Rochester Area
TRANSPORTATION STUDY

SPONSORED BY THE **GENESEE TRANSPORTATION COUNCIL**

JUNE 2012

RSG INC.
RESOURCE SYSTEMS GROUP, INC

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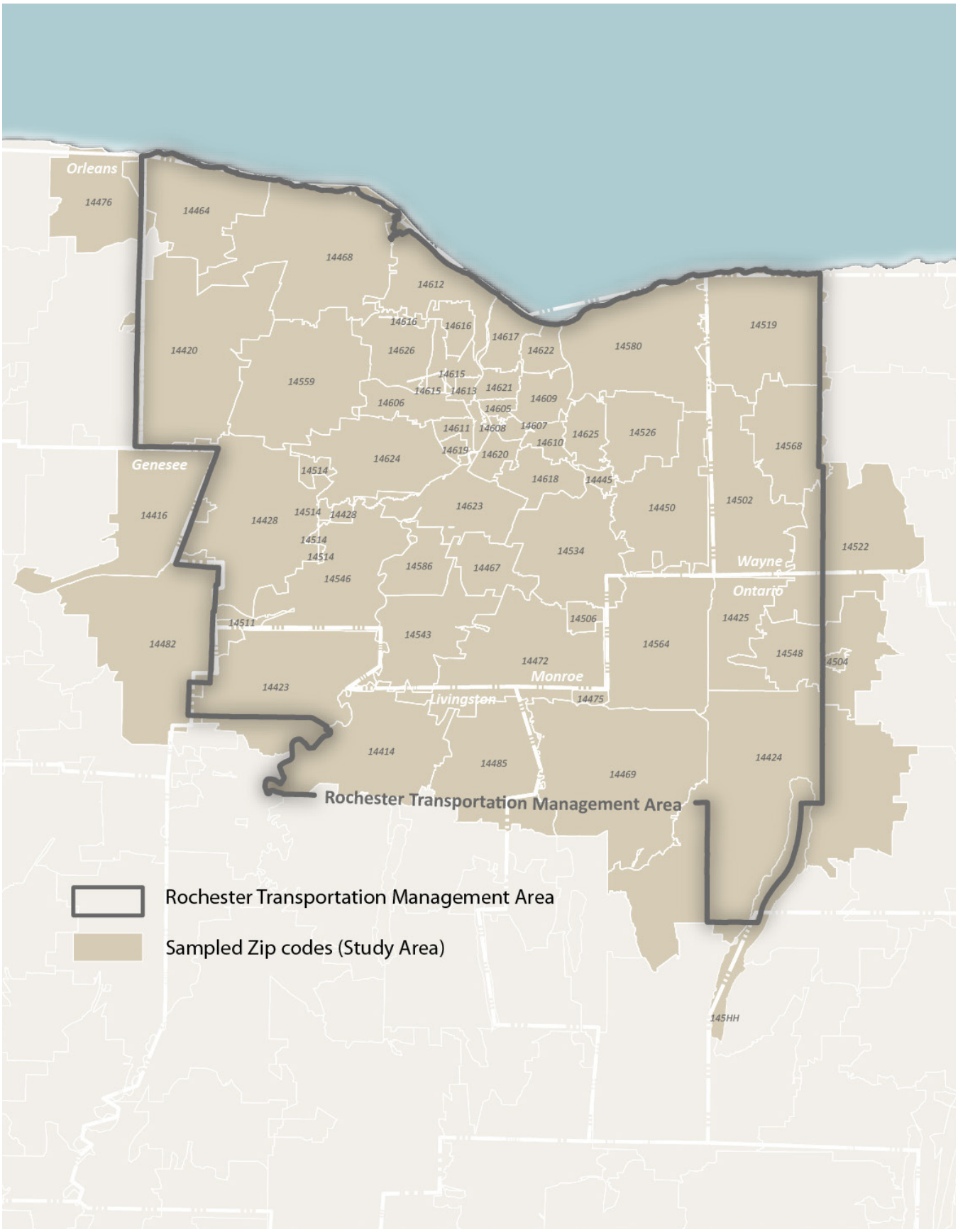
1 EXECUTIVE SUMMARY

In the fall of 2011, Resource Systems Group, Inc. (RSG) conducted a household travel diary survey for the purpose of updating and enhancing the accuracy of the Genesee Transportation Council (GTC) travel demand model. The last household travel survey for the Rochester Transportation Management Area (TMA) was conducted in 1993. Over the subsequent 18 years, the Rochester region has experienced transportation infrastructure and socio-economic changes that impact and alter travel behavior and travel patterns. The 2011 household travel diary survey data collection will be the primary basis for understanding current travel and future year scenarios in the Rochester TMA. The data will be used to estimate, calibrate, and confirm the TMA's forecasting model.

Figure 2.1: ZIP Codes in Study Area



2 SURVEY ADMINISTRATION

This section describes the methods used to efficiently and effectively collect data and complete the travel diary study. RSG employed a multi-method data collection strategy with an emphasis on the advanced web-based diary retrieval survey and the option of telephone retrieval.

2.1 Survey Sample

The sampling frame is all residential addresses in the study area (Figure 2.1), which includes ZIP codes that are either partially or entirely within the Rochester TMA.

The sample sizes used (for the pre-test survey and the main survey) were based primarily on the following factors:

- Bench-marking of industry practices throughout the U.S;
- RSG's understanding of sample sizes suitable for large metropolitan area travel diary studies;
- RSG's ongoing work and understanding of GTC travel demand models.

Address Based Sample

The sampling unit is an individual address. RSG used an address database from the U.S. Postal Service's Computerized Delivery Sequence (CDS) File, an electronic database that provides and continually updates all mailing addresses served by the USPS, with the exception of general delivery. The CDS File contains address information for all other varieties of addresses, including addresses that receive (or have received) mail delivery, addresses only delivered on a seasonal basis, vacant addresses, and throwback addresses (addresses not delivered to because of PO boxes). The CDS File also contains households with all types of telephone (e.g. no-telephone, landline only, cell phone mostly, cell phone only) and combinations therein. RSG used the address-based sample frame maintained by Marketing Systems Group (MSG), which is updated bimonthly and stratified based on residential land use classifications, as well as by geographic location within the Rochester Transportation Management Area.

The invited household addresses for the pre-test and full sample were randomly selected among all existing residential addresses throughout the Rochester region, proportional to the number of households in the study area, which is defined by the ZIP codes that are partially or entirely within the Rochester TMA. Once the set of addresses was obtained by RSG, each address was randomly assigned a travel date. Each group of travel dates was then verified for uniform spread through the study area.

Since the sample is based on residential addresses, these records can be matched to other datasets, which are commonly referred to as "ancillary data." In this case, the ancillary data were appended to the known addresses and were used for the following purposes:[1]

- Allow comparisons between respondents' reported data and the ancillary data available for the full recruited sample to the subset of study participants;
- Demonstrate the ability to analyze non-response bias by comparing the ancillary data available for the full recruited sample to the subset of study participants.

Among the ancillary data that MSG appended to the residential address were such variables as telephone number, latitude-longitude location, dwelling type, and demographic data, including income, ethnicity, and education level.

2.2 Ways to Participate

The primary survey instrument for the Rochester Area Transportation Study was an online survey, which was developed by RSG and administered through a website produced specifically for the project. Each household was first invited to complete a brief Household Information Survey, which was to be completed by one adult member of the household. On the household's assigned travel date (or a date very soon thereafter), each household member completed the Travel Diary section of the survey by logging all the trips made on that day. Respondents could also opt to complete the survey via telephone. Calls to the toll-free telephone number were fielded by Corey, Canapary & Galanis (CC&G), a marketing research firm. In some cases, respondents may have used both methods to complete their household survey. Finally, respondents could also reach RSG by emailing with questions or requests.

Online – To participate in the online version of the Rochester Travel Study, participants logged onto the website and entered their household-specific 8-digit password. These passwords were included in the invitation packet, as well as on all postcard and email reminders. At any point, respondents could exit out of the survey and later return to the survey homepage, log in using their password, and continue exactly from where they left off.

Telephone – Respondents who preferred not to complete their survey online or lacked Internet access could call a toll-free number and operators were available to walk them through the survey over the phone. Additionally, participants could choose to be contacted at a preferred date and/or time and the operators would call the households at their preferred time(s). For non-English speaking households, CC&G offered their standard AT&T foreign language service during business hours and early evenings so that respondents could complete the survey in the language of their choice.

The toll-free telephone number associated with the project was printed on all invitation materials for the survey (postcards, invitation packet, etc.). Call center operators were trained to administer the identical survey that online participants saw. Data from respondents that used the call-in option were fully integrated with all other respondents' answers. The telephone operators also had additional materials and information on hand, such as the project FAQ's, and copies of all printed materials to inform their dialogue with household members.

Households found the telephone option to be a useful resource. During the main survey administration, 2,554 inbound and outbound calls were made. Interviewers answered general questions about the survey, helped resolve technical issues with the survey, and walked respondents through the survey. CC&G also made outbound calls to respondents who had left a voicemail after hours and placed reminder calls to select households that had yet to participate.

Email - For any questions and comments, participants could email RSG. The Rochester Area Transportation Study team at RSG regularly monitored the inbox for emails, which ranged from questions on how to take the survey, to comments on how to improve the survey. Generally, RSG responded to all emails within one business day.

2.3 Pre-Test Survey

RSG conducted a pre-test survey in August 2011 by inviting a sample of 4,000 households to take the Rochester Travel Study. The purpose of the pre-test survey was to evaluate the overall success, efficacy, and methodology of the survey before the main survey launch in September 2011. The goals and objectives of the pre-test process are described in Table 2.1.

2.3.1 Process

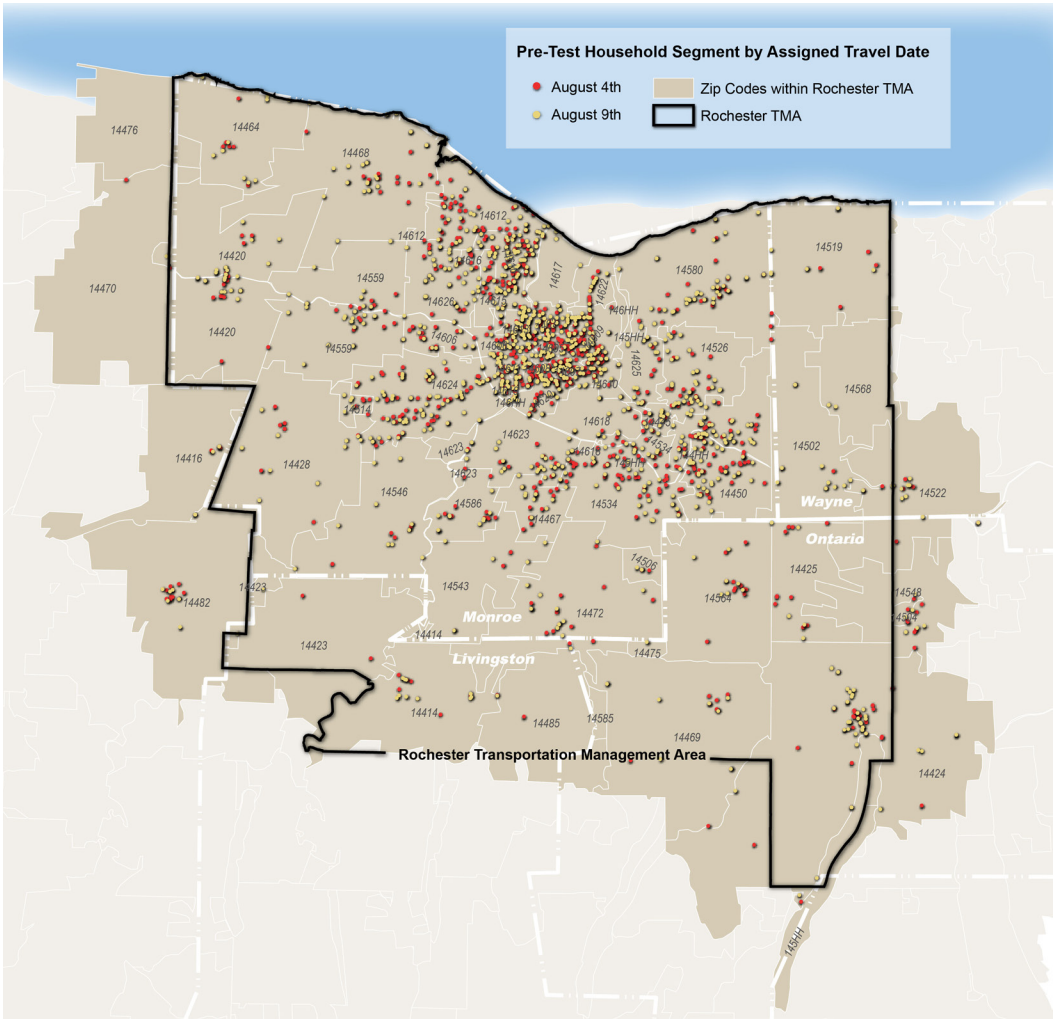
Pre-test households were randomly assigned one of two travel dates, either Thursday, August 4, 2011 or Tuesday, August 9, 2011. The printed material and subsequent follow-up emails to households also indicated their assigned travel date. The two non-consecutive weekday dates were chosen because they were more likely to represent typical travel.

Figure 2.2 shows the distribution and geographic extent of the 4,000 household addresses sampled within the study area.

Table 2.1: Pre-Test Goals and Objectives

Pre-test Goals	Objectives
Allow the entire project team to evaluate the overall project process and to identify any areas for improvement prior to the main survey.	• Question wording and response categories in terms of clarity and confusion for respondents • Review and evaluate the full range of procedures associated with respondent contact, data retrieval, and data processing for the household diary • Examine the full data-set for quality and ability to meet client modeling needs.
Evaluate the effectiveness of the survey materials – both the survey instrument and all accompanying materials such as the memory jogger, postcards, invitation materials, etc.	• Determine the time required for respondents to complete the questionnaire online and over the telephone, both the range and the average • The pre-notice letter, instructions, and memory jogger are thoroughly tested as a part of the pretest for ways to further clarify content (questions and instructions).
Evaluate all aspects of the study methodology to allow the project team to properly estimate and plan reasonable response rates.	• Check and confirm incidence and response rate assumptions • Determine if there are any sub-populations that need additional focus for the main study by oversampling or offering a higher incentive

Figure 2.2: Pre-Test Sample of Households



2.3.2 Online Debrief

At the end of the Travel Diary portion of the survey, all adult participants were asked two open-ended questions regarding feedback for how the survey could be improved upon:

1. Were there any instructions, directions, or questions that were confusing or unclear? If so, please tell us which instructions were confusing and why.

2. Do you have any general recommendations for how we can further improve the study? If so, please tell us your ideas and suggestions for how to improve our study.

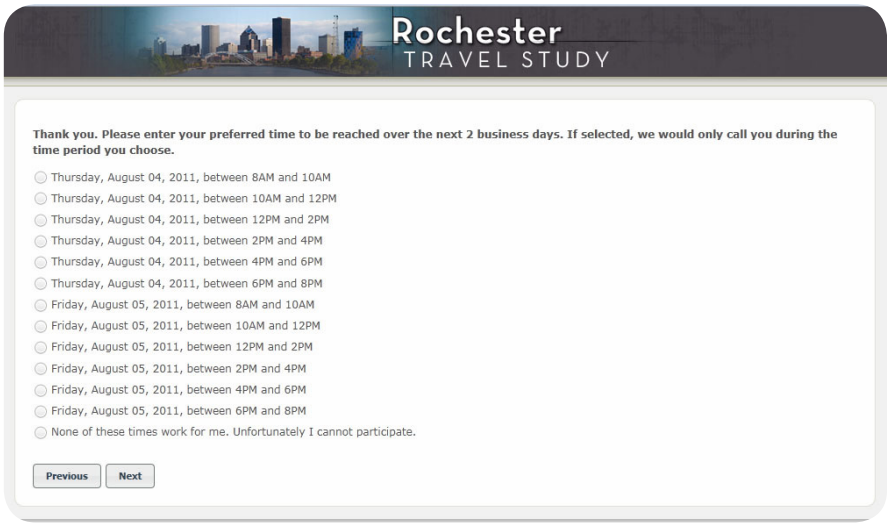
The goal of the open-ended questions was to leave adequate space for a response and to ask the question in a way, that respondents felt comfortable sharing any and all suggestions they had for how to improve the survey.

2.3.3 Telephone Debrief

After having the opportunity to answer the two open-end questions, each adult member of the household was asked if they were willing ("yes or no") to participate in a 20-minute telephone call to further share their suggestions for how to improve the survey. The purpose of the debrief call to participants was to identify any issues with the survey, including confusing language or features, and get participants' suggestions for how to improve the survey for households across the Rochester region.

Respondents who were willing to further participate in a debrief call, were asked to provide the preferred telephone number and time of day for reaching them (Figure 2.3). This question was dynamic and automatically showed two-hour time periods to select from over the course of the next two business days. These volunteers were also informed that if they were selected and called, they would receive an additional $20 gift Amazon.com card. When RSG conducted the call, the operator stressed the value of honest answers in improving the survey for the full field effort.

Figure 2.3: Preferred Time for Pre-Test Debrief Telephone Call



RSG strategically conducted the selection process for which household to contact for a debrief call. In order to maximize the value in conducting debrief calls, RSG chose a subset of the pre-test population that was demographically diverse and that included individuals who provided insightful and/or detailed open-end comments. Similarly, an effort was made to balance feedback from online and telephone participants, as well as households with a low number of reported trips and those who completed numerous trips on their assigned travel date.

The debrief call questionnaire with answers and raw feedback from respondents is included in Appendix A.

2.3.4 Non-Responding Households – Telephone Debrief

At the conclusion of the pre-test survey administration period, CC&G – the opinion research company that handled all telephone interviews – conducted brief, five-minute calls to a random sample of approximately 25 households who were invited to take part in the Rochester Travel Study but did not participate. These were pilot households who had not participated at all (either by logging on to the study website or by calling the toll-free number).

The purpose of the call to non-responders was to identify specific items in the survey process that could be changed to encourage greater response, as well as identify any characteristics that hinder participants from responding.

Mainly, the debrief calls asked respondents about two parts of the survey administration process:

- What do they remember about the survey invitation mailings?
- What were the reasons why they did not participate?

They were also are asked what would have caused them to decide to participate.

The results provided insight on the reasons for not participating. Almost three-quarters of households (73%) remembered receiving the survey invitation materials; the large majority of those received the packet through the mail (88%). The most-read mailing was the postcard announcing the study (90% of those who remembered receiving the mailings read it), compared to the least-read mailing, the reminder postcards (31%).

The top three cited reasons for not participating were:

1. They did not feel that their trips were relevant to a "travel" survey because they either did not make any trips, thought the study was for those who needed help with mobility, or did not feel they had the knowledge to complete a travel study survey.
2. The mailed materials were not deemed "important" or considered junk mail and were ignored, lost, thrown away.
3. They were out of town or did not have the time to complete a survey.

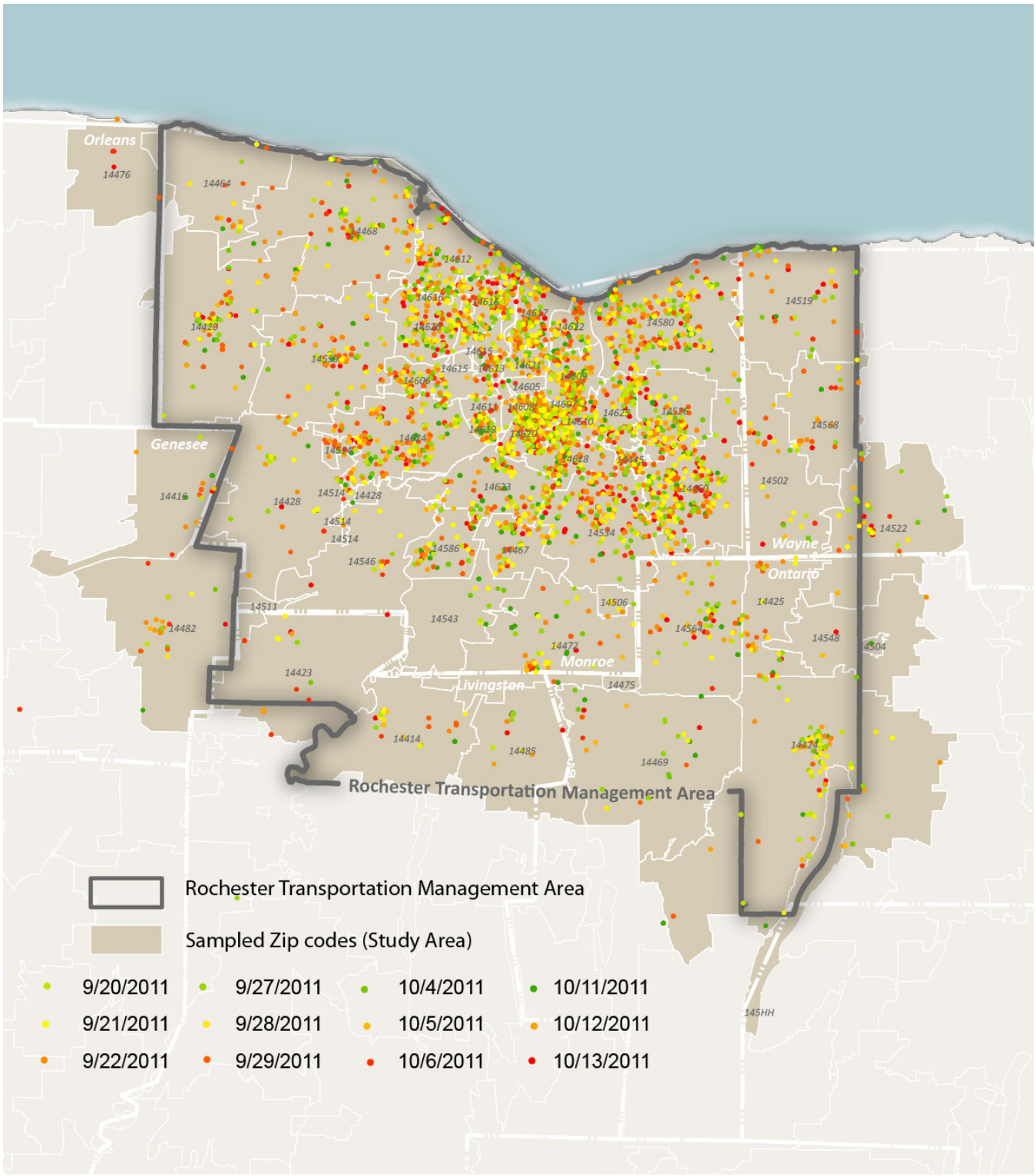
The non-response questionnaire with answers and raw feedback from non-responders is included in Appendix A.

2.3.5 Survey Refinement

Based on the results and comments from the pre-test survey, RSG worked with the client on refining the questionnaire to make the survey more concise and reduce confusion for participants. For the main survey effort, the project name was changed from "Rochester Travel Study" to "Rochester Area Transportation Study" in order to better capture the geographic scope of the project, and to address the non-response feedback such that "transportation" was more broadly invited respondents to participate in the study than the word "travel" did. The Travel Diary portion of the survey was also expanded to include more questions regarding transit usage. In addition, RSG added 20-40 second instructional on-screen help-videos to guide respondents step-by-step through more complex multi-part questions over the course of the survey. Additional effort was made to modify the survey invitation materials, most specifically the FAQs so that some of the issues raised in the non-response interviews were addressed.

The majority of edits were grammatical changes to the opinion and attitude questions in the Household Information Survey and Travel Diary. These and other edits are discussed further in Section 3.1.

Figure 2.4: Main Survey Sample of Households



2.4 Main Survey

Beginning in mid-September 2011, RSG invited a representative sample of 48,000 households within the study area to complete the Rochester Area Transportation Survey. All invited households were randomly assigned one of 12 travel dates beginning on Tuesday, September 20 and ending on Thursday, October 13. On any given travel date, approximately 4,000 households were invited to participate on that day. To best capture a snapshot of each member's typical weekday trips, all assigned travel dates occurred on a Tuesday, Wednesday, or Thursday. Travel dates are shown in Table 2.2.

Table 2.2: Travel Dates

Number	Week	Day of Week	Date
1	1	Tuesday	9/20/2011
2	1	Wednesday	9/21/2011
3	1	Thursday	9/22/2011
4	2	Tuesday	9/27/2011
5	2	Wednesday	9/28/2011
6	2	Thursday	9/29/2011
7	3	Tuesday	10/4/2011
8	3	Wednesday	10/5/2011
9	3	Thursday	10/6/2011
10	4	Tuesday	10/11/2011
11	4	Wednesday	10/12/2011
12	4	Thursday	10/13/2011

Figure 2.4 shows the extent and geographic distribution of all invited household addresses, color coded by their initial assigned travel date.

2.5 Survey Invitation Materials

The Rochester Area Transportation Study invitation and outreach process included the following methods:

1. Printed materials for mail-out invitation packets and postcard reminders;
2. Email reminders to study participants;
3. Phone number and email for any questions or comments

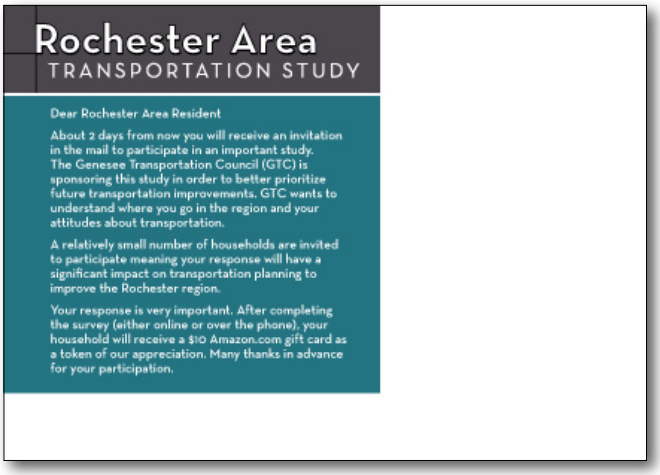
RSG sent all survey materials via first-class mail. All printed materials and online graphics featured consistent visual elements, including survey titles and description, color scheme, fonts, logos and picture graphics. The intended effect of this coordination is to connect all invitations, reminders, and other notices about the project.

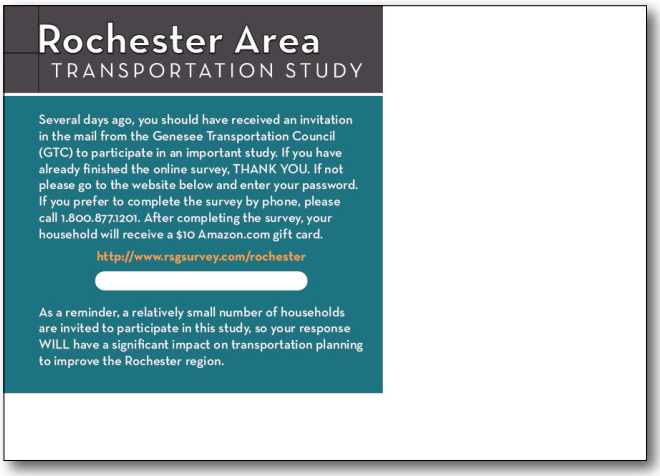
2.5.1 Postcards

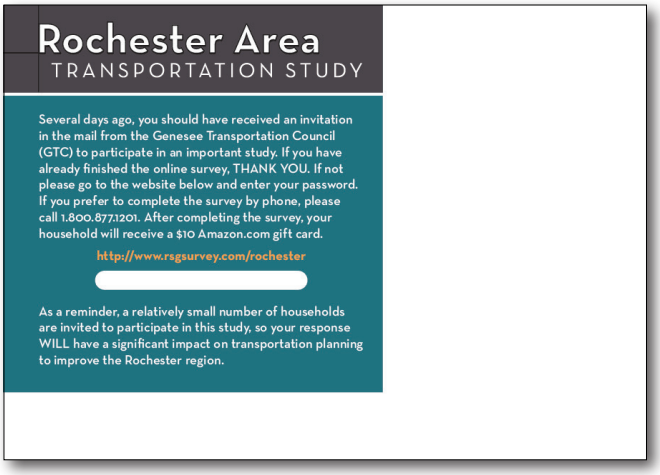
A 6" by 4.25" pre-notification (advance notice) postcard was sent to arrive approximately five business days prior to the assigned travel date. The postcard announces the study and conditioned the household to expect a survey invitation in the coming days. On average, pre-notification announcements have been shown to improve the base response rate by 15%.[2]

Two additional 6" by 4.25"postcards were also mailed to each household, reminding them to complete the survey. The first reminder postcard is arrived approximately on the assigned travel day and the second reminder postcard arrived approximately two days after the assigned travel day.

Figure 2.5: Pre-Notification and Reminder Postcards (front and back)







2.5.2 Survey Invitation Packet

The survey invitation packet was sent out in a 9" by 6" envelope and scheduled to arrive approximately two to three days prior to the assigned travel date. The survey invitation packet included:

- Invitation Envelope: Each invitation packet was branded on the outside with a return address PO Box in Rochester to match the look and feel of the study website and postcards. As part of the process of determining an accurate response rate, RSG tallied any "return to sender" mailings that were undeliverable (Figure 2.6)
- Invitation Letter: The invitation letter was printed on GTC letterhead and served to explain the purpose of the study, the study sponsor, and why it was in the household's best interest to fully participate in the study. The letter also included the study website and password for the household. On average, introductory letters have been shown to improve the base response rate by 30%[3]. (Figure 2.7)
- Travel Log: Each invitation packet included three travel logs that served as a "worksheet" for household members to record information about their daily trips, which they could later use as a resource for completing the survey online or over the telephone. This document was also available on the study website to download and print additional copies. (Figure 2.8)
- Study FAQ document: A double-sided document with basic information, conveyed the importance and legitimacy of the study, and answered commonly asked questions and about the project and the survey itself (Figure 2.9)

Figure 2.6: Invitation Packet Envelope

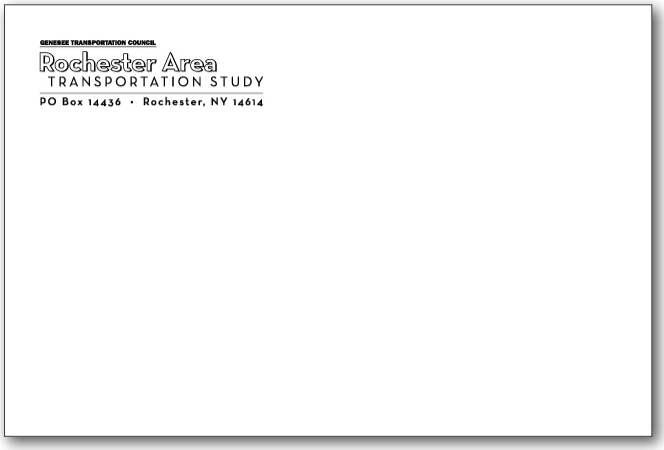
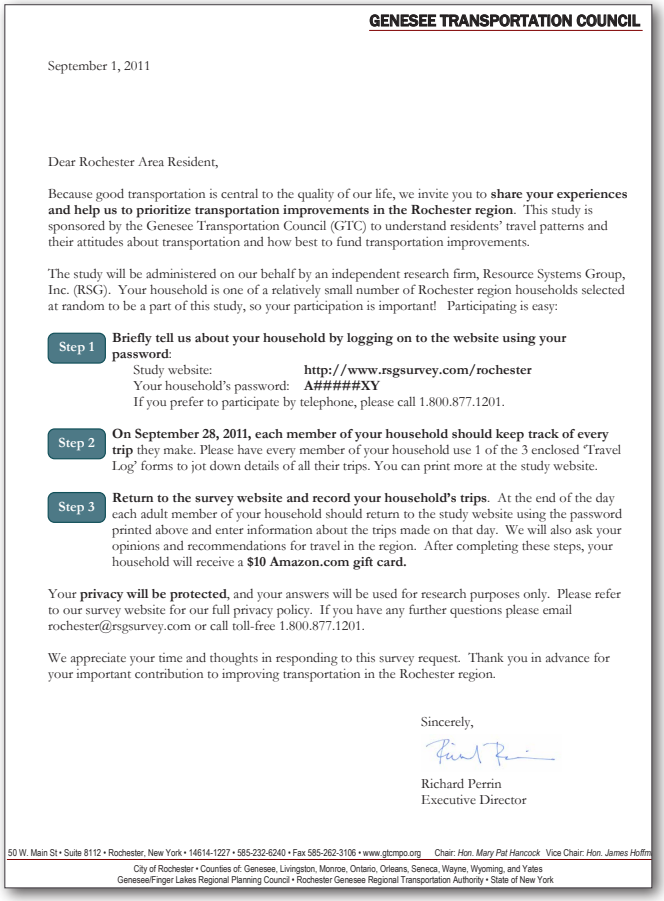


Figure 2.7: Invitation Letter



GENESEE TRANSPORTATION COUNCIL

September 1, 2011

Dear Rochester Area Resident,

Because good transportation is central to the quality of our life, we invite you to **share your experiences and help us to prioritize transportation improvements in the Rochester region**. This study is sponsored by the Genesee Transportation Council (GTC) to understand residents' travel patterns and their attitudes about transportation and how best to fund transportation improvements.

The study will be administered on our behalf by an independent research firm, Resource Systems Group, Inc. (RSG). Your household is one of a relatively small number of Rochester region households selected at random to be a part of this study, so your participation is important! Participating is easy:

Step 1 **Briefly tell us about your household by logging on to the website using your password**:
Study website: **http://www.rsgsurvey.com/rochester**
Your household's password: **A#####XY**
If you prefer to participate by telephone, please call 1.800.877.1201.

Step 2 **On September 28, 2011, each member of your household should keep track of every trip** they make. Please have every member of your household use 1 of the 3 enclosed 'Travel Log' forms to jot down details of all their trips. You can print more at the study website.

Step 3 **Return to the survey website and record your household's trips**. At the end of the day each adult member of your household should return to the study website using the password printed above and enter information about the trips made on that day. We will also ask your opinions and recommendations for travel in the region. After completing these steps, your household will receive a **$10 Amazon.com gift card.**

Your **privacy will be protected**, and your answers will be used for research purposes only. Please refer to our survey website for our full privacy policy. If you have any further questions please email rochester@rsgsurvey.com or call toll-free 1.800.877.1201.

We appreciate your time and thoughts in responding to this survey request. Thank you in advance for your important contribution to improving transportation in the Rochester region.

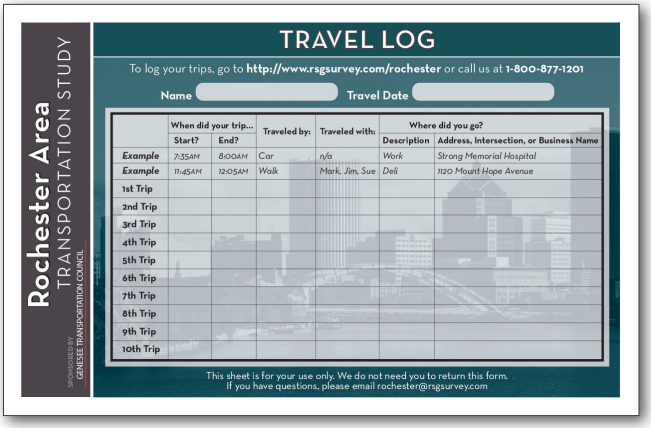
Sincerely,

Richard Perrin
Executive Director

50 W. Main St • Suite 8112 • Rochester, New York • 14614-1227 • 585-232-6240 • Fax 585-262-3106 • www.gtcmpo.org Chair: *Hon. Mary Pat Hancock* Vice Chair: *Hon. James Hoffm*

City of Rochester • Counties of: Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates
Genesee/Finger Lakes Regional Planning Council • Rochester Genesee Regional Transportation Authority • State of New York

Figure 2.8: Travel Log (front and back)



Rochester Area
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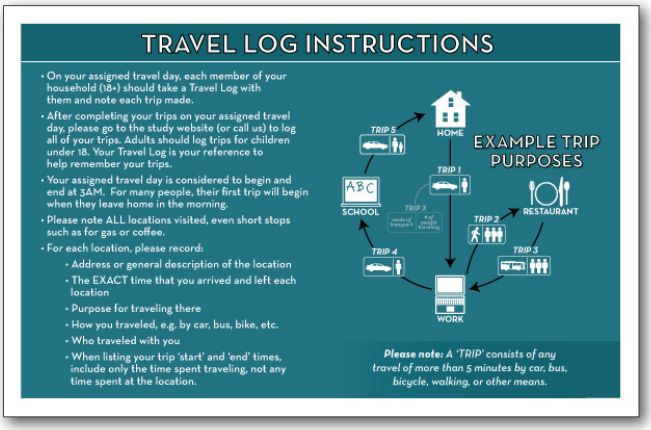
TRAVEL LOG

To log your trips, go to **http://www.rsgsurvey.com/rochester** or call us at **1-800-877-1201**

Name _____ Travel Date _____

	When did your trip...		Traveled by:	Traveled with:	Where did you go?	
	Start?	End?			Description	Address, Intersection, or Business Name
Example	*7:35AM*	*8:00AM*	*Car*	*n/a*	*Work*	*Strong Memorial Hospital*
Example	*11:45AM*	*12:05AM*	*Walk*	*Mark, Jim, Sue*	*Deli*	*1120 Mount Hope Avenue*
1st Trip						
2nd Trip						
3rd Trip						
4th Trip						
5th Trip						
6th Trip						
7th Trip						
8th Trip						
9th Trip						
10th Trip						

This sheet is for your use only. We do not need you to return this form.
If you have questions, please email rochester@rsgsurvey.com

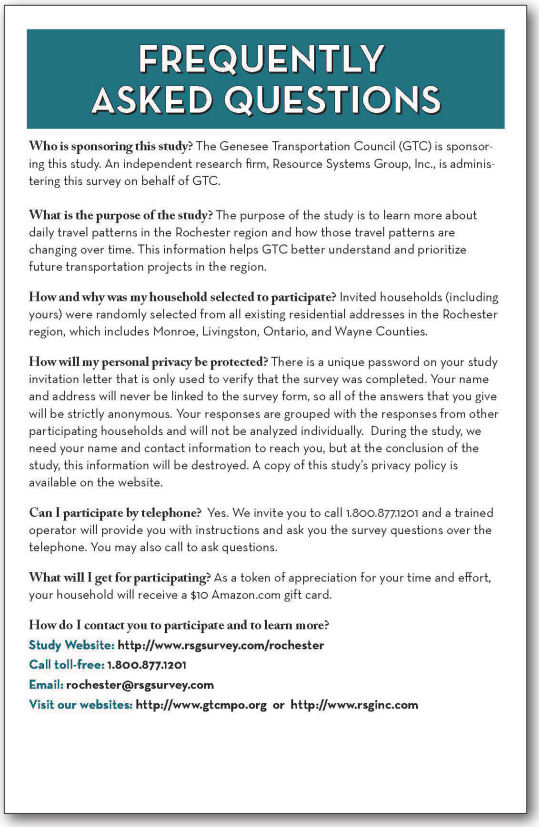


TRAVEL LOG INSTRUCTIONS

- On your assigned travel day, each member of your household (18+) should take a Travel Log with them and note each trip made.
- After completing your trips on your assigned travel day, please go to the study website (or call us) to log all of your trips. Adults should log trips for children under 18. Your Travel Log is your reference to help remember your trips.
- Your assigned travel day is considered to begin and end at 3AM. For many people, their first trip will begin when they leave home in the morning.
- Please note ALL locations visited, even short stops such as for gas or coffee.
- For each location, please record:
  - Address or general description of the location
  - The EXACT time that you arrived and left each location
  - Purpose for traveling there
  - How you traveled, e.g. by car, bus, bike, etc.
  - Who traveled with you
  - When listing your trip 'start' and 'end' times, include only the time spent traveling, not any time spent at the location.

***Please note:** A 'TRIP' consists of any travel of more than 5 minutes by car, bus, bicycle, walking, or other means.*

Figure 2.9: FAQs (front and back)



FREQUENTLY ASKED QUESTIONS

Who is sponsoring this study? The Genesee Transportation Council (GTC) is sponsoring this study. An independent research firm, Resource Systems Group, Inc., is administering this survey on behalf of GTC.

What is the purpose of the study? The purpose of the study is to learn more about daily travel patterns in the Rochester region and how those travel patterns are changing over time. This information helps GTC better understand and prioritize future transportation projects in the region.

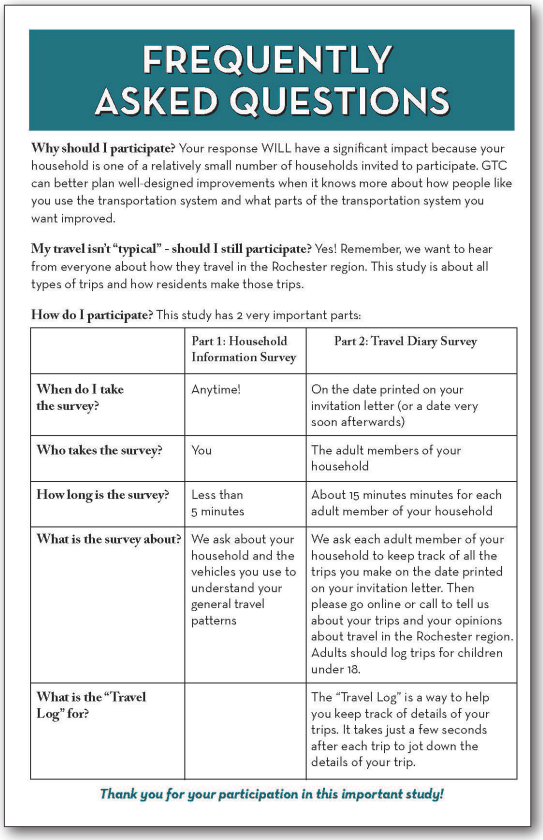
How and why was my household selected to participate? Invited households (including yours) were randomly selected from all existing residential addresses in the Rochester region, which includes Monroe, Livingston, Ontario, and Wayne Counties.

How will my personal privacy be protected? There is a unique password on your study invitation letter that is only used to verify that the survey was completed. Your name and address will never be linked to the survey form, so all of the answers that you give will be strictly anonymous. Your responses are grouped with the responses from other participating households and will not be analyzed individually. During the study, we need your name and contact information to reach you, but at the conclusion of the study, this information will be destroyed. A copy of this study's privacy policy is available on the website.

Can I participate by telephone? Yes. We invite you to call 1.800.877.1201 and a trained operator will provide you with instructions and ask you the survey questions over the telephone. You may also call to ask questions.

What will I get for participating? As a token of appreciation for your time and effort, your household will receive a $10 Amazon.com gift card.

How do I contact you to participate and to learn more?
Study Website: http://www.rsgsurvey.com/rochester
Call toll-free: 1.800.877.1201
Email: rochester@rsgsurvey.com
Visit our websites: http://www.gtcmpo.org or http://www.rsginc.com



FREQUENTLY ASKED QUESTIONS

Why should I participate? Your response WILL have a significant impact because your household is one of a relatively small number of households invited to participate. GTC can better plan well-designed improvements when it knows more about how people like you use the transportation system and what parts of the transportation system you want improved.

My travel isn't "typical" - should I still participate? Yes! Remember, we want to hear from everyone about how they travel in the Rochester region. This study is about all types of trips and how residents make those trips.

How do I participate? This study has 2 very important parts:

	Part 1: Household Information Survey	Part 2: Travel Diary Survey
When do I take the survey?	Anytime!	On the date printed on your invitation letter (or a date very soon afterwards)
Who takes the survey?	You	The adult members of your household
How long is the survey?	Less than 5 minutes	About 15 minutes minutes for each adult member of your household
What is the survey about?	We ask about your household and the vehicles you use to understand your general travel patterns	We ask each adult member of your household to keep track of all the trips you make on the date printed on your invitation letter. Then please go online or call to tell us about your trips and your opinions about travel in the Rochester region. Adults should log trips for children under 18.
What is the "Travel Log" for?		The "Travel Log" is a way to help you keep track of details of your trips. It takes just a few seconds after each trip to jot down the details of your trip.

Thank you for your participation in this important study!

2.5.3 Email Reminders to Study Participants

Respondents were asked to provide a contact email for the household in the Household Information Survey. RSG used the email addresses to send households reminders and encourage participation, as well as send Amazon.com gift cards to those households who had completed the survey. A total of five possible emails were sent to households who had not completed their travel diaries.

1. Morning of the household's assigned travel date: An email was sent to the primary contact email address for those households that have already provided an email address as part of the Household Information Survey. This message thanked the household for completing the Household Information Survey and reminds the household of their assigned travel date.
2. On the day immediately after the assigned travel day: Any household that had not yet completed all of their travel diaries for all adult household members was sent a follow-up email reminding them to go online and complete their travel diaries and enter their trips to qualify for the Amazon.com gift card incentive.
3. Third and fourth follow-up reminder email: Two additional follow-up emails—one on a weekday and one on a Saturday—were sent within seven days of the assigned travel date to households that still had not completed all of their assigned travel diaries.
4. Fifth and final reminder email: On the Friday of the week after the assigned travel date, any households who had not yet completed their travel diaries were sent one final reminder email.

All reminder emails provided general information about the project and the incentive for its completion. Additionally, the emails included the study website, the household's login password, and a return email address for participants with any questions or comments about the project. RSG has a standard of responding to emails sent from participating households within one business day.

2.5.4 Travel Date Reassignment

Wave A

In order to increase response rate, RSG provided households that were invited to participate but did not complete the survey with a new travel date, in a process called travel date reassignment. This method is more cost-effective than inviting an entirely new sample of households and is common practice of household diary survey administrations.

On October 3, at the midpoint of the data collection period, RSG evaluated the sample size and response rate and determined that travel date reassignment would be conducted for a portion of the sample to help reach the target of having 3,500 households complete the survey. RSG implemented three strategies for the second half of the survey:

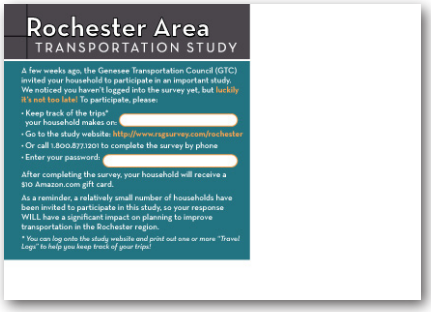
1. Increased capacity at the call center to allow more time for outbound reminder calls;
2. Email outreach to households that were in-progress or had completed the Household Information Survey but had not yet started the Travel Diary; and
3. Reassigning travel dates to non-responding households.

In order to handle more inbound calls as well as add capacity for placing outbound reminder calls to households, CC&G added interviewers to the project team.

For the actual reassignment of travel dates, households that were in-progress or had completed the Household Information Survey but had not yet started the Travel Diary were sent a follow-up email informing the household of their opportunity to still participate with their new assigned travel date. This effort included households from both the first and second week of travel dates.

In terms of scope, the primary strategy for reaching the target sample size was reassigning the travel dates for non-responding households, notifying them of the change, and encouraging them to participate. Notifying these households of their new travel date was done via postcard mail out. If these households then completed the Household Information Survey, RSG sent them a set of follow-up reminder emails. RSG revised the language of the original postcard and email to inform households of their opportunity to still participate in the survey with a new travel date.

Figure 2.10: Reassignment Postcards



To reach the target sample size and contain costs, RSG reassigned the travel dates of all non-responding households from the second week of travel dates (9/27 – 9/29). This decision was based on the following information known and assumptions held on October 3:

- 6.1% response rate from the first two weeks of travel dates. If that response rate held for the third and fourth week of travel dates, the overall sample size would be approximately 2,925, or 575 short of the target.
- Approximately 11,000 households were invited but did not participate during the second week of travel dates

The new assigned travel dates were from Tuesday, October 18 to Thursday, October 20. Households retained their original day of week, as shown in Table 2.3.

Table 2.3: Reassignment Travel Dates

Day of Week	Original Travel Date	New Travel Date	Contact Method
Tuesday	9/20/2011	10/18/2011	Email reminders
Wednesday	9/21/2011	10/19/2011	Email reminders
Thursday	9/22/2011	10/20/2011	Email reminders
Tuesday	9/27/2011	10/18/2011	Postcard, email reminders
Wednesday	9/28/2011	10/19/2011	Postcard, email reminders
Thursday	9/29/2011	10/20/2011	Postcard, email reminders

The benefit of reassigning the second week of travel dates only was to minimize the length between the original travel date and the reassigned travel date (three weeks, in this case). Additionally, the number of non-responding households from week two (approximately 11,000) was reasonable given our assumed response rate and the amount of additional completed surveys needed.

Wave B

A second reassignment process happened after the third and fourth weeks of travel dates. Given the success of the Wave A reassignment process, the Wave B process was smaller in scale, as RSG only sent targeted emails for households that requested reassignment, as well as households that were either in-progress or had completed the Household Information Survey but had not yet started the Travel Diary. No postcards were sent during Wave B of the reassignment process.

2.6 Incentives

The suite of survey invitation materials included notification that households would receive a $10 incentive (an Amazon.com gift card) upon completing the entire survey. The purpose offering this incentive was to encourage participation.

Near the end of the Household Information Survey, households were asked to provide a contact email address. In addition to sending email reminders, RSG used the contact email address to email $10 Amazon.com gift cards to households that completed the entire survey. A message was included with each of the gift cards that read:

> Thank you for recently completing the Rochester Area Transportation Study. We know you could have easily ignored the invitation, but you didn't, which means your survey answers will help the Genesee Transportation Council (GTC) better understand and prioritize future transportation projects in the region.
>
> Here's a $10 gift card to Amazon.com as a token of our appreciation. Thank you again for participating in the study!
>
> Best,
>
> Rochester Area Transportation Study

Each Tuesday, RSG provided the incentive for all households that completed the survey during the previous period. For example, on October 11, households that completed the survey between October 4 and October 10 received a gift card. This process continued throughout the duration of survey administration until the survey was closed down on Monday, November 7.

For households that completed the survey over the phone with CC&G or entered an invalid email address, RSG sent the $10 gift card via first class mail to the household's mailing address.

3 SURVEY QUESTIONNAIRE

3.1 Main Survey Modifications

Pursuant to the comments and results from the pre-test survey, the RSG team worked with GTC to fine tune the Rochester Area Transportation Study questionnaire script in order to rectify areas for improvement that were noted from the pre-test survey. Although four new questions were added to the survey and two more were removed, the majority of edits were grammatical.

3.2 General Updates

In order to clarify the wider geographical scope of the study, the project was renamed "Rochester Area Transportation Study" (originally "Rochester Travel Study") throughout the survey and in the invitation and reminder material. To also better reflect its purpose, the "Memory Jogger" was re-titled "Travel Log." All references to "town center" were changed to "village or city".

To reduce confusion between the adult and child travel diaries, all participants were reminded at the start of the survey that "adults should log trips for children under 18." Participants were further reminded that the $10 Amazon gift card would be sent once the entire household had completed all of their Travel Diary surveys.

3.2.1 Household Information Survey Updates

To simplify the opinion and attitude questions about the important considerations respondents made in choosing to live in the Rochester area, RSG slightly modified the text shown to those who have lived in the Rochester region for 10 or fewer years. They text changes were:

Table 3.1: Household Survey Text Changes

Pre-test Survey Text	Main Survey Text
Job or school change in the household	[Removed]
Change in family size, marital, or partner status	A change in family size or marital/ partner status
Close to job or school	Being close to job or school
Desire good schools (K-12)	Quality of schools (K-12)
Walkable neighborhood and near local activities	Having a walkable neighborhood and being near local activities
Value having space and separation from others	Having space and separation from others
Close to family, friends or other family reasons	Being close to family or friends

3.2.2 Travel Diary Updates

With the addition of a few questions, participants in the full-sample survey were told that the travel diary would take 15 minutes for each adult to complete, compared to the 12 minutes for the original pre-test survey. To explain how to take the survey and what trips to include, RSG added examples of different trip types. The RSG team also included instructional videos to show step-by-step how the user should enter their information on more complex questions, which included:

- Trip Roster: Where the respondent lists each location they visited on their travel day
- Geocoder: Show respondents how to enter a location by address, business name, or pin-point from an interactive map.

An additional trip confirmation page was added in the final survey to show respondents the complete list of trips they entered, their origin/destination, and the approximate distance between locations (Figure 3.1).

To help respondents keep track, each trip information page included a display box in the corner indicating which trip the respondent was currently answering questions about (Figure 3.2).

Following the pilot some minor edits were made to the list of trip purposes and details. The changes were:

- Added “Make a quick stop (e.g. ATM, drive-thru, fast-food, coffee)”
- Added “volunteer” to the religious/community activity category
- “College/Hospital Shuttle service” was added to the list of transportation mode options.

The project team also wanted to better understand the motivation for transit users. A new question was added to ask where respondents would want to locate future transit stations or hubs in their region. For those that indicated their interest in having direct bus routes, a follow-up question was added asking where they would want a bus to travel directly within the Rochester region.

In addition, four checkbox options were added to the question on what would encourage respondents to take a bus more frequently:

- Not having to transfer
- Greater feeling of safety onboard the buses
- Other, please specify
- Nothing will encourage me to take a bus more frequently

Two opinion questions were removed from the final survey:

- Opinion question on how walkable or easily accessible groceries and gathering places were to their home
- Opinion question on whether they feel trapped in the place they live

Lastly, one final additional to the questionnaire asked respondents if they would be willing to participate in future travel studies in the Rochester region (Figure 3.3).

Figure 3.1: Trip Confirmation Page

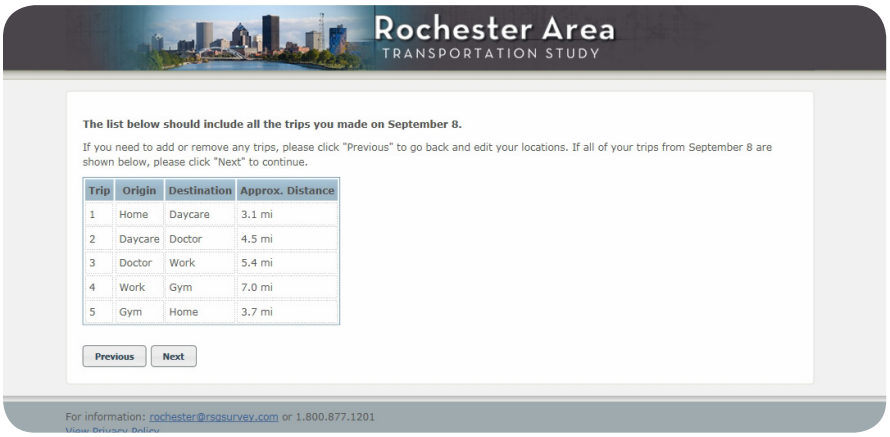


Figure 3.2: Trip Details with Display Box Showing Current Trip (Upper Right Corner)

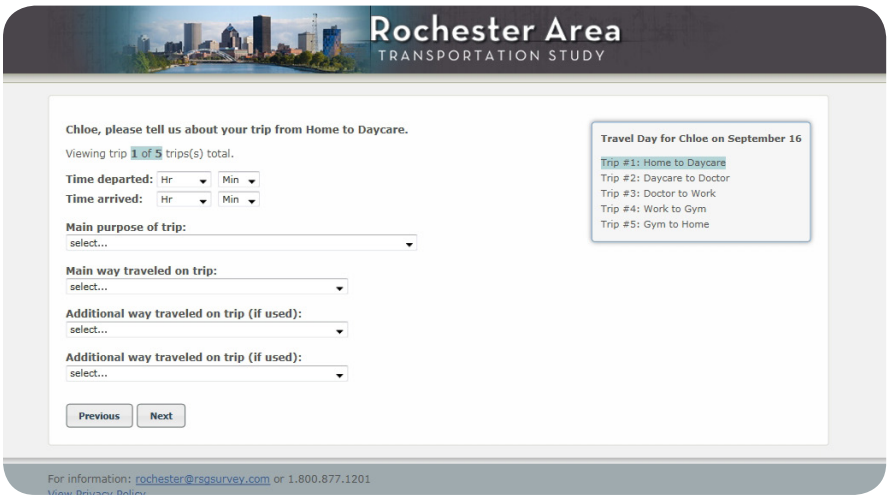
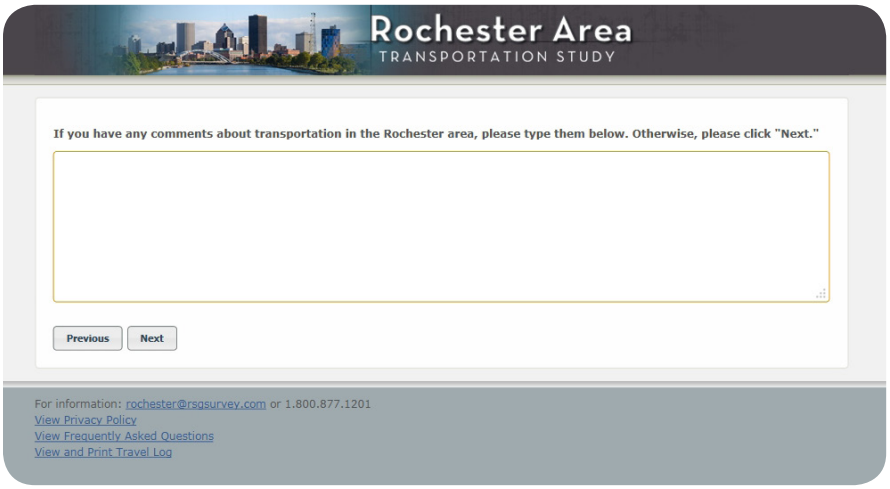


Figure 3.3: Final Comments



3.3 Questionnaire Script

The Rochester Area Transportation Survey was comprised of two primary components, the Household Information survey and the Travel Diary survey.

3.3.1 Household Information Survey

This brief (approximately five minute) survey was completed by one adult member of the household who was asked to provide information about the demographic characteristics of the household. This included questions of three types:

- Household Data: Home ZIP code, years lived at current residence, months of the year living full-time at residence, housing type, home location, household income, preferred way(s) of contacting household, and preferred time(s) to contact household. (Figure 3.4)
- Person Data: Number of adults and children in household and the gender, ages, relationship, race, ethnicity, education, employment status, and number of jobs of household members. The name or initials of each household member are also provided for ease of distinguishing each person and were not associated with the final survey data. (Figure 3.5)
- Vehicle Data: Number of motor vehicles in household, year/make/model/fuel type of each household vehicle, and miles driven in the past year for each household vehicle. (Figure 3.6)

Figure 3.4: Example Household Data Question - Household Information Survey

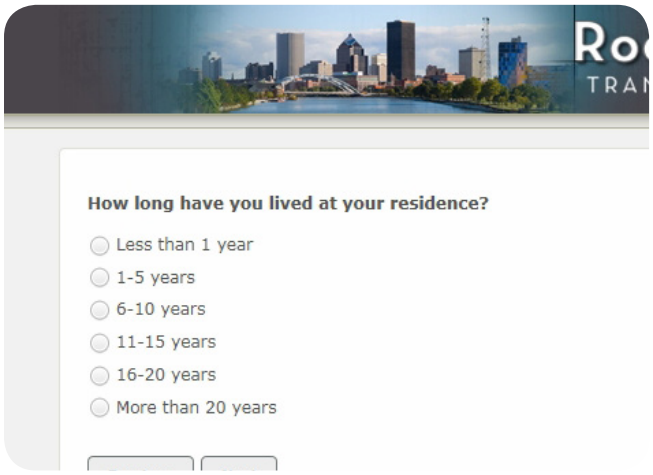


Figure 3.5: Example Person Data Question - Household Information Survey

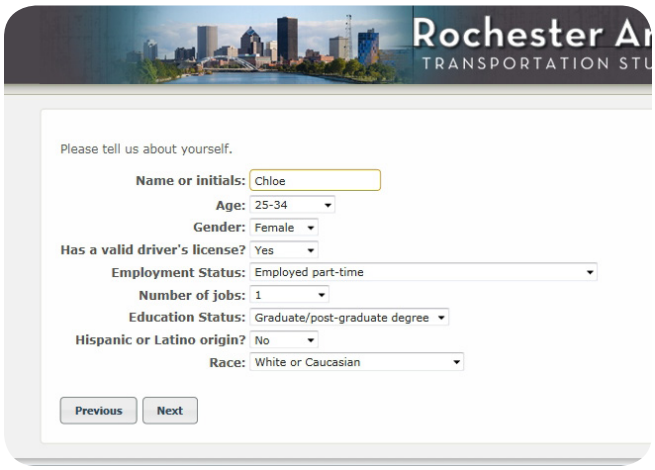
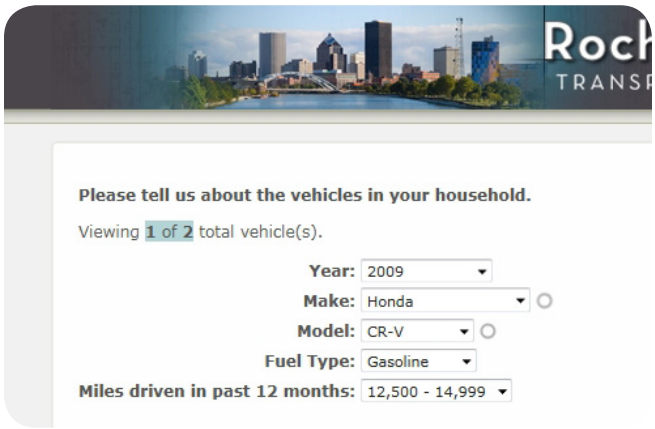


Figure 3.6: Example Vehicle Data Question - Household Information Survey



3.3.2 Travel Diary Survey

Each adult in the household was asked to complete the Travel Diary survey which is composed of two basic sections.

Travel Diary

The primary purpose of the Travel Diary survey was to comprehensively obtain information about the travel that occurred over a pre-assigned 24-hour period (beginning at 3:00 a.m. on the assigned travel date) for each adult member of the household. To that end, each household member was asked if they made any trips (at all) on their assigned travel date. Those who made zero trips were asked their reasons for not leaving the house.

All respondents who made at least one trip on their assigned travel date were asked to list all the locations they visited (Figure 3.7), including the address of the trips' origin and destination (Figure 3.8). Using interactive Google mapping technology, respondents could search for an address, a business name, or place a marker on the map to find each location. Once the location was selected, its latitude and longitude coordinates were automatically geocoded by the survey software.

Figure 3.7: Trip Roster - Travel Diary Survey

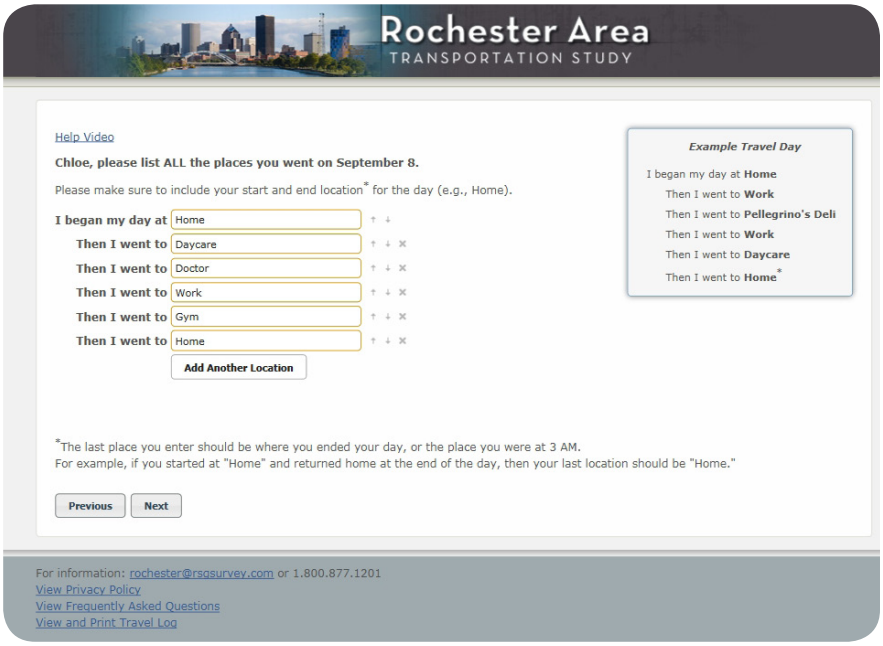
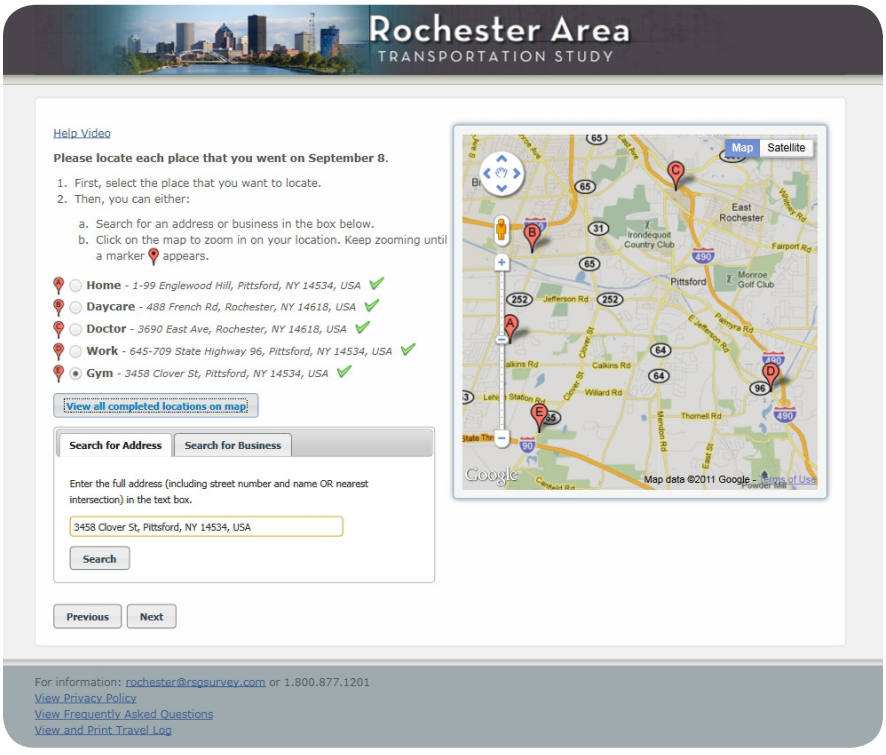


Figure 3.8: Google Map Geocoder - Travel Diary Survey



Having provided the roster of trips made, respondents were then asked specific details about each of their trips, including start and end times, trip purpose, and travel mode(s) used. (Figure 3.9)

Respondents were also asked to provide travel mode specific information. Those who traveled by personal vehicle were asked to indicate:

- Household vehicle that was used on the trip,
- Any costs on the trip (toll or parking),
- Vehicle occupancy, and
- The specific household members who traveled along in the vehicle.

Similarly, those traveling by bus were asked to indicate how they paid for their transit trip and what transit route they used. Lastly, those who made a walking or biking trip were asked if they used a dedicated sidewalk or bike path on their trip.

General Travel & Opinion Questions

After concluding the Travel Diary portion of the survey, each adult member of the household was asked a set of follow-up questions. Specifically, respondents who were employed were asked a few general questions about their commute; how many days per week they commute, what time of day they typically arrive to and leave from work, and how they typically commute to and from work. Students attending school were asked a similar set of travel questions about their school commute.

All respondents were asked a few general questions about using transit such as how often they ride a bus in the Rochester region, what would encourage them to use transit more often, and how many minutes they would be willing to walk from a bus stop to their place of employment. Lastly, all respondents were asked a set of questions to understand their opinions and attitudes about travel around the Rochester region (Figure 3.10).

Figure 3.9: Trip Information – Auto Example – Travel Diary Survey

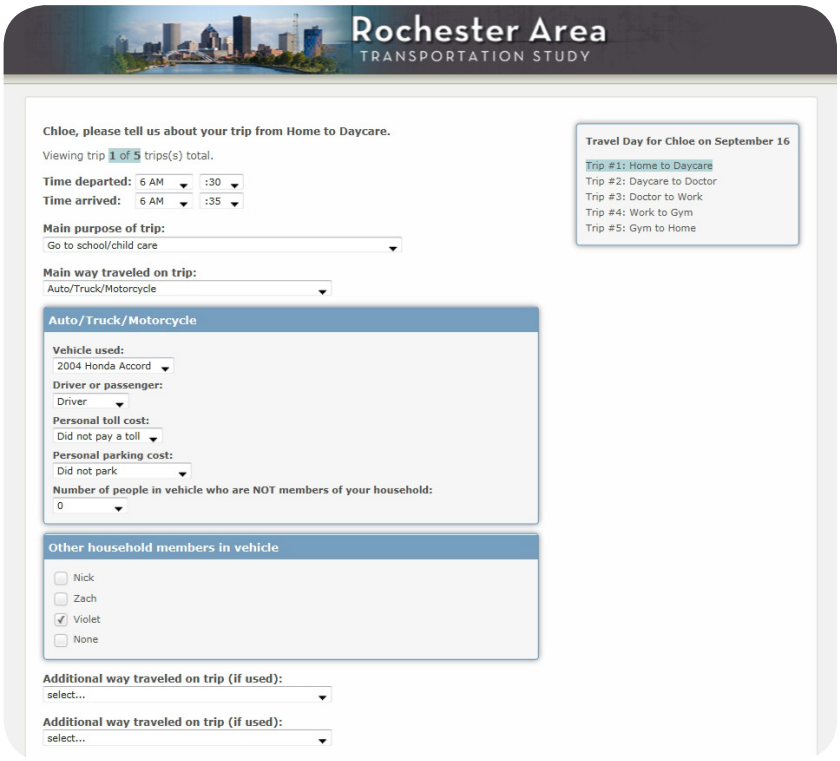
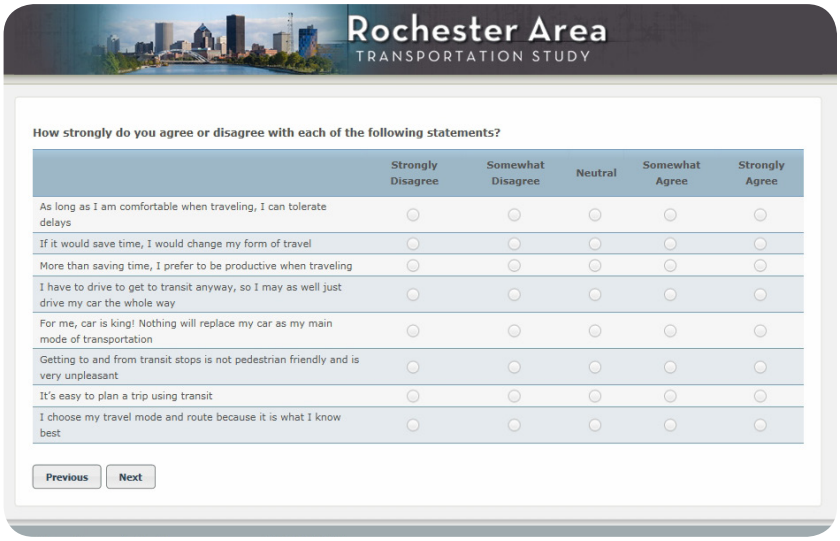


Figure 3.10: General Opinion Questions - Travel Diary Survey



4 SURVEY RESULTS AND FINDINGS

After closing the online survey on November 6, 2011, RSG merged the data collected from the pilot survey and the main survey and then conducted a data cleaning process, which involved checking for incompletes, outliers, and inaccuracies. The final, "cleaned" dataset included households from which every adult completed the entire travel diary portion of the survey. In total, 94% (3,454) of the 3,671 households in the dataset participated in the main survey during the fall of 2011. The remaining households participated in the pilot survey during August 2011.

In order to more closely reflect the true population of those living in the Rochester TMA, the collected survey data were weighted by household size, household income, and the number of vehicles available. The control data—geographically defined by the set County Subdivisions (municipalities) included in the Rochester TMA—were based on the most recent and available 2010 U.S. Census data (household size) and the American Community Survey (ACS) 5-year data (household income and vehicle ownership). After obtaining these observed data, RSG expanded the survey dataset to control for totals across the three dimensions. The expansion results are summarized in Table 4.1.

Table 4.1: Household Survey Text Changes

	Unweighted Survey Data	Weighted Survey Data
Households	3,671	334,127
Adults	6,425	597,289
Person trips	27,296	2,588,228

The following section contains the representative data gathered from the weighted survey responses. The numbers reflect the extrapolated information used to analyze the findings at a scale reflective of the entire Rochester Transportation Management Area (TMA).

4.1 General Information

Of the adult participants, there was slightly more representation from female members; 324,970 (54%) are female, compared to 272,320 (46%) male. (Figure 4.1) The age breakdown shows that there is a fairly even representation from people ages 25 through 64 (72%), with relatively fewer adults between 18 and 24 (10%) and over 64 (18%). (Figure 4.2)

Given that the largest contingent of respondents is between the ages of 25 and 64, the majority of household members (62%) are employed in some capacity (full-time, part-time, self-employed, or student who works 25 or more hours a week). Even though 18% of the adult population is of retirement age (65 or older), slightly more than one-fifth are retired (21%). The smallest group is students who work 25 hours a week or more, totaling 11,857 individuals—or 2%—of all respondents. (Figure 4.3)

Figure 4.1: Gender

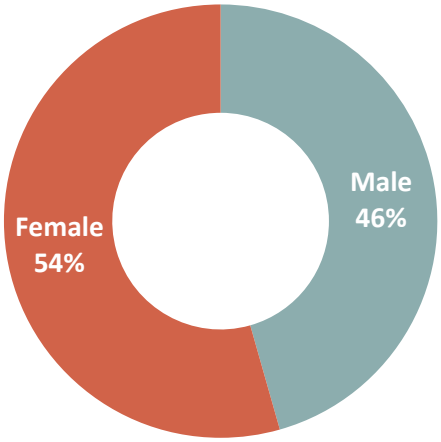


Figure 4.2: Age

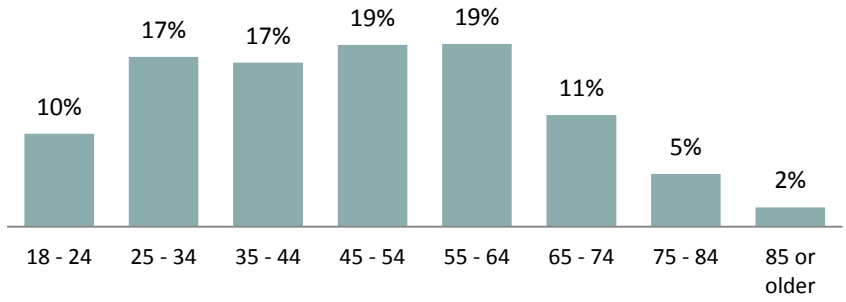


Figure 4.3: Employment status

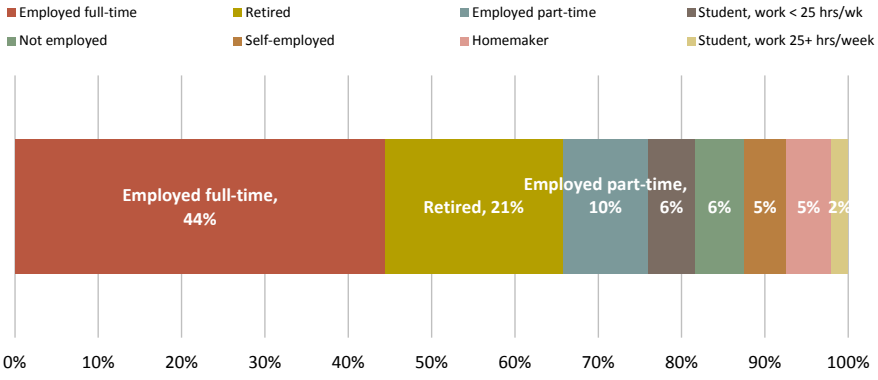


Figure 4.4: Employed status

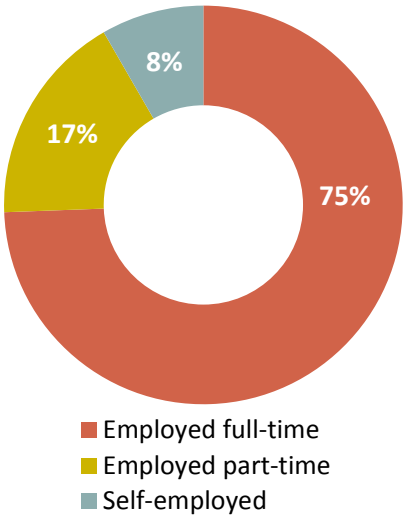


Figure 4.5: Student status

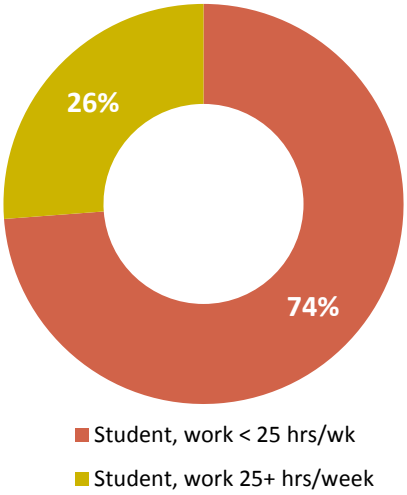


Figure 4.6: Dwelling type

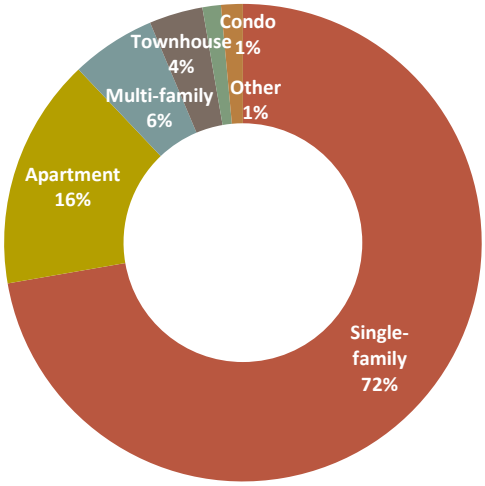
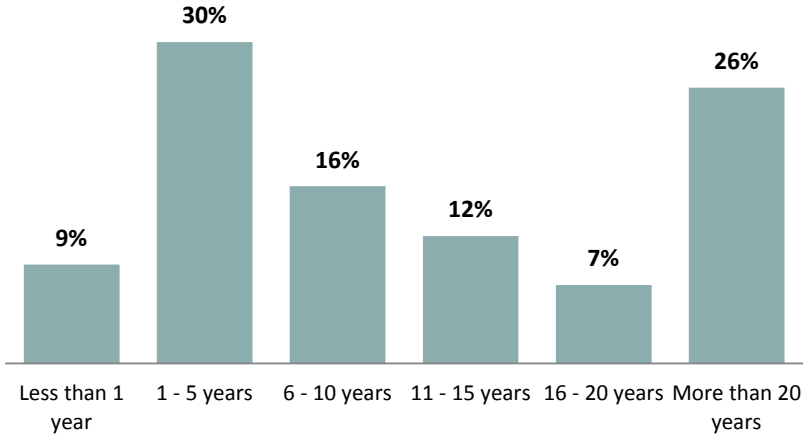


Figure 4.7: Years lived at residence



Of those who are employed and not students (60%), three-quarters are employed full time and 17% are employed part-time. Self-employed members constituted 29,721—or 8%—of all employed workers. (Figure 4.4) Of students — a cohort that represents 8% of the population — nearly three-quarters are employed less than 25 hours a week, while 26% are employed 25 hours a week or more. (Figure 4.5)

The majority of survey respondents live in single-family homes (72%). Slightly over a quarter of those surveyed live in either rental or owned multi-unit or attached housing. (Figure 4.6)

Over a third of households in the survey (39%) moved into their current residence in the past five years. (Figure 4.7) The number of households who have lived in their current residence steadily declines over time, with the largest drop between relatively short term residents (1 to 5 years) and medium term residents (6 or more years). However, a quarter of respondent households are long term Rochester area residents, having lived in their home for more than 20 years.

4.2 Residential Preferences

Respondents who moved into their current residence in the past 10 years were asked a series of seven questions about factors that influenced their residential location decision and what degree of importance each factor had on their choice. The factors were:

- Change in family size, marital or partner status
- Affordability and taxes
- Proximity to job or school
- Desirability for good K-12 schools
- To be in a walkable neighborhood, near local activities
- Value of having space and separation from others
- Proximity to family, friends, or other family reasons

For analysis purposes, the results are divided into three separate categories, based on the age of the primary adult in the household — the individual who completed the Household Information portion of the survey:

- 65 or older (18% of the population)
- 35 to 64 years old (55% of the population)
- 18 to 34 years old (27% of the population)

These age categories were chosen because each group likely faces a different set of circumstances and has its own preferences.

Affordability and taxes was, across the board and consistent, an extremely important factor in residential decisions. Overall, more households selected this as an "extremely important" factor than any other factor. (Figure 4.8)

"Walkable neighborhoods, near local activities" followed affordability and taxes as a close second for most important factor for moving to one's current residence, with 74% of all respondents selecting it as a "somewhat important" or "extremely important" factor. (Figure 4.9) This factor also has the least overall neutral responses, suggesting that the choice to be in a walkable neighborhood or not is a very conscious decision that residents make when deciding on where to live.

While nearly three-quarters of households valued living in a walkable neighborhood, 57% also valued the importance of having space and separation from others, though the majority felt it was only "somewhat important". (Figure 4.10) Those between 35 and 64 valued this factor slightly more than the other two age categories while nearly one out of every five households was neutral on this factor.

Unsurprisingly, moving for jobs and good schools was a considerably more important factor for those in the 18 to 64 age groups than for those 65 and older. (Figure 4.11 and Figure

Figure 4.8: Importance factor: Affordability/taxes

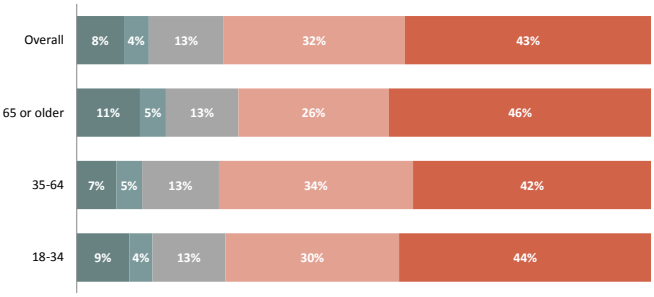
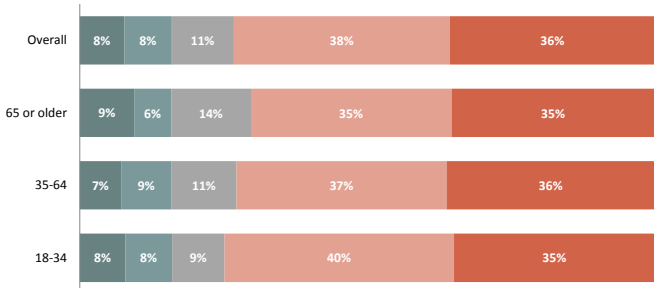


Figure 4.9: Importance factor: Walkable neighborhood/near local activities



4.12) Nearly 80 percent of respondents between 18 and 34 selected moving to their current residence to be close to their job or school as an important factor. Of those, over half considered it an extremely important factor. The desirability for good K-12 schools was more important for those in the 35 to 64 age group than any others, since they are the most likely to have school-aged children. However, neither good schools nor proximity to jobs and schools are an important factor for those in the 65 or older age group. For the 65 or older age group, the single most important factor for moving to their current residence is to be close to family, friends, or other family reasons, with 49% selecting it as being extremely important. (Figure 4.13)

One factor that stood out for its relative lack of importance for all age groups is change in family size, marital status, or partner status as a reason for moving to their current residence. Roughly two-thirds of all members were either neutral on the factor, or felt it was unimportant. This suggests that, while this is a factor when considering a move, it is generally not considered a primary factor in ultimately deciding where to reside.

At the end of the travel diary portion of the survey, each adult answered opinion questions about their current and possible future residence and their likelihood of moving or adopting new modes of transportation depending on changes to their living environment. Those who reported living in suburban or rural parts of the Rochester TMA (henceforth referred to as suburban/rural) were asked separate questions about whether their household would own fewer cars or feel comfortable using transit if they moved to a village or city. Individuals who live in the City of Rochester or in a smaller city (e.g. Canandaigua), village, or town center (henceforth referred to as Rochester/village/town/small city) were asked whether they felt it was easy to plan a trip using transit.

Both groups of respondents overwhelmingly preferred to remain in their current type of living environment, whether it was suburban/rural or Rochester/village/town/small city. Overall, however, respondents who are currently living in Rochester or a village/town/small city are nearly three times more likely (17% versus 6%) to answer that they planned to

Figure 4.10: Importance factor: Value space/ separation from others

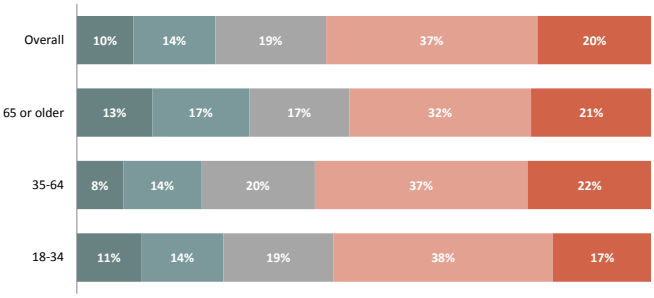


Figure 4.11: Importance factor: Close to job or school

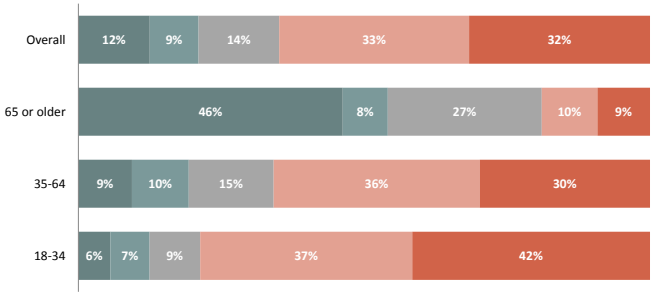


Figure 4.12: Importance factor: Desire good schools (K-12)

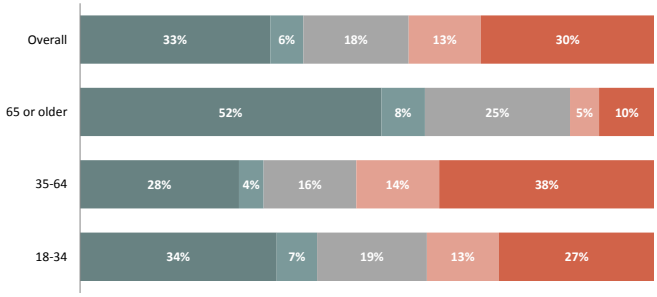
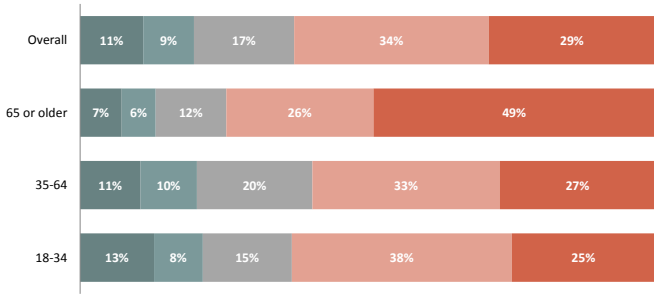


Figure 4.13: Importance factor: Close to family, friends or other family reasons



Extremely unimportant | Somewhat unimportant | Neutral | Somewhat important | Extremely important

move to a suburban town or rural area in the next five years. (Figure 4.14 and Figure 4.15) Those in the 18-34 age category in both groups are most likely to plan a move in the next five years, although a higher percentage in the "Rochester/village/town/small city" group (22% versus 13%). Similarly, those in the 65 and older age groups are least likely to plan a move away from their current living environment in the next five years.

When individuals were asked whether most of the people who are important to them lived in the Rochester region, the vast majority agreed, with nearly a third of all respondents strongly agreeing with the statement. (Figure 4.16 and Figure 4.17) These responses by individual members are consistent with the household responses on how important "being close to family, friends, or other family reasons" factored into their reason for moving to their current residence. Older respondents are most likely to live near important family and friends.

Figure 4.14: If suburban/rural: Plan to move to a Rochester area village/city in the next 5 years

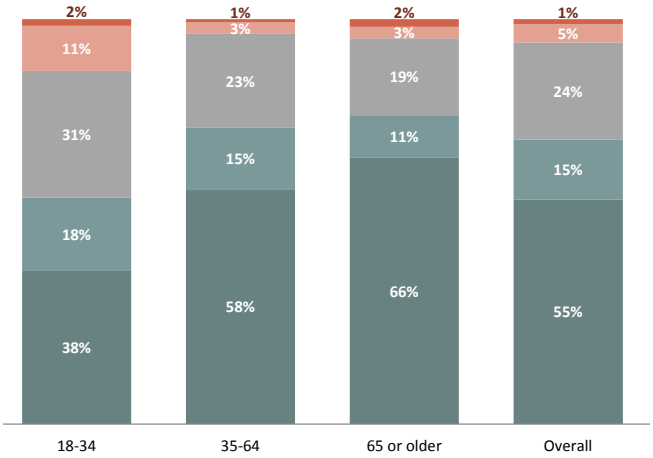


Figure 4.15: If Rochester/village/town/small city: Plan to move to a Rochester suburban/rural area in the next 5 years

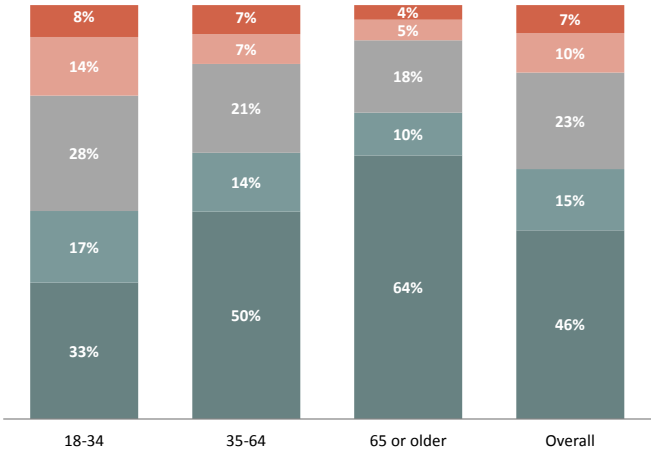


Figure 4.16: If suburban/rural: Most important people to me live in the Rochester region

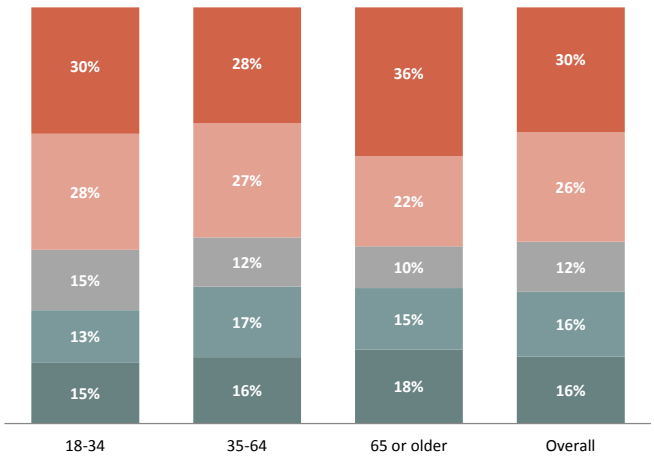
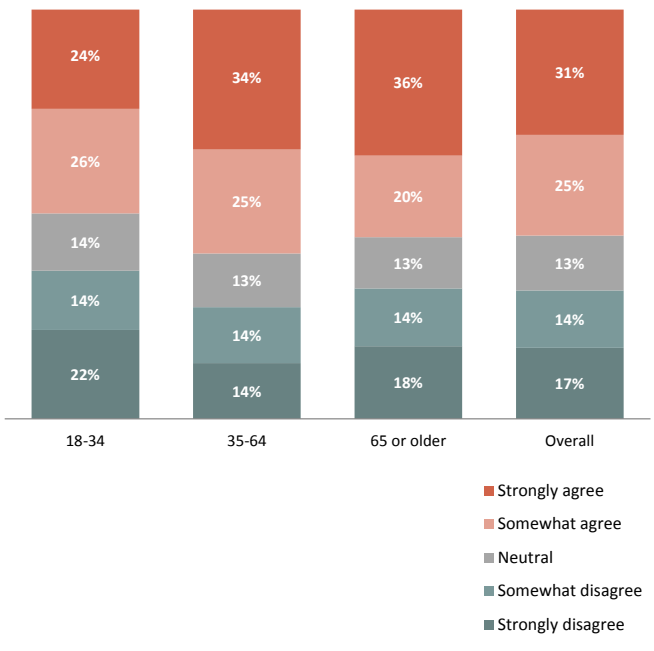


Figure 4.17: If Rochester/village/town/small city: Most important people to me live in the Rochester region



4.3 Transportation Findings and Preferences

To understand more about the available transportation options and preferences of respondents, the survey asked household members about general commute distances and patterns, access to vehicles, and opinions on transit. Households were also asked about the number of vehicles in their household, the make and year of their vehicle(s), and the type of fuel used by their vehicle(s).

There is a strong correlation between the number of vehicles in a household and the household's income, as shown in Figure 4.18. Overall, the average household has 1.5 vehicles, with over half of those earning less than $50,000 per year owning one car and the majority earning $50,000 or more owning two vehicles per household. Nearly half of households who make less than $10,000 per year did not own a car (47%) while the same percentage of households earning $200,000 or more own three or more vehicles. This relationship can be attributed to a variety of possible factors including: lower income households are unable to afford a car or are located in areas with alternative transportation options; smaller households with fewer income-earning members do not have the need to own multiple cars; or households with higher income have more income-earning members who need access to a vehicle.

Figure 4.18: Number of vehicles in household, by household income

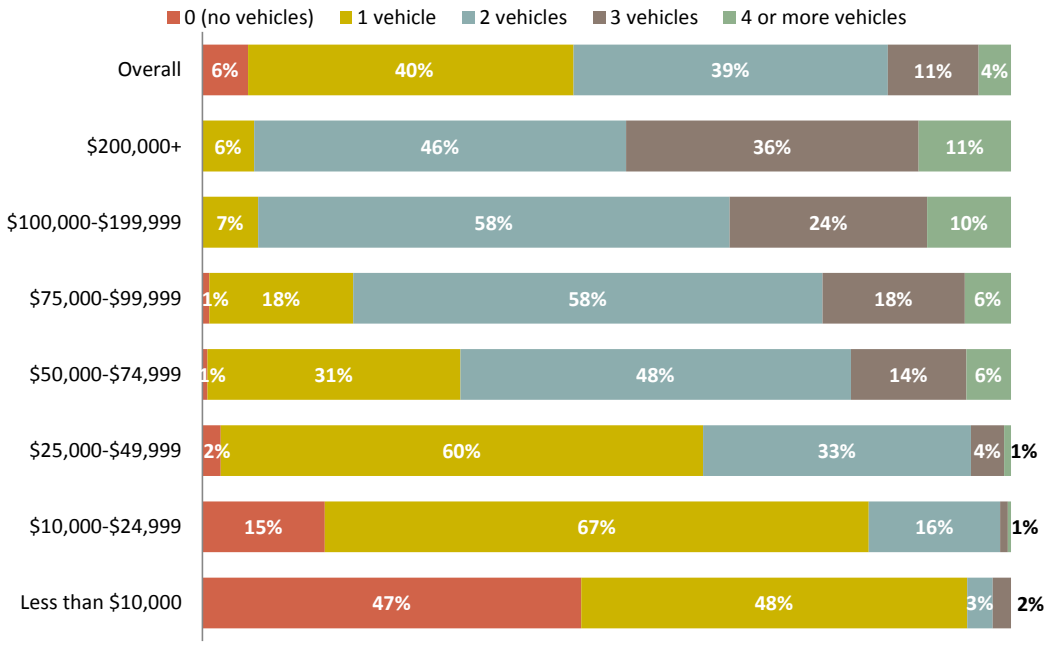
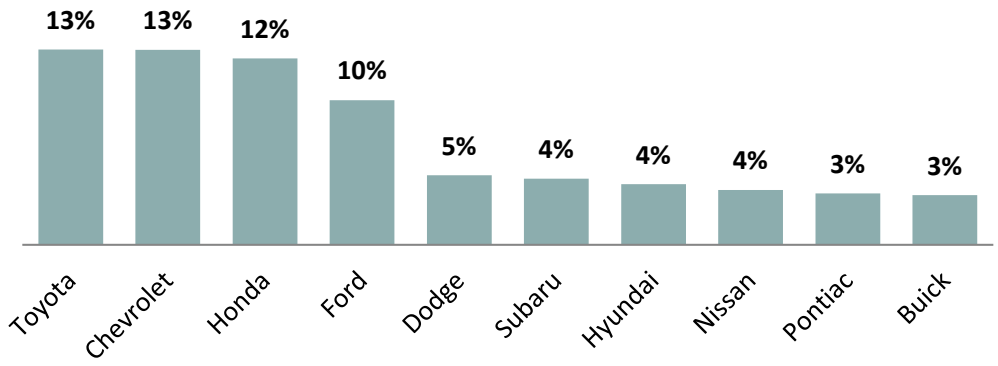


Figure 4.19: Top 10 most popular car makes



4.3.1 Vehicle and Commute

There is an even mix between American and Japanese automakers among the top 10 most popular car makes for survey respondents. There is a close tie between the top three most popular car makes in the Rochester region: Toyota (13%), Chevrolet (13%), and Honda (12%). (Figure 4.19) The median age of household vehicles is six years (2006) and the vast majority of respondents' vehicles were manufactured in the past 10 years. The most popular manufacture year of cars currently on the road is 2008. (Figure 4.20) The overwhelming majority (96%) of cars are fueled by gas, with only 2% of respondents driving hybrids, and another 1% using diesel. (Figure 4.21)

Vehicle Miles

The survey also asked respondents about how many vehicle miles they drove in the past year. (Figure 4.22) Overall, the largest percentage of residents (31.5%) drove between 5,000 and 9,999 miles per year, and another one-third drove between 10,000 and 14,999 miles in 2010-2011. Only 12.9% of drivers logged 15,000 miles or more.

Figure 4.20: Year of household vehicle

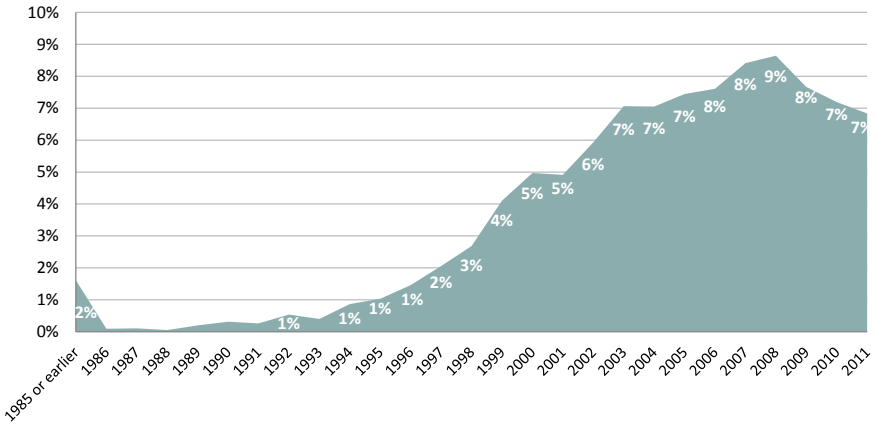


Figure 4.21: Vehicle fuel type

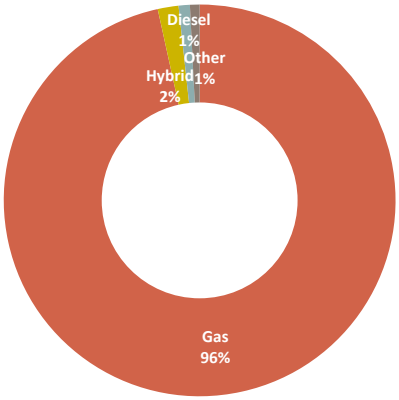


Figure 4.22: Vehicle miles driven per year

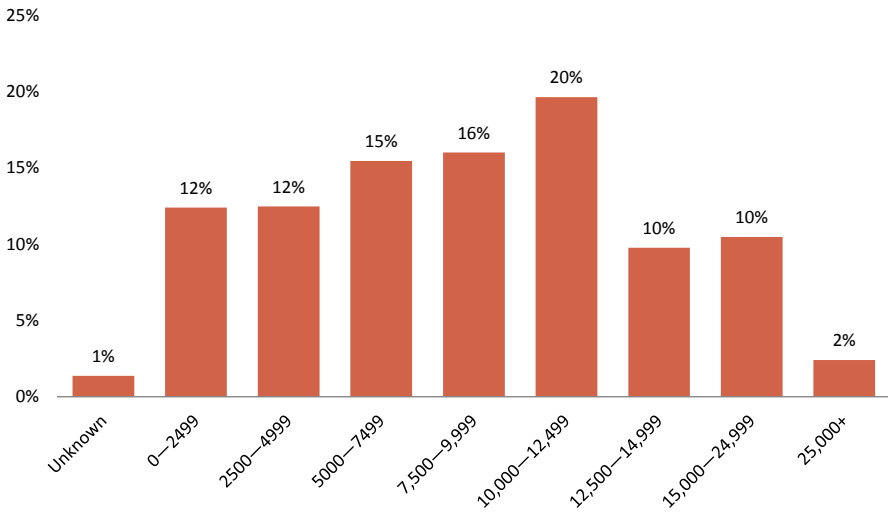


Figure 4.24: If employed: Frequency of telecommuting for work

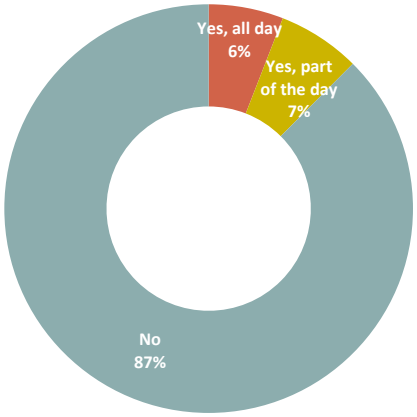


Figure 4.25: If employed and frequent commuter: Typical work commute mode

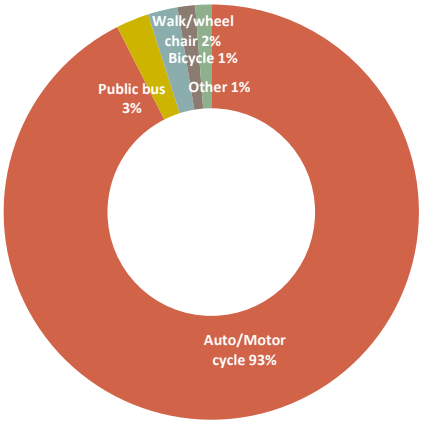
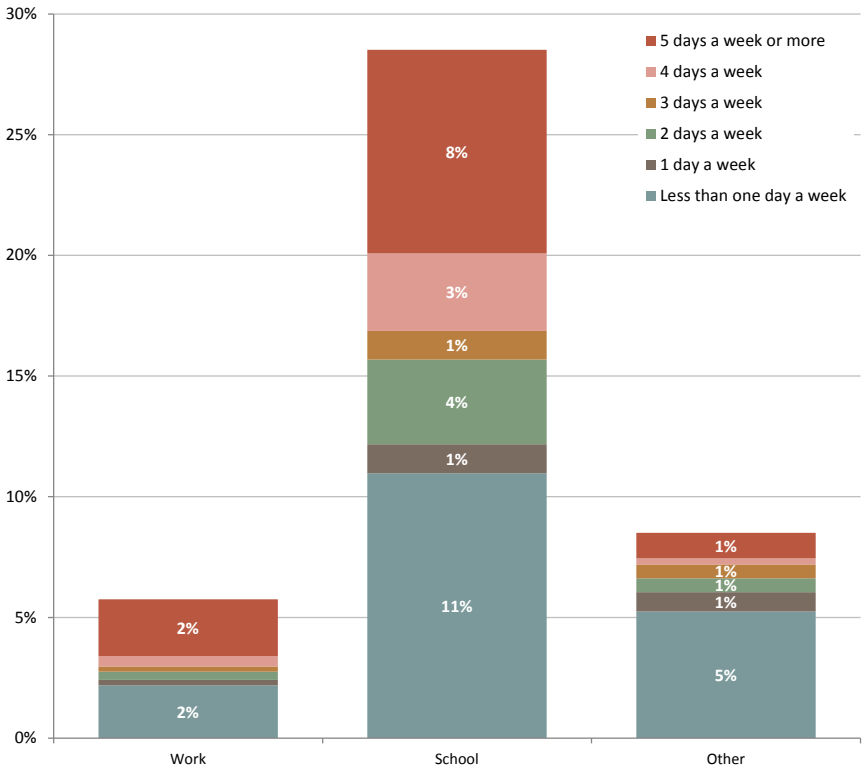


Figure 4.26: Number of bus rides per week, by employment status



Commute

Shown in Figure 4.24, of those who are employed, the large majority do not telecommute for work (87%). For those who do commute, 93% rely on motor vehicles to get to work. Only 3% of employed commuters (i.e. commute to work at least a few times per month) who were surveyed take the public bus on their commute trips. Even fewer people walk (2%) or bike (1%) to work. (Figure 4.25)

4.3.2 Alternative Transportation Options

The study also looked at transit use. Employed students make the most number of weekly transit trips, with 22% using the bus three days a week or more to go to school. The lowest bus ridership was in the employed group; overall, 94% of workers never use the bus for commuting purposes. (Figure 4.26) Approximately 17% of students reported making at least one trip per week for school.

The survey also asked respondents to consider how their vehicle usage would change if they were to move to a different living environment. Individuals living in suburban or rural areas were asked if they would own fewer cars and be comfortable using transit if they moved to a village or city in the Rochester region. (Figure 4.27 and Figure 4.28) Likewise, the survey asked those who already live in Rochester/village/town/small city if they found it easy to plan a trip using transit. (Figure 4.29) Very few suburban/rural individuals felt that their household would own fewer vehicles if they moved to a village or city. However, most residents do not plan to move to a more urban setting in the next five years. Overall, slightly more than a quarter of suburban/rural residents agreed that they would feel comfortable using transit if they moved to a village or city, and older members are more likely to agree than those under 35 years old. In contrast, 41% of Rochester/village/town/small city residents agree that it is easy to plan a trip using transit in Rochester. These results suggest that, for those who do not have experience using transit in the Rochester region, there is a perception that the bus is difficult to use.

Individual household members were asked what would encourage them to take transit, and given 11 multiple choice options ranging from "nothing" to varying service times, locations, and amenities. Taking into account that a large majority of Rochester residents do not currently use transit, slightly more than half (56%) are unwilling to consider a shift to public transit as a mode option. (Figure 4.30)

Figure 4.27: If suburban/rural: My household would own fewer cars if moved to Rochester area village/city

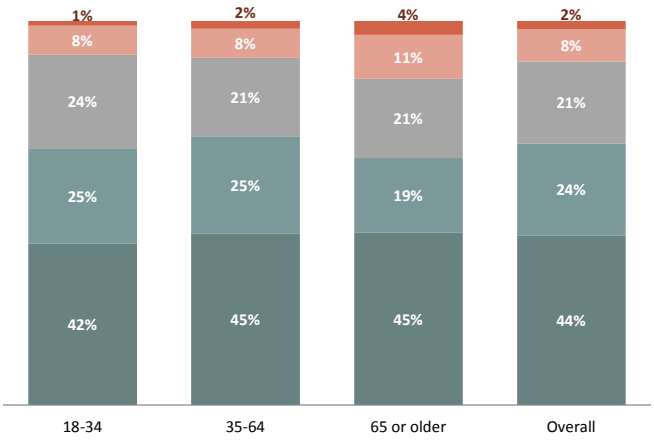


Figure 4.28: If suburban/rural: I would feel comfortable using transit if moved to Rochester area village/city

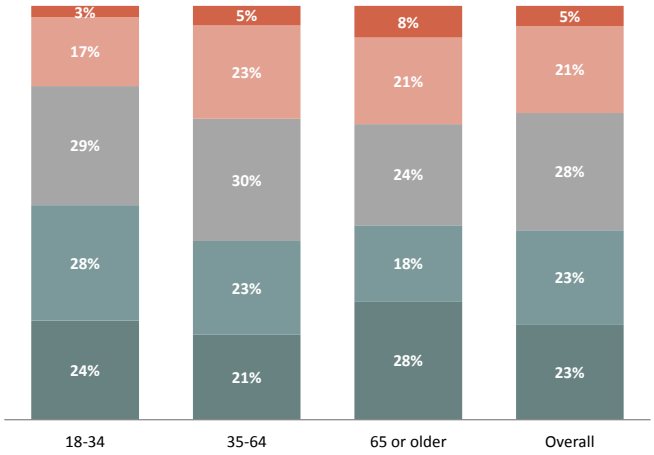
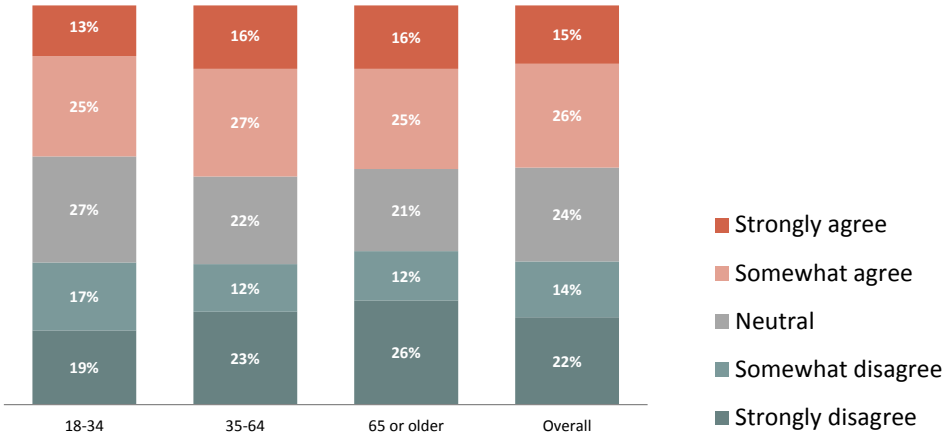


Figure 4.29: If Rochester/village/town/small city: It's easy to plan a trip using transit



There is, however, a close tie between the top four methods that would encourage respondents to take transit, and they run the gamut of available transit improvement options, starting with the highest favorable response to: More frequent service (20%); Closer service to home (19%); Not having to transfer (17%); and real-time info (16%). All of the top four most selected reasons serve to help reduce the overall transit trip time either by increasing the frequency and route options, altering the location of stops, or providing information that would reduce waiting time for users.

Methods that would enhance the quality of the transit ride itself, such as improving the feeling of safety and free Wi-Fi, are considered secondary by survey respondents. It is also worth noting that respondents preferred having a transit stop close to home (19%) over having one close to work (12%), and only 7% selected that a park-and-ride facility in their community would encourage them to use transit. This suggests that many would choose a transit option only if they are able to commute by transit for the entirety of the trip.

4.3.3 Gas and Mileage Taxes

The survey also asked employed commuters about the price they are willing to pay for gas before considering a shift to an alternate transportation mode (other than driving alone) for some of their trips. (Figure 4.31) The responses suggest that people have a fairly low threshold before considering the use of other modes (transit, carpool, walk, bicycle, etc.), given that gas prices at the time of the study already ranged from approximately $3.65 to $3.75 per gallon. The responses suggest that a gas price of approximately $4.00 or more per gallon would encourage the use of alternate modes for one-third of survey respondents. Over half of those surveyed would only begin to consider using an alternative mode at least two days a week if gas prices were over $5.50 per gallon, with 20% of respondents willing to pay $8.50 per gallon in order to continue driving.

To assess opinions of gas taxes, the study also asked whether members supported or opposed two different means of raising revenues to invest in transportation: a gas tax increase of 10

Figure 4.30: What would encourage you to take transit? (Select all that apply)

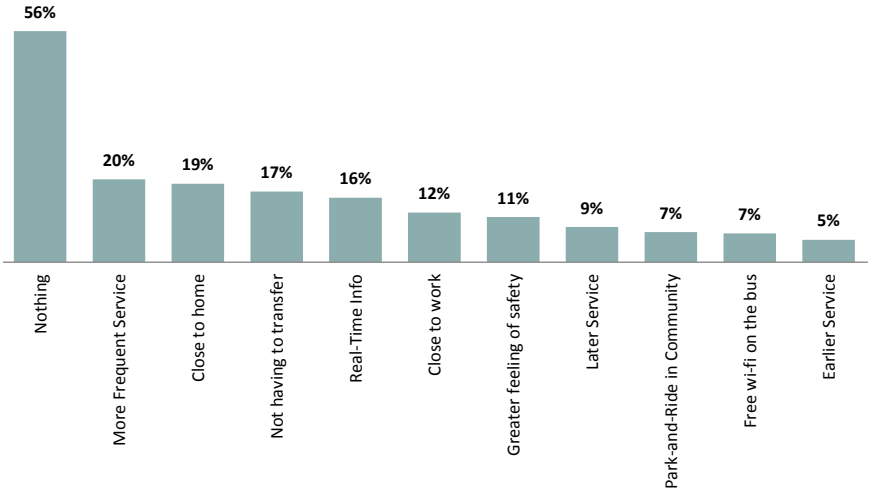
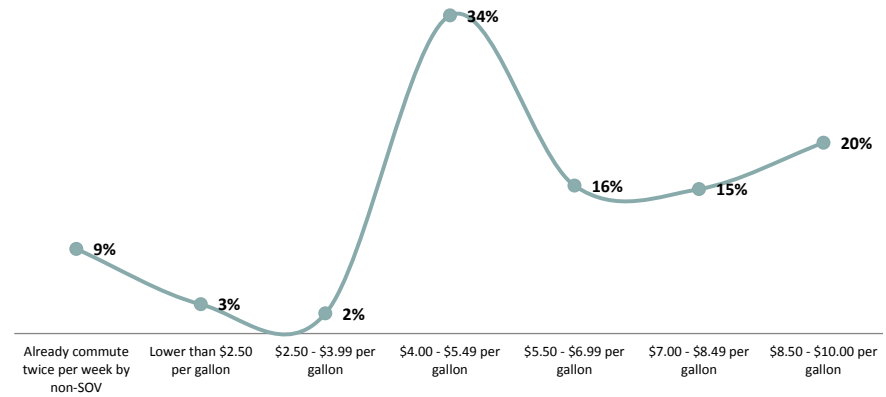


Figure 4.31: If employed and frequent commuter: Minimum gas price in order to encourage using an alternate transportation mode (other than driving alone) at least 2 days per week



cents per gallon; or a mileage tax of one cent per mile driven. (Figure 4.32) The vast majority of respondents are strongly opposed to either option when revenues are to be spent on undefined transportation purposes, with 70% opposed to the per gallon increase, and 74% opposed to the mileage tax. However, when asked whether they would support a 10 cent per gallon gas tax increase if it were spent only on certain transportation-system-related measures, support increased significantly. Possible answers included: reducing local air pollution; reducing transportation's contribution to global warming; road condition and maintenance; improving safety; and technologically advanced systems. (Figure 4.33) The single option that gained support from over half the respondents (57%) is for the per gallon increase to be used on projects to maintain streets, roads, and highways. There is the least amount of support for using the tax to reduce transportation systems' contribution to global warming (33%). This is consistent with the success of recent ballot initiatives for transportation across the country that have involved increase in taxes or fees.

Figure 4.32: Opinion of gas tax versus mileage tax

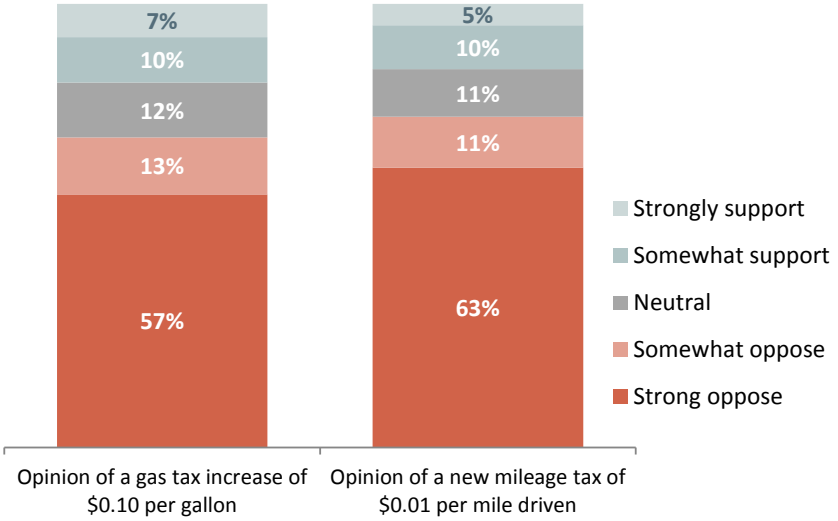
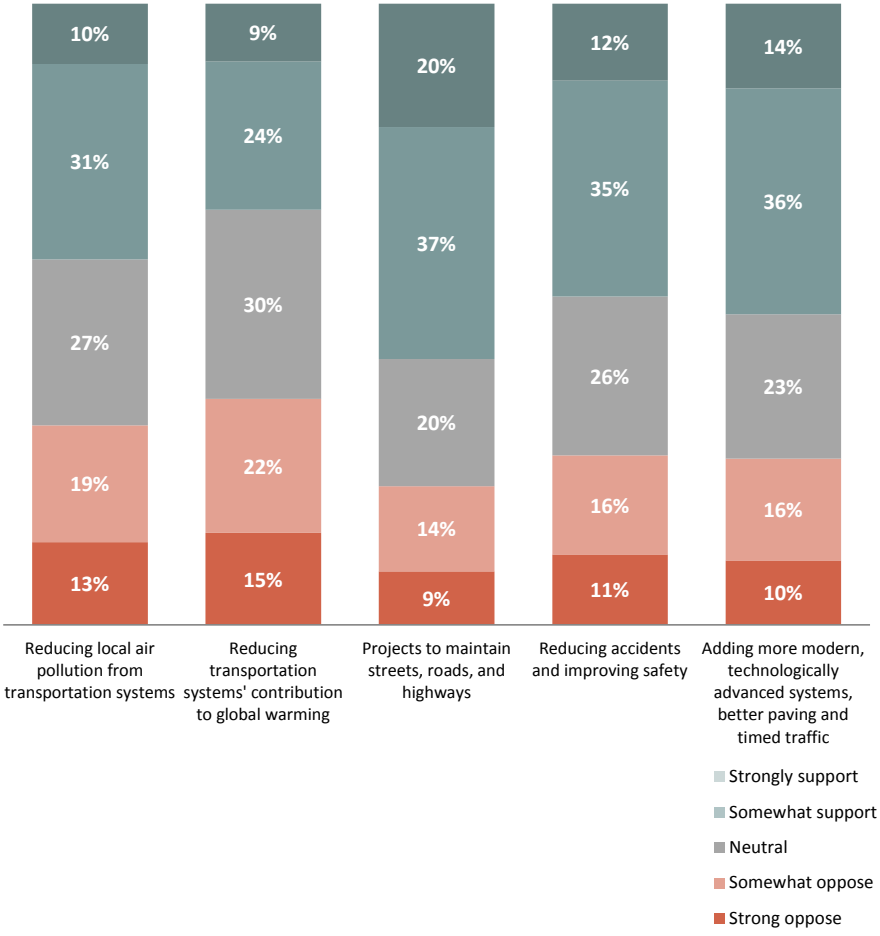


Figure 4.33: Would support gas tax if it were spent only on…



4.4 Trip Findings

The study also looks at results at the individual trip level[4]. Overall, respondents made an average of 4.3 trips per day, with females and males making roughly equal numbers of daily trips (4.4 trips per day versus 4.3 trips per day, respectively). Looking more closely at the trip rates by household size and number of vehicles, there is a noticeable correlation between trip rates and vehicle ownership. (Figure 4.34) There is also a positive relationship between trip rates and household size, although not a direct correlation.

For households with 3 or fewer members, the trip rate remains relatively constant, despite access to more vehicles in the household. For single member households, this may be due to the fact that an individual can only make a trip with one vehicle at any given time so having more vehicles does not encourage more trips. Similarly, households where there were more members than available vehicles did not make more trips than households who had as many vehicles as household members.

In general, a large majority of employed commuters arrive to and depart from work at similar times of day, with 60% arriving at work between 7 AM and 9 AM, and 53% departing from work between 4 PM and 6 PM, reflecting a normal 8 to 9 hour work day with more staggered departure times than arrival times. Shown in Figure 4.35 is the overlay of the departure times from all trips reported in the study, irrespective of trip purpose or the respondents' employment status. The overlay shows that, while the majority of trips to and from work occur at distinct times, people are making trips consistently throughout the day, with slight peaks at the hours where people generally travel to and from work and a small increase during lunch hours between 11 AM and 1 PM.

Figure 4.34: Trip rates, by number of vehicles and household size

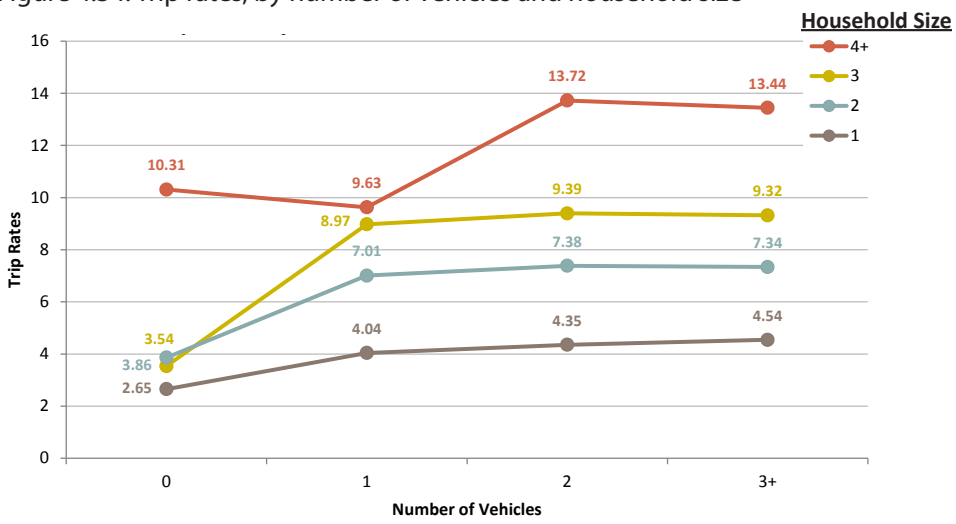
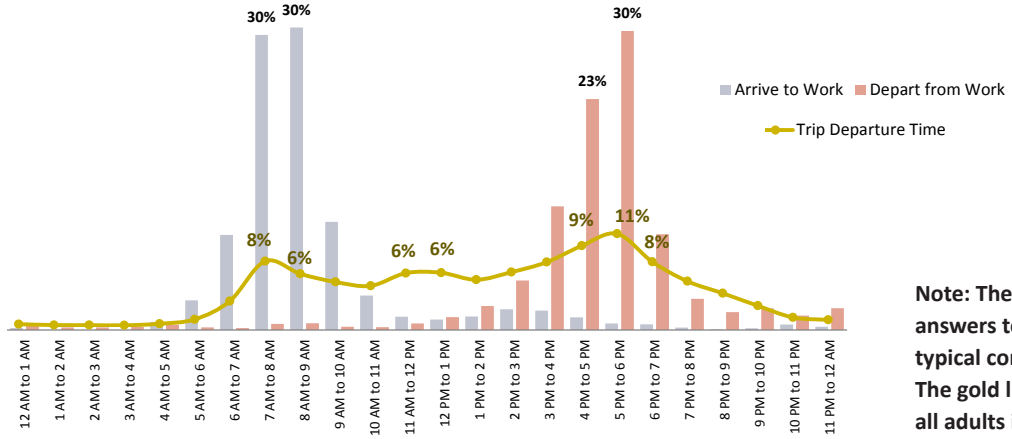


Figure 4.35: Trip departure time and typical commuting times to/from work



Note: The bars represent member's answers to individual questions on their typical commute times to and from work. The gold line represents all trips made by all adults in this study.

(Endnotes)

1 C. DiSogra, JM. Dennis, and M. Fahimi. On the Quality of Ancillary Data Available for Address-Based Sampling, JSM 2010.

2 Hill, N., Self, B., and Roche, G. Customer Satisfaction Measurement for ISO 9000:2000. Institute of Quality Assurance, Butterworth-Heinemann Press, 2002.

3 Hill, N., Self, B., and Roche, G. Customer Satisfaction Measurement for ISO 9000:2000. Institute of Quality Assurance, Butterworth-Heinemann Press, 2002.

4 A more complete analysis of trip rates and distributions is included in a separate report, which contains a description of updated parameter values in the region's travel demand model.

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