



**REGIONAL TRANSPORTATION COMMISSION  
TECHNICAL ADVISORY COMMITTEE  
MEETING AGENDA**

**Wednesday, March 7, 2018 at 9:00 am  
Regional Transportation Commission  
1<sup>st</sup> Floor Conference Room  
1105 Terminal Way, Reno NV 89502**

I. The RTC 1<sup>st</sup> Floor Conference Room is accessible to individuals with disabilities. Requests for auxiliary aids to assist individuals with disabilities should be made with as much advance notice as possible. For those requiring hearing or speech assistance, contact Relay Nevada at 1.800.326.6868 (TTY, VCO or HCO). Requests for supporting documents and all other requests should be directed to RTC Metropolitan Planning at 775-348-0480. Supporting documents may also be found on the RTC website: [www.rtcwashoe.com](http://www.rtcwashoe.com).

II. The Technical Advisory Committee (TAC) has a standing item for accepting public comment on topics relevant to the RTC TAC that are not included on the agenda. No action may be taken on a matter raised under this item of the agenda until the matter itself has been specifically included on an agenda as an item upon which action will be taken. For specific items on the TAC agenda, public comment will be taken at the time the item is discussed. Individuals providing public comment will be limited to three minutes. Individuals acting as a spokesperson for a group may request additional time. Attempts to present public input in a disruptive manner will not be allowed. Remarks will be addressed to the TAC as a whole and not to individual members.

III. The TAC may combine two or more agenda items for consideration and/or may remove an item from the agenda or delay discussion relating to an item on the agenda at any time.

**ITEM 1** Approval of Agenda (*For Possible Action*)

**ITEM 2** Public Comment - *please read paragraph II near the top of this page*

**ITEM 3** Approval of the February 7, 2018 Meeting Minutes (*For Possible Action*)

**ITEM 4** Park and Ride Lot Planning in the RTC Metropolitan Planning Area (*For Possible Action*)

**ITEM 5** 2015-2016 Washoe County Regional Travel Characteristics Study (*For Possible Action*)

**ITEM 6** Development Updates (*Informational Only*)

**ITEM 7** Member Items

- |                   |                                       |
|-------------------|---------------------------------------|
| a) City of Reno   | b) Reno-Tahoe Airport Authority       |
| c) City of Sparks | d) FHWA                               |
| e) Washoe County  | f) Air Quality Management Div. (AQMD) |
| g) NDOT           | h) TMRPA                              |
| i) WCSD           | j) Reno-Sparks Indian Colony (RSIC)   |

**ITEM 8** Agenda Items for Future TAC Meetings (*For Possible Action*)

**ITEM 9** RTC Staff Items (*Informational Only*)

**ITEM 10** Public Comment - *please read paragraph II near the top of this page*

**ITEM 11** Adjournment (*For Possible Action*)

*The Committee **may** take action on any item noted for possible action*

**REGIONAL TRANSPORTATION COMMISSION  
TECHNICAL ADVISORY COMMITTEE**

**Meeting Minutes**

**Wednesday, February 7, 2017**

**Attendees**

Daniel Inouye	Washoe County Health District-Air Quality Management Division
Steve Bunnell, Chair	City of Reno Community Development
Joe Spencer	Nevada Department of Transportation
Scotty Carey	Reno-Sparks Indian Colony
Clara Lawson	Washoe County Community Development
Kelly Mullin	Washoe County Community Development
Kevin Verre	Nevada Department of Transportation
Lauren Knox	Truckee Meadows Regional Planning Agency
Armando Ornelas	City of Sparks Community Development
Christina Leach	Federal Highway Administration

**RTC Staff**

Dan Doenges	Brian Stewart
Mark Maloney	Jennifer Meyers
Amy Cummings	Susi Trinidad
Julie Masterpool	Jeff Wilbrecht
Ed Park	Cole Peiffer

**Guests**

Dilan Axtell, Traffic Works

The Committee met in the First Floor Conference Room, 1105 Terminal Way, Reno, Nevada. The meeting was called to order at 9:00 a.m. by the Chair, Steve Bunnell.

**ITEM 1. APPROVAL OF AGENDA**

The agenda was approved as submitted.

**ITEM 2. PUBLIC COMMENT**

There were no public comments given.

**ITEM 3. APPROVAL OF THE DECEMBER 6, 2017 MEETING MINUTES**

The minutes of the TAC meeting December 6, 2017 were approved as submitted.

**ITEM 4. BUS STOP ACCESSIBILITY AND IMPROVEMENTS**

Ed Park, RTC Transit Planner gave a presentation on the Bus Stop Accessibility and Improvements report. A copy of the PowerPoint presentation is on file at the RTC Metropolitan Planning Department. He asked members of the Committee if there were any questions.

Armando Ornelas asked about what is or can be done to improve ADA accessibility to bus stops that are not currently ADA-compliant. He asked specifically about the stop on Sharlands Avenue that was highlighted in the presentation.

Ed Park responded by saying there is a small annual budget that RTC uses to program ADA improvements, however, there are far more non-compliant stops than available funding for improvements so RTC must prioritize improvements based on a number of factors. One consideration for the Sharlands Avenue stop is to remove it completely.

Ed stated after the January RTC Board meeting, the RTC Board directed RTC to expedite the accessibility improvements to bus stops and to not build were not accessible.

A motion was made and seconded to acknowledge receipt of an update report on Bus Stop Accessibility and Improvements.

The motion carried unanimously.

**ITEM 5. 2018 RTC RIDE and RTC ACCESS SERVICE CHANGE AND FARE CONCEPTS**

Mark Maloney, RTC Operations Manager Public transportation and Operations gave a presentation on the proposed 2018 RTC RIDE and ACCESS Service Change and Fare Concepts. A copy of the PowerPoint presentation is on file at the RTC Metropolitan Planning Department. He asked members of the Committee if there were any questions.

Chairman Bunnell with the City of Reno asked about the proposed elimination of transfers for RTC RIDE.

Mark Maloney responded that with a base fare of \$2.00, and almost everyone taking a round trip, the new low price day pass of \$3.00 would allow for multiple trips in a day at a cheaper rate than two one-way fares with a free transfer.

A motion was made and seconded to acknowledge receipt of the preliminary service change and fare concepts for the RTC RIDE and RTC ACCESS planned for 2018.

The motion carried unanimously.

## **ITEM 6. FIXED-ROUTE (RTC RIDE) RFP DEVELOPMENT**

Mark Maloney, RTC Operations Manager Public transportation and Operations gave a presentation on the fixed-route (RTC RIDE) RFP development. He asked members of the Committee if there were any questions.

A motion was made and seconded to acknowledge receipt of this memorandum regarding the development of a request for proposal (RFP) for the operations and maintenance of the RTC RIDE fixed-route system.

The motion carried unanimously.

## **ITEM 7. PRESENTATION ON THE 2017 BICYCLE, PEDESTRIAN, AND WHEELCHAIR DATA COLLECTION PROGRAM ANNUAL REPORT**

Cole Peiffer, RTC Transportation Planner, introduced Dilan Axtell from Traffic Works, whom gave a presentation on the 2017 Bicycle and Pedestrian Data Collection Annual Report. A copy of the PowerPoint presentation is on file at the RTC Metropolitan Planning Department. He asked members of the Committee if there were any questions.

Chairman Bunnell with the City of Reno asked about changing some of the count locations to places where there would be more bikes/pedestrians, specifically at the Village Pkwy at White Lake location.

Cole Peiffer responded by stating RTC would look at modifying the count locations based on this input going forward.

A motion was made and seconded to acknowledge receipt of a presentation on the 2017 Bicycle and Pedestrian Data Collection Annual Report.

The motion carried unanimously.

## **ITEM 8. DEVELOPMENT UPDATES**

- Kelly Mullin gave development updates for Washoe County.
- Armando Ornelas gave development updates for the City of Sparks.

## **ITEM 9. MEMBER ITEMS**

- Joe Spencer gave an update for NDOT on the TAP call for projects.
- Daniel Inouye gave an update for the Washoe County Health District - Air Quality Management Division regarding the 2018 Annual Ozone Report.

**ITEM 10. AGENDA ITEMS FOR FUTURE TAC MEETINGS**

A suggestion was made to have an agenda item regarding long-term plans for Park and Ride lots in the Truckee Meadows.

**ITEM 11. RTC STAFF ITEMS**

Dan Doenges provided a reminder of the deadline to receive applications for the RTC Transportation Alternatives (TA) Set-Aside program. He also mentioned that there would likely be additional funding than what was previously anticipated to be available.

**ITEM 12. PUBLIC COMMENT**

There was no public comment.

**ITEM 13. ADJOURNMENT**

The meeting adjourned at approximately 10:30 a.m.



**REGIONAL TRANSPORTATION COMMISSION**

*Metropolitan Planning • Public Transportation & Operations • Engineering & Construction*

Metropolitan Planning Organization of Washoe County, Nevada

March 7, 2018

**AGENDA ITEM 4**

**TO:** Technical Advisory Committee

**FROM:** Scott Miklos  
Trip Reduction Analyst

**SUBJECT: Park and Ride Lot Planning in the RTC Metropolitan Planning Area**

**RECOMMENDATION**

Acknowledge receipt of a presentation on Park and Ride Lot Planning in the RTC Metropolitan Planning Area.

**SUMMARY**

The RTC VANPOOL program has experienced steady growth over the last several years and the location of potential park and ride lots to support this program requires strategic planning to address a variety of factors. RTC staff will provide an update of the park and ride lot planning process in the context of changes in employment, population, and demand in the Reno-Sparks area.



## **REGIONAL TRANSPORTATION COMMISSION**

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Metropolitan Planning Organization of Washoe County, Nevada

March 7, 2018

### **AGENDA ITEM 5**

**TO:** Technical Advisory Committee

**FROM:** Xuan Wang, Senior Technical Planner

**SUBJECT:** 2015-2016 Washoe County Regional Travel Characteristics Study

### **RECOMMENDATION**

Acknowledge receipt of the final report and presentation of the 2015-2016 Washoe County Regional Travel Characteristics Study.

### **SUMMARY**

The Regional Transportation Commission (RTC) Washoe County Regional Travel Characteristics Study was a collaborative effort designed to conduct a series of travel surveys in the Truckee Meadows in 2015 to 2016. The study consists of three distinct surveys addressing:

- 1) Travel characteristics of households
- 2) Travel characteristics related to transit ridership
- 3) Visitor travel patterns

The final report, with three sub-reports for the three survey areas, is attached.

The study results are used to update, calibrate, and validate the RTC's existing activity-based Travel Demand Model.

### **ADDITIONAL BACKGROUND**

In 2005, travel surveys were conducted in the Reno-Sparks area to obtain information about regional travel characteristics and patterns. That data was the primary resource for the RTC's travel demand model, which used EMME/2 as its platform. In 2013, when the model was converted to operate with TransCAD software, the model conversion used the 2005 travel survey data. Since 2005, the region has experienced considerable population and employment changes and strong growth is expected to continue. Given the projected growth and the possible shifts in demographic and travel characteristics, the region requires updated travel behavior data that better reflects current conditions.

The intent of this study is to obtain statistically significant, high-quality travel characteristic data for a typical weekday in the Washoe County Metropolitan Planning Area to be used to update,

calibrate, and validate the RTC's existing activity based Travel Demand Model for the 2015 base year.

The travel characteristics study includes the following three surveys:

1. Household Travel Survey

The objective of this task is to obtain statistically significant data on household travel characteristics and socioeconomic conditions. RTC expected to collect the traditional diary data on at least 1% of the total households, or approximately 1,650 surveys. Additionally, a subset of at least 10% of the sampled households were surveyed using GPS methods to adjust the unreported trips.

Through the study, 2,154 completed households were collected, which includes 1,929 non-GPS households and 225 GPS diary households. Of the GPS households, 155 used GPS data logger and 70 used GPS RouteScout smartphone applications.

2. Transit On-to-Off and On-Board Survey

The primary goal of the survey is to acquire additional data for the household travel survey to ensure that transit travel is adequately covered with a statistically sound sample for use with the transit sub-model within the RTC Travel Demand Model.

The completed project yielded 1,209 onboard surveys and 3,631/3,752 on-to-off surveys. The objectives of the full study were two-fold: 1) examine and confirm the travel behavior characteristics of RTC bus passengers; and 2) obtain the socio-economic characteristics of RTC bus passengers. The data weighting and expansion provide an appropriate representation of the RTC system.

3. Visitor Travel Survey

The visitor sub model considers the travel behavior of visitors to the area once they have reached a lodging location. The purpose of the information collected from this survey will be used to refine and calibrate the sub-models predicting visitor trip behavior. The final survey results include a total of 421 interviews that were conducted. Of these, 354 were completed by short-term visitors and 67 were completed by long-term visitors (staying 7 or more days in the area).

Attachment





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## Regional Transportation Commission

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# ***Washoe County Regional Travel Characteristics Study***

### **1.0 Household Travel Survey**

#### **1.1 Summary**

The Regional Transportation Commission (RTC) Washoe County Regional Travel Characteristics Study was a collaborative effort designed to collect household social economics data, travel diary data, and GPS data from 2,500 households in the RTC travel demand model region.

The RTC Household Travel Survey (HHTS) was designed to collect data utilizing Computer Assisted Telephone Interviewing (CATI), on-line, paper diary mailed back to NuStats, and two Global Positioning System (GPS) technologies: data logger and smartphone technology (RouteScout). A pilot survey was conducted in early summer of 2015 in which the survey instrument and methodology were tested. The pilot survey was conducted in English only; however the full study was conducted in both English and Spanish.

For both the pilot and the main survey, travel days were assigned during the school year on Tuesdays, Wednesdays, and Thursdays throughout data collection, with the exception of holidays. The travel period for non-GPS households was one 24 hour period beginning at 12:00 a.m. on the assigned travel day, and ending at 11:59 p.m. that same day. Households that participated in the GPS study were asked to carry their GPS device or smartphone for a seven day period, with the first day of the travel period being their assigned travel day. All participating households were recruited either via CATI, or online (self-recruitment). Travel information was retrieved via CATI, online (self-retrieval), or mailed back diaries.

There were 2,154 completed households, which includes 1,929 non-GPS households and 225 GPS + diary households. Of the GPS households 155 used GPS data logger and 70 used GPS RouteScout.

The overall recruit response rate for the main survey was 13.5 percent<sup>1</sup>, which was higher by 3.4 percent than the pilot recruit response rate of 10.1 percent. The overall retrieval rate for the main survey was 63.7 percent, which was nearly 10 percent higher than the pilot retrieval response rate of 53.9 percent.

Presented in Table 2 in the next section are the average trip rates broken down by demographic characteristic. The lowest trip rate of 1.16 trips per household per day is reported by respondents of African American ethnicity. The highest trip rate of 16.28 trips per household per day is found in respondents residing in households with four or more household members. This was followed by households having 3 or more workers with an average trip rate of 13.78 trips per day. The average trip rate per household is 7.30 trips per day. The average trip rate per person is 3.42 trips per day.

Presented in Table 3 in the next section is a summary of trip statistics. Total trips include all household trips by all modes of travel. Auto trips include driver/passenger trips using household vehicles, carpool/vanpool, motorcycle, and rental car trips. Driver trips include household vehicle driver trips. Included in transit trips are private shuttle, RTC Ride, RTC Access, RTC Intercity, Sierra Spirit, RTC Rapid, RTC Vanpool, Amtrak, school bus, and other bus.

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<sup>1</sup> Based on the Council of American Survey Research Organization's (CASRO's) calculation of response rate, which includes all eligible and assumed eligible sampled households in the denominator,

### **1.2 Background**

The 2015-2016 RTC Travel Characteristics Survey was a multi-modal study of the demographic and travel behavior characteristics of residents throughout Washoe County, Nevada. Detailed travel behavior information was obtained from 2,154 households, using multiple data collection methods, including Computer Assisted Telephone Interviewing (CATI), online, mail surveys, wearable GPS devices, and a smartphone application. The survey sampling plan was designed to ensure an accurate representation of the entire RTC region.

#### **1.2.1 Survey Objectives and Overall Approach**

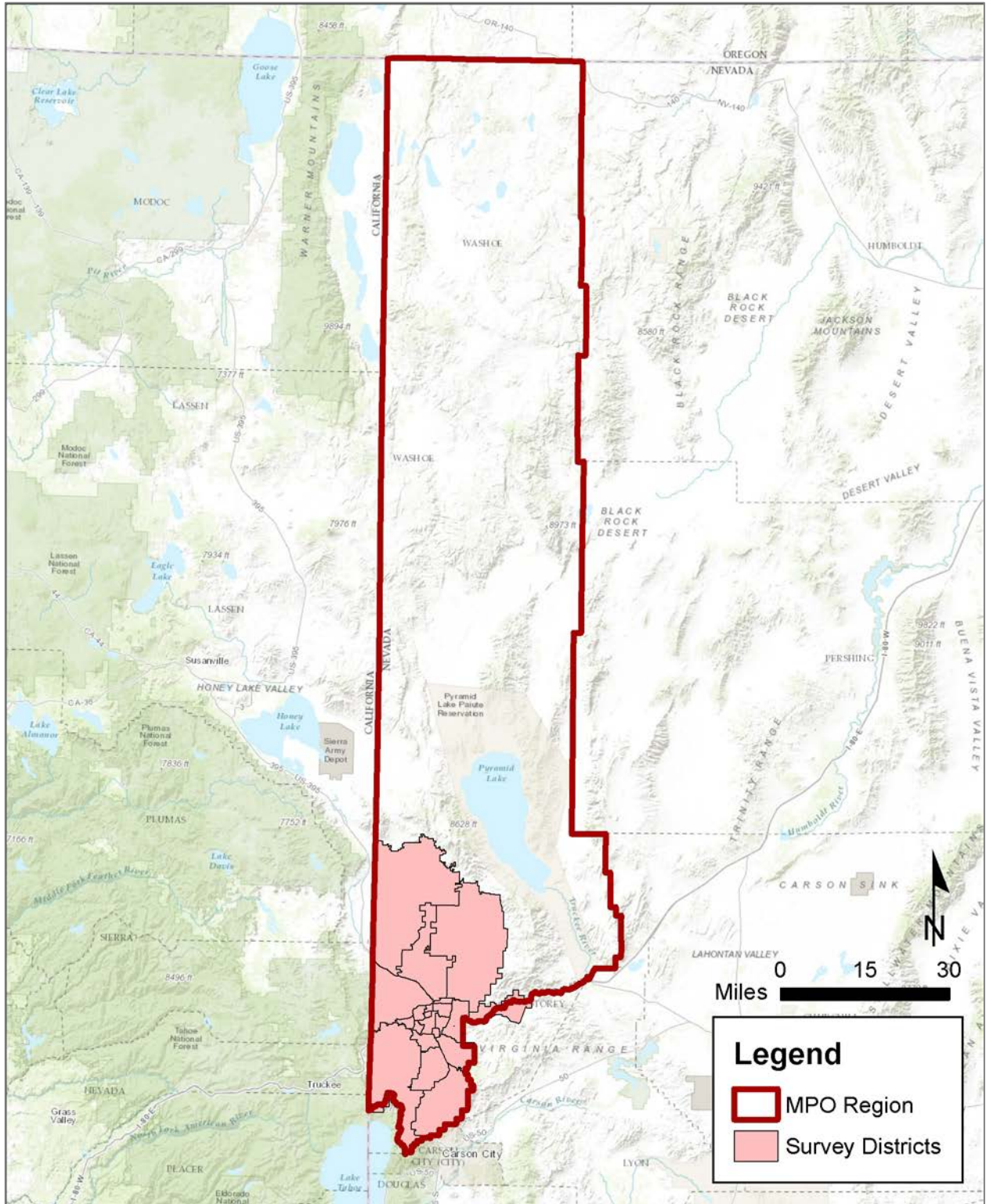
The main objective of the household travel study was to collect completed travel surveys from 2,500 households in the RTC region. The completed households are representative of the population of the 20 planning districts in Reno-Sparks. These 20 districts were disaggregated based on geographic and socioeconomic characteristics. Of particular interest to the RTC is the stratification of the resulting data into 2 two-dimensional categories: vehicles per household and number of workers per household and; household size and household income level. Ten percent of the responding households were selected to participate with GPS technology, either by wearing a GPS Data Logger (DL) or by utilizing RouteScout (NuStats' smartphone GPS tracking application). Participating households were required to complete a traditional travel diary. The GPS data serves to adjust unreported trips.

Assigned travel days were Tuesday through Thursday, except for holidays that fell on one of those days. During school breaks, data collection was suspended until school was back in session. With the approval of the RTC project manager, several travel days were added to the assigned travel day schedule in late fall 2015, and in early spring 2016.

A pilot study was conducted in early summer 2015 in order to assess respondent reaction to the survey and to confirm that the survey questions would yield the desired data. The pilot report provided recommendations for modifications that were implemented for the full study.

Figure 1 shows a map of the survey study area.

Figure 1: RTC MPO Map of the Household Travel Survey Study Area\*



\*Source: [http://www.rtcwashoe.com/mapwarehouse/RTC\\_MPO\\_Area.pdf](http://www.rtcwashoe.com/mapwarehouse/RTC_MPO_Area.pdf)

**1.2.2 Description of the Survey Components**

An overview of the key aspects of the RTC HHTS survey design is presented in Table 5. These three aspects, Sample Type, Household Type, and Survey Mode, are described as follows:

**Sample Type:** The sampling frame for the RTC HHTS was an address-based sample. Households whose addresses were sampled fell into two types—those for which there was a telephone number matched to the address (Matched Sample) and those without a matching telephone number (Unmatched Sample). In general, Matched Sample households have landline telephones, and Unmatched Sample households are those with no telephone, or cell phone numbers only.

**Household Type:** Households were recruited as: 1) those using Global Positioning System (GPS) technology (GPS Households) to augment their travel reporting and; 2) those not using GPS technology (Non-GPS). In the RTC HHTS design, GPS households were further recruited to use one of two different types of GPS technology:

- ✓ Wearable GPS
- ✓ RouteScout (Smartphone GPS tracking technology)

**Survey Mode:** To provide potential respondents with multiple ways to respond, there were different survey modes offered in the Recruitment and Retrieval phase of the survey. Recruitment was available to all Household Types through computer-assisted telephone interviewing (CATI) as well as on the Internet through the RTC Survey website. Retrieval of travel information was offered through CATI and Online, as well as by Mail for Non-GPS Households.

**Table 1: RTC HHTS Survey Design Schematic**

Sample Type	Household Type		Survey Mode				
			Recruitment		Retrieval		
			CATI	Online	CATI	Online	Mail
Matched or Unmatched Sample supplemented with targeted listed samples and targeted consumer cell sample	GPS Households	GPS					
		RouteScout					
	Non-GPS Households						

Traditionally, household travel surveys have two phases—recruitment, in which households are screened for participation; and retrieval, in which the detailed travel and activity information is collected. The recruitment phase contained a robust list of questions to collect person, household, vehicle, demographic, and habitual location information. The retrieval phase included the collection of detailed household travel information from all survey respondents. Additionally, any information that was refused during the recruitment interview was attempted to be collected during the retrieval interview.

**1.2.3 Survey Schedule**

NuStats was contracted on April 15<sup>th</sup>, 2015 to conduct the Regional Transportation Commission of Washoe County Travel Characteristics Study. Upon execution of the contract, NuStats began work on the tasks noted. Figure 2 provides the summary of the tasks performed, with the timeframe dedicated to each. As noted in Section 4.1, several travel days were added to the original proposed schedule. This was due to participation levels being lower than originally predicted.

## Agenda Item 5 ATTACHMENT

- Task 1 Research & Sampling – This task included: finalization of the Project Work and Management Plan; travel for the kick-off meeting; project management; finalization of the Sampling Plan; and obtaining and processing the study sample.
- Task 2 Survey Design – This task included finalization of the Public Awareness Plan; finalization of the diary and GPS survey methodologies; survey materials development; and programming.
- Task 3 Survey Instruments – This task included printing and fulfillment of the survey materials; postage; shipping; and business reply costs.
- Task 4 Public Outreach – This task was for all public outreach activities performed by our subconsultant, including time spent participating in meetings with regard to this project.
- Task 5 Conduct the Pilot – This task encompassed the activities necessary to administer the pilot study, analyze the results, prepare the data file and final report, and implement approved recommendations prior to beginning the full study.
- Task 6 Conduct the Main Survey – This task included: travel for trip purpose training; translation services; survey administration; weekly reporting; and management and cost of incentives.
- Task 7 Data Processing – This task encompassed the activities necessary for processing the retrieved data, and preparing it for delivery.
- Task 8 Analysis – All analysis activities are included in this task.
- Task 9 Final Reports – The activities involved to prepare the final technical report fall under this task.

**Figure 2: Survey Schedule**



### **1.3 Key Statistics**

Presented in Table 2 are the average trip rates broken down by demographic characteristic.

**Table 2: Average Trip Rates by Demographic Characteristic (weighted and GPS factored)**

Item	Trips per household/person per day
Household	7.30
Person	3.42
Household size	

## Agenda Item 5 ATTACHMENT

1	2.94
2	5.37
3	9.11
4+	16.28
<b>Household vehicles</b>	
0	3.75
1	4.97
2	8.72
3+	9.71
<b>Household workers</b>	
0	3.10
1	7.05
2	11.03
3+	13.78
<b>Household income</b>	
Less than \$25,000	4.89
\$25,000 to less than \$50,000	6.50
\$50,000 to less than \$75,000	8.81
\$75,000 or less than \$100,000	7.64
\$100,000 or more	10.27
Refused to report income	4.66
<b>Age</b>	
<25 years old	3.10
25 – 34	3.26
35 – 44	4.63
45 – 54	3.88
55 – 64	3.60
65+	2.65
<b>Hispanic Status</b>	
Yes	3.45
No	3.41
<b>Ethnicity</b>	
White	3.52
African American	1.16
American Indian/Alaska Native	2.47
Asian	3.36
Native Hawaiian/Pacific Islander	2.10
Other	3.30
Refused to report ethnicity	3.19

Table 3 provides a summary of trip statistics.

**Table 3: Key Household Travel Survey Trip Statistics (weighted and expanded)**

	Total – 2015/2016
Total Household Trips	1,181,426
Total Household Auto Trips	1,022,150
Total Household Driver Trips	762,585

## Agenda Item 5 ATTACHMENT

	Total – 2015/2016
Total Transit Trips <sup>2</sup>	30,726
Avg. Daily Household Trips per Household	7.30
Avg. Daily Person Trips (Per Person)	3.42
Avg. Daily Driver Trips Per Household	5.78
Avg. Daily Transit Trips per Household	0.45
Avg. Trip Length (All Trips In minutes)	14.5
Avg. Trip Length (All Trips In miles)	6.9
Avg. Trip Length (In minutes, Home to Work Trips <sup>1</sup> )	18
Avg. Trip Length (In miles, Home to Work Trips <sup>1</sup> )	10.23
Avg. Vehicle Occupancy (private vehicle driver, passenger, carpool trips only)	1.74

<sup>1</sup>Home to Work Trips include unlinked trips between home and work place.

<sup>2</sup>Transit trips in 2016 survey includes RTC Ride, RTC Access (paratransit services), RTC Intercity, Sierra Spirit, RTC Rapid, RTC Vanpool, Amtrak, and Other Bus

Travel mode distribution is presented in Table 4.

**Table 4: Travel Mode Distribution (weighted)**

Mode	2015-2016 Mode Share
Non-Motorized Travel – walk, bike, wheelchair, other	8.1%
Private Vehicle – driver, passenger, carpool, motorcycle	86%
Private transit – taxi, rental, private shuttle, greyhound, airplane and other	1%
Public transit	4.9%
Total	100%



## **2.0 On-to-off and Onboard Surveys**

### **2.1 Background**

The 2015 RTC Washoe County Regional Travel Characteristics Study conducted two separate transit related studies to provide supplemental data to update and calibrate the transit sub-model within the RTC Travel Demand Model. Two survey instruments were developed: one to collect travel behavior information from a large sample of RTC riders (On-to-Off study); and one to administer a more complex survey to a smaller sample of RTC riders (Onboard study).

In recent years, the Federal Transit Administration (FTA) has introduced stricter guidelines for conducting O/D onboard studies, including FTA New Starts/Small Starts requirements. As a result, NuStats utilized updated methodologies and newly developed ones to meet these requirements. NuStats targeted to collect, at a minimum, five percent of the total ridership or approximately 1,200 clean and usable surveys for updating the RTC Travel Demand Model.

NuStats teamed with Coulter and Associates, a local Public Relations firm, in development of a strategic plan to notify the public of their opportunity to participate in the On-to-Off and Transit Onboard surveys.

A high level review of the 2015 RTC operations and vehicle schedule was performed during the design phase in order to develop an understanding of how RTC conducts business with regards to the dispatch, operators, riders, and overall transit system. This was helpful in order to understand the idiosyncrasies of the schedules of each individual vehicle at the block, work run, or trip level. Additional meetings with key staff were held to ensure all parties understood the goals and mechanisms of the On-to-Off and Onboard Transit Surveys. General Transit Feed Specification (GTFS) and other pertinent data were requested to assist in this review.

### **2.2 Summary**

The pilot survey was conducted beginning in the fall of 2015, followed by the main survey. Data collection concluded in February, 2016. NuStats, in collaboration with RTC, designed a sampling plan targeting to collect a sample of 1,200 completed Onboard surveys and 1,200 completed On-to-Off surveys that would be representative of bus riders in the region. The most recent ridership numbers available were from 2014, which were utilized as a guide to develop the sampling plan.

The survey approach for both the On-to-Off and Onboard surveys was grounded in two main principles: 1.) reduce respondent burden while increasing participation; and 2.) enhance the quality of the data. The Onboard survey was conducted utilizing TransiTap, NuStats' tablet technology. During the interview process, data were subjected to real-time geocoding, and quality control procedures to ensure that respondents provided accurate information and to identify and correct illogical trips. For the On-to-Off survey, cards were handed to boarding passengers, and then collected from them as they alighted. Further detail about methodology and survey instruments is found in subsequent sections of this report.

Data collection for both the Onboard and On-to-Off surveys was conducted on all routes as determined in collaboration with RTC, NuStats, and RTC's modeler.

### **2.3 Key Findings**

The completed project yielded 1,209 onboard surveys. The objectives of the full study were two-fold: 1) examine and confirm the travel behavior characteristics of RTC bus passengers; and 2) obtain the socio-economic characteristics of RTC bus passengers. The data weighting and expansion provide an appropriate representation of the RTC system.

Important findings from the analysis of the RTC bus system ridership are presented below:

- Fifty-three percent of RTC bus passengers are from households with an annual income of less than \$25,000.
- Fifty-five percent of RTC bus passengers are transit-captive riders (i.e., they are from households that did not have a vehicle available to complete their one-way trip).
- Fifty-eight percent of RTC bus passengers are employed, with 38 percent employed full-time.
- Nearly two-thirds (61 percent) of RTC bus passengers do not possess a valid driver's license.
- Almost the entire group (99.7 percent) of RTC bus passengers took the survey in English with less than one-half of one percent taking the survey in Spanish.
- Fifty-six percent of RTC bus passengers are between the ages of 18 and 44.
- Thirty-seven percent of RTC bus passengers reported paying their fare with cash while 26 percent used a PrePurchase – 31 day pass.
- Travel behavior characteristics of RTC bus passengers indicate that home and work are the most prevalent trip origins and destinations.
  - Nearly one half (49 percent) of trips originate from home, 22 percent of trips originate from work, both school categories (K-12 and College/University) account for 3 percent of origin trip purposes.
  - The final destination for 34 percent of trips is home, whereas 22 percent end at work. Other common destination trip attractions are Social or Recreational, which represent 17 percent of all destinations, and shopping (11 percent).
- Overall, 93 percent of RTC bus passengers reported walk as their mode of access and/or egress.

### 3.0 Visitor Survey

#### 3.1 Background

The RTC Visitor Survey was intended to capture accurate and reliable travel behaviors of visitors, who stayed overnight, in the Reno/Sparks area. The visitor survey data collection combined with Kimley Horn’s familiarity with travel modeling provided RTC with the necessary data to support the visitor travel component of RTC’s Travel Demand Model.

According to the Reno/Sparks Convention and Visitors Authority, an estimated 4.6 million visitors traveled to the Reno/Sparks and Washoe County area in 2014. The importance of the Visitor Survey provided insight into visitors of the region and described who they were, what motivated them to travel to the region, and their activity-based travel patterns throughout the area.

The Visitor Travel Survey was conducted in February and October 2016, and it complements the Household Travel Behavior Survey and On-Board Transit Survey. RTC contracted with NuStats for the design and implementation of the suite of travel surveys. Subcontractors to NuStats for the Visitor Travel Survey included Reno-based firm Coulter & Associates, Kimley Horn and Associates, and temporary local field staff provided

The purpose of the Visitor Travel Survey was to obtain accurate information on regional travel characteristics in order to develop and calibrate the regional travel demand model. The survey focused on travel by visitors staying at least 24 hours in the area and with at least one overnight stay.

#### 3.2 Survey Design

The Visitor Travel Survey was conducted as an interviewer-mediated intercept survey utilizing NuStats’ tablet application.

Visitors were interviewed at local venues, including hotels, casinos, resorts, and other activity centers. In total, 13 survey sites were selected, representing a range of locations that would be frequented by visitors to the area. Sites were surveyed at various hours, dependent upon the hours of operation at the location. Interviews were conducted with visitors, residing outside Washoe County and that had been in the region for at least 24 hours. Only one person per traveling party was eligible to respond. The data elements included characteristics of the visit, of the traveling party, of trips taken while visiting the study area, and an estimate of how much money the respondent anticipated spending while in the study area. Because the sample was a "choice" sample and not probability sample, the resulting data set was neither weighted nor expanded to reflect population parameters.

As may be seen in Table 5 a total of 421 interviews were conducted. Of these, 354 were completed by short-term visitors and 67 were completed by long-term visitors (staying 7 or more days in the area). Table 6: Survey Outcomes by Length of Visit

Length of Visit	Count 2016	Percentage 2016	Average (days) 2016
Short-term (1-6 days)	354	84.1%	3.1

Long-term (7+ days)	67	15.9%	26.2
Total	421	100.0%	6.8

### 3.3 Survey Content

The tablet program utilized for the RTC Visitor Travel Survey is a maps-based intercept survey that geocodes all locations as they are entered. It allowed for real-time data review with the respondents to validate their data. To improve the efficiency and quality of data collected, a drop-down menu of the local hotels was programmed to make input of the lodging data easy and consistent. Additionally, the program utilized text box pop-ups to provide additional information when needed.

The average completion time for the RTC Visitor Travel Survey was ten minutes. During the interview process, 100 percent of the spatial data were reviewed by a highly trained interviewer to detect issues with the data. This real-time quality control allowed the interviewer to document atypical travel behavior, which provided RTC with accurate and model-ready data. The application collected the following key variables:

- Respondent characteristics (gender, household income, age, and home location);
- Length of visit;
- Visit purpose;
- Traveling party size and characteristics;
- Lodging location and type;
- Travel modes to Washoe County;
- Primary travel mode while visiting Washoe County;
- Geocoding of all locations (home, lodging, and all destinations);
- Anticipated amount of money to be spent while in the region; and
- Trip characteristics for one day (including destinations, activities, activity durations, and mode).