger intercity rail (e.g. Amtrak), commuter rail (e.g. Metro-North), and light-rail transit (e.g. the “T” from MBTA). The data included rail stations, intercity passenger routes, route travel time, and frequency of service information. The commercial service passenger airline network was created using the Research and Innovative Technology Administration (RITA) Bureau of Transportation Statistics (BTS) Office of Airline Information T-100 Air Carrier Traffic and Capacity Data by Non-Stop Segment and On-Flight Market data and the Aviation Policy Domestic Airline Consumer Airfare Report, both from the US Department of Transportation (USDOT). Data used from these sources included airport pairs, airline information, air carrier group, travel time, service class, monthly departures scheduled, monthly departures performed, seats available, passengers per day, and average airfare.

The Esri Streets4 network dataset was imported into TransCAD. The GTFS files for each agency were imported into TransCAD following validation of the files with a transit feed validator and any necessary and identified data pre-processing. Data pre-processing included, when applicable, replacing delimiters with spaces, preserving quotations for headerlines, and adding line ends to headerlines with carriage returns. The data files generated from GTFS import include a route file (.rts), a geographic file (.dbd), and several

additional auxiliary files. The routes file contains all information about the line, node, route, physical stops, and transit stops. Caliper, the developers of TransCAD, provided technical support, as needed, for processing GTFS data. Airport node data points were created using latitude and longitude coordinates, obtained from the Federal Aviation Administration's (FAA) National Plan for Integrated Airport Systems (NPIAS) 2015-2019 report. The three letter airport identifier was used to join data to the airport node points, from the T-100 BTS and airfare data, referenced above. Only airports with Service Class F, and one or more scheduled flights per month were included. There are several ways this data can be filtered for use in future analysis.

The resulting dataset will be used for future research work, particularly to analyze the accessibility to large metropolitan areas by multiple modes from origins throughout the region. Future work, using this dataset, will include developing an accessibility index that provides a measurement for this type of multimodal accessibility, and exploring how this type of accessibility, to large metropolitan areas, originating from areas outside of large metropolitan areas, varies across the Northeast US. Part of the analysis will explore how multimodal accessibility might vary across the region in ways that aren't explained by distance alone.

5. Future Research

For traveling to NYC by bus or train, the planning tool was related to positive attitudes about scheduling flexibility and travel time for certain age and education groups. It was also related to negative attitudes about the ability to get and understand schedules for a bus or train to NYC.

The research work, survey dataset, and multimodal network dataset, presented in this report, will be used for future related research. Further analysis will aim to better quantify the impacts of access to trip planning information, on attitudes about intercity travel by automobile, bus, and passenger rail. Creating GTFS data for intercity bus operators, and incorporating it into the multimodal network dataset developed, and presented in this report,is anticipated for future work related to this research. The intermodal network dataset will contribute to future research examining multimodal intercity accessibility. This type of accessibility describes the ability and ease of traveling from origins across the region, to large metropolitan areas, by multiple modes of travel.

The multimodal network dataset will be used to develop an accessibility index across the study region. The index will incorporate measures, representing the level of accessibility, to large metropolitan areas, from outside of large metropolitan areas, by multiple modes of travel. The measures will incorporate the availability of each mode of travel, including the existence and frequency of service, number of transfers, and network travel time, calculated using the network dataset, for origins from across the region, going to the four destination cities (Boston, New York City, Philadelphia, and Washington, DC). Whether or not differences in measured accessibility values can be explained by network distance alone will be examined. The relationship between network-based accessibility measures, to revealed preferences and stated preferences for mode choice, taken from the survey dataset, and how this might vary with gender and age level, will also be explored.

Possible research questions, pertaining to the survey and network datasets presented in this report, to be addressed in future research include:

How does locational and/or individual accessibility to large metropolitan areas vary over space and time?

If accessibility to large metropolitan areas, from Northern New England, can be measured and mapped, can areas then be identified, with greater accessibility, in truth, than areas with the same measured score? If so, what is it that increases their accessibility?

How do attitudes among study participants, about traveling by multiple modes, to large metropolitan areas, compare with accessibility levels that are calculated, for their origin zipcodes, using the multimodal network?

How does accessibility to large metropolitan areas, by multiple travel modes, relate to population density and urban form?

What is a healthy relationship between the level of accessibility, by multiple travel modes, to population density and urban form?

The research and datasets presented in this report will provide the foundation for future research that will explore multimodal accessibility across the Northeast US, its relationship to population density and urban form, and address some of the possible research questions included here.