Final Report
Bi-State Regional Commission
Household Travel Survey Documentation

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Contents

# 1.0   INTRODUCTION

The purpose of this report is to provide documentation of the recent Quad Cities Household Travel Survey, which was pilot tested in July 2013 and the full study conducted from October 2013 to January 2014.   This survey documented the demographic and travel behavior characteristics of almost 1,800 regional households. The survey results provide a snapshot of daily travel and are intended to help transportation planners in the Quad Cities region better understand how and why people travel. The results will be used by planners and local officials to identify current travel choices and their effect on the regional transportation system. The data will also be used to update the regional travel demand model.

The Quad Cities Metropolitan Area is home to more than 400,000 residents and includes five neighboring cities along the Mississippi River in Iowa and Illinois. In order of decreasing population size, the five Quad Cities are Davenport, Iowa; Moline, Illinois; Rock Island, Illinois; Bettendorf, Iowa; and East Moline, Illinois[1]. The 2040 Quad Cities MPO Long Range Transportation Plan defines the IL/IA Quad City region as having four geographies: "*... the five-county Bi-State Region served by the Bi-State Regional Commission, the Metropolitan Statistical Area, the Quad Cities Area, and the MPO Planning Area and/or MPO boundary.*" A map of the region, highlighting the MPO boundary is shown in Figure 1.

Figure 1.Quad Cities MPO Region
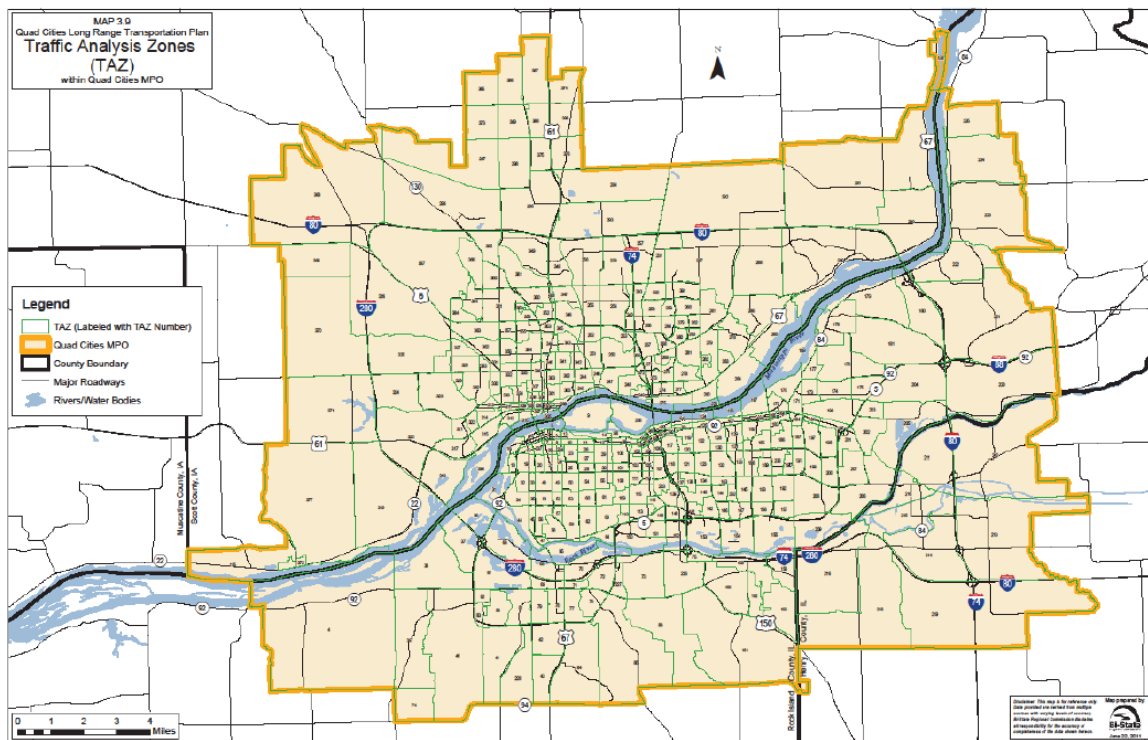
Source: Transportation Model Document for the 2040 Quad Cities Long Range Transportation Plan (2011).

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[1] http://www.quadcities.com/about/#

The Bi-State Regional Commission (BSRC)[2], a regional transportation planning organization in the Quad-Cities region, authorized the **Bi-State Household Travel Survey and Travel Model Data Integration** project in early 2013. URS Corporation (URS), ETC Institute and the Texas A&M Transportation Institute (TTI) comprise the consultant team tasked to provide an origin-destination survey instrument, conduct that travel survey and incorporate the survey results into the travel demand model. This report focuses on the household travel survey portion of the project.

The overall project management approach and the detailed project management plan were based on three key goals: involvement of the advisory committee and key staff, early coordination and communication of the study, and coordination with other BSRC efforts. The URS team worked with BRSC and its stakeholders to develop and conduct a technically sound and effective household travel survey, led by ETC Institute and TTI staff, to support the following needs associated with this study:

- **Enhanced data for model support:** Current trip making behavior in the Quad City model is estimated based on survey data collected elsewhere and on national averages. The Quad Cities is a unique community that has evolved over time, and conducting a household travel survey provides BSRC the opportunity to capture the nature of current trip making in the region. The survey results will provide trip making data in terms of a) person trips, b) mode of travel and c) time of day.
- **Advancing travel modeling capabilities and practice at BSRC:** The data provided by the survey will allow the consultant to guide BSRC staff through enhancing the functions and performance of the travel demand model.

The fundamental purpose of this project is to answer the question, "What does trip making in the Quad Cities really look like?" The data collected by this study will provide answers to several questions for the different types of households in the Quad Cities:

- How many trips are made?
- When are those trips made?
- How are those trips made? (on foot, via car, via transit, on bike, etc.)

By answering these questions, this study provides the model with the necessary parameters to evaluate more accurately potential infrastructure investments, land use development scenarios, and policy decision implications.

This report has six parts: this introduction, technical documentation on sampling design, fielding methods, fielding results, quality control and data preparation and survey results. Supporting materials, including the Travel Diary Packet and other Survey materials and data codebook can be found in the Appendix. **The purpose of this report is to provide a set of technical and non-technical summary documents that allow the general public and key staff and the advisory committee to understand the overall household travel survey, implementation and results.**

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[2]http://bistateonline.org/

2.0   SAMPLING DESIGN

A sampling plan was developed for the household travel survey based on the needs of the regional travel demand model. The sampling strategy and the rationale used to develop the sampling plan are presented in this chapter. The following key elements were included in the sampling approach:

- Proposed target for completed surveys. Based on the region's size, the proposed target for completed surveys was 1,500 households.
- Demographic Controls. Demographic controls are an effective strategy to control the demographic distribution of the survey sample and to monitor for special or hard to reach population groups. Stratification by household size, workers and/or income are often used to provide clear control over how many elderly/retired households participate in the survey (without controls, this can be triple the census proportions) as well as clear monitoring of the participation of large households, single worker households, and low income households – the three most problematic groups to include in travel surveys. This study considered a household size by income stratification, with additional monitoring of the proportion of households with workers.
- Special populations. In order to understand characteristics of the households using transit in the region, a geographic targeted over-sample of transit routes was used. This was not intended to provide the detailed data necessary for mode choice modeling, which is best achieved through a transit on-board survey.

The sampling plan presented in the remainder of this chapter summarizes the details in a Technical Memorandum on sampling, as submitted on June 21, 2013 and included in the appendix. It details the study area definition, sample size and stratification, sampling strategy, sample frame, and sample source as well as reflecting the rationale used to develop the sampling plan.

2.1   Study Area Definition

The 2040 Quad Cities MPO Long Range Transportation Plan[3] defines the IL/IA Quad City region as having four geographies:

> ... the five-county Bi-State Region served by the Bi-State Regional Commission, the Metropolitan Statistical Area, the Quad Cities Area, and the MPO Planning Area and/or MPO boundary.

This survey is ultimately to be used in the travel demand model analysis. For the modeling purpose, the MPO Planning Area (or the MPO Boundary) is defined as the Census-designated urbanized area, plus its expected growth boundary. The current MPO Planning Area is contained as a subset geography within Rock Island and Scott Counties, which is also referred to as the Quad Cities MPO area. The MPO Planning Area is split into Traffic Analysis Zones (TAZs) for

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[3] http://www.bistateonline.org/ser/tra/lon.shtml

the modeling efforts. The 2006 Base Year model structure for the region includes 382 internal and 34 external TAZs in the MPO planning area, as shown in Figure 1 (earlier in this document). As part of the model update process, a new zonal structure is being developed.

This sampling plan assumes that the study area for this survey effort is defined as **all of Rock Island and Scott Counties, and that portion of Henry County as captured in the MPO boundary**.

Two evaluations were undertaken to arrive at this definition:
1. Do we expand the Henry County portion of the study area to include Geneseo? No. A review of census data and the census geography showed a lack of connectivity needed for sampling. Thus, the team recommended leaving the Henry County portion as is. Thus, the study area definition is limited only to that portion of Henry County within the MPO boundaries.
2. Do we extend the MPO boundaries to capture all of Rock Island and Scott Counties? Yes. The key criterion here was an understanding of how such an expansion might influence the sample distribution for those two counties. To address this question, the team evaluated the distribution of population throughout the region, summarized in Table 1. As indicated in the last column of Table 1, the current MPO boundaries capture 15% of the population of Henry County, 95% of Rock Island County, and 91% of Scott County. By extending to the full county borders of Rock Island and Scott Counties, the survey captures an additional 5% and 9% of populations, respectively. Most of these additional captures are in the fringe city areas discussed during the kick-off meeting, which exhibit strong connections to the Quad Cities metropolitan area.

Table 1. Population Distribution

Name	County	State	Count of TAZs in MPO Boundary	2006 Population of TAZs in MPO Boundary	2000 Population of TAZs in MPO Boundary	2000 County Population (P001, SF1, Census 2000, US Census Bureau)	Ratio of TAZ Population to County Population, 2000
Henry County, Illinois	Henry	IL	9	7,632	7,661	51,020	15.02%
Rock Island County, Illinois	Rock Island	IL	218	138,450	141,501	149,374	94.73%
Scott County, Iowa	Scott	IA	155	148,419	144,825	158,668	91.28%

The main implication for including the full counties in the survey study area is its effect on the distribution of samples across the study area. As shown in Table 2, the added population is not anticipated to modify significantly the distribution of surveys.

Table 2. Implications of Expanded Survey Boundary

County	Stay with Current MPO Boundary				Expand to Full Counties			
	MPO Population	MPO HHlds (estimate)	MPO HHlds %	Estimated Surveys	Proposed Population	Proposed HHlds (estimate)	Proposed HHlds %	Estimated Surveys
Henry	7,651	3,060	3%	39	7,651	3,060	2%	30
Rock Island	141,501	56,600	48%	722	143,233	57,292	46%	690
Scott	144,825	57,930	49%	739	161,890	64,756	52%	780
Total	293,977	117,591	100%	1,500	311,052	125,108	100%	1,500

*Source: MPO population data from the TAZ file, reflecting 2000 County Population (P001, SF1, Census 2000, US Census Bureau).Full County data from Census Table H10: TOTAL POPULATION IN OCCUPIED HOUSING UNITS - Universe: Population in occupied housing units, 2010 Census Summary File 1.
*Note: See Section 2 below for a more detailed discussion of sample size and stratification.

As indicated above, the final study area is defined as 100% of Rock Island and Scott Counties, and that portion of Henry County that falls within the MPO boundaries. The full study area geography is shown in Figure 2. In that figure:

- The MPO boundaries are displayed in blue hues (light, medium and dark representing Henry, Rock Island, and Scott County).
- The additional portions of Rock Island County are shown in turquoise.
- The additional portion of Scott County is shown in hunter green.

Figure 2. Study Area Boundaries
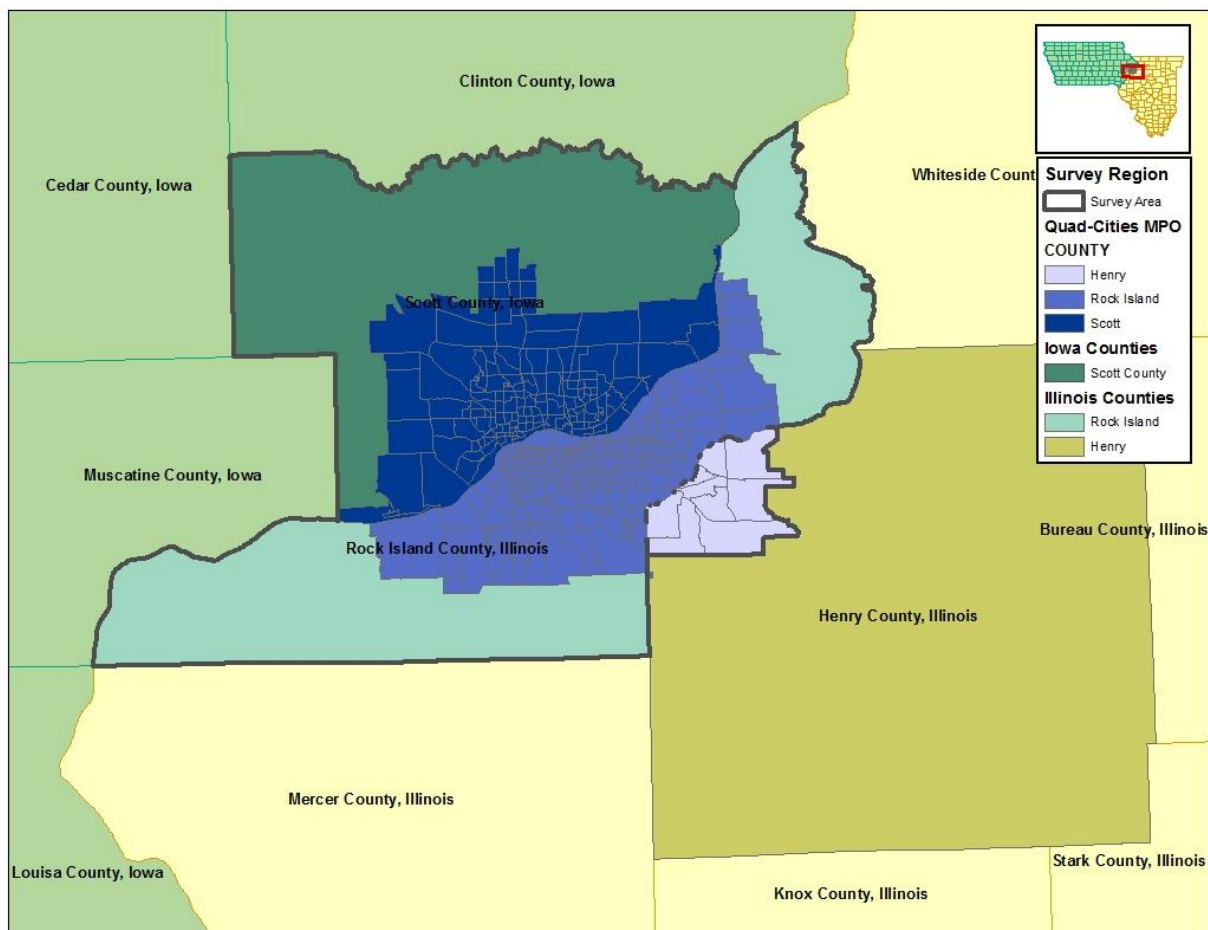
2.2   Sample Size and Stratification

The study area is estimated to have 125,108 households (Census 2010). A sample size of 1,500 households or one out of every 83 households (1.1%) was identified as the minimum desired sample size for this project. This sample size was determined based on a cursory review of the current models, discussions regarding travel patterns of interest, and budget available. It is comparable, and even slightly higher than sampling rates in peer cities.

The survey design obtained demographic and travel behavior details from all members of the sampled households. The travel behavior details are documented for a 24-hour period that occurs during the week (non-holiday Monday through Friday when school is in session).

2.2.1   Demographic Sample Distribution

Data collection was guided by demographic goals. Initially, a 3-way stratification of household income (quartiles) by household size (1, 2, 3, 4+) by presence of workers in the household (yes or no) was considered. This type of stratification has been found to be effective in controlling how many elderly households are included in the sample. In addition, by considering income and

household size, the participation rates of the rarer one-worker households and the larger low-income households can be monitored.

The Census Transportation Planning Package (CTPP) 2006-2008 data was used to determine the appropriate stratification for the demographic targets.[4] This data is the only source that provides the 3-way stratification for the variables of interest. The CTPP data is for Rock Island and Scott Counties only as the table was available only at the County level. For purposes of this sampling plan, it was assumed that the population distributions in the MPO portion of Henry County are similar to those in the Rock Island and Scott Counties.

After reviewing the appropriate census data, the team recommended that the demographic goals for the Household Travel Survey be set as follows:
- Size and income at the regional level, as a cross-tabulation
- Presence of workers (yes, no) be monitored separately.

The demographic goals as employed in the survey were identified as:

Table 3. Proposed Demographic Distribution of Surveys

Survey Distribution: Households					
Household Income	Household Size				Total households
	1-person	2-person	3-person	4-or-more-persons	
Less than $25,000	223	84	30	31	368
$25,000 - $49,999	155	145	46	64	410
$50,000 - $74,999	53	127	49	58	286
$75,000 or more	36	178	90	131	436
Total	*467*	*534*	*215*	*284*	*1,500*

With households targeted to be
- Approximately 27% households with no workers (about 400 surveys)
- Approximately 73% households with one or more workers (about 1,100 surveys).

2.2.2 *Geographic Sample Distribution*
The general sample was drawn proportionate to population. There was no geographic stratification of the sample. Table 4 shows the forecasted distribution of surveys by Geography.

Note that varying levels of participation across the region influence the final survey sample distribution. As such, analysis of the data at the "place" level is not supported by the survey data –Table 4 is included for illustrative purposes only.

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[4] The Census Transportation Planning Package (CTPP) is a special census product with data tabulations designed to support transportation planning. The 2006-2008 CTPP tabulations were based on ACS 2006-2008 data, and are limited geographies with populations 20,000 or greater. For more details, see http://ctpp.transportation.org/

Table 4. Proportionate Distribution of Surveys by Geography

	Population in Occupied Housing Units	% of Study Area Population	Number of surveys	% of Study Area Surveys
Scott County, Iowa				
Davenport city	96,574	31%	466	31%
Bettendorf city	33,041	11%	159	11%
Eldridge city	5,651	2%	27	2%
Le Claire city	3,765	1%	18	1%
Park View CDP	2,389	1%	12	1%
Rest of County	20,470	7%	99	7%
Scott Total Population	**161,890**	**52%**	**781**	**52%**
Rock Island County, Illinois				
Moline city	43,161	14%	208	14%
Rock Island city	36,577	12%	176	12%
East Moline city	19,796	6%	95	6%
Silvis city	7,479	2%	36	2%
Milan village	5,083	2%	25	2%
Rest of County	31,137	10%	150	10%
Rock Island Total Population	**143,233**	**46%**	**691**	**46%**
Henry County, Illinois				
Census Tract 301	5,929	2%	29	2%
Survey Area Total	**311,052**	**100%**	**1,500**	**100%**
Source: Table H10, 2010 Census Summary File 1, U.S. Census Bureau.				

2.2.3   Transit Using Households

For purposes of this study, a transit-using household is defined as one in which at least one member makes at least one trip by transit on the assigned travel day. Sample was drawn to maximize the capture of transit using households.

Reaching this type of household required a special type of geographic oversampling typically accomplished through drawing a buffer about the transit routes with the highest ridership levels. ETC performed this step prior to finalizing the draw of the sample from the sampling frame.

2.3   Sampling Frame
An enhanced address-based sampling frame was used for this project. This type of sampling frame provides strong geographic controls and draws from the USPS mail delivery database. It is enhanced with telephone numbers (both landline and cell numbers), typically providing telephone numbers for most of the sampled households.

In terms of estimating the size of the sample to be drawn, the following logic was used:
- To retrieve 1,500 households, we anticipate recruiting 2,200 households
- To recruit 2,200 households, we anticipate needing 22,000 pieces of sample. This accounts for samples without telephone numbers, telephone numbers that are disconnected, non-contacts, and refusals.

The sample was selected at random from all known residential addresses in the survey study area. It was drawn from InfoUSA® (http://www.infousa.com/) recently acquired "Edith Roman's database" of residential housing units in the region. To ensure the randomness of the sample, every nth record in the database was selected for the sample. The nth value was determined based on the number of records available vis-à-vis our estimated need for 22,000 samples and varied based on the different sample draws needed to ensure sufficient sample throughout the data collection period.

Once the random sample of residential addresses was selected, contact information was added to each record. The contact information included the associated phone numbers (landline and/or cell phone numbers) with each address. This process ensured that households that only have cell phones were included in the sample. Since the sample was selected by address, households without phones will have the same probability of being selected as households with phones.

To ensure that households without phones had an opportunity to participate in the study, ETC mailed an advanced notification letter that explained the purpose of the study to all households that were selected. The advance notification letter included information that allowed households without phones to contact ETC Institute staff to request an opportunity to participate in the survey. A copy of the advance letter is included in Appendix 7.1.

2.4   Language
The survey was conducted in English and Spanish. All forms and materials were produced in English, with a tag line directing those preferring to conduct the survey in Spanish to a toll-free number. Bi-lingual staff representatives assisted the Spanish-speakers by telephone. A total of 58 households were Spanish speaking, with 113 respondents conducting the interview in Spanish.

3.0 FIELDING

The following narrative discusses how the design of the survey instruments. It also summarizes a pilot test conducted to determine the need for any changes to the survey prior to full implementation.

The project team used the following guidelines to shape the design of the survey instrument:
- Travel data was to be gathered for one 24-hour travel day only.
- The travel day was to be a weekday.
- Unique travel and activity data were to be collected for all household members. Travel data for young children were provided by parents.
- The travel and activity data collected were to be gathered in a manner that would minimize the burden on the household.
- Respondents were not required to provide detailed tracking of in-home (non-travel related) activities.
- Survey procedures and materials were designed to fit the local context.

Pre-Survey Design Assessment. The project team assessed the potential survey design for the household survey. The assessment included a review of the guidelines listed above and the identification of all data requirements for the project. Samples of survey instruments administered by ETC Institute for travel surveys in other communities were used as the basis for the development of this household travel survey.

3.1   Design of the Survey

The survey instrument was designed to collect travel behavior in support of travel demand model updates. The main data collection tool was a 24-hour household travel diary that was kept by all household members. The household survey recruitment script and travel diary were structured and worded to allow the participants to answer the questions easily.

Survey instruments including the Recruitment Survey and Travel Diary Packet can be found in Appendices 7.2 and 7.3 of this report.

Conducting a Pilot Test
The Quad Cities Regional Household Travel Survey Pilot was conducted in July and August 2013. The purpose of the pilot survey was to assess and evaluate the methods, materials, and processes that were planned for use in the household travel survey. A total of 100 households were contacted, of which 36 agreed to participate in the survey. Of the 36 recruited households, 31 ultimately provided travel behavior details through the retrieval process. The pilot study did not include any GPS samples, given the cost and the short time period.

Key aspects of the pilot included survey training and the pilot test itself. The pilot survey included the following steps:

1. Randomly selecting households to participate
2. Recruiting the households by phone
3. Survey mail-out
4. Reminder call
5. Retrieval call to obtain and review completed surveys
6. Data entry of the results

Training

ETC Institute conducted training for interviews and data entry personnel during the week of July 16-17, 2013. A total of 24 interviewers, data entry personnel, and researchers participated in the training. The training was led by ETC Institute's project manager, Chris Tatham. All 24 of the people who participated in the training were experienced in conducting household activity travel surveys at ETC Institute.

The key elements of the training included the following:

July 16:
AM
- Overview of the purpose of the survey
- Review of the key element of the survey
- Review of the sampling plan and recruitment procedures
- Methods to encourage respondent participation
- Frequently asked questions
- Things to avoid

PM
- Review how to properly fill out all survey materials
- Proper methods for recording trip purpose
- Proper methods for recording addresses
- Methods for conducting the surveys in English and Spanish and protocol for handling non-English speaking respondents.
- What to do in various situations

July 17:
AM: Quiz on Day 1 topics and Interviewers conduct mock interviews
PM: Certification Exam by Supervisor

Limitations of the Pilot Test
The pilot test by design included only 31 households. As a result, this pilot focused on the process, materials, and data structure. The pilot evaluation was qualitative in nature and the focus was on key indicators. Despite the small size, specific results pointed to a solid survey design with minimal adjustments needed for the full study.

Since the pilot test was conducted during the summer, it was much more difficult to reach households with children because many families were on vacation and/or their daily schedules were not normal so they declined to participate. As a result, the sample for the pilot test was significantly older than the sample for the main survey will be. Since the purpose of the pilot test was to test to the survey administration process, this is not a concern. While the results of the pilot test should not be used as a predictor of the results for the main survey, this limitation confirms the need to include several design elements recommended by the team, as noted in the sections below.

Pilot Test Evaluation
The evaluation of the pilot test includes:
- Field indicators
- Interviewer feedback
- Respondent feedback
- Data indicators (conducted by TTI).

Field Indicators
The pilot test process followed standard household travel survey protocol. The main indicators of fielding were the response rates for recruitment and retrieval.
- **Response rate of households agreeing to participate in the survey via telephone recruitment:** Thirty-six percent (36%) or 36 of the 100 households that were initial contacted agreed to participate in the pilot test. The goal was 30%.

- **Proportion of recruited households providing complete travel survey data:** Of the households that initially agreed to participate, 86% or 31 of the 36 households actually provided complete travel survey data. The goal was 67%.

- **Proportion of households reporting travel by phone or mail**. Of the 31 households providing travel data, six did so by mailing in their diaries, while the remainder reported their data by phone. This supports the need to provide both options.

Interviewer Feedback
The interviewers are the main contact with respondents. They read the scripts, work in the computer program to collect the data, and are involved throughout the entire survey process. As part of the pilot, the interviewer team was debriefed about their pretest experience.

- **Interviewer Input on Survey Process.** Interviewers reported only grammatical issues with the CATI survey scripts. Respondents seemed pleasant and willing to participate in the survey.

- **Quality of Data Entry Operations.** No problems were experience with the data entry and processing of the survey data that was collected. Special attention was paid to bridge crossings as that entailed new questions and different wording, but no problems were encountered.

- **Adequacy of survey forms and scripts for recruitment and retrieval**: No problems were identified with the design of survey forms. During the post-survey interviews that were conducted, all participants indicated that the surveys were easy to understand.

Respondent Feedback

At the conclusion of the retrieval survey, all respondents were given the opportunity to provide feedback about their experience. Of the 31 participating households, representatives from 23 households provided feedback.

- **Ease of participating**: Four respondents commented about how easy it was to participate in the survey.
    - The first respondent indicated that the first glance of the packet suggested it might be hard to do, but after a quick call with BSRC staff, realized how easy it was. This confirms the need to have the toll-free survey number prominent in the materials.
    - One didn't like the diary and was glad for the follow-up telephone retrieval call. This was a young adult (age 27), unemployed and not a student, typically a difficult group to reach. This confirms the approach of trying to speak with each adult member of the household during retrieval.
    - Two respondents commented on the need for all members to complete the diary, on the same day. One commented that it would be easier if we did not need to keep track of everyone in the household. The other respondent didn't mind tracking all household members, just not on the same day. Typically, this type of comment would be ascribed to a large household (the "burden" of tracking all household members.) What is interesting about this pair of comments is that they come from two members of a 3-person household who reported a total of eight trips. The two parents provided these comments, and the young-adult member was the one that did not like the diary (as noted in the bullet above).

- **Length of Time**: Seven respondents commented on the survey length. All of them said it took much more time then they realized. One respondent indicated that they didn't mind doing the survey despite the length, while two others indicated they would not have done the survey if they had realized how much time was involved.
    - What appeared to take the most time, in the mind of the respondent, was the need for the interviewers to speak directly with each adult household member. However, this provides the highest quality data. This is a point addressed below.
    - One respondent wished they could have just mailed their forms in. Mailback was an option, although it is not clear why this person did not utilize that option.

- **Questions about the survey**: Three respondents had questions about parts of the survey they did not understand.
  - Two respondents did not understand why income was needed and what would be done with that data. This may speak to the need to add a clarifier to the script to explain those items, if the respondent asks.
  - One respondent did not know who the Bi-State Regional Council was.

- **What could be done to improve the survey?**: Six respondents provided suggestions to improve the survey:
  - Two respondents felt that survey promotion was needed, including more media announcements, so that when potential households received the letter, they had heard about the survey. (Note that we purposefully did not do any type of survey promotion for the pilot).
  - Two respondents felt that there should be some type of incentive offered. (Note that we purposefully did not offer any type of incentives for the pilot).
  - One respondent recommended not asking as many demographic questions. In reviewing the data elements collected, the survey appears to ask only for data that is necessary, so reducing demographic questions does not appear to be an option.
  - Another respondent suggested not collecting travel for children. This is an interesting comment and something debated in the travel survey community. This is discussed more in the next section, along with the survey length issue previously identified.

Data Indicators
At the conclusion of the pilot test, TTI performed an independent review of the pilot data. This review focused on the structure and content of the data, comparing the data set to the data dictionary developed at the start of the project. With only a few exceptions, the data compared favorably to the planned structure.

Three inconsistencies were noted in the data: the codes for HHCNTY, PROXY, and PSTATE were incorrect. These have been corrected to conform to the data dictionary.

Discussion
In reviewing the pilot results, ETC and TTI noted the following items for discussion:

First, the pretest focused on process and materials, not on sampling or response patterns. However, the results from the pilot can help to inform the full study in the following ways:
1. The over-participation of elderly households in the pilot confirms the need to include a data collection control for presence of workers in the household (yes/no) as planned.
2. The respondent feedback, combined with standard survey protocol, confirms the need to provide incentives to encourage participation.
3. The pilot test included questions to screen for bridge crossing during recruitment. Nine households reported bridge-crossing behavior. Of those, six actually reported a bridge crossing trip on the travel day. These are positive results in two regards: the incidence of bridge-crossing households in the sample and the proportion who actually carried out that activity on the travel day. The team will continue to monitor these results in the full study, but anticipate a strong presence of bridge crossing behavior in the data set.

4. Conversely, the random sample included only one transit-using household, and that household did not report any transit trips on the travel day. This confirms the need for a transit over-sample to reach minimum presence of transit users in the data set.

Second, respondent feedback points to a long survey – some citing an interview that took an hour. This is caused by the design calling for the collection of data for all household members (including children) and for the retrieval of data from all adult members of the household. More details on each of these are provided.

- For simpler models, travel by children is not necessary or can be inferred in the adult travel (providing the correct questions are asked). However, often, a parent's missed trip is noted through the recounting of children's travel. The recommendation is that all trips by all household members be collected.
- With respect to the retrieval of travel data for all household members, there are different approaches that yield different levels of data quality.
  - o The simplest is to ask all households to mail in their diaries and be available for telephone calls to clarify missing or inconsistent data. This is not the best approach, as interviewer mediation during data collection has been shown to help capture missed trips. However, if they agree to be called back after their data has been transcribed, this minimizes the missed trip rates.
  - o The former method of retrieval was to have one household member serve as proxy for all other household members and report on their travel. This works when the household members all completed a diary. The challenge is when there is not a diary – studies show a significant loss in reported trips through proxy reporting without a diary.
  - o The current method for the Quad Cities survey is to allow for a mail back option (with clarification) but when a household reports by phone, to talk with all household adults directly. This yields the best quality data, but is time consuming for all involved.

Changes to the Survey Instrument
Based on the results of the Pilot Test, only a few minor changes to the survey instruments were completed. All of the changes involved the correction of minor typos and grammatical errors. None of the changes affected the content of the data collected.

Based on the pilot debriefs, it may be helpful to add a few sentences to the CATI, such that when the respondent asks about income (why needed or what happens to the data), the interviewer has a ready and canned response to alleviate concerns.

3.2   Administration of the Household Travel Survey

Successfully completing the survey required the survey team to take several administrative steps to ensure residents were aware of the survey, willing to participate, able to accurately fill-out the survey, and return the needed information.

Importance of a High Response Rate. One factor that can greatly influence the quality of data collected is the percentage of households recruited that actually participate in the survey. A low response rate can inherently bias the survey results. Consequently, a great deal of emphasis was placed on measures that would maximize the response rate to the survey.

Building Awareness of the Household Survey. Given the private nature of the data to be collected, public awareness was an important factor to the success of the survey. People who participated in the pilot-test said they would be much more likely to participate and provide a complete answer if they thought the survey was legitimate.

For this reason, a public awareness campaign was developed to inform the community about the study. The campaign involved a two-tiered strategy.

> **Tier 1: General Awareness**: This tier involved building general awareness about the study in the region through newspaper, radio, website, and other sources. Press releases were sent to newspapers, radio stations, and television stations in the region. In addition, a wide range of information about the study was posted on their website so that residents and the media could verify the legitimacy of the survey and get more information about the survey as needed. Prior to the survey, several newspaper articles were published in area newspapers to promote the survey. .

> **Tier 2: Detailed Awareness**. The second tier involved direct communication with each of the households that were recruited to participate in the study. This group of people needed to understand the details of the survey administration process in order to complete their travel diaries. Those who were recruited also had to know that their responses would be kept confidential. In order to accomplish these tasks, ETC Institute worked with the project management staff to design a series of direct mailings that included reminder letters, post cards, and refrigerator magnet reminders. In addition, ETC Institute established a toll free number (1-888-801-5368) so that recruited households could contact ETC Institute to get answers to their questions about the study. A local phone number to the agencies office was also provided so that residents could contact staff with questions about the project.

Household Survey Administration Procedures. The Regional Household Travel Survey was administered to a randomly selected sample of households in the region in Fall2013through Winter 2014. The process for recruiting households to participate is described below:
- ETC Institute sent an advance letter to all households that were randomly selected to participate in the survey to provide information about the survey and encourage participation. The advance material listed the toll-free number so that households without listed phone numbers could request to participate in the study.
- ETC Institute conducted recruitment calls to households with listed phone numbers to request participation in the survey.
- ETC Institute personnel assigned participating households a travel day (the day they would complete the survey) and asked them to confirm their home address. In addition, household level data (number of occupants, ages of occupants, number of vehicles, etc.) was collected from all households that agreed to participate in the study.

- ETC Institute then mailed a travel diary packet that contained a cover letter, travel day reminder, travel diaries for all household members, instructions, and a sample diary to all households who agreed to participate in the study. The packet included a postage-paid return envelope.
- ETC Institute then mailed a reminder postcard to each of the households that agreed to participate to remind them of their travel day. The reminder postcard was mailed 7-10 days prior to the travel day. In addition, ETC Institute placed reminder calls to each household to confirm participation one or two days before they were scheduled to begin the travel survey.
- ETC Institute then placed follow-up calls to verify participation the day after travel diary activity was scheduled to begin. If the household indicated that they did not complete the diaries, ETC Institute personnel rescheduled the travel day for the household.

3.3   Administration of the Passive GPS Survey

GPS Equipment. ETC Institute used G-Log 760 Trip Recorders to collect the majority of the GPS survey data. The G-Log 760 unit is battery-operated unit with a motion detector and a self-contained antenna. The G-Log 760 unit pauses when the car is not in motion and the units were programmed to stop recording if the vehicle speed fell below five miles per hour for a continuous period of 30 minutes or more. No effort was required by travel survey participants to turn the unit on or off. The devices were placed in the windshield, or other area where signal would not be disrupted. If the vehicle had a working cigarette lighter, ETC Institute connected the GPS device to the lighter to provide backup power in the event the batteries failed.

Figure 3. G-Log 760 Trip Recorder used in Passive GPS Survey.

ETC Institute installed the GPS devices at central locations in the study area. Households that agreed to participate in the GPS Survey met ETC Institute representatives at a central facility to have the GPS device installed. ETC staff set up in conference rooms at local hotels for the installation and retrieval locations.

GPS Administration Process. Households that participated in the passive GPS data collection were involved in the project for seven days:

➤ **Day 1**: The recruited households drove their vehicle(s) to a designated location in the Quad Cities metropolitan area. ETC Institute's bilingual staff installed the G-Log 760 and explained how the GPS device works. Up to three vehicles in each household were equipped with GPS. Final instructions and a hands-on demonstration were also given

to each participant so that they understood how to record information on the written portion of the activity travel diary and to ensure that they understood how the GPS devices worked.

➢ **Day 2**: All household members recorded their travel information on the written household travel diaries. The G-Log 760 recorded all vehicle travel data. The GPS data was only collected while the vehicle was in operation. Participants were given a local phone number to call if they had any questions.

➢ **Days 3-8**: Household members drove their vehicles in the region with no special attention to the passive collection of GPS data.

➢ **Day 9**: All households returned to the same location where the G-Log 760 was originally installed. Prior to returning, they called ETC Institute's call center and the travel data was retrieved by phone. Once the household had successfully communicated their travel data to ETC Institute's call center, they were instructed to return to the location where the GPS device was installed so that ETC Institute staff could retrieve the device.

GPS Data Elements. The following types of GPS survey data were collected by ETC Institute:
- The position of the vehicle by longitude and latitude in one-second increments and the time and date at each position.
- Distance and direction traveled since the last position.
- Vehicle's distance, speed, elevation, date, and heading.
- Times (by hour and minute) when survey vehicle engines were turned on and turned off.

The GPS data was prepared in an ASCII comma delimited format. Information that was included as part of the GPS Administrative File included the following:

1. GPS Unit ID Number
2. Household ID Number
3. GPS File Name
4. Vehicle Number
5. Household Travel Date
6. Vehicle Year
7. Vehicle Make
8. Vehicle Model
9. Beginning Odometer Reading
10. Ending Odometer Reading
11. Installation Date
12. Installation Time
13. Removal Date
14. Removal Time
15. GPS Power Source
16. Type of Vehicle

4.0   FIELDING RESULTS

The full survey effort collected travel data from October 8, 2014 through January 16, 2014. The purpose of this chapter is to summarize the fielding results from that effort.

4.1   Response Rates and Sample Performance

The survey resulted in the collection of complete demographic and travel behavior data from 1,793 households. The following is a summary of response rates and the distribution of those completed households as they compared to census.

4.1.1   Response Rates

ETC Institute mailed 9,830 advance letters. Of these, 6,798 sampled households were also contacted by phone, as either there was a telephone number available for the sampled residential address or a respondent contacted ETC from the advance mailing.

- Of the 6,798 households contacted, 2,205 households (32%) agreed to participate in the survey and provided their demographic information in the recruitment interview. The recruitment interview averaged 14.3 minutes across all households (shorter for smaller households and longer for the larger households).

- The 2,205 recruited households received a reminder call, the night prior to the assigned travel day. This averaged 1.6 minutes on average.

    Between the time necessary for the recruitment and reminder calls, the 2,205 households volunteered 584 hours of their time.

- Of the 2,205 recruited households, 1,793 provided travel diary data for all household members. This is a retrieval completion rate of 81%. The retrieval interview averaged 43.7 minutes on average.

    Between the time spent completing the diaries (average of 30 minutes per household) and the time spent on the telephone for the retrieval calls, the 1,793 households volunteered 2,202 hours of their time.

- The overall response rate is 26% (32% recruitment rate x 81% retrieval rate). This is high and reflects a strong interest in transportation for the Quad Cities region.

- Of the 1,793 households, 168 households participated in the 7-day GPS supplemental survey.

4.1.2 Goals vs. Actual

The survey plan called for completing 1,500 surveys. ETC Institute completed 1,793 households. The following table shows the actual proportion of completed surveys as compared to census-based goals. The distribution of completed surveys matches the expected census distributions fairly well. A map of the home locations of the 1,793 participating households appears in Figure 4.

Table 5. Census-Based Goals vs. Actual Distributions

Household Type	Census %	Survey %
Income > $25k, HH Size=1	15%	16%
Income > $25k, HH Size=2	6%	7%
Income > $25k, HH Size=3	2%	2%
Income > $25k, HH Size=4+	2%	2%
Income $25-50k, HH Size=1	10%	11%
Income $25-50k, HH Size=2	10%	13%
Income $25-50k, HH Size=3	3%	4%
Income $25-50k, HH Size=4+	4%	4%
Income $50-75k, HH Size=1	4%	4%
Income $50-75k, HH Size=2	8%	11%
Income $50-75k, HH Size=3	3%	2%
Income $50-75k, HH Size=4+	4%	4%
Income $75k+, HH Size=1	2%	3%
Income $75k+, HH Size=1	12%	20%
Income $75k+, HH Size=1	6%	6%
Income $75k+, HH Size=1	9%	10%

Figure 4. Household Locations
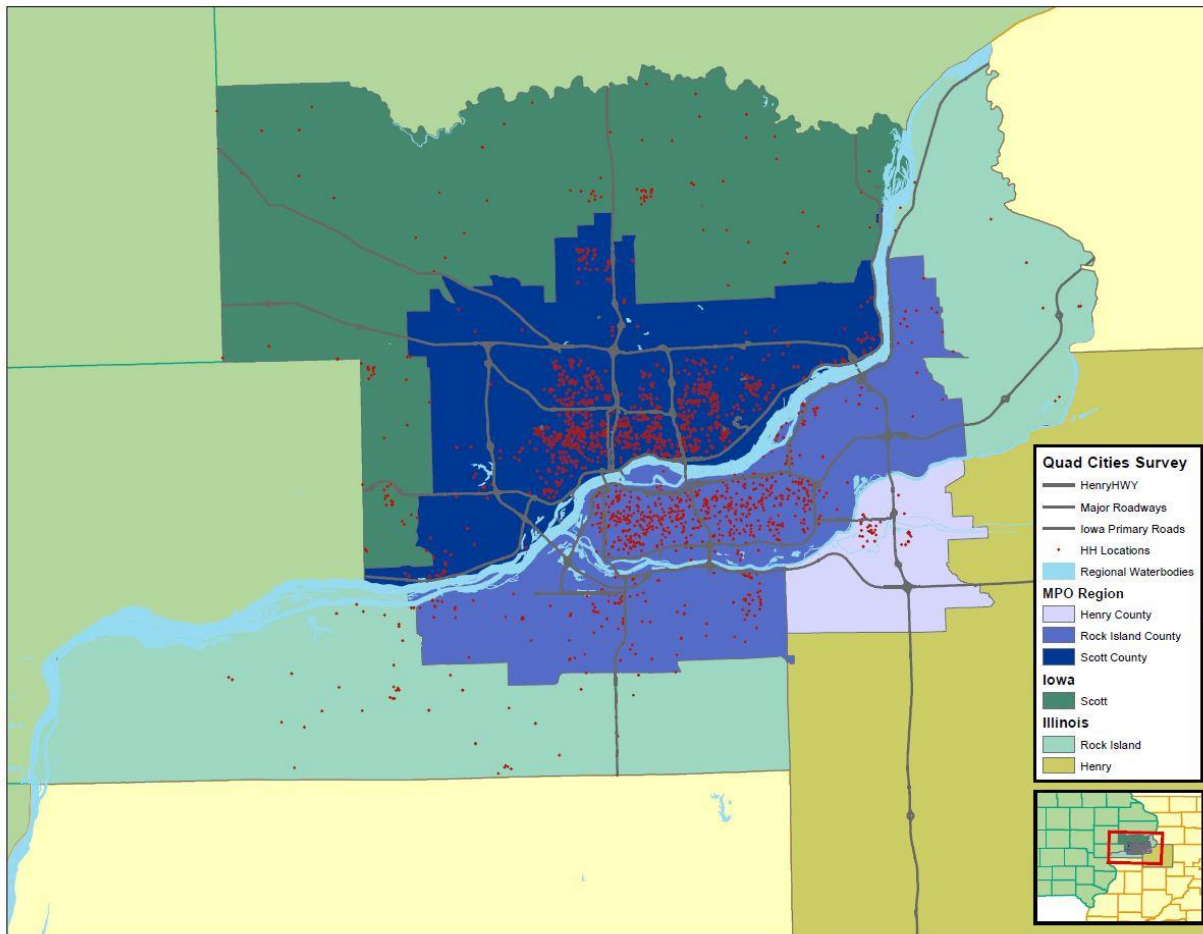
Date: 3/20/2014

4.1.3   Bad Weather Travel and Resulting Final Data Set Used for this Report

January 2014 was an extremely cold winter for the Quad Cities region. Temperatures on January 6 and 7 were sub-zero and most businesses and schools were closed. Surveys were not collected for those two days, but were collected for January 8 and 9 as schools were back in session and businesses re-opened. An analysis of overall trip rates for the study suggest that while the businesses and schools were re-opened, travel levels were about half what was expected.

A total of 168 households (unweighted) provided travel details for January 8 and 9, with 18% of the households assigned travel on those two days reporting they did not make any trips at all. The household trip rates for those 168 households (unweighted) were 6.1 trips per household, as compared to a "typical" unweighted household trip rate of 8.0 trips per household on average. Because of the much lower rates of travel for those 168 households, **they were given a weight of zero in the final data set, effectively excluding their demographic and travel behavior data from inclusion in this report whenever weighted data are reported**. The data were retained

in the data set, to support future analysis of the impacts of extreme cold weather on travel in the Quad Cities region.

4.2   Data Set Contents

In addition to exhibiting a strong response rate and demographic characteristics consistent with the census distributions for the region, the contents of the data sets were also evaluated. This included consideration of the completeness of responses to the various questions posted and the level of trip reporting in the data set.

- An assessment of item response was conducted, and all variables in the data show a level of 95% or higher completion rates.
- Of the 1,625 households that reported travel on dates other than January 8 or 9, 140 reported no travel for the day. This is 9% of the sample, which is within the generally acceptable range of no more than 10% of households reporting no travel.

5.0   DATA PREPARATION

5.1   Quality Control Plan and Procedures

Quality control (QC) was a consistent component embedded in all activities performed for both surveys. Senior professionals directly supervised all QC phases of the project to ensure that the overall survey effort was as accurate and complete as possible. The quality control plan addressed review procedures for data entry of mail-in surveys and geoprocessing.

5.1.1   Data Entry and Quality Control for Mail-In Surveys

Some of the specific procedures followed by ETC Institute to protect the quality of the data obtained through mailbacks are described below:

- Upon receipt of the travel diaries, ETC Institute conducted a thorough review of 100% of the entries.
- A review of completed travel diaries consisted of the following: an examination of the diary information collected from each household; a review of the compatibility of the data among household members; a review of travel times for short travel distances; a review of the spelling of addresses and the existence of street addresses.
- If an entry on a survey form did not conform to the specifications established for the field, was incomplete, or illegible, ETC Institute employees took one of two actions: (1) they corrected the entry; the corrections were sometimes easy to make given the data provided; or (2) they called participating households to gather the correct data via telephone. When an employee took either of these actions, the employee noted the action taken and reported the action to the project supervisor. This review process prior to data entry ensured that origin and destination addresses were as complete as possible before the information was entered into the computer.
- ETC Institute personnel conducted dual data entry for 100% of the records.   All completed surveys were entered into two independent databases by different people. After the data entry was completed for each database, the files were compared and screened for records that did not match. Records that did not match were corrected in each of the databases by different people. The files were then merged again, and records that still did not match were corrected again. This process was repeated until all records in each of the two databases matched. This process ensured that the database was nearly 100% accurate before the geocoding process began.

5.1.2   Geocoding Process

An important step in the survey data QA/QC process was the geocoding of survey data and records to precise locations in the region. Essentially this allows the data to be mapped and allows for the examination of logical errors in survey results such as trips that do not make sense.

The survey team initially compiled survey results in Excel data files. Each of the worksheets in the final Excel data file was imported into a GIS application for geocoding. The resulting geocoded survey table was saved and exported back out as an Excel file. The table maintained the unique record identifier assigned by ETC Institute when the household was originally recruited (GIS_ID). Some of the key fields of the geocoded survey table are listed in Table 6 below.

Table 6. Key Fields for Geocoding Survey Table

Data Field Name	Type	Remarks
GIS_ID	Integer	Unique record identifier
START_LON	Integer	Longitude of the trip start address
START_LAT	Integer	Latitude of the trip start address
END_LON	Integer	Longitude of the trip end address
END_LAT	Integer	Latitude of the trip end address
HOME_LON	Integer	Longitude of the household address
HOME_LAT	Integer	Latitude of the household address
EMP_LON	Integer	Longitude of the employer address
EMP_LAT	Integer	Latitude of the employer address

Pre-Processing of Survey Records. A number of standard data integrity checks and corrections were performed before actual geocoding was conducted. This included the identification of duplicate records and corrections to the spelling of street names and zip codes. The quality of the original survey database was very good.

Geocoding Process and Results. Geocoding was performed in TransCAD using the latest edition of Caliper's street layer. In addition, government location databases and other commercial sources and software were used to enhance the geocoding accuracy and match rates through extended reference datasets and by utilizing several different locations (address) and reading/translation algorithms. TransCAD provides some of the most sophisticated address matching functionality available.

Final Survey Results. The final data set contains data for all 1,793 households surveyed, 4,100 persons, 3,531 vehicles, and 13,790 trip locations. Figure 5shows the trip locations, color-coded by county of residence.

Figure 5. Survey Trip Locations
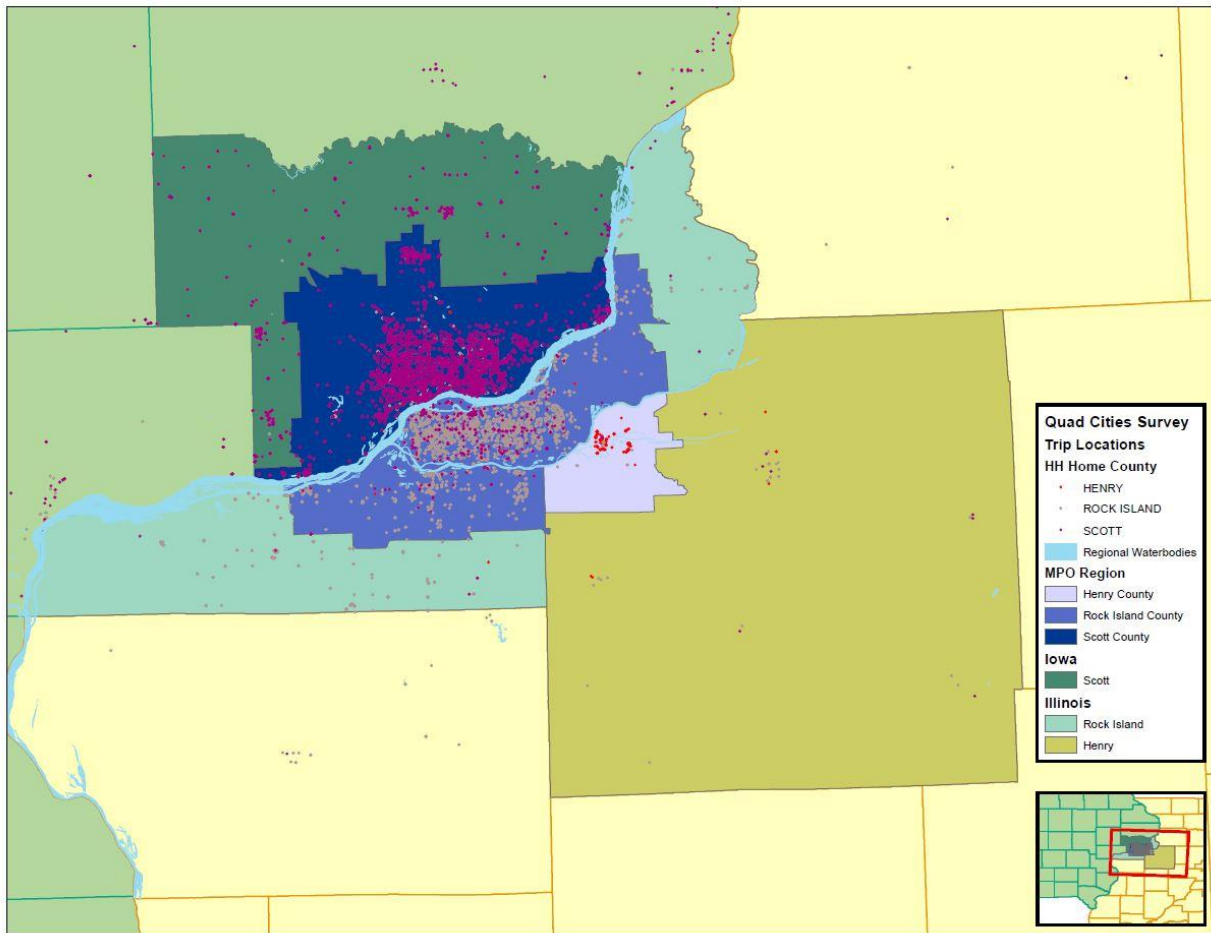
Date: 3/20/2014

5.2   Weighting and Expansion

The weighting process involved the development of adjustment factors that serve to align the survey results such that they adequately represent the regional population, as defined in census data. The survey sample was adjusted based on geography (location of household), head of householder age and tenure (own vs. rent). These individual adjustment factors were then combined to create composite weights that were applied to the household, person, activity and vehicle survey data. Once the survey data was adjusted, mathematical factors were developed to "expand" the survey data to the regional totals (households and persons). Since the universe of vehicles and trips is unknown, the expanded household and person weight was applied to the vehicle and trip file, respectively.   Data weights and expansion factors were developed in accordance with current best practices and the steps are detailed in the following sections.

5.2.1   Sample Evaluation

The Quad Cities HHTS data was initially received from ETC Institute on February 25, 2014. This delivery consisted of the household and vehicle files. TTI immediately reviewed these data files. On February 26, TTI provided their comments to ETC, asking for a re-submission. On February 26, 2014, TTI received the person file, followed by TTI comments on February 27, 2014. The Activity file was received on March 2, 2014, with TTI comments provided on the same day. The household, vehicle, person and activity files were finalized on March 4, 2014.

Table 7 contains a summary of the content of the finalized data sets. It should be noted that travel behavior information from one household was removed due to a high level of non-response for key variables.   Table 8 presents the source tables for all U.S. Census estimates used in the weighting and expansion process.

A weight of zero (0) was assigned to164 "bad weather" households, effectively removing them from analysis.

Table 7. Content of Quad Cities HHTS Database

File	Unweighted Records	Weighted Records
Household	1,793*	130,399
Vehicle	3,531	241,756
Person	4,098	311,053
Activity (unlinked – includes place zero)	17,888	1,348,550

*Includes 164 households that have a weight of zero

Table 8. Source of Census Estimates

Demographic Characteristic	Table	Survey
Tenure	DP04	ACS 5 Year Estimate: 2008-2012
Vehicles Available	DP04	ACS 5 Year Estimate: 2008-2012
Head of Householder Age	QTH2	2010 Census - SF1
Population in Occupied Housing Unites	GCTH3	2010 Census - SF1
Households in Occupied Housing Units	DP1	2010 Census - SF1
Age by Sex	DP1	2010 Census - SF1

5.2.2   Geographic Weight

Once the data were cleaned, the weighting process began. The first step was the creation of a geographic weight to ensure that the data were geographically representative of the survey area, which consisted of all of Scott and Rock Island County and part of Henry County (Census tract 301). The following procedure was utilized for the creation of a geographic weight.

1. Creation of an initial household geographic weight, by dividing universe proportion by survey proportion.

2. Application of initial household geographic weight to household file.
3. Compare frequency distribution of initial household geographic weighted and un-weighted data.
4. Create normalization factor to ensure that final normalized household geographic weighted data proportions match universe proportions.
5. Create normalized weight by multiplying initial geographic household weight and normalization factor.
6. Application of normalized household geographic weight to un-weighted survey data.
7. Application of normalized household weight to person file (using sample number as key field) and replication of steps 1 through 6 for the person file.
8. Application of normalized person weight to unlinked trip file (using sample number and person number as key fields) and replication of steps 1 through 6 for the linked trip file.

At this point, the survey distributions for key demographics were compared to U.S. Census estimates. Once it was deemed that the geographic weight alone would not be sufficient to realign the survey data, a composite weight was created. The composite weight combined the geographic weight with a head of householder age weight and a tenure weight (own vs. rent). The creation of the latter is described below.

5.2.3   Head of Householder Age Weight

The head of householder age weight was created to balance the proportional distribution of households observed in the survey dataset to the proportional distribution of the universe population (as estimated by the US Census) by the age of the head of householder. The ACS defines householder as follows:

One person in each household is designated as the householder. In most cases, this is the person, or one of the people, in whose name the home is owned, being bought, or rented and who is listed on line one of the survey questionnaire. If there is no such person in the household, any adult household member 15 years old and over could be designated as the householder.

Households are classified by type according to the sex of the householder and the presence of relatives. Two types of householders are distinguished: a family householder and a non-family householder. A family householder is a householder living with one or more individuals related to him or her by birth, marriage, or adoption. The householder and all people in the household related to him or her are family members. A nonfamily householder is a householder living alone or with non-relatives only.

TTI used an algorithm developed by Parsons Brinckerhoff (PB) in their analyses of the New York Metropolitan Transportation Council (NYMTC) Household Travel Survey Data (and later used by TTI to weight the Oregon Household Activity Survey Data) as the framework upon which the Quad Cities Head of Householder was predicated. The PB algorithm essentially identified the head of householder using employment status and age. In an effort to more closely match the US Census definition of Head of Householder, the OHAS team used the following variables in their algorithm: employment status, hours worked, volunteer status, relationship to

other household members, tenure, length of time the home has been occupied, presence of elementary or secondary school children and age. Because the Quad Cities study did not collect length of time the home has been occupied, this variable was omitted (with very little detrimental impact). This resulted in 5[5] types of householders. See Table below.

Table 9. Work Status Classifications used in Head of Householder (HOHH) Age Weights – Initial Assignment

1	Full Time Worker
2	Part Time Worker
3	Employed but Refused Hours Worked or Hours Worked Unknown
4	Does Not Work - Volunteers
5	Does Not Work - Does Not Volunteer

After the initial assignment, the script revisits young HOHH living with older people to determine if further refinement should be made. If the HOHH is under 30 and is the respondent or spouse of the respondent no reassignment is done. Otherwise, the following protocol is implemented:

- If under age 25 and the house is owned, HOHH is reassigned to the older respondent (relate=0) or their spouse.
- If under age 25 and the house is rented and lived in more than two years, HOHH is reassigned as above.

After the secondary assignment, the script also revisits households where HOHH age has been refused. In those instances, the following protocol is implemented.

- If the HOHH is married and the spouse reported their age, the spouse's age is used. If HOHH is unmarried, or if spouse also refused age, then:
- If the HOHH has preschool, elementary, or secondary school children, age category 25-54 was used; otherwise,
- If the HOHH is working full or part-time, then use age category 55-64; otherwise:
- Use age category 4 (65+).

Once the head of householder had been identified, the households were classified into one of four head of householder age categories (<25, 25-44, 45-64, 65+), the head of householder weight was created. The process used for the creation of the head of householder weight was as follows.

1. Creation of an initial non-normalized household head of householder age weight, by dividing universe proportion by survey proportions.

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[5] It should be noted that the original PB algorithm only created 3 householder types. However, further refinement to this algorithm was made during the OHAS project.

1. Creation of an initial non-normalized household composite weight.
2. Creation of expansion factor by dividing the number of households in each county by the total number of households surveyed in each county.
3. Create non-normalized expanded household composite weight by multiplying non-normalized household composite weight by the expansion factor.
4. Application of non-normalized expanded household composite weight to household file.
5. Compare frequency distribution of non-normalized expanded household composite weighted and to county household totals.
6. Create normalization factor to ensure that final expanded normalized household composite weighted data estimates match universe proportions.
7. Create normalized expanded household composite weight by multiplying non-normalized expanded household composite weight by normalization factor.
8. Application of normalized expanded household composite weight to un-weighted survey data to ensure that final expanded normalized household composite weighted data estimates match universe proportions.
9. Application of normalized expanded household composite weight to person file (using sample number as key field) and replication of steps 1 through 9 for the person file.
10. Application of normalized expanded person composite weight to unlinked trip file (using sample number and person number as key fields).
11. Application of normalized expanded household composite weight to vehicle file (using sample number as key field).

5.2.6   Final Expanded Weight

Each file in the database (household, vehicle, person, and trip) contains the expanded composite weight.

6.0   SURVEY RESULTS

6.1   Demographic Summary of Key Household, Person, and Vehicle Data

Household Summary. The following tables describe key survey results at the household level. The results are presented overall, and based on the state of residence for each surveyed household.

Table 10. Household Size by Home Location

HH Size	Home Location		Total (n=130,400)
	Iowa (n=63,659)	Illinois (n=66,741)	
1	34.3%	24.4%	29.2%
2	40.2%	32.8%	36.4%
3	10.1%	14.3%	12.3%
4+	15.4%	28.5%	22.1%
Total	100.0%	100.0%	100.0%

Table 11. Dwelling Type by Home Location

Dwelling Type	Home Location		Total (n=130,398)
	Iowa (n=63,659)	Illinois (n=66,739)	
Single family unit	74.8%	81.1%	78.1%
Duplex	6.8%	5.1%	5.9%
Building with 3 or more apartments/units	17.6%	12.7%	15.1%
Mobile home	0.5%	1.1%	0.8%
Refused	0.3%	0.0%	0.1%
Total	100.0%	100.0%	100.0%

Table 12. Household Income by Home Location

Household Income	Home Location		Total (n=130,399)
	Iowa (n=63,659)	Illinois (n=66,740)	
<$25,000	31.7%	28.6%	30.1%
$25,000 - $49,999	30.6%	23.0%	26.7%
$50,000 - $74,999	14.8%	14.8%	14.8%
$75,000+	22.9%	33.6%	28.4%
Total	100.0%	100.0%	100.0%

Table 13. Household Vehicles by Home Location

HH Vehicles	Home Location		Total (n=130,400)
	Iowa (n=63,659)	Illinois (n=66,741)	
0	8.6%	3.9%	6.2%
1	36.8%	26.2%	31.3%
2	37.9%	44.9%	41.5%
3+	16.7%	25.0%	21.0%
Total	100.0%	100.0%	100.0%

Table 14. Household Workers by Home Location

HH Workers	Home Location		Total (n=130,399)
	Iowa (n=63,659)	Illinois (n=66,740)	
0	39.1%	22.4%	30.5%
1 or more	60.9%	77.6%	69.5%
Total	100.0%	100.0%	100.0%

Table 15. Household Trip Rates

Trip Rate	Home Location		Total (n=130,399)
	Iowa (n=63,659)	Illinois (n=66,740)	
Household Person Trip Rate	7.15	8.31	7.74
Household Vehicle Trip Rate	5.14	5.99	5.58

Person Summary. The following tables describe key survey results at the person level. Each table presents the statistic at the state level and for the survey region as a whole.

Table 16. Gender of Population by Home Location

Gender	Home Location		Total (n=311,052)
	Iowa (n=161,890)	Illinois (n=149,162)	
Male	49.2%	46.1%	47.7%
Female	50.8%	53.9%	52.3%
Total	100.0%	100.0%	100.0%

Table 17. Age of Population by Home Location

Age	Home Location		Total (n=311,053)
	Iowa (n=161,891)	Illinois (n=149,162)	
<10	13.1%	7.9%	10.6%
10-19	15.3%	9.6%	12.6%
20-24	2.2%	2.8%	2.5%
25-34	17.9%	12.2%	15.2%
35-44	14.8%	12.1%	13.5%
45-54	14.9%	16.7%	15.8%
55-64	11.7%	17.8%	14.6%
65+	8.4%	19.5%	13.7%
Refused	1.7%	1.4%	1.5%
Total	100.0%	100.0%	100.0%

Table 18. Persons Age 16+ Who Work for Pay

Work for Pay (Age 16+)	Home Location		Total (n=282,424)
	Iowa (n=139,828)	Illinois (n=142,596)	
Employed	48.2%	37.1%	42.6%
Not employed	51.8%	62.9%	57.4%
Total	100.0%	100.0%	100.0%

Table 19. Number of Paying Jobs (Among Workers that Work for Pay)

Number of Paying Jobs (Workers that work for pay)	Home Location		Total (n=120,313)
	Iowa (n=67,343)	Illinois (n=52,970)	
1	95.4%	96.7%	10.6%
2+	4.6%	3.3%	89.4%
Total	100.0%	100.0%	100.0%

Table 20. Level of Education by Home Location

Education	Home Location		Total (n=311,051)
	Iowa (n=161,890)	Illinois (n=149,161)	
Not a high school graduate, 12 grade or less	30.7%	22.8%	26.9%
High school graduate (high school diploma or GED)	20.4%	23.6%	22.0%
Some college credit but no degree	14.2%	19.0%	16.5%
Associate or technical school degree	7.9%	9.1%	8.5%
Bachelor's or undergraduate degree	14.3%	15.4%	14.8%
Graduate degree (includes professional degree)	11.2%	9.6%	10.4%
Other	0.6%	0.0%	0.3%
Refused	0.7%	0.5%	0.6%
Total	100.0%	100.0%	100.0%

Table 21. Student Status by Home Location

Student Status	Home Location		Total (n=311,053)
	Iowa (n=161,891)	Illinois (n=149,162)	
Full time student	26.4%	17.9%	22.3%
Part time student	1.1%	1.6%	1.3%
Not a student	71.5%	79.8%	75.5%
Refused	1.0%	0.7%	0.9%
Total	100.0%	100.0%	100.0%

Vehicle Summary. The following tables describe key survey results at the vehicle level. Each statistic is presented at the state level and for the survey region as a whole.

Table 22. Vehicle Model Year by Home Location

Year	Home Location		Total (n=241,755)
	Iowa (n=133,949)	Illinois (n=107,806)	
Model year 1999 or older	18.8%	20.5%	19.5%
Model year 2000 - 2005	30.7%	31.1%	30.9%
Model year 2006 - 2010	24.9%	24.5%	24.7%
Model year 2011 and newer	18.2%	18.7%	18.4%
Refused	7.4%	5.2%	6.5%
Total	100.0%	100.0%	100.0%

Table 23. Vehicle Body Type by Home Location

Body	Home Location		Total (n=241,756)
	Iowa (n=133,949)	Illinois (n=107,807)	
Car	47.8%	52.9%	50.1%
Van	10.7%	10.2%	10.5%
SUV	23.5%	18.2%	21.1%
Truck	15.7%	17.0%	16.3%
RV	0.1%	0.2%	0.1%
Motorcycle	2.0%	1.1%	1.6%
Refused	0.2%	0.4%	0.3%
Total	100.0%	100.0%	100.0%

Table 24. Vehicle Fuel Type by Home Location

Fuel	Home Location		Total (n=241,756)
	Iowa (n=133,950)	Illinois (n=107,806)	
Gas	96.4%	96.5%	96.4%
Diesel	1.1%	1.2%	1.1%
Hybrid	1.6%	1.1%	1.4%
Flex fuel	0.4%	0.8%	0.6%
Other	0.0%	0.3%	0.1%
Refused	0.5%	0.1%	0.4%
Total	100.0%	100.0%	100.0%

6.2   Trip Rate Summaries

Standard modeling categories were used to identify the trip purposes associated with the reported travel. These included:

- Home-Based Work (HBW): one end of the trip was the respondent's home, the other end was their work location. [Activity Codes 1 or 2 indicate home, Activity Codes 3 or 4 indicate work].
- Home-Based School (HBSch): one end of the trip was the respondent's home, the other end was the respondent's school location (any level of schooling). [Activity Codes 1 or 2 indicate home, Activity Code 5 indicates school].
- Home-Based Shop (HBShp): one end of the trip was the respondent's home, the other end was a shopping location. [Activity Codes 1 or 2 indicate home, Activity Codes 9 or 10 indicate a retail establishment].
- Home-Based Social-Recreation (HBSocRec): one end of the trip was the respondent's home, the other end was recreational location. [Activity Codes 1 or 2 indicate home, Activity Codes 11-14 indicate a social/recreational location].
- Home-Based Other (HBO): one end of the trip was the respondent's home, the other end was a non-work/non-school/non-shopping/non-social/recreational location. [Activity Codes 1 or 2 indicate home, Activity Codes 6-8 or 97 indicate other purpose].
- Non-Home-Based Work (NHBW): one end of the trip was the respondent's work, the other end was a non-home/non-work location. [Activity Codes 3 or 4 indicate work, Activity Codes>2 indicate non-home location].
- Non-Home-Based Non-Work (NHBNW): neither end of the trip was a home or work location. [Activity Codes >4].

6.2.1   Person Trip Rate Summary

Tables 25 − 26 present the person trip rates for Quad Cities households residing in Illinois, broken down by household size by trip purpose and number of household vehicles by trip purpose. Tables 27 − 28 present the same tables for households living in the Iowa portion of the region. Tables 29 − 30 are the overall person trip rates for all households in the region.

Person Trip Rates – Illinois portion of the region

Table 25. Person Trip Rate - Household Size by Trip Purpose
(Home Location = Illinois)

HHSIZE		HBW	HBShop	HBSoc Rec	NHBW	NHBNW	HBOall
1	Mean	.37	.91	.59	.20	.74	.09
	N	14627	14627	14627	14627	14627	14627
2	Mean	.58	.81	.64	.30	.83	.13
	N	39529	39529	39529	39529	39529	39529
3+	Mean	.50	.39	.39	.25	.54	1.08
	N	107734	107734	107734	107734	107734	107734
Total	Mean	.51	.54	.47	.26	.63	.76
	N	161890	161890	161890	161890	161890	161890

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational;
NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work; HBOall=Home-Based Other Trips.

Table 26. Person Trip Rate - Household Vehicles by Trip Purpose
(Home Location = Illinois)

HH Vehicles		HBW	HBShop	HBSoc Rec	NHBW	NHBNW	HBOall
1	Mean	.26	.67	.55	.21	.77	.58
	N	26443	26443	26443	26443	26443	26443
2	Mean	.49	.57	.48	.30	.61	.87
	N	78451	78451	78451	78451	78451	78451
3+	Mean	.67	.45	.42	.25	.58	.71
	N	54157	54157	54157	54157	54157	54157
Total	Mean	.51	.54	.47	.26	.63	.76
	N	161890	161890	161890	161890	161890	161890

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational;
NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work; HBOall=Home-Based Other Trips.

Person Trip Rates – Iowa portion of the region

Table 27. Person Trip Rate - Household Size by Trip Purpose
(Home Location = Iowa)

HH Size		HBW	HBShop	HBSoc Rec	NHBW	NHBNW	HBOall
1	Mean	.37	.99	.67	.20	.75	.11
	N	24087	24087	24087	24087	24087	24087
2	Mean	.40	.96	.75	.19	.86	.17
	N	56075	56075	56075	56075	56075	56075
3+	Mean	.44	.43	.43	.27	.85	.95
	N	69001	69001	69001	69001	69001	69001
Total	Mean	.41	.72	.59	.23	.84	.52
	N	149162	149162	149162	149162	149162	149162

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational;
NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work; HBOall=Home-Based Other Trips.

Table 28. Person Trip Rate - Household Vehicles by Trip Purpose
(Home Location = Iowa)

HH Vehicles		HBW	HBShop	HBSoc Rec	NHBW	NHBNW	HBOall
1	Mean	.31	.90	.58	.18	.80	.40
	N	38082	38082	38082	38082	38082	38082
2	Mean	.40	.69	.75	.23	.98	.54
	N	66742	66742	66742	66742	66742	66742
3	Mean	.64	.68	.41	.34	.73	.68
	N	35745	35745	35745	35745	35745	35745
Total	Mean	.41	.72	.59	.23	.84	.52
	N	149162	149162	149162	149162	149162	149162

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational;
NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work; HBOall=Home-Based Other Trips.

Overall Person Trip Rates

Table 29. Overall Person Trip Rate - Household Size by Trip Purpose

HH Size		HBW	HBShop	HBSoc Rec	NHBW	NHBNW	HBOall
1	Mean	.37	.96	.64	.20	.75	.10
	N	38713	38713	38713	38713	38713	38713
2	Mean	.47	.90	.70	.23	.85	.16
	N	95604	95604	95604	95604	95604	95604
3+	Mean	.47	.41	.41	.26	.66	1.03
	N	176735	176735	176735	176735	176735	176735
Total	Mean	.46	.63	.53	.25	.73	.64
	N	311053	311053	311053	311053	311053	311053

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work; HBOall=Home-Based Other Trips.

Table 30. Overall Person Trip Rate - Household Vehicles by Trip Purpose

HH Vehicles		HBW	HBShop	HBSoc Rec	NHBW	NHBNW	HBOall
1	Mean	.29	.81	.57	.19	.79	.47
	N	64525	64525	64525	64525	64525	64525
2	Mean	.45	.62	.60	.26	.78	.72
	N	145193	145193	145193	145193	145193	145193
3+	Mean	.66	.54	.42	.28	.64	.70
	N	89902	89902	89902	89902	89902	89902
Total	Mean	.46	.63	.53	.25	.73	.64
	N	311053	311053	311053	311053	311053	311053

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work; HBOall=Home-Based Other Trips.

6.2.2   Vehicle Trip Rate Summary

Tables 31 and 32 present the vehicle trip rates for households residing in the Illinois portion of the region, broken down by household size by trip purpose and number of household vehicles by trip purpose. Tables 33 and 34 present the same tables for households residing in the Iowa portion of the region. Tables 35 and 36 are the overall person trip rates for all households in both states.

Vehicle Trip Rates – Illinois portion of the region

Table 31. Vehicle Trip Rate - Household Size by Trip Purpose
(Home Location = Illinois)

HH Size		vHBW	vHBShop	vHBSoc Rec	vNHBW	vNHBNW	vHBOall
1	Mean	.36	.86	.60	.20	.67	.11
	N	24087	24087	24087	24087	24087	24087
2	Mean	.39	.77	.53	.18	.68	.15
	N	56075	56075	56075	56075	56075	56075
3+	Mean	.41	.26	.25	.25	.43	.40
	N	69001	69001	69001	69001	69001	69001
Total	Mean	.39	.55	.41	.21	.56	.26
	N	149162	149162	149162	149162	149162	149162

vHBW=Home-Based Work; vHBShop=Home-Based Shopping; vHBSocRec=Home-Based Social Recreational; vNHBW=Non-Home-Based Work; vNHBNW=Non-Home-Based Non-Work; vHBOall=Home-Based Other Trips.

Table 32. Vehicle Trip Rate - Household Vehicles by Trip Purpose
(Home Location = Illinois)

HH Vehicles		vHBW	vHBShop	vHBSoc Rec	vNHBW	vNHBNW	vHBOall
1	Mean	.29	.73	.45	.15	.61	.24
	N	38082	38082	38082	38082	38082	38082
2	Mean	.38	.54	.48	.21	.64	.22
	N	66742	66742	66742	66742	66742	66742
3+	Mean	.63	.51	.32	.33	.50	.42
	N	35745	35745	35745	35745	35745	35745
Total	Mean	.39	.55	.41	.21	.56	.26
	N	149162	149162	149162	149162	149162	149162

vHBW=Home-Based Work; vHBShop=Home-Based Shopping; vHBSocRec=Home-Based Social Recreational; vNHBW=Non-Home-Based Work; vNHBNW=Non-Home-Based Non-Work; vHBOall=Home-Based Other Trips.

Vehicle Trip Rates – Iowa portion of the region

Table 33. Vehicle Trip Rate - Household Size by Trip Purpose
(Home Location = Iowa)

HH Size		vHBW	vHBShop	vHBSoc Rec	vNHBW	vNHBNW	vHBOall
1	Mean	.35	.85	.50	.20	.67	.09
	N	14627	14627	14627	14627	14627	14627
2	Mean	.57	.69	.46	.29	.69	.13
	N	39529	39529	39529	39529	39529	39529
3+	Mean	.46	.27	.20	.24	.30	.50
	N	107734	107734	107734	107734	107734	107734
Total	Mean	.48	.43	.29	.25	.43	.37
	N	161890	161890	161890	161890	161890	161890

vHBW=Home-Based Work; vHBShop=Home-Based Shopping; vHBSocRec=Home-Based Social Recreational;
vNHBW=Non-Home-Based Work; vNHBNW=Non-Home-Based Non-Work; vHBOall=Home-Based Other Trips.

Table 34. Vehicle Trip Rate - Household Vehicles by Trip Purpose
(Home Location = Iowa)

HH Vehicles		vHBW	vHBShop	vHBSoc Rec	vNHBW	vNHBNW	vHBOall
1	Mean	.23	.57	.34	.19	.57	.29
	N	26443	26443	26443	26443	26443	26443
2	Mean	.47	.43	.29	.29	.42	.41
	N	78451	78451	78451	78451	78451	78451
3+	Mean	.63	.38	.28	.24	.38	.37
	N	54157	54157	54157	54157	54157	54157
Total	Mean	.48	.43	.29	.25	.43	.37
	N	161890	161890	161890	161890	161890	161890

vHBW=Home-Based Work; vHBShop=Home-Based Shopping; vHBSocRec=Home-Based Social Recreational;
vNHBW=Non-Home-Based Work; vNHBNW=Non-Home-Based Non-Work; vHBOall=Home-Based Other Trips.

Overall Vehicle Trip Rates

Table 35. Overall Vehicle Trip Rate - Household Size by Trip Purpose

HH Size		vHBW	vHBShop	vHBSoc Rec	vNHBW	vNHBNW	vHBOall
1	Mean	.35	.85	.56	.20	.67	.10
	N	38713	38713	38713	38713	38713	38713
2	Mean	.46	.74	.50	.22	.68	.14
	N	95604	95604	95604	95604	95604	95604
3+	Mean	.44	.27	.22	.24	.35	0.46
	N	176735	176735	176735	176735	176735	176735
Total	Mean	.44	.48	.35	.23	.49	.32
	N	311053	311053	311053	311053	311053	311053

vHBW=Home-Based Work; vHBShop=Home-Based Shopping; vHBSocRec=Home-Based Social Recreational; vNHBW=Non-Home-Based Work; vNHBNW=Non-Home-Based Non-Work; vHBOall=Home-Based Other Trips.

Table 36. Overall Vehicle Trip Rate - Household Vehicles by Trip Purpose

HH Vehicles		vHBW	vHBShop	vHBSoc Rec	vNHBW	vNHBNW	vHBOall
1	Mean	.27	.67	.41	.17	.59	.26
	N	64525	64525	64525	64525	64525	64525
2	Mean	.43	.48	.37	.25	.52	.32
	N	145193	145193	145193	145193	145193	145193
3	Mean	.63	.43	.30	.27	.43	.39
	N	89902	89902	89902	89902	89902	89902
Total	Mean	.44	.48	.35	.23	.49	.32
	N	311053	311053	311053	311053	311053	311053

vHBW=Home-Based Work; vHBShop=Home-Based Shopping; vHBSocRec=Home-Based Social Recreational; vNHBW=Non-Home-Based Work; vNHBNW=Non-Home-Based Non-Work; vHBOall=Home-Based Other Trips.

6.3 Travel Summary: Travel Mode, Trip Purpose, Time of Day of Travel

The following tables provide travel characteristics for Illinois, Iowa and both states overall. It presents this data using an original set of trip purpose variables and an updated set that incorporates a trip purpose category for Home Based School trips.

6.3.1 Travel Mode Share by Trip Purpose

Illinois Travel Mode

Table 37. Illinois Mode Share by Trip Purpose

Mode	Trip Purpose						Total
	HBW	HBShop	HBSoc Rec	HBO	NHBW	NHBNW	
Walk	1107	1025	3513	5930	296	751	12622
Bike	0	163	99	82	63	0	407
Auto-Driver	58780	81798	61270	38921	31741	83940	356450
Auto-Passenger	2038	22934	26453	28535	1697	37165	118822
Transit	362	2248	199	1018	922	3419	8168
School Bus	0	0	0	9306	0	815	10121
Other	433	695	0	0	0	212	1340
Total	62720	108863	91534	83792	34719	126302	507930

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; HBO=Home-Based Other Trips, NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work.

Table 38. Illinois Mode Share by Updated Model Trip Purpose

Mode	New Model Trip Purpose							Total
	HBW	HBShop	HBSoc Rec	HBSchool	HBO	NHBW	NHBNW	
Walk	1107	1025	3513	4862	1067	296	751	12621
Bike	0	163	99	0	82	63	0	407
Auto-Driver	58780	81798	61270	6604	32316	31741	82267	354776
Auto-Passenger	2038	22934	26453	18591	9944	1697	36269	117926
Transit	362	2248	199	184	834	922	3419	8168
School Bus	0	0	0	9306	0	0	815	10121
Other	433	695	0	0	0	0	212	1340
Total	62720	108863	91534	39547	44243	34719	123733	505359

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; HBSchool=Home-Based School; HBO=All Other Home-Based Other Trips, NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work.

Iowa Travel Mode

Table 39. Iowa Mode Share by Trip Purpose

Mode	Trip Purpose						Total
	HBW	HBShop	HBSoc Rec	HBO	NHBW	NHBNW	
Walk	1036	2634	5121	6166	252	1515	16724
Bike	0	0	80	468	40	0	588
Auto-Driver	77371	69001	46907	59948	40484	69193	362904
Auto-Passenger	4004	18591	29213	47470	1463	29604	130345
Transit	528	0	0	0	219	208	955
School Bus	0	0	0	14972	0	2664	17636
Other	0	79	101	0	0	173	353
Total	82939	90305	81422	129024	42458	103357	529505

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; HBO=Home-Based Other Trips, NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work.

Table 40. Iowa Mode Share by Updated Model Trip Purpose

Mode	New Model Trip Purpose							Total
	HBW	HBShop	HBSoc Rec	HBSchool	HBO	NHBW	NHBNW	
Walk	1036	2634	5121	4323	1843	252	1515	16724
Bike	0	0	80	367	101	40	0	588
Auto-Driver	77371	69001	46907	11034	48914	40484	67732	361443
Auto-Passenger	4004	18591	29213	37402	10068	1463	28661	129402
Transit	528	0	0	0	0	219	208	955
School Bus	0	0	0	14893	79	0	2584	17556
Other	0	79	101	0	0	0	173	353
Total	82939	90305	81422	68019	61005	42458	100873	527021

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; HBSchool=Home-Based School; HBO=All Other Home-Based Other Trips, NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work.

Overall Travel Mode

Table 41. Overall Mode Share by Trip Purpose - Original

MODE	Trip Purpose						Total
	HBW	HBShop	HBSocRec	HBO	NHBW	NHBNW	
Walk	2143	3659	8634	12096	548	2265	29345
Bike	0	163	179	549	103	0	994
Auto-Driver	136151	150799	108177	98869	72225	153132	719353
Auto-Passenger	6041	41525	55666	76005	3161	66769	249167
Transit	890	2248	199	1018	1141	3627	9123
School Bus	0	0	0	24278	0	3479	27757
Other	433	774	101	0	0	385	1693
Total	145658	199168	172956	212815	77178	229657	1037432

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; HBO=Home-Based Other Trips, NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work.

**Table 42. Overall Mode Share by Updated Model Trip Purpose**

MODE	New Model Trip Purpose							Total
	HBW	HBShop	HBSocRec	HBSchool	HBO	NHBW	NHBNW	
Walk	2143	3659	8634	9186	2910	548	2265	29345
Bike	0	163	179	367	182	103	0	994
Auto-Driver	136151	150799	108177	17639	81230	72225	149999	716220
Auto-Passenger	6041	41525	55666	55993	20012	3161	64931	247329
Transit	890	2248	199	184	834	1141	3627	9123
School Bus	0	0	0	24199	79	0	3399	27677
Other	433	774	101	0	0	0	385	1693
Total	145658	199168	172956	107568	105247	77178	224606	1032381

HBW=Home-Based Work; HBShop=Home-Based Shopping; HBSocRec=Home-Based Social Recreational; HBSchool=Home-Based School; HBO=All Other Home-Based Other Trips, NHBW=Non-Home-Based Work; NHBNW=Non-Home-Based Non-Work.
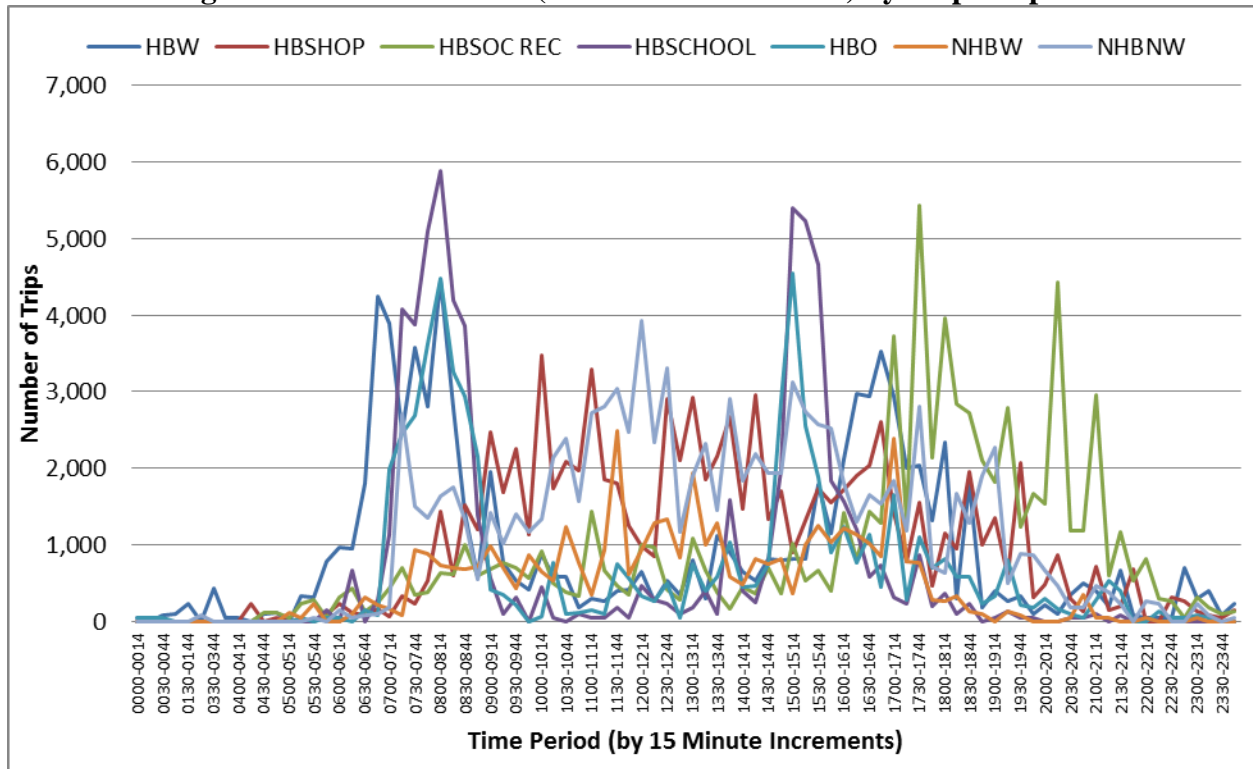
6.3.2 Trip Start Time (Departure) by Trip Purpose

Iowa Start (Departure) and End (Arrival) Times by Trip Purpose

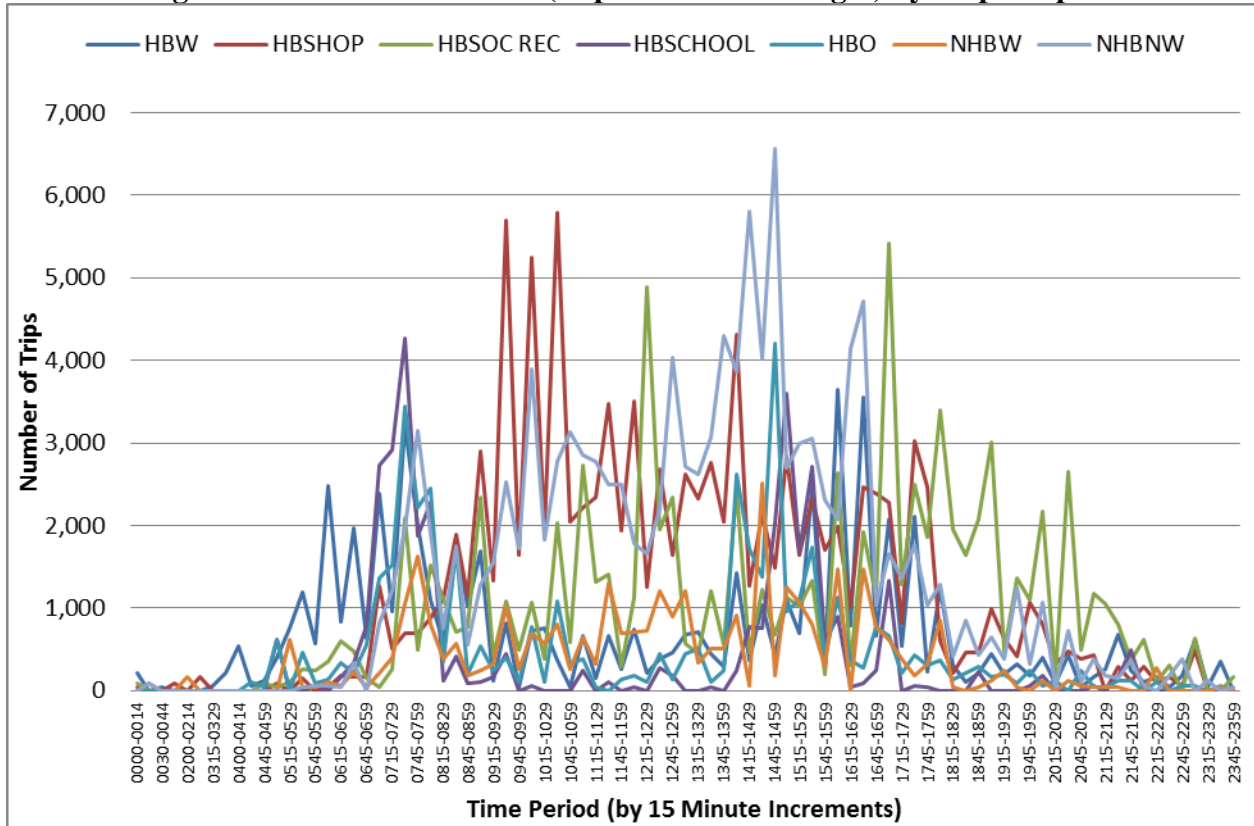**Figure 6. Iowa Start Times (Departure from Origin) by Trip Purpose**
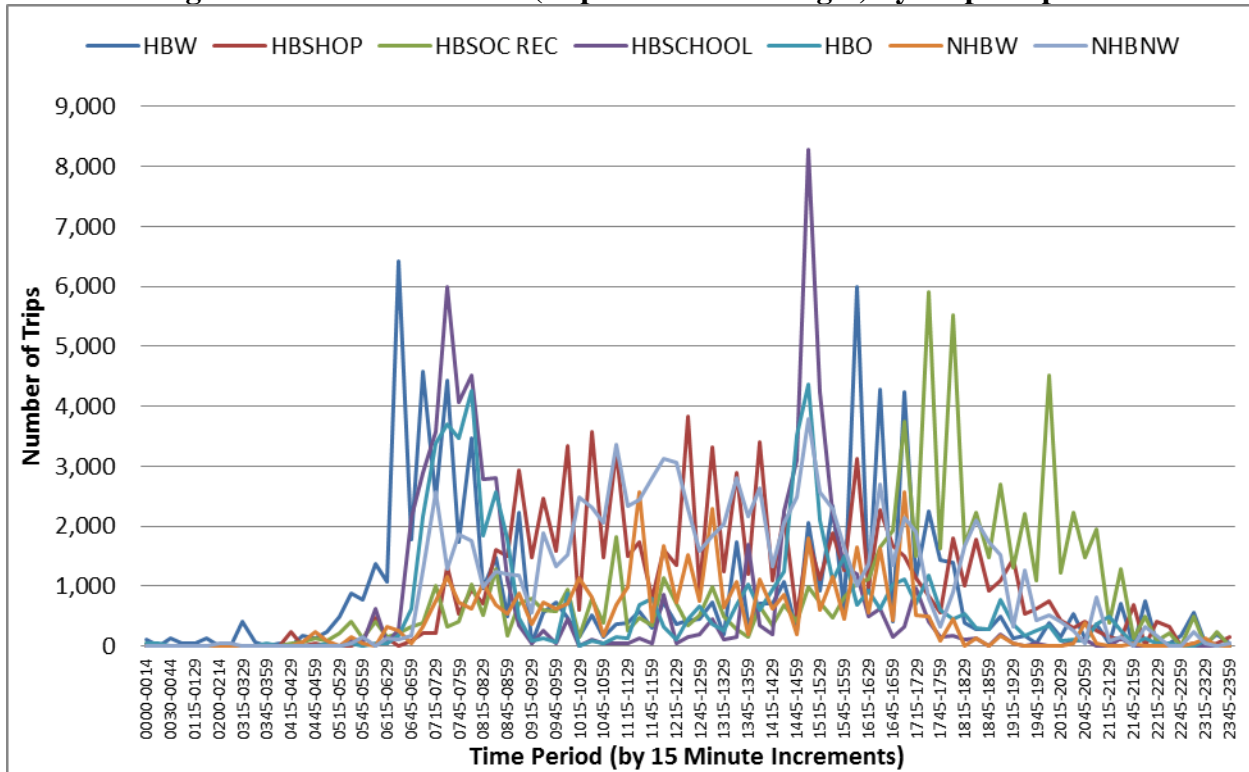
Figure 7. Iowa End Times (Arrival at Destination) by Trip Purpose
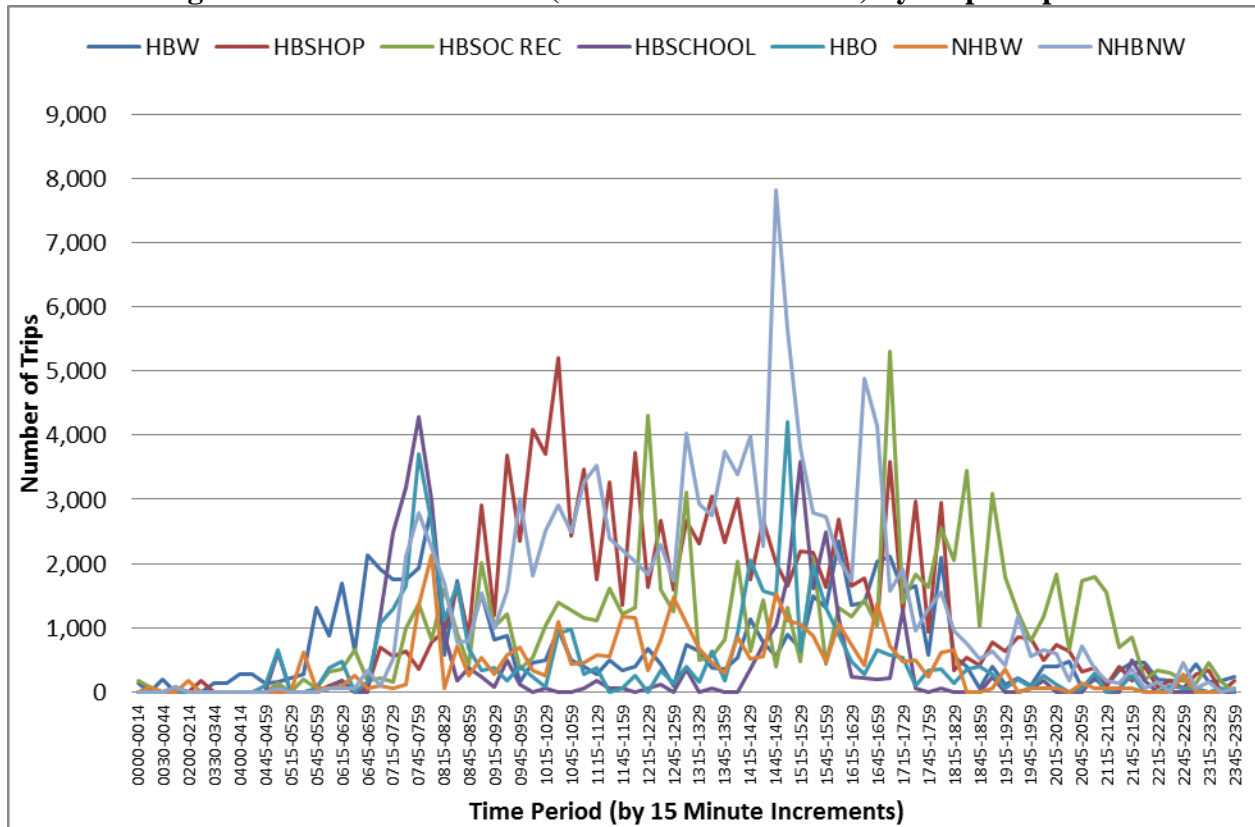
Illinois Start and End Times by Trip Purpose

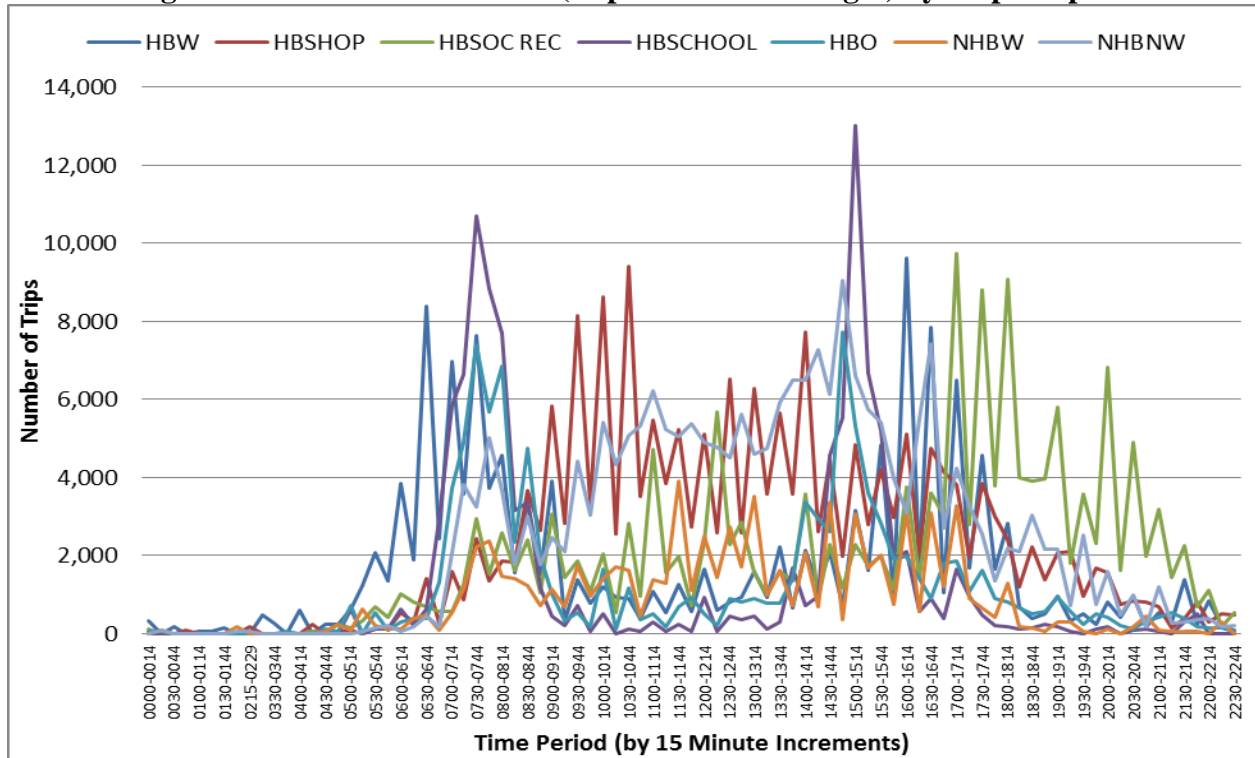**Figure 8. Illinois Start Times (Departure from Origin) by Trip Purpose**

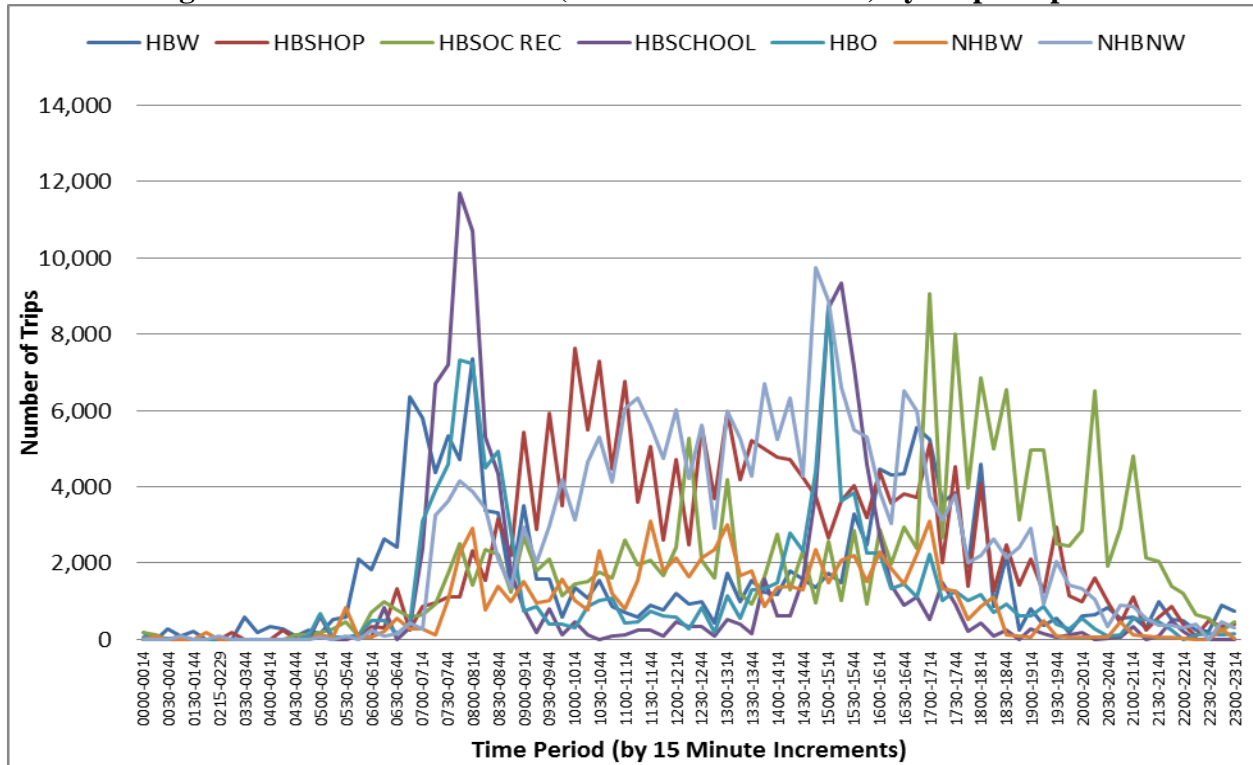**Figure 9. Illinois End Times (Arrival at Destination) by Trip Purpose**

Overall Start and End Times by Trip Purpose

**Figure 10. Overall Start Times (Departure from Origin) by Trip Purpose**

Figure 11.Overall End Times (Arrival at Destination) by Trip Purpose

6.4   Bridge Crossing Households Summary

A total of 1043 households reported they regularly travel across the Mississippi River on a regular basis. Figure 12 shows the home locations of those households. The following tables summarize the household and travel characteristics for households that included bridge-crossing trips in their daily travel.

Figure 12. Bridge-Crossing Household Locations

Date: 3/21/2014
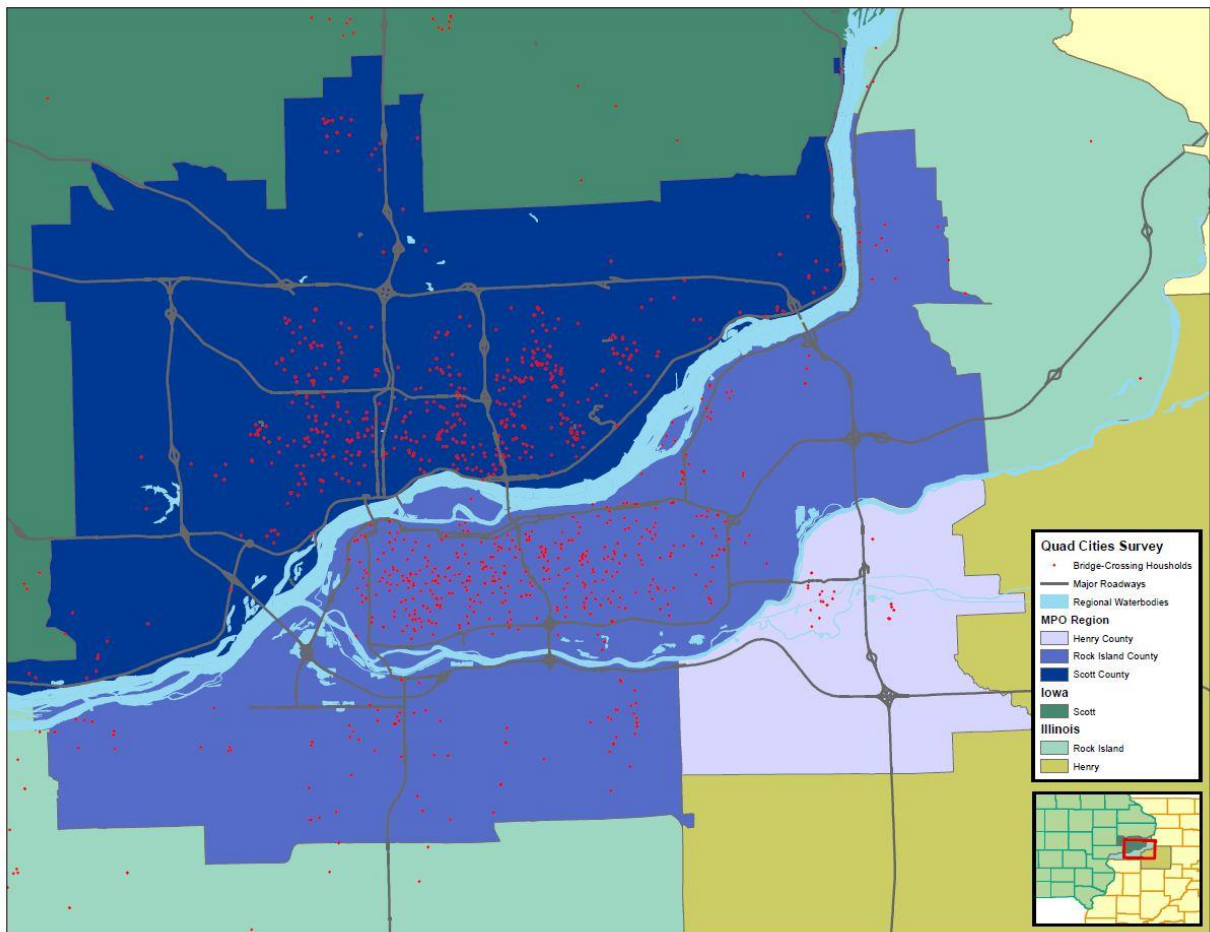
Table 43. Household Size for Bridge-Crossing Households

HH Size	State		Total (n=54,234)
	Iowa (n=26,078)	Illinois (n=28,156)	
1	15.0%	3.5%	9.0%
2	51.2%	32.3%	41.4%
3	12.5%	21.4%	17.1%
4+	21.3%	42.8%	22.1%
Total	100.0%	100.0%	89.6%

Table 44. Dwelling Type for Bridge-Crossing Households

Dwelling Type	State		Total (n=54,234)
	Iowa (n=26,078)	Illinois (n=28,156)	
Single family unit	82.7%	60.4%	86.7%
Duplex	4.0%	2.6%	3.2%
Building with 3 or more apartments/units	12.2%	6.7%	9.3%
Mobil home	0.5%	0.3%	0.4%
Refused	0.6%	0.0%	0.4%
Total	100.0%	70.0%	100.0%

Table 45. Household Workers for Bridge-Crossing Households

HH Workers	State		Total (n=54,234)
	Iowa (n=26,077)	Illinois (n=28,157)	
0	32.6%	14.2%	23.0%
1 or more	67.4%	85.8%	77.0%
Total	100.0%	100.0%	100.0%

Table 46. Household Workers for Bridge-Crossing Households

HH Vehicles	State		Total (n=54,233)
	Iowa (n=26,078)	Illinois (n=28,155)	
0	0.8%	0.0%	0.4%
1	30.4%	13.3%	21.4%
2	43.4%	54.6%	49.3%
3+	25.4%	32.1%	28.9%
Total	100.0%	100.0%	100.0%

Table 47. Household Income for Bridge-Crossing Households

Household Income	State		Total (n=54,234)
	Iowa (n=26,077)	Illinois (n=28,157)	
<$25,000	19.4%	18.7%	19.0%
$25,000 - $49,999	34.4%	19.1%	26.4%
$50,000 - $74,999	14.9%	16.7%	15.8%
$75,000+	31.3%	45.5%	38.8%
Total	100.0%	100.0%	100.0%

Table 48. Trip Rates for Bridge-Crossing Households

Trip Rate	State		Total (n=54,234)
	Iowa (n=26,077)	Illinois (n=28,156)	
Household Person Trip Rate	10.37	12.03	11.24
Household Vehicle Trip Rate	7.26	8.10	7.69

7.0 APPENDIX