



R | S | G INC.
RESOURCE SYSTEMS GROUP, INC.

South Sound Travel Study



FINAL Household Survey Report

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Submitted by
RSG



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1.0 INTRODUCTION

During the fall of 2013, RSG and ETC (market research firms) conducted the South Sound Travel Study household travel survey (HTS) for the Thurston Regional Planning Council (TRPC). This survey was conducted to collect up-to-date information about regional travel patterns, which will help inform updated transportation models and plans.

This report reviews the design, administration, and results from the South Sound Travel Study's main household survey. This report is intended to accompany the dataset from this study and help explain the methodology used to collect the data.

1.1 Project Overview

Since the last household travel survey was conducted in 1998-1999, the Thurston region has experienced significant growth and socioeconomic shifts. Understanding these changes, which can alter travel behavior and travel patterns, is crucial. The data from the 2013 household travel survey (HTS) will help refine and enhance the travel assumptions used in the Thurston Regional Planning Council's (TRPC) travel demand model. This travel survey will be the cornerstone for calibrating the travel demand model just as the last survey was approximately 14 years ago.

Briefly, the Thurston Regional Planning Council (TRPC) is the regional planning agency for the Thurston County, Washington region. TRPC is the federally-designated Metropolitan Planning Organization (MPO) for the Olympia urbanized area and is also the state-designated Regional Transportation Planning Organization (RTPO) for Thurston County. The Figure 1 identifies several of the key features in the region:



Figure 1: TRPC Study Region

The study area includes roughly 265,000 households (approximately 100,000 in Thurston County and 165,000 in the Pierce County sub-area). Thurston County experienced a



consistently high rate of population growth over the last two decades. On average, the population grew by about 2% per year in the past decade (compared to just over 1% per year for the state as a whole)¹.

The most important roadway in the region, I-5, links Seattle, Tacoma and other points only 30-60 miles to the north with Portland (OR) approximately 120 miles to the south. I-5 is heavily congested during peak periods, particularly in the vicinity of Thurston and Pierce Counties, and its proximity to the Nisqually River means the corridor is in an environmentally sensitive area. In addition, Joint Base Lewis-McChord (JBLM)—that supports 40,000 active duty, 15,000 civilian workers, 60,000 family members, and 30,000 military retirees living within 50 miles of the base—is located along the Thurston County/Pierce County boundary (though largely located within Pierce County).²

1.2 Main Household Study Overview

The goal of the main household survey was to collect detailed information about all of a household's trips in a 24-hour weekday period from 2,500 households in Thurston County and a sub-area of Pierce County. This information is intended to provide a representative sample of weekday travel patterns of households in the study area.

A pilot of this survey was conducted in June 2013 to test the administration process and questionnaire design. Minor changes were made to several aspects of the survey process and design based on review of the pilot study results to improve clarity, encourage higher response rates, and increase efficiency in the survey process. These changes were described in detail in the Pilot Study documentation in July 2013.

After refinement based on the results of the pilot, the main household survey was conducted from September 5-November 7, 2013 and included 21 travel dates. The final dataset includes responses from 2,447 households that fully completed the study (where every household member answered every question). It also includes responses from 183 households that only partially completed the study. "Partial" household records include at least one person with a fully completed travel diary (including the long-distance section) or one person with a partially completed diary (where the one-weekday diary is complete but the long-distance diary is not complete); but for "partial" households, one or more members of these households did not complete the travel diary, therefore the data from these households should be used appropriately. The survey dataset does not include "recruit-only" households where the Household Information survey was completed, but no household members completed the diary for the assigned travel date.

¹ Thurston County 2013 Profile (<http://www.trpc.org/data/Documents/ProfileDec2013/CompleteProfile.pdf>), accessed December 2013.

² Joint-Base Lewis-McChord website (<http://www.lewis-mcchord.army.mil/jblm/about.html>), accessed February 2013.



2.0 SAMPLING AND TRAVEL DATE ASSIGNMENT

2.1 Sample Frame and Size

The sample frame for the South Sound Household Survey was all of the households in Thurston County as well as all the households in the Pierce County sub-area as identified by the Transportation Analysis Zones (TAZs) from TRPC's travel demand model that overlap Pierce County. This area includes roughly 265,000 households (approximately 100,000 in Thurston County and 165,000 in the Pierce County sub-area). The sample size goal for this study was 2,500 households, about 2% of households in Thurston County or about 1% of households in the overall study area including both Thurston County and the Pierce County sub-area.

2.1.1 Address-based Sample

In the final sampling strategy, the sample goal was distributed across sub-geographies with slightly higher sampling rates in the more urbanized areas of Thurston County, followed by lower sampling rates in rural Thurston and even lower rates in the Pierce County sub-area. This stratification was used to obtain more information from busy areas, regional economic centers with high densities of businesses and households, and areas more likely to have lower vehicle ownership and higher transit use. The sub-geographies were defined using 2010 Census Blocks overlapping each of the areas and are shown in the map below:

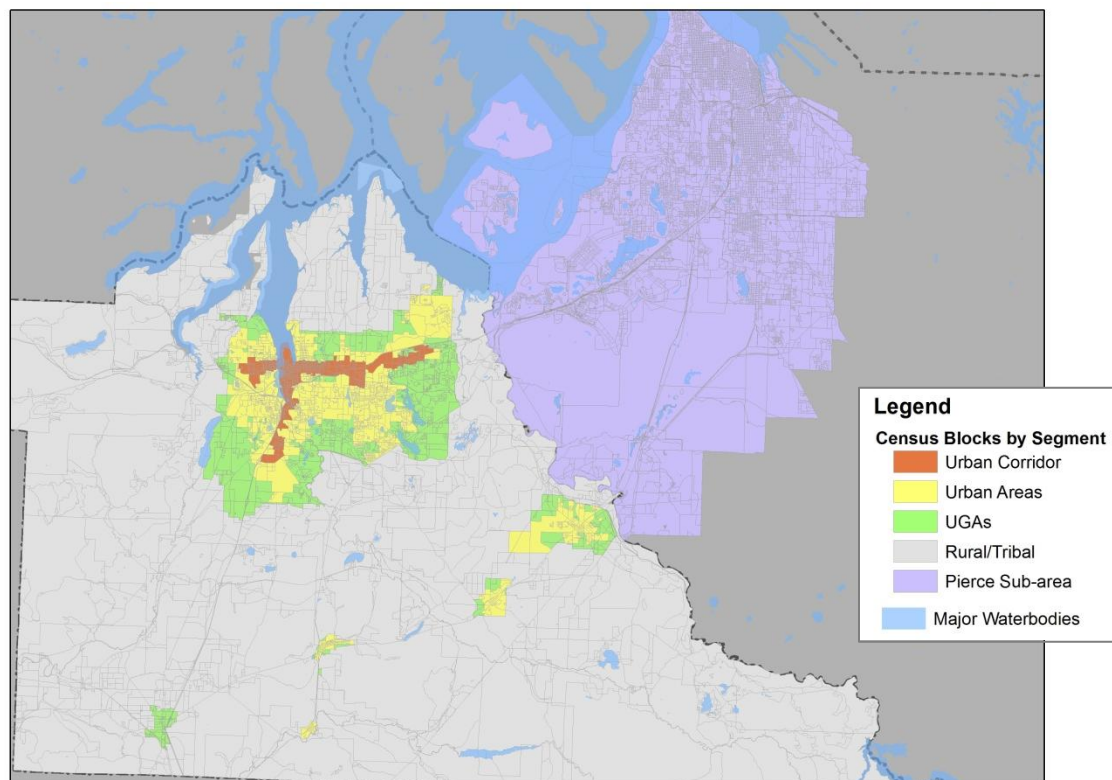


Figure 2: South Sound Travel Study Sample Areas

The Urban Corridor (in red) is the most densely developed part of Thurston County where mixed land uses, frequent transit service, and a dense road network (including I-5 as well as local and arterial roads) allows for multi-modal travel options. It is expected that residents in



this area are more likely to use transit and non-motorized modes. Because of the density and complexity of transportation in this area, TRPC and other local agencies intend to analyze travel in the Urban Corridor carefully.

Sampling rates in the rest of the urban areas (in yellow) are also somewhat higher to capture more information from busy areas and activity centers where a higher density of use generates significant traffic and traffic impacts. Households in these areas are also more likely to use transit. The Urban Growth Areas (in green) are areas at the edges of existing towns and cities where future urban development is encouraged (while urban development outside of these areas, in rural areas, is discouraged)¹. A higher sampling rate was used in these areas to help inform plans for future development in these areas.

The rural segment of Thurston County (in light gray) is generally less busy and therefore sampled at a somewhat lower rate than the urbanized areas. However, given the rural areas' importance in the mandated regional transportation plan, it was sampled at a relatively higher rate than the Pierce County sub-area.

The Pierce County sub-area (in purple) is not part of the mandated transportation planning area. However, a small sample of households from this area was included in the sample frame to help understand inter-regional trips and travel patterns.

The sample sizes from each of these geographic areas are shown below².

Table 1: Geographic Segment Sample Sizes

Geographic Sample Segment	Sample Size Goal (# HHs)	Percent of Sample	# of Invitations	Total HHs in Geography	Sampling Rate
Thurston					
Urban Corridor	350	14.8%	4,350	11,145	3.14%
Urban Growth Areas	425	18.0%	5,302	21,160	2.01%
Rest of urbanized area	675	28.6%	8,361	37,074	1.82%
Rest of region (rural)	350	14.8%	4,329	30,801	1.14%
Thurston Sub-Total	1,800	76.3%	22,342	100,180	1.77%
Pierce County Sub-area	400	16.9%	5,788	164,516	0.24%
Geographic Sample Total	2,200	93.2%	28,130	264,696	0.82%

The geographic sample was a random address-based sample, drawn from the U.S. Postal Service's Computerized Delivery Sequence (CDS) File, an electronic database of all mailing addresses. RSG obtained the stratified random sample of addresses described above from Marketing Systems Group (MSG), a firm that maintains a regularly updated sampling database with the USPS CDS File.

2.1.2 Targeted Sample

In addition to the geographic sample, additional households that were identified as using certain types of transportation facilities (Vanpools and Park and Ride lots) were invited in order to collect more data about those travel behaviors. These "convenience samples" were added because, while these transportation behaviors are an important facet of TRPC's

¹ Revised Code of Washington (RCW) 36.70a.110: Comprehensive Plans – Urban Growth Areas (<http://apps.leg.wa.gov/rcw/default.aspx?cite=36.70a.110>), accessed October 2013.

² The final sample size numbers shown are slightly lower than those described in the Sample Plan document due to the removal of duplicate addresses (e.g. where one address is provided in both the Vanpool list and the random geographic sample).



transportation planning efforts, they are not currently observed with much frequency in the general population and would therefore be difficult to collect a sufficient number of samples from a purely random sample.

All households with members registered with an Intercity Transit (IT) vanpool were invited to the survey. This includes residents who live outside of the TRPC study area who commute into Thurston or Pierce County as well as those who live and work in the study area. A sample of Park and Ride lot users was identified via license plate capture of parked cars in Thurston County lots; the license plates were then matched to vehicle registration addresses through the DMV. This sample was also provided by Intercity Transit (IT). The sample sizes of each of these targeted groups are shown below.

Table 2: Targeted Segment Sample Sizes

Targeted Sample Segment	Assumed Response (# HHs)	Percent of Sample	# of Invitations
Park & Ride Users	17	0.7%	151
Vanpoolers	143	6.1%	1,581
Targeted Sample Total	160	6.8%	1,732

The RFP also identified Joint Base Lewis-McChord (JBLM) for targeted sampling. However, in order to conduct this survey, RSG coordinated with the South Sound Military Communities Partnership (SSMCP) and the JBLM military base. The sampling, design and administration of this survey were conducted separately and are discussed in a separate memo “South Sound Travel Study: JBLM Survey”.

The final sample size goals from both the random address-based sample and the targeted sample groups are shown below.

Table 3: Total Sample Size

Survey Sample	Sample Size Goal (# HHs)	Assumed Response Rate	# of Invitations
Geographic Sample	2,200	8%	28,130
Targeted Sample	160	9%	1,732
Total Sample	2,360	8%	29,862

The overall response rate assumptions were based on response rates in the Pilot Study, where approximately 8% of the Thurston County sample and 7% of the Pierce County sample completed the survey. It was assumed that the targeted sample of vanpool and Park and Ride using households would respond at a slightly higher rate given their involved interactions with specific parts of the transportation system. Additional details about the development of the sample were previously described in the Sample Plan.

As shown in Table 4, the response rates in all sample segments were slightly higher than anticipated, with the exception of the Pierce County sub-area. This is likely due to the fact that the study was primarily focused on Thurston County and was developed and promoted by a Thurston County agency which does not directly plan for the Pierce County area.



Table 4: Response Rate by Sample Segment

Sample Segment	# HHs Invited	# HHs in Dataset*	% of Dataset	Response Rate
Thurston				
Urban Corridor	4,350	369	14.0%	8.5%
Urban Growth Area	5,302	492	18.7%	9.3%
Other Urban Area	8,361	788	30.0%	9.4%
Rural Area	4,329	413	15.7%	9.5%
Thurston Sub-total	22,342	2,062	78.4%	9.2%
Pierce County Sub-Area	5,788	320	12.2%	5.5%
Geographic Sub-total	28,130	2,382	90.6%	8.5%
Park and Ride	151	18	0.7%	11.9%
Vanpool	1,581	225	8.6%	14.2%
Targeted Sub-total	1,732	243	9.2%	14.0%
Volunteer	-	5	0.2%	-
Total	29,862	2,630	100.0%	8.8%
<i>*Includes fully and partially complete households</i>				

2.2 Travel Dates

Each household that was invited was assigned a specific travel date on which they were asked to track all the trips made by all household members. The study had 21 pre-assigned “travel dates” on Tuesdays, Wednesdays and Thursdays between September 10 and October 31 (no travel dates were assigned the week of October 14, as many schools and government offices were closed for Columbus Day). Invitations and responses were spread relatively evenly across all of the travel dates, with the exception of the Targeted samples. The Vanpool and Park and Ride households were all assigned to Week 3 travel dates (September 24-26) in addition to the geographic sampled households assigned to that week.

Table 5: Response Rate by Day of Week of Assigned Travel Date

	# HHs Invited	# HHs in Dataset*	Response Rate
Tuesdays	9,957	927	9.3%
Wednesdays	9,954	822	8.3%
Thursdays	9,954	881	8.9%
Total	29,865	2,630	8.8%
<i>*Includes fully and partially complete households</i>			

A full summary of the number of responses per travel date is included with the Dataset Tabulations provided to TRPC.

2.2.1 Travel Date Reassignment

At several points during the data collection period, RSG reviewed the response rates and evaluated the progress towards the targets for the geographic and demographic sample segments. In order to increase response rates from segments that were below target, households that completed the Household Information Survey but missed their travel dates were then assigned a new future travel date and encouraged again to complete the Travel Diary.



This process was deemed the least costly method for increasing response since these households had already demonstrated interest by completing part of the study and providing their email or phone information, which minimized the cost of additional communication efforts.

Households targeted for travel date reassignment included:

- Pierce County Sub-area households
- Urban Corridor households
- Vanpool and Park and Ride households
- Low-income households
- Large households (4 or more members)
- 0-vehicle households

Due to overlap between the sample segment groups and demographic segments, households could belong to more than one reassigned segment (for example, some of the Pierce County households were also 0-vehicle households, and some of the low-income households were also large households). A small number of 0-vehicle households were reassigned twice (after missing their original travel date and the first reassigned travel date). This additional effort was made because 0-vehicle households were deemed the most difficult segment to reach through other means. Overall, 13 households fully completed their diaries after being assigned a new travel date. The tables below summarize the number of households that were reassigned in each sample and demographic segment.

Table 6: Travel Date Reassignment by Sample Segment

Sample Segment*	# HHs Reassigned Week of 7 October	# HHs Reassigned Week of 21 October	# HHs Reassigned Week of 28 October**	Total # Reassigned HHs***	Fully Complete Reassigned HHs
Thurston Urban Corridor	28	6	4	34	5 (14.7%)
Thurston Urban Growth Areas	16	6	1	22	1 (4.5%)
Thurston Other Urban Areas	29	13	2	42	4 (9.5%)
Thurston Rural Areas	11	3	1	14	0 (0.0%)
Pierce County Sub-area	36	16	2	52	3 (5.8%)
Park and Ride	2	0	0	2	0 (0.0%)
Vanpool	26	0	0	26	0 (0.0%)
Volunteer	1	0	0	1	0 (0.0%)
Total HHs	149	44	10	193	13 (6.7%)

* HHs NOT in a targeted sample segment were reassigned due to demographic characteristics

** All HHs in this group were reassigned for a second time

*** Sum of the number of HHs reassigned the weeks of the 7th and 21st of October; does not re-count HHs reassigned the week of October 28th



Table 7: Travel Date Reassignment by Demographic Segment

Demographic Segment*	# HHs Reassigned Week of 7 October	# HHs Reassigned Week of 21 October	# HHs Reassigned Week of 28 October**	Total # Reassigned HHs***	Fully Complete Reassigned HHs
HH size					
1-3 people	83	30	1	113	9 (8.0%)
4+ people	66	14	9	80	4 (5.0%)
HH Vehicles					
0 Vehicles	11	2	10	13	1 (7.7%)
1+ Vehicles	138	42	0	180	12 (6.7%)
HH Income					
Low-income	36	22	6	58	4 (6.9%)
Not low-income	113	22	4	135	9 (6.7%)
Total HHs	149	44	10	193	13 (6.7%)

* HHs NOT in a targeted demographic segment were reassigned due to their presence in a targeted sample segment

** All HHs in this group were reassigned for a second time

*** Sum of the number of HHs reassigned the weeks of the 7th and 21st of October; does not re-count HHs reassigned the week of October 28th



3.0 SURVEY DESIGN

The South Sound Household Travel Study includes three main sections:

- The Household Information Survey
- The One-Weekday Travel Diary
- The Long-distance Diary

This section describes the design of the questions in each of these sections of the survey. Screenshots of the survey pages and a copy of the questionnaire are included in Appendix 1.

3.1 Household Information Survey

The Household Information Survey was designed to be approximately five minutes and was completed by one adult in each household. This survey collected basic demographic data that are commonly collected in household surveys, including:

- Household size and intra-household relationships
- Household income and vehicle ownership
- Residency details (home location, home ownership, and length of residency)
- Household member demographics (age, employment, and educational status)

Other questions in the survey asked about details specific to the Thurston region and about typical travel behavior, including:

- Government employment status: many employees in the study area work for the government in some capacity, either at the military base, at the state government (as Olympia, WA is the state capitol) or at other levels of government.
- Military affiliation: due to the proximity of the military base (JBLM), many respondents were directly or indirectly affiliated (such as veterans, Reservists, or civilian Department of Defense workers).
- Military assignment location: If a household member was reported as active or reserve military, the respondent was asked where they were assigned. If the member was deployed out of the area (e.g. in Afghanistan), that person would not be required to complete the diary.
- Frequency of toll road and paid parking use: responses to this question were used to filter questions about these topics for specific questions. If a household member typically used toll roads or paid parking, they would then be asked if they used these facilities on their travel day vehicular trips.

Respondents were also asked to describe their vehicles, including:

- Year, make and model
- Fuel type: while most vehicles use gasoline or diesel, it is becoming more common for people to own hybrid, electric, or other alternative fuel vehicles that may have an impact on air quality.
- Annual miles traveled
- Whether the vehicle had a disability parking permit: this question was used as a proxy for household members' disability status. It was used instead of asking members directly because it was viewed as a less personally-intrusive question.



Finally, respondents answered a few administrative questions, including:

- How they preferred to be contacted during the study for reminders and incentive distribution.
- Whether they would be willing to participate in future studies.

Once the Household Information Survey was complete, respondents could see a “dashboard” with instructions for completing the Travel Diary. The Travel Diary survey links for individual household members were activated on this dashboard the day after the assigned travel date, and were available for one week.

3.2 One Weekday Travel Diary

The main purpose of the travel diary was to collect detailed information about all the trips each household member had made on their assigned travel day. The travel day was defined as the 24-hour period between 3AM on the assigned travel date and 3AM the next day.

This portion of the survey generally took 10-15 minutes per person in the household, depending on how many trips each person made. The details that were collected included:

- Where the person started and ended their day
- The destination of all of the trips they made (the respondent located each destination on a map)
- The time, purpose, and travel mode of each trip
- The number of other people on the trip, including both household and non-household members
- Whether the trip involved the use of toll roads, parking facilities, or park and ride lots
- Transit systems and routes used (for bus or rail trips)

If a person said they didn’t make any trips on the travel day, they were asked why. They could select a variety of reasons why they didn’t need to make any trips or were unable to make trips.

Everyone was then asked if their travel day was typical. Approximately one-third of respondents described reasons why their assigned travel date was not typical.

One important feature of this section that was added after the pilot survey was a function to allow household members to “copy” trips that previous members had described. For example, if a parent reported driving a child to school in his or her diary, they could save time by copying that trip into the child’s diary instead of having to repeat all of the details.

Following the questions about the travel day, respondents were asked a few more questions about their typical travel behavior. All respondents were asked how frequently they used transit. Employed adults were also asked:

- Typical commute mode and frequency
- Telecommute frequency
- The types of commuter benefits available to and used by the employed respondent (such as flex time, parking and transit subsidies)

After completing the typical travel behavior questions, respondents under the age of 18 were presented with an optional “comments” box, and then finished the diary. The comments are included in Appendix 7.



All adults were then asked to continue with the long-distance section in order to complete their diaries.

3.3 Long-Distance Travel Diary

The long-distance diary collected information about any trips that adult respondents had recently made farther than 40 miles away. This section of the survey collected data to help evaluate travel patterns around the greater region, throughout the state, and the use of interstate transportation facilities.

The long-distance diary began by asking respondents how frequently in the past three months they had traveled to several common destinations in and around Washington State, including Seattle, Portland (OR), Vancouver (BC), and Eastern Washington.

Then, respondents were asked to complete a diary similar to the one-day travel diary, but for long-distance trips (trips greater than 40 miles). Respondents were asked to report their long-distance trips from the past month; if they had not made any long-distance trips in the past month, they were asked to instead report their most recent long-distance trip from the past year. Respondents also had the option of reporting no long-distance trips from the previous year.

For trips reported from the past month, respondents were asked to describe several details about each trip, including:

- The departure and return dates
- The number of other people on the trip with them
- How frequently they made each trip
- The locations of their primary destination (or destinations, if they stayed in multiple places during their trip)
- The primary mode they used to travel to and from their destination(s)
- The primary purpose of their trip

If a respondent instead reported their most recent trip from the past year, they reported fewer details because many of the specific details might have been more difficult to recall over time:

- The trip departure date
- The city of the primary destination
- The primary purpose of the trip
- How frequently they made this trip

After providing details for their most recent trip (or trips), adult respondents saw the optional “comments” box and then completed the diary.



4.0 SURVEY ADMINISTRATION

4.1 Survey Invitation Materials

4.1.1 First Class Mail

All of the households invited to the survey were initially contacted with materials sent via first-class mail. Each household received the following pieces of mail before or after their travel date:

- *A pre-notification postcard*, delivered approximately seven days before the assigned travel date. This provided an introduction to the study and a link to the study website for more information.
- *An invitation packet*, delivered approximately four days before the assigned travel date. This packet included:
 - An large envelope branded with the study logo to help it stand out from a household's ad mail;
 - A letter signed by TRPC's director with information about the study, the survey link and the household's password so that the household could begin participating;
 - An FAQ sheet (on the back of the letter) with more information about various aspects of the study and survey process;
 - Travel logs for recording the household's travel day trips; and
 - An insert with basic information about the long-distance survey.
- *Two reminder postcards*, one was delivered approximately on the travel date, and one delivered approximately three days after the travel date. These were sent to remind households to complete the travel diary. All households received these postcards regardless of whether they had already completed the diary as the postcards had to be printed and mailed before the assigned travel date.

Examples of all of these invitation materials are included in Appendix 3.

4.1.2 Email and Telephone Reminders

In addition to the printed materials, households also received telephone and email reminders encouraging them to participate in the study. ETC operated the call center for the study and conducted outbound telephone reminder calls in addition to answering incoming calls.

When the address-based sample was obtained from MSG, ancillary data was also purchased including a telephone match for approximately 41% of the households and estimated household incomes for approximately 83% of the households. This ancillary data was used to conduct "recruitment" phone calls before households participated in the survey. Recruitment calls were prioritized by income and geography – typically, lower-income households have lower response rates, so these households were called first. Households in the sub-geographies where higher response was desired or lower response was expected were also prioritized. This included the Thurston County Urban Corridor and Urban Growth Areas and Pierce sub-area households. These priorities were adjusted over the course of the study as response targets were evaluated. Recruitment phone calls were made up until the day before the travel date, at which point reminder efforts were focused on households that had completed the first part of the study.

When respondents completed the Household Information Survey, they provided an email address or telephone number to be used for travel diary reminders. For people who provided a



telephone number, ETC conducted telephone reminders the day before the travel dates to remind households to track their trips. Then ETC conducted additional reminder calls for up to a week after the travel date to collect the Travel Diary responses. These reminder phone calls were also prioritized to focus on collecting responses from geographic and demographic segments with lower response rates (such as low-income, 0-vehicle, or large households). The table below summarizes the number of households that received one or more phone calls from ETC to recruit them and/or remind them to complete the diary. Overall, approximately 23% of households that fully or partially completed the study received at least one recruitment or reminder phone call.

Table 8: Number of Households Receiving Reminder Calls by Sample Segment

Sample Segment	Fully Complete HHs	Partially Complete HHs	Recruit-only HHs	Non-completing HHs
Thurston Urban Corridor	123	5	19	765
Thurston Urban Growth Area	126	13	22	833
Thurston Other Urban Area	130	14	24	802
Thurston Rural Area	71	10	15	457
Pierce County Sub-Area	97	3	22	1,204
Park and Ride	1	0	0	4
Vanpool	4	1	8	11
Volunteer	0	0	0	0
HHs Receiving Calls	552	46	110	4,076
Total HHs	2,447	183	434	26,804
% of HHs	22.6%	25.1%	25.4%	15.2%

For people who preferred email or text reminders, RSG sent email reminders on a schedule similar to the phone reminder schedule (one day before, one day after, and the Monday following the travel date). Households stopped receiving reminders after they completed the Travel Diary survey. If they did not complete the Travel Diary, they stopped receiving reminders one week after their travel date (as the ability to accurately recall trip details significantly decreases over time). Examples of the email reminders are included in Appendix 4. The table below summarizes the number of households that received one or more email reminders.



Table 9: Number of Households Receiving Email Reminders by Sample Segment (Recruited HHs)

Sample Segment	Fully Complete HHs	Partially Complete HHs	Recruit-only HHs
Thurston Urban Corridor	207	13	37
Thurston Urban Growth Area	270	21	64
Thurston Other Urban Area	432	44	110
Thurston Rural Area	193	25	39
Pierce County Sub-Area	182	16	44
Park and Ride	13	1	2
Vanpool	141	24	45
Volunteer	1	3	0
HHs Receiving Emails	1,439	147	341
Total HHs	2,447	183	434
% of HHs Receiving Emails	58.8%	80.3%	78.6%

Depending on the timing of when respondents completed the Household Information survey and their travel diaries, some households did not receive any reminder emails or phone calls. (These are households that completed both the Information and Diary surveys at roughly the same time after their travel date – therefore, even though they were required to provide contact information for telephone or email reminders, they would not receive reminders because they completed the diary before the reminders were sent.)

4.2 Survey Retrieval

The primary survey instrument for the South Sound Travel Study was the online survey, administered through a website produced specifically for the project. Screenshots of the online survey tool are included for reference in Appendix 2. The online survey consisted of two separate parts. First, one adult in each invited household was asked to complete the Household Information Survey. On the household’s assigned travel date, each adult member could then log on to the survey dashboard to complete the Travel Diary section of the survey. Adults were also asked to complete the Travel Diary for all children aged 5-18.

Respondents could also choose to complete the survey via telephone. Calls to the project’s toll-free telephone number were answered by ETC operators who were able to go through the online survey instrument with the household’s password and record their answers online as they collected them verbally. In some cases, respondents used both methods to complete their household survey. Overall, approximately 14% of fully or partially complete households completed at least part of the study over the phone.



Table 10: Number of Households Participating by Phone by Sample Segment

Sample Segments	Fully Complete HHs	Partially Complete HHs	Recruit-only HHs
Thurston Urban Corridor	46	0	8
Thurston Urban Growth Area	69	1	5
Thurston Other Urban Area	113	2	13
Thurston Rural Area	57	1	16
Pierce County Sub-Area	47	0	8
Park and Ride	1	0	0
Vanpool	13	0	2
Volunteer	1	0	0
Total HHs Participating by Phone	347	4	52
Total HHs	2,447	183	434
% of HHs Participating by Phone	14.2%	2.2%	12.0%

4.3 Public Outreach and Communication

4.3.1 Study Website and Other Public Information

Several activities were conducted to maintain communication about the study with the general public as well as with study participants. First, RSG developed a public website (www.southsoundtravel.org) which served several purposes. The website hosted the online survey (which was the only part of the site that required a password to enter). It also shared general information about the study through summary pages, an FAQ page, links to the study sponsors' websites, and links to various news and blog posts that were released about the study. Screenshots of the website are included in the Appendix. Members of the general public were also permitted to volunteer for the study on the website. Passwords were provided for six volunteer households, and five of these households either fully or partially completed the study.

Additional information was shared with the public in multiple venues. The study team coordinated to share information on multiple agency websites, including TRPC's main website and the Thurston Here-to-There blog. TRPC sent a press release to multiple news organizations just before the study began on August 29, 2013; TRPC also published several posts on the Thurston Here-to-There blog and on its Facebook page at different points during the study to share information about the study progress and encourage continued interest and participation from invited households. The study was also covered in Intercity Transit's (IT) newsletter and on IT's Facebook page.

4.3.2 Email and Phone Inquiries

Survey respondents could email or call with questions or comments about the study or the survey instrument. RSG's standard is to reply to emails within one business day. Some of the most common emails received during the South Sound study included:

- "Amazon Thank-you" emails: respondents could send an optional reply from Amazon.com when they redeemed their gift card. No reply from RSG was necessary.



- **Technical issues:** Respondents facing difficulties using the survey or website emailed to ask for help. Often these issues related to older web browsers that did not display the survey pages properly; some respondents had difficulty using the maps in the survey (either due to display issues or due to a lack of familiarity with using online maps); and some respondents had questions about how to enter trip data. If a respondent could not view the survey properly on their computer or continued having other difficulties, RSG typically suggested they complete the survey over the phone.
- **Gift card questions:** sometimes respondents would email to ask about the status of their gift card. Typically RSG could reply with an estimated arrival date or could tell them where to look for the gift card (for example, sometimes Amazon emails are sent to junk mail folders).
- **Survey question issues:** some respondents emailed to ask about the content of certain questions (as opposed to asking more technical questions about how to fill in answers). Often these emails were related to privacy concerns, such as respondents who wondered why the survey asked about their income or other personal details.
- **Other (general study questions):** some members of the general public, as well as study participants, occasionally emailed to ask about the study in general (such as asking about the purpose of the study).

A tally of all the emails received during the study period is shown below.

Table 11: Number of South Sound Email Inquiries by Topic

Email Subject	# of Emails, Sept 1-Nov 3
Amazon Thank-you (no reply)	146
Technical issues	62
Gift card questions	28
Issue resolved (no reply)	26
Other (general study questions)	22
Survey question issues	14
Password/log-in help	14
Reassignment	13
Request to participate	8
Unsubscribe request	6
Auto-reply (no reply)	5
Change information	4
Comments	3
Total	351

Respondents and members of the public could also call the toll-free number to ask similar questions. If ETC operators were not available to answer an incoming call; the person could leave a voicemail. ETC would then return the call within one business day. The table below summarizes the number households from each segment that made one or more calls to the toll-free number for any purpose.



Table 12: Number of Households Making Inbound Calls by Sample Segment

Sample Segments	Fully Complete HHs	Partially Complete HHs	Recruit-only HHs	Non-completing HHs
Thurston Urban Corridor	47	0	6	9
Thurston Urban Growth Area	70	1	2	10
Thurston Other Urban Area	119	3	11	8
Thurston Rural Area	65	3	11	9
Pierce County Sub-Area	45	0	7	7
Park and Ride	1	0		0
Vanpool	13	1	2	1
Volunteer	1	0		0
HHs Making Calls	361	8	39	44
Total HHs	2,447	183	434	26,804
% of HHs Making Calls	14.8%	4.4%	9.0%	0.2%

4.4 Survey Incentives

Survey incentives were used to encourage participation. In the printed survey invitation materials and in the reminders, households were notified that they would receive a \$10 Amazon.com gift card upon completion of the Travel Diary. For households who reported in the Household Information survey that they either had more than four adults, zero vehicles, or low incomes (under \$35,000), the incentive was increased to a \$20 gift card. The larger incentive was used to try and encourage a higher response from these traditionally “hard-to-reach” demographic segments. The total number of gift cards ordered for completed households is shown below.

Table 13: Completed Households by Incentive Amount

Incentive Amount	# Complete HHs
\$10 Amazon gift card	1,897
\$20 Amazon gift card	550
Total HHs	2,447

The incentives were ordered from Amazon once per week for households that had completed the Travel Diary in the previous week. When they completed the Household Information survey, households were asked to provide an email address for delivering the gift card or to indicate their preference to receive a physical gift card by regular mail (delivered to the address where they had received the survey invitation). Households that provided an invalid email address also were sent physical mailed gift cards. Approximately 36% requested to receive the physical mailed gift card. This demand for physical gift cards caused some delays to gift card delivery, as Amazon.com informed RSG that there were restrictions on the number of physical gift cards that Amazon would mail per week for one customer. However, despite this minor delay, all gift cards were ordered for delivery within two weeks of the survey close date.



5.0 SUMMARY OF SURVEY RESPONSES

As previously mentioned, 2,447 households fully completed the South Sound Travel Study, and 183 households partially completed the Study (with at least one member completing a Travel Diary) for a total of 2,630 households. These households provided data for more than 5,000 individuals, reported more than 20,000 travel day trips, and reported more than 5,000 recent long-distance trips.

Table 14: Household, Person and Trip Data Results

Data Type	Fully Complete HHs	Partially Complete HHs	Total
Households	2,447	183	2,630
Persons*	5,388	539	5,927
Person-diaries**	5,088	225	5,313
Travel Day Trips**	20,206	947	21,153
Long-distance Trips	5,222	211	5,433
<i>* Includes members not eligible for diaries (children under 5 and military deployed away from the area) as well as partial HH members that did not complete their diaries</i>			
<i>** Diaries from Partial HHs Include member members who completed everything except the Long-Distance diary as well as fully complete individual diaries</i>			

All results provided below are based on unweighted, raw data samples collected in the study.

5.1 Household Information Survey Results

In many respects, the households that responded to the South Sound Travel Study are similar to the population of Thurston County¹. In the survey, 61% of adult respondents are employed, compared to 60% of Thurston County adults; 1.7% of surveyed adults are active military members, compared to 2% of Thurston County adults; 47% of surveyed household members are male, compared to 49% of Thurston County.

Other demographics of the surveyed population are slightly different than the general population in ways that are typically expected of survey respondents. For example, 78% of surveyed households owned their own homes (compared to 67% in Thurston County), and 55% of the surveyed adults had Bachelor's or Graduate degrees (compared to 29% in Thurston County). There are also slightly fewer 0-vehicle households and more small (1-2 person) households.

¹ Comparisons to the general population refer to either the 2010 Census Data or the 2011 5-year Estimates of American Community Survey (ACS) Data.



Table 15: Household Size by Number of Vehicles

# HHs: HH Size	# HHs: Number of HH Vehicles					Thurston ACS: HH Size
	0 vehicles	1 vehicle	2 vehicles	3+ vehicles	Total HHs	
1 person	60 (2.3%)	532 (20.2%)	105 (4.0%)	24 (0.9%)	721 (27.4%)	26%
2 people	15 (0.6%)	184 (7.0%)	610 (23.2%)	325 (12.4%)	1,134 (43.1%)	36%
3 people	2 (0.1%)	56 (2.1%)	146 (5.6%)	145 (5.5%)	349 (13.3%)	16%
4+ people	3 (0.1%)	33 (1.3%)	213 (8.1%)	177 (6.7%)	426 (16.2%)	21%
Total HHs	80 (3.0%)	805 (30.6%)	1,074 (40.8%)	671 (25.5%)	2,630 (100%)	
Thurston ACS: HH Vehicles	5%	30%	40%	26%		

** Includes fully and partially complete HHs*

Additionally, there are somewhat fewer low-income households in the survey sample than in the general population.

Table 16: Household Income

Household Income	# HHs	% of HHs	Thurston ACS: HH Income
Under \$35,000	488	18.6%	26%
\$35,000-\$74,999	939	35.7%	34%
\$75,000-\$99,999	456	17.3%	15%
\$100,000 or more	592	22.5%	24%
Prefer not to answer	155	5.9%	
Total HHs	2630	100.0%	

** Includes fully and partially complete HHs*

These differences are expected, as it is common in surveys to have lower response rates from households with lower incomes, fewer advanced degrees, fewer vehicles, and renters. Additionally, given the length of typical travel diaries, larger households tend to respond less frequently. However, many of these differences can be accounted for in analysis and weighting of the data which will be subsequently conducted on this dataset.

5.2 One Weekday Travel Diary Results

Of the fully completed households (where all members completed their diaries), approximately 4% reported making no travel day trips. Of the individual members who completed their diary, approximately 16% reported making no trips. For households and household members that did report trips, the average numbers of trips did not vary greatly across the region.

Table 17: Average One-day Diary Trip Rates* by Self-reported Home Region

Home Region**	Trips/ HH	Trips/ Person
Thurston Urban Corridor	8.2	4.9
Thurston Urban Growth Area	8.8	4.4
Thurston Other Urban Area	8.6	4.6
Thurston Rural Area	8.5	4.2
Pierce Sub-Area	8.7	4.7
Outside of study area (Vanpool or Park and Ride sample)	9.0	4.5

** Average Trip Rates only include fully complete households and people with at least one trip*

*** The Home Region is the sub-geography (identical to the sample sub-geographies) where each household's self-reported home address was located*



Households in the Urban Corridor made slightly fewer travel day trips than other regions, though individuals in the Urban Corridor made slightly more trips on average. This is not unreasonable, as Urban Corridor households likely have fewer household members. The majority of the trips made were to go home or to work.

Table 18: Trip Purposes at Destination

Trip Purposes	# of Trips	% of Trips
Go home	6,588	31.1%
Go to primary workplace	2,682	12.7%
Go to other shopping (e.g., mall, pet store)	1,373	6.5%
Go grocery shopping	1,325	6.3%
Other	1,273	6.0%
Go to school/daycare (e.g., daycare, K-12, college)	1,228	5.8%
Conduct personal business (e.g., doctor, bank, post office)	1,210	5.7%
Drop-off/pick-up someone (e.g., son at friend's house, spouse at bus stop)	1,160	5.5%
Go to restaurant to eat/get take-out	1,076	5.1%
Go exercise (e.g., gym, walk, bike ride)	989	4.7%
Go to other work-related place (e.g., meeting, second job, delivery)	699	3.3%
Attend social event (e.g. visit with friends, family, co-workers)	531	2.5%
Go to medical appointment (e.g. doctor, dentist)	457	2.2%
Attend recreational event (e.g., movies, sporting event)	289	1.4%
Go to religious/community/volunteer activity	273	1.3%
Total	21,153	100.0%

** Includes trips reported by fully and partially complete HHs*

Also, the majority of trips were made by automobile (driving alone or with other people).

Table 19: Primary Travel Mode

Travel Modes	# of Trips	% of Trips
Drive Alone (auto/truck)	11,016	52.1%
Drive with household members or others (carpool)	6,547	31.0%
Walk	1,644	7.8%
Bus (public transit)	432	2.0%
Vanpool	415	2.0%
School bus	409	1.9%
Bicycle	333	1.6%
Other	255	1.2%
Motorcycle	60	.3%
Train (rail)	24	.1%
Paratransit (Dial-a-Lift)	15	.1%
Taxi	2	.0%
Senior Transportation Services	1	.0%
Total	21,153	100.0%

** Includes trips reported by fully and partially complete HHs*



Of the 6,547 carpool trips, 78% were made only with other household members; only 15% were more “traditional” carpools that only included non-household members in the travel party.

5.3 Long-Distance Travel Diary Results

On average, households across the region reported slightly more than two long-distance trips in the past month or year.

Table 20: Average Long-distance Trip Rates* by Self-reported Home Region

Home Region**	LD Trips/ HH	LD Trips/ Person
Thurston Urban Corridor	2.3	1.7
Thurston Urban Growth Area	2.5	1.7
Thurston Other Urban Area	2.4	1.7
Thurston Rural Area	2.6	1.7
Pierce Sub-Area	2.2	1.5
Outside of study area (Vanpool or Park and Ride sample)	2.3	1.4

* Average Trip Rates only include fully complete households and people with at least one trip in the past month

** The Home Region is the sub-geography (identical to the sample sub-geographies) where each household’s self-reported home address was located

Slightly more than half of the long-distance trips reported from the past month were day trips, and less than 5% of long-distance trips lasted longer than a week.

Table 21: Long-distance Trip Duration

Number of Nights*	# of Trips	% of Trips
0 nights (day trip)	2,220	52.6%
1-3 nights	1,383	32.8%
4-7 nights	417	9.9%
8+ nights	200	4.7%
Total	4,220	100.0%

* Only includes trips reported from the past month from both fully and partially complete HHs

The majority of these long-distance trips (approximately 83%) had one primary destination, though some respondents reported visiting 5 or more cities on a multi-destination trip. A large majority of long-distance trips (approximately 73%) were for social or recreational purposes.

Table 22: Long-distance Trip Purpose

Trip Purpose*	# Trips	% of Trips
Company business (meeting, sales call, etc.)	493	11.7%
Social (visit family/friends)	1,698	40.2%
Recreational (hiking, sporting event, etc.)	1,396	33.1%
Personal business	276	6.5%
Commute to/from work	39	0.9%
Other	318	7.5%
Total	4,220	100.0%

* Only includes trips reported from the past month from both fully and partially complete HHs; only includes the purpose of the first stop (if there was more than one stop)



Given the high proportion of day trips and shorter duration trips, it is not surprising that the majority of long-distance trips were made in personal vehicles.

Table 23: Long-distance Trip Mode

Primary mode*	# of Trips	% of Trips
Personal vehicle (your car, friend's car, etc.)	3,556	84.3%
Airplane	358	8.5%
Rented vehicle	26	0.6%
Company vehicle	144	3.4%
Bus/motor coach	61	1.4%
Train	25	0.6%
Other (e.g. bike)	50	1.2%
Total	4,220	100.0%

** Only includes trips reported from the past month from both fully and partially complete HHs; only includes the mode to the first stop (if there was more than one stop)*



6.0 NEXT STEPS

The Household Travel Survey closed to respondents on November 7, 2013. RSG processed all the data collected while the survey was open and developed dataset dictionaries and accompanying documentation. These datasets and documentation were delivered to TRPC and to Cambridge Systematics (CS) at the end of November 2013. In 2014, CS will weight and expand the datasets and will conduct additional data processing tasks to prepare the data for the travel demand model.

The travel survey conducted at the JBLM military base collected data throughout December 2013. The methodology and results of this survey were summarized in a separate technical memo, and the data were processed and delivered separately.



7.0 APPENDICES

1. Final Questionnaire
2. Survey Screenshots
3. Example Printed Materials
4. Example Reminder Emails
5. Press Release and Midpoint Blog Posts
6. Website Screenshots
7. Open-end Survey Comments (Excel spreadsheet)

