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2019 UTA ONBOARD SURVEY

Final Report | April 30, 2020

PREPARED FOR:
UTAH TRANSIT AUTHORITY

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1.0 INTRODUCTION

The Utah Transit Authority (UTA) has expanded its services substantially over the past ten years, and with the expansion of services it is important to understand how travel patterns have changed. The 2019 survey provides UTA and relevant agencies with this comprehensive overview of travel patterns, in addition to providing important information regarding transit riders, including: (a) socio-demographics, (b) fare payment, (c) travel purpose, (d) means of access and egress to/from the system and (e) time of travel, and (f) ultimate origins and destinations.

The 2019 study was conducted as a tablet-based intercept study. The O-D survey targeted 10% of average weekday boardings for rail, while setting a 7.5% average weekday boarding level for buses. These levels were adjusted by route/line, time period, and direction, roughly proportional to actual ridership. In addition, an On-to-Off survey was conducted in 2019, with targets of approximately 20% of ridership for rail and for bus routes with over 3,000 riders (all TRAX routes, FrontRunner, and bus routes 200, 217, 470, and 830X).

2.0 SAMPLING PLANS

The study team developed sampling plans for each of UTA's weekday fixed routes. The sampling plans identified the number of surveys to be completed on each route by direction and time of day with an eye for ensuring an adequate number of surveys by boarding and alighting stop group pair. Surveying was conducted on Mondays through Thursdays and focused on trips between 5:30 a.m. and 9:00 p.m. (FrontRunner), 6:00 a.m. and 9:00 p.m. (bus and TRAX), and 6:30 a.m. and 9:00 p.m. (S-Line). Specifically, the sampling plans and all survey efforts were constructed around the following four UTA-defined time periods:

- AM peak
    - FrontRunner: AM Peak (5:30 a.m.-9:30 a.m.)
    - Bus and TRAX: AM Peak (6:00 a.m.-9:30 a.m.)
    - S-Line Streetcar: AM Peak (6:30 a.m.-9:30 a.m.)
- Midday (all): 9:31 a.m.-3:30 p.m.
- PM Peak (all): 3:31 p.m.-6:30 p.m.
- Evening (all): 6:31 p.m.-9:00 p.m.

The RSG team avoided surveying during holidays or during weeks that the college campuses were out of session. Blackout dates are shown in Table 1.

TABLE 1: BLACKOUT DATES

Day of Week	Date	Holiday	Type of Holiday
Wednesday	11/11/2019	Veterans Day	National
Thursday	11/28/2019	Thanksgiving	National
Friday	11/29/2019	Thanksgiving	National

The O-D survey sampling plan was designed to obtain surveys from 10% of average weekday boardings for rail while setting a 7.5% average weekday boarding sampling level for buses. These levels were adjusted by route/line, time period, and direction, roughly proportional to actual ridership. Overall, UTA has approximately 125,000 weekday boardings during the sampling periods, with about 64,000 on bus (including 35M and 830X) and 61,000 on rail. Based on these ridership numbers, Table 2 shows the survey sampling targets that were set for intercept fielding by service.

The On-to-Off survey sampling plan was designed in a similar manner as the O-D and included survey targets that are approximately 20% of ridership for rail and for bus routes with over 3,000 riders (i.e., all TRAX routes, FrontRunner, and bus routes 200, 217, 470, and 830X).

TABLE 2: RIDERSHIP DATA USED FOR OD AND ON-TO-OFF SAMPLING GOALS

SERVICE	RIDERSHIP	OD SAMPLING RATE	OD SURVEYS	ON-TO-OFF SURVEYS
Bus	55,518	7.5%	4,164	2,015
35M	1,744	7.5%	131	n/a
830X	7,173	7.5%	538	1,435
FrontRunner	14,463	10%	1,446	n/a
TRAX - Blue	14,762	10%	1,476	2,952
TRAX - Green	13,648	10%	1,365	2,730
TRAX - Red	17,083	10%	1,708	3,417
S-Line Streetcar	1,115	10%	112	n/a
Total	**125,506**		**10,940**	**12,549**

Note: On-to-Offs for buses were only conducted for routes with over 3,000 riders (Routes: 200, 217, 470, and 830X)

3.0 QUESTIONNAIRE DEVELOPMENT

The 2015 questionnaire formed the basis for the 2019 questionnaire, but updates were made where appropriate. The complete questionnaire can be seen in Appendix A: Questionnaire. The OD survey was administered by an interviewer with a tablet computer. The data collected for the OD survey include:

- Route surveyed on;
- Direction of travel;
- Any other transit routes used and number of transfers;
- Time of trip;
- Origin location and type;
- Boarding location;
- Alighting location;
- Destination location and type;
- Access and egress modes;
- Frequency of UTA use;
- Gender of respondent;
- Age;
- English language ability and other language spoken at home;
- Household income;
- Race and Ethnicity of respondent;
- Household Size;
- Number of employed individuals in household;
- Number of children in travel party;
- Employment status;
- Disability;
- Student status:
- Driver license status;
- Number of vehicles in household;
- Method of fare payment;
- Alternative to using UTA;
- Reason for use of transit for journey;
- Smart phone availability;
- Home address of respondent (at least ZIP Code);

The Study team designed the survey as a tablet-administered personal interview. The Study team used tablets that integrate with GIS software to allow for accurate real-time geocoding of survey data.

4.0 SURVEY ADMINISTRATION

4.1 STAFFING, SURVEYOR TRAINING AND REMEDIATION

The job positions for this project included On-to-Off count administrators and on-board passenger survey administrators (interviewers). Both roles required surveyors to board bus and rail vehicles and interact with passengers. The trainings and work assignments were conducted between Mondays through Thursdays except for blackout dates identified in Table 1. ETC Institute partnered with the staffing firms Stat Team Staffing and ANIK International to provide surveyors and interviewers.

ETC constantly maintained a survey staff between 15 and 30 individuals in order to assure that there was adequate daily survey coverage. Any time that staff levels dropped below 20, additional hiring and training sessions took place. For the duration of data collection, field operations were managed from individual platforms. There were many advantages when operating with this flexibility. The majority of survey starting locations were centered in close proximity to the light rail system, which allowed survey staff ease of access getting to and from their daily assignments. Furthermore, this reduced survey staff dead head times in comparisons with fielding from bus garages.

During the data collection, field supervisors monitored survey performance, quality of collected survey data, and collected feedback from passengers in order to evaluate each individual interviewer. When necessary, ETC provided surveyor coaching on a daily basis, which consisted of each surveyor receiving constructive feedback and remediation in order to improve their overall performance. On occasion survey staff had to be removed due to the continuation of poor performance. When this happened and survey staff were terminated due to performance issues, no call/no shows, etc., ETC documented these issues and the reasoning for removal.

4.2 ON-TO-OFF ADMINISTRATION

Training

ETC conducted an On-to-Off training on September 16, 2019, which involved two hours of classroom training and four hours of field training for a total of six hours per surveyor. The primary tool that was used for the training session was a PowerPoint presentation. The training went over the following details:

- Equipment use and set up
- Methodologies for collecting rail and bus boarding and alighting pairs
- How to approach passengers
- Distribution and collection of bus On-to-Off cards
- How to handle refusals

- How to react in various situations that may be encountered

After surveyors demonstrated that they were capable of performing the On-to-Off count, the surveyors were invited to field training. The field training provided hands-on training that involved the actual conducting of the On-to-Off count with bus and train passengers. During the field training, surveyors were tested on their proficiency and were provided with additional coaching if needed. If the surveyor was deemed unable to perform the On-to-Off count, they were replaced.

Procedure

The On-to-Off count data collection occurred a day after the training and was conducted between September 17, 2019 and October 2, 2019 for bus On-to-Offs, and between September 17, 2019 and October 17, 2019 for rail On-to-Offs. Surveyors were responsible for the distribution and collection of the On-to-Off count cards. Typically, there were two surveyors assigned to each bus with one surveyor covering the front of the bus and a second surveyor positioned at the back of the bus. The surveyor at the front of the bus scanned and distributed barcoded cards to boarding passengers while the surveyor at the back of the bus collected and scanned the cards as passenger alight. The surveyors were equipped with handheld scanning devices in order to capture the boarding and alighting locations. If three door buses were surveyed such as the 830X, then a third surveyor was added to the third door.

For TRAX, survey staff rode the rail lines and asked each passenger the location that they boarded the line and where they will be exiting the line. In some instances, when TRAX station level goals were close to a goal, surveyors would be stationed at certain TRAX stations and would ask passengers what station they would be getting off since the survey staff would know the boarding station since they were positioned at that station.

4.3 OD SURVEY ADMINISTRATION

OD Pilot Test

A pilot test for the UTA Onboard Survey was conducted from September 10 - 12, 2019 between the hours of 5:30am and 10:00pm. The purpose of the pilot test was to assess all aspects of the survey including survey design, sampling methodology, implementation, and data processing tasks. All interviewers who participated in the pilot test participated in one day of training prior to the start of the pilot test (i.e., Tuesday September 9th, 2019). The training activities that were covered included:

- An introduction to the project (purpose, scope, etc.)
- Fare category and type breakdown from UTA
- Review of tablet functionality (projected on screen)
- Extensive training on survey administration and sampling procedures
- Individual interviewer training on the tablet
- Practice interviews with ETC supervisory staff

The training also included a practical exercise to ensure that all interviewers were technically competent to perform all tasks that would be required in the field.

The pilot test was administered to transit riders on all TRAX rail lines, the S Line, FrontRunner, and bus routes 17, 21, 213, and 525, therefore consisting of Light Rail, Commuter Rail, Streetcar, and Bus in order to evaluate response rates on a mixture of service types.

A total of 792 passengers were asked to participate in the pilot test. Of these, 674 agreed to participate with the in-person interview, while 10 respondents provided call back or e-mail information, overall resulting in 600 usable surveys. 255 of the 600 surveys (42%) were collected on bus lines and 345 (58%) were collected on rail. There were no problems with the sampling procedures and the process for randomly selecting riders on buses and trains worked very well. Based on the successful results of the pilot test, ETC Institute proceeded with no changes to the sampling procedures.

Survey Administration

TRAINING

The main Origin and Destination training occurred on September 12, 2019. The training involved four hours of classroom training and eight hours of field training, with an additional two hours of follow-up training for a total of 14 hours per interviewer. The ETC data collection manager created the necessary training materials and conducted the OD training. The classroom training session included a PowerPoint presentation to explain the purpose and objectives of the survey, questionnaire content, interviewer procedures and requirements, survey logistics, how to maximize response rates (including hard-to-survey passengers), and the data collection process in a step-by-step format. Other goals of the training included building interview staff confidence, helping interview staff feel that they are an important part of the survey's success, and helping them understand the importance of the survey and the long-term benefits to their community.

ETC Institute ensured that the training addressed the following details:

- Overview of all topics covered in tablet questionnaire
- Importance of understanding the intent of the questions
- Instructions on conveying the purpose of the survey to passengers
- Importance of random selection and properly recording all refusals
- Importance of data confidentiality
- How to handle passenger comments and complaints
- Instructions on how to record/pass any unsolicited comments on to supervisors so they can be passed on to appropriate agency staff
- Tips on intercepting/interacting with passengers with disabilities
- Tips on intercepting/interacting with limited English Proficient passengers
- Cultural sensitivity

Towards the end of training, interviewers conducted mock interviews using the survey tablets. This allowed ETC staff to gauge each interviewer's comprehension of the survey and instrument and provide feedback as needed. At the conclusion of the training, interviewers were tested on items discussed in training. Following classroom training, applicants had a chance to conduct interviews under the supervision of an experienced supervisor from ETC Institute. Supervisors oversaw interviewers and provided feedback on performance throughout the day. Interviewers who were conducting the survey properly were allowed to go to the next phase of field training. Interviewers who needed more help, but showed promise were asked to spend a second day in the field under direct supervision. Once an interviewer demonstrated proficiency under direct supervision, he/she was given a field test during which the prospective interviewer conducted surveys on his/her own. During this period, the interviewer's productivity and data quality were remotely assessed by ETC Institute's staff. Additional, smaller OD survey training sessions were held throughout fielding approximately every two weeks.

ADMINISTRATION PROCEDURE

Data collection for both TRAX and bus started on September 16, 2019 and ended on December 11, 2019. Interviewers boarded their assigned bus/train and selected riders at random to participate in the survey. While conducting the interview, interviewers asked the respondent each question from the survey tablet and recorded each response provided to them by the passenger. Interviewers had to be capable of establishing conversation in regards to the survey with bus/rail passengers and inputting passenger responses. If a passenger did not have the opportunity to complete the survey on board their bus/rail line, they were offered to provide their name and phone number or e-mail to complete the survey later. If the respondent did not respond to the text within three days, an ETC call center representative called and followed up with the respondent. If a respondent did not respond to the e-mail, a follow up e-mail was sent.

PERFORMANCE MONITORING

To ensure that quality data were collected, and interviewers were conducting the OD survey in accordance with the study team's standards, real-time monitoring and in-person monitoring were conducted, as described below.

Real-Time Monitoring of Surveyor Performance. The tablet PC program was designed in a manner that allowed ETC Institute's field supervisors to monitor the performance of individual interviewers in real time. Throughout the day field supervisors evaluated the performance of each interviewer. This included a review of response rates and the characteristics of the passengers who were interviewed with regard to age, gender, race, and the average length of each interview. These daily reviews allowed the research team to provide immediate feedback to interviewers to improve their overall performance. It also allowed the research team to quickly identify and remove interviewers who were not conducting the survey properly. Separately, spot checks were conducted on the location and transfer information to make sure the trips being captured were logical.

In-Person Monitoring. As part of the initial training interviewers were monitored as they conducted interviews with passengers to ensure that surveying protocols were followed. As part of ongoing quality control checks interviewers were periodically monitored during the data

collection. These checks were primarily conducted with interviewers who were struggling in some capacity.

5.0 DATA PROCESSING

5.1 DATA CLEANING

Completeness of Data

To ensure that accurate and quality data were collected, completed surveys were reviewed by field supervisors upon receipt. Field supervisors then provided feedback and additional training to interviewers. Real-time review had the added benefit of calculating the number of surveys completed by time period. Additionally, it provided overall daily progress, the progress of each route, and the progress of the surveyors. This information was also used in the creation of the weekly progress reports.

REAL-TIME GEOCODING

Because a web-based tablet survey was used to conduct and administer intercept interviews, addresses and intersections collected during field interviews were instantaneously geocoded with nearly 100% accuracy because the tablets were equipped with 4G/3G service and interface with Google Maps in real-time. In addition, after addresses and intersections were geocoded, the survey software plots the locations on a map, which served as a visual aid that interviewers used to confirm accurate information was gathered.

All data were automatically coded and geocoded in real-time with the tablet-based survey. Much of the data were cleaned in real-time as well, with interviewers double-checking whether a respondent's trip made sense while they took the survey. However, additional checking were done after surveys have been collected. Some of the specifics that were performed include the following:

- Checking for valid home, origin, and destination street names, city names, and zip codes;
- Ensuring the number of household occupants was greater than or equal to the number of employed members of the household;
- Ensuring the respondents who indicated that they were employed also reported that at least one member of their household was employed;
- Ensuring that transit route/line names and stops/stations were consistently spelled/coded
- Ensuring that transfers to/from other transit routes/lines were possible, with some leeway provided for riders who walk several blocks to reach their next route;
- Ensuring the time of day a survey was completed was reasonable given the published operating schedule for the route;
- Ensuring the origin and destination addresses were not the same;
- Ensuring that the boarding and alighting addresses were not the same;
- Ensuring the boarding and alighting addresses made sense for the route;
- Ensuring that the respondent did not list the same route twice;
- Checking to be sure the access/egress mode was appropriate given the distance of travel from the trip origin/destination to place where the respondent boarded/alighted transit; and
- Reviewing the total distance on transit compared to the total trip distance.

In addition, each trip was visually inspected. The key tasks that were conducted as part of this visual inspection included the following:

- Visually inspecting and examining key variables of survey trips with very short distances;
- Visually inspecting the sensibility of trips with zero transfers or three or more transfers;
- Visually inspecting the sensibility of drive access/egress trips given the distance traveled by car relative to the distance traveled by transit;
- Visually inspecting the sensibility of drive access/egress trips with more than one transfer;
- Visually inspecting sensibility of the origin-to-destination path with respect to the survey route that was used for the trip; and
- Visually inspecting the routes reported being used for the trip.

If a record passed all of the visual checks and verifications listed above, the record was classified as “useable” and tagged for inclusion in the final survey database.

5.2 DATA WEIGHTING/EXPANSION

The OD survey data were weighted and expanded using an iterative proportional fit (IPF) process with the On-to-Off data (where available) used as the seed matrix. Survey data were weighted and expanded to match boarding and alighting counts by route, direction, time period, board location and alight location.

Stop-level APC data for the study period were obtained from UTA. For the TRAX light rail routes, the Sugarhouse streetcar and FrontRunner, UTA provided average weekday boarding and alighting counts from the period between September and November, 2019 (excluding holidays). For bus routes, average weekday boarding and alighting counts were provided for the period between August and December, 2019 (again, excluding holidays).

The following time periods were used:

- AM Peak
    - FrontRunner (5:30-9:30am)
    - Bus and TRAX (6:00-9:30am)
    - S-Line Streetcar (6:30am-9:30am)
- Midday (9:30am-3:30pm)
- PM Peak (3:30-6:30pm)
- Evening (6:30pm-9:00pm)

The study team weighted to stop location at the most disaggregate level possible, but aggregation of stops into “stop segments” was necessary to ensure sample sizes were adequate in each cell for the weighting process. Segments were assigned based on a combination of geography and the surveys that were collected from each route so that there were some boardings and alightings in each segment at each time period. Higher ridership routes were divided into multiple segments and lower ridership routes (under 3,000 daily riders) were divided into two segments.

The IPF technique assigns a weight to each joint board and alight combination by route, direction and time of day so that the sum of each dimension matches the targeted marginal

totals of boardings and alightings. The process starts by using the on-to-off flow data as a "seed" boarding and alighting matrix. This matrix is then adjusted so that a) the total number of boardings is equal to the corresponding number of APC boardings and then b) the total number of alightings is equal to the corresponding number of APC alightings. This adjustment is repeated, iteratively, until the matrix converges. This results in a board and alight matrix that has boarding and alighting totals that equal the APC data counts and boarding and alighting pair totals that are as close as possible to the data collected in the on-to-off survey. For routes without an on-to-off survey, the same process was used, but the unweighted OD survey counts themselves were used as the seed matrix.

The ridership targets, original sampling goals, unweighted survey counts and average weights for each service type are shown in Table 3. Overall, 13,417 usable OD surveys were collected (13,328 and 89 of these were conducted in English and Spanish, respectively).

TABLE 3: WEIGHTING AND TOTAL RIDERSHIP

ROUTE	AVERAGE WEEKDAY RIDERSHIP*	SAMPLING GOAL	SURVEYS (UNWEIGHTED/NOT EXPANDED)	% OF TARGET	SURVEYS (WEIGHTED/ EXPANDED)	AVERAGE WEIGHT
TRAX- Red	22,107	1,708	2,024	119%	22,107	10.92
TRAX- Blue	15,811	1,476	1,800	122%	15,811	8.78
TRAX- Green	14,771	1,365	1,682	123%	14,771	8.78
Frontrunner	18,825	1446	1,947	135%	18,825	9.67
S-Line	1,270	112	164	146%	1,270	7.75
Bus	72,284	4,853	5,800	120%	72,284	12.46
Total	**145,069**	**10,960**	**13,417**	**122%**	**145,069**	**10.81**

**Note: Ridership data for TRAX, the Sugarhouse streetcar and FrontRunner are weekday data (excluding holidays) from the period between September and November, 2019. Ridership data for bus routes are weekday data (excluding holidays) from the period between August and December 2019.*

Linked Trip Weight

The weights calculated in the IPF process are unlinked weights, meaning that they represent all boardings on UTA transit vehicles over an average weekday. A linked trip weight was calculated from the unlinked weight for all UTA routes in the system and represents the number of overall trips within the system on an average weekday. The linked weight accounts for transfers being made on a single trip. A respondent making no transfers to another route would receive a linked trip weight of 1 time their unlinked weight, while a respondent who transferred to one other sampled route would have a weight of 0.5 times their unlinked weight, and so on.

Analyses conducted using the linked trip weight represent individual passengers among the sampled routes and accounts for transfer activity between the routes. This weight should be applied when analyzing markets so that riders making transfers are not counted multiple times; unlinked weights should be applied when analyzing a single route.

5.3 GEOGRAPHY

Origin and destination addresses were joined to Traffic Analysis Zones (TAZs) using GIS software. The TAZs have been further aggregated for simplicity of analysis. In this report, results are reported by “medium” TAZ district. The 46 medium TAZ districts within the study area are shown in Figure 1. Analysis included in this report is based on these geographies. A description of each district is provided in Table 4.

FIGURE 1: MEDIUM TAZ DISTRICTS

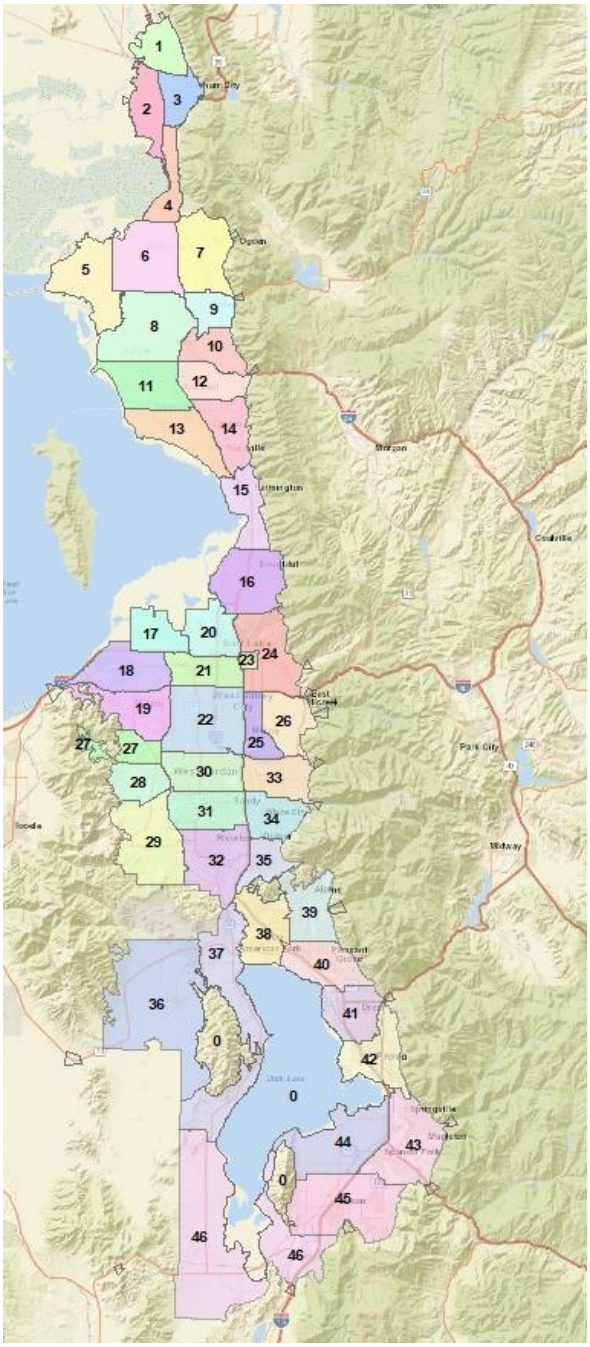


TABLE 4: MEDIUM TAZ DISTRICT DESCRIPTIONS

1	North of Brigham City	24	SLC east of I-15
2	Brigham City, Perry - West of I-15	25	SSL-Murray
3	Brigham City, North Perry	26	Millcreek-Holladay
4	South Perry, Willard	27	S.Flat, U-111@62nd
5	Ex-West Weber	28	WJ, WB, west of MVC
6	NW Weber	29	W.Daybreak, Herriman
7	North Ogden	30	WJ, I-15 to MVC
8	Hooper-Roy-W.Haven	31	SJ, I-15 to MVC
9	Ogden Core	32	Riv, I-15 to MVC
10	S.Og-Riverdale-Uintah	33	Midvale, Cot, N.Sandy
11	Clinton-W.Pt-Clearfield	34	Sandy
12	HAFB area	35	Draper
13	Kaysville-Syracuse	36	Cedar Valley
14	Layton-Ft.Heights	37	Saratoga Springs
15	Farmington-Centerville	38	Lehi
16	WX, Bountiful, NSL	39	Alpine-Highland
17	NW Quad-International	40	AF-PG
18	MVC to Tailings	41	Orem-Vineyard
19	MVC-Magna-ATK	42	Provo
20	Airport-Rose Park	43	SF-Springville
21	I-15 to MVC, I-80 to 20	44	Lake Shore-Palmyra
22	WVC-Taylors	45	Payson-Salem
23	SL CBD	46	Santaquin-Elberta

6.0 RIDER PROFILE

The demographic results presented below are weighted with the linked trip weight, since this accurately represents the entire UTA ridership population. Choice ridership, that is, whether someone could have taken a mode other than UTA or walking for their trip, is presented by transit mode, since there is considerable variation between the three modes.

6.1 DEMOGRAPHICS

UTA ridership consists of slightly more men than women (58% vs. 41%, Figure 2). A majority of riders, 63%, were younger than 35 years old (Figure 3).

FIGURE 2: GENDER

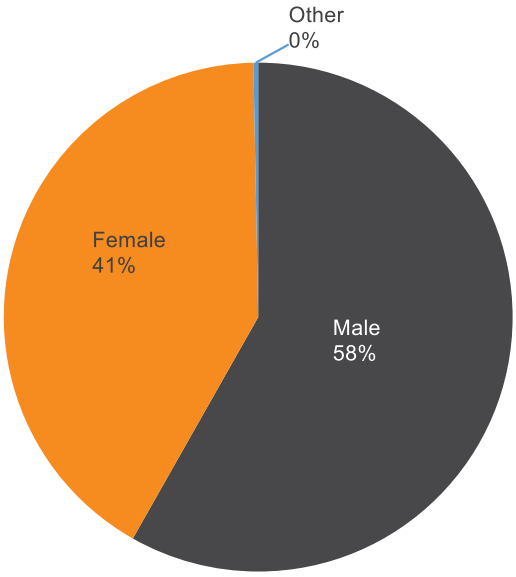
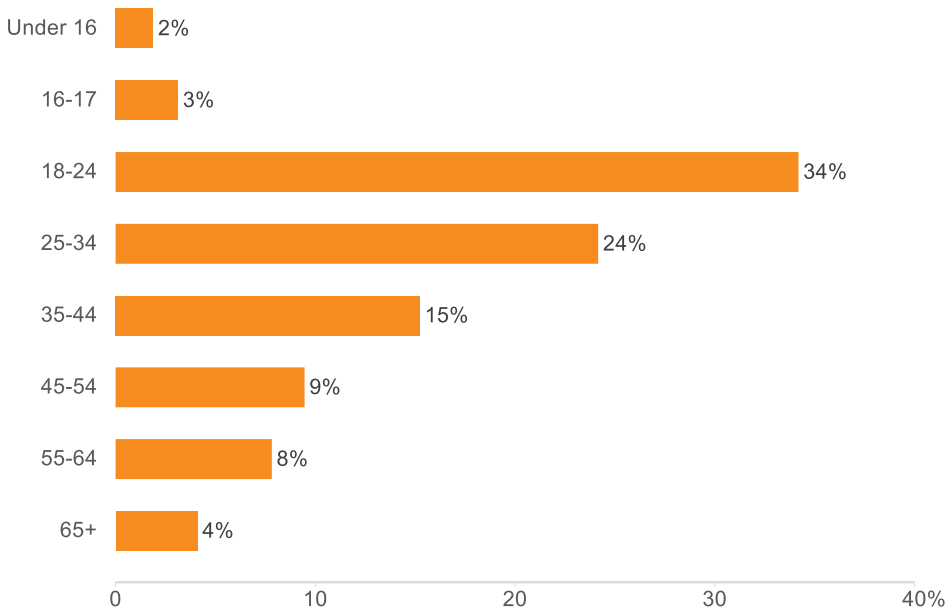


FIGURE 3: AGE



One third of respondents, 33%, reported annual household incomes of under $25,000 while the median annual household income was in the $32,000-$39,999 range (Figure 4). The great majority of UTA riders, 76%, identifies as White (Figure 5).

FIGURE 4: ANNUAL HOUSEHOLD INCOME

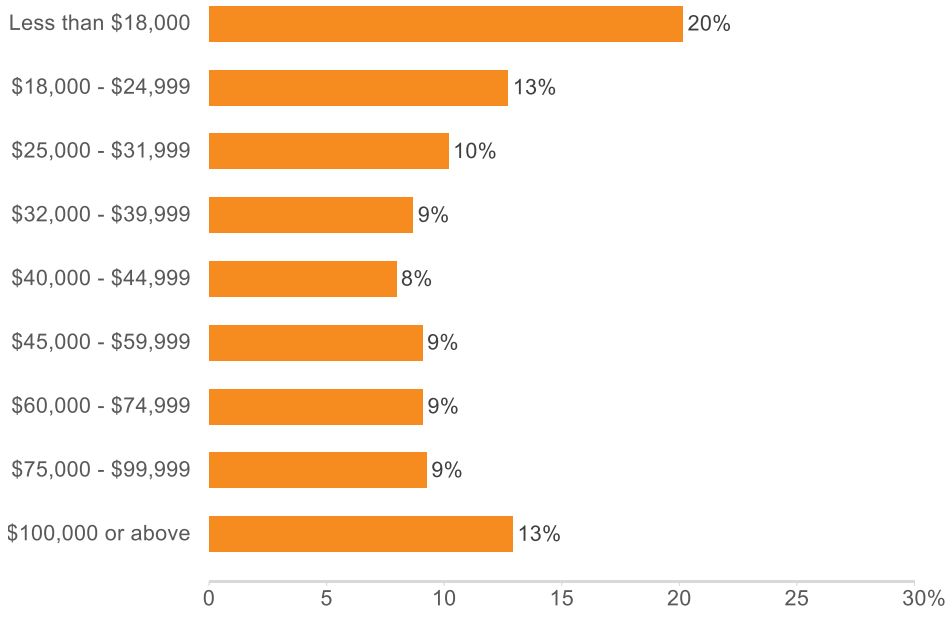
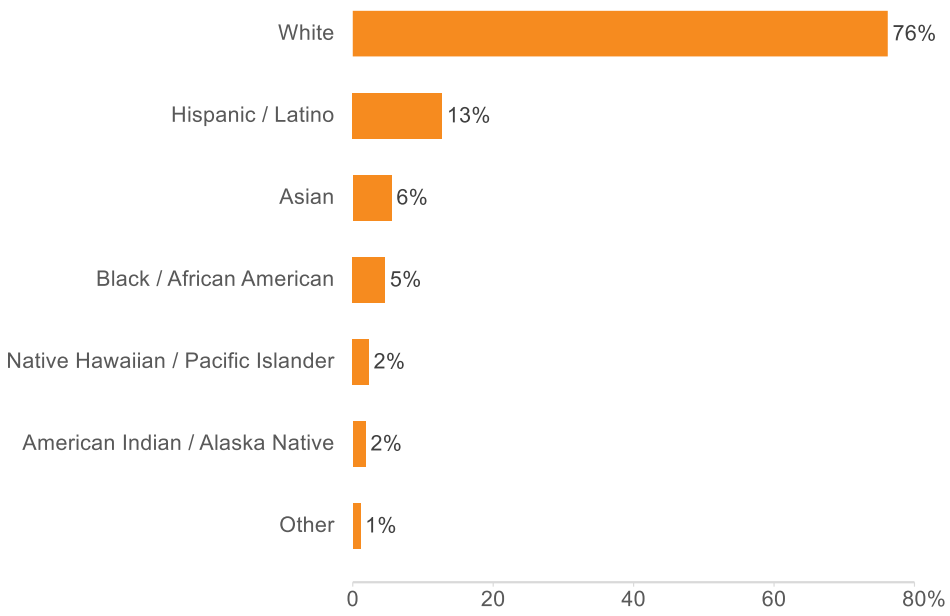


FIGURE 5: RACE



Note: Respondents could select multiple responses and therefore the totals do not add to 100%.

Nearly half of respondents reported working full-time, while 30% reported being employed part-time and one-fifth being unemployed or retired (Figure 6). Forty percent of respondents identified as a full- or part-time student at some level (Figure 7).

FIGURE 6: EMPLOYMENT STATUS

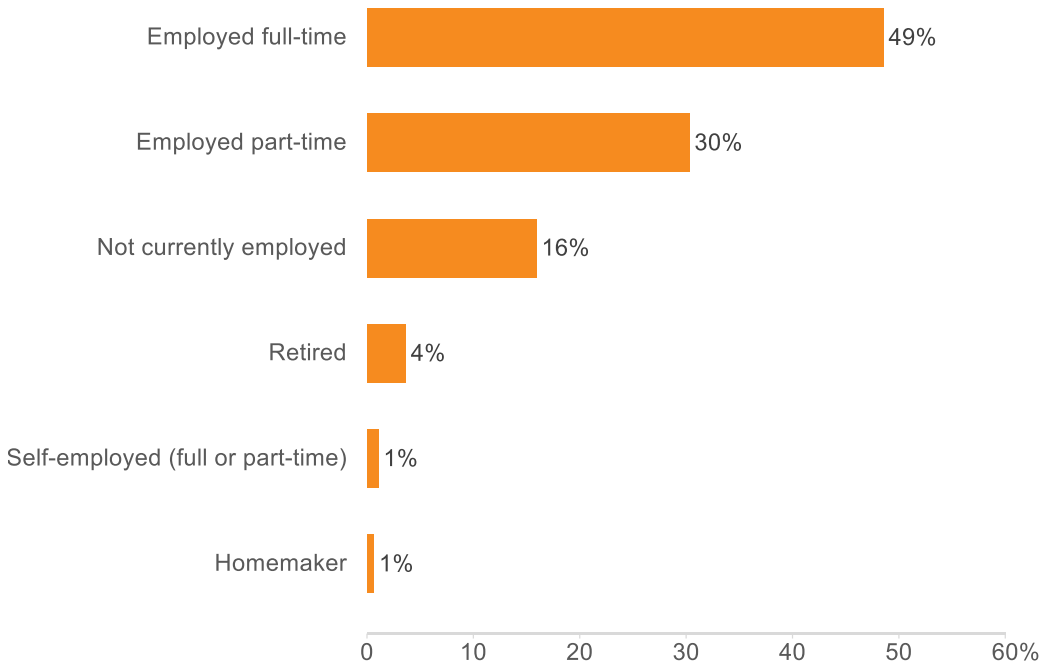
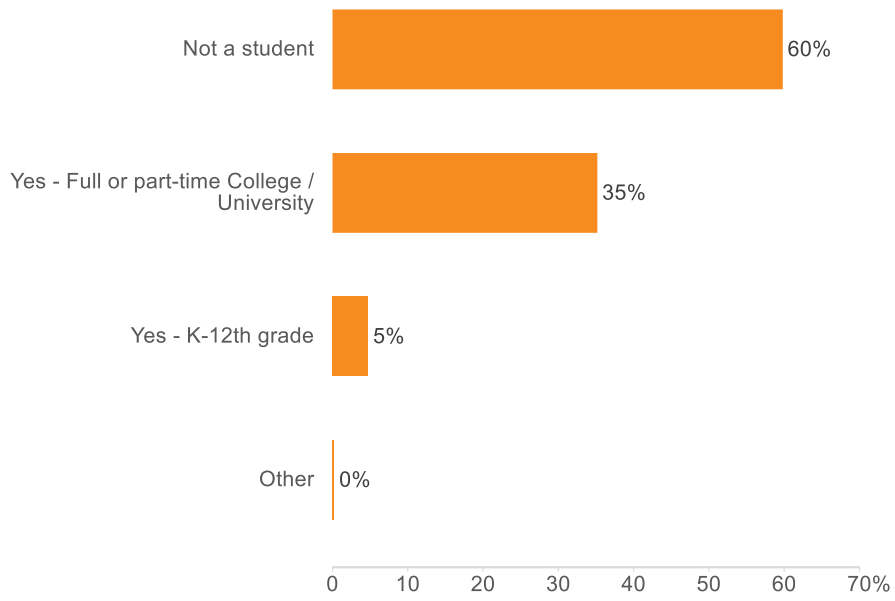


FIGURE 7: STUDENT STATUS



CHOICE RIDERSHIP

Overall, a slight majority of UTA riders are captive riders (53%), meaning that they could have only taken UTA or walked for this trip. However, this varies substantially by transit mode; for instances, a majority of bus riders, 61%, are captive riders but 51% of light rail users and 71% of commuter rail users are choice riders (Figure 8). Choice riders are more likely to travel in the peak periods and are less likely to travel during the midday (Figure 9).

FIGURE 8: CHOICE RIDERSHIP BY MODE

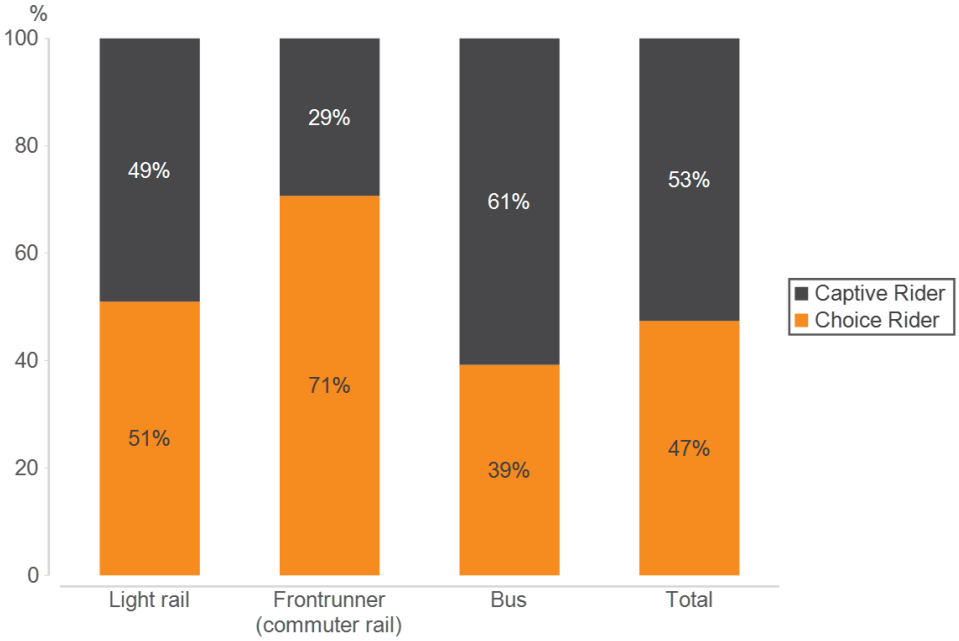
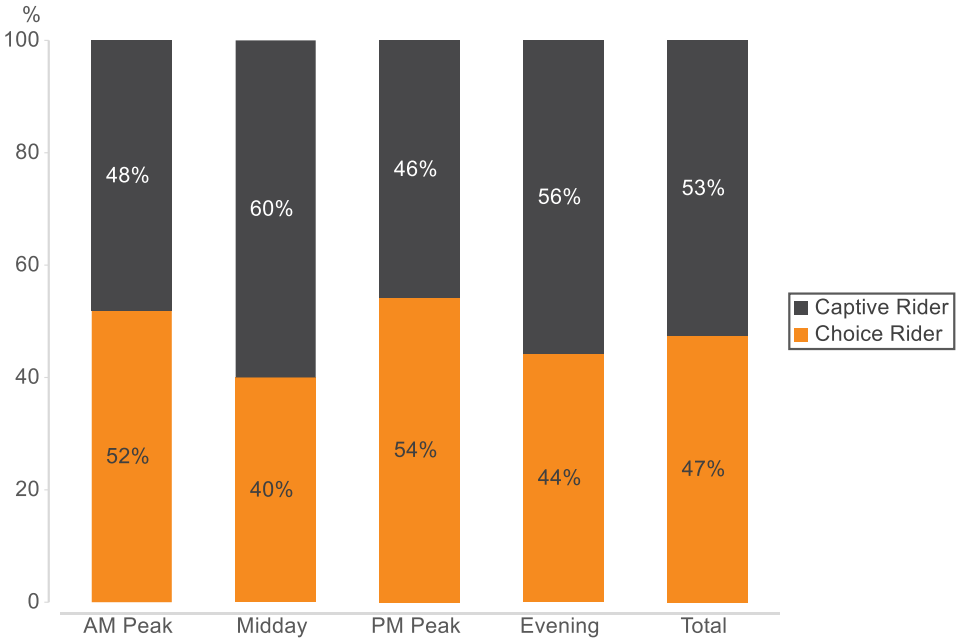


FIGURE 9: CHOICE RIDERSHIP BY TIME PERIOD OF BOARDING



Compared to light rail (27%) and bus riders (32%), a smaller percentage of FrontRunner riders currently do not already possess any car (7%, see Figure 10). However, these FrontRunner riders with currently no car are much more likely to report that they plan to purchase a car soon (35%) compared to light rail (27%) or bus riders (23%), see Figure 11. Similarly, only 65% of bus riders report having a driver's license compared to 75% of light rail and 91% of commuter rail riders (Figure 12).

FIGURE 10: NUMBER OF VEHICLES IN HOUSEHOLD

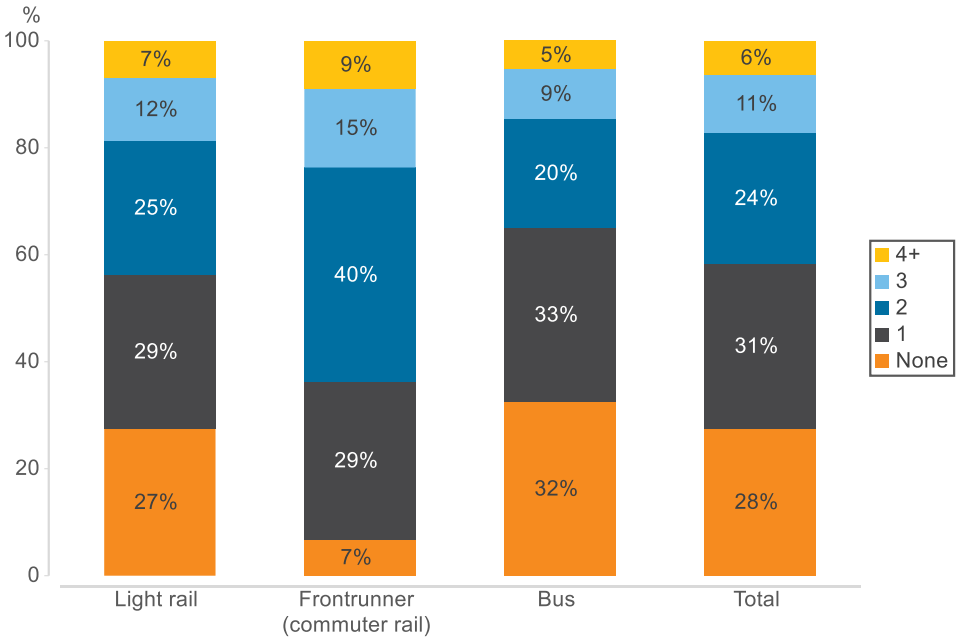


FIGURE 11: IF WITHOUT CAR IS GOING TO BUY ONE SOON

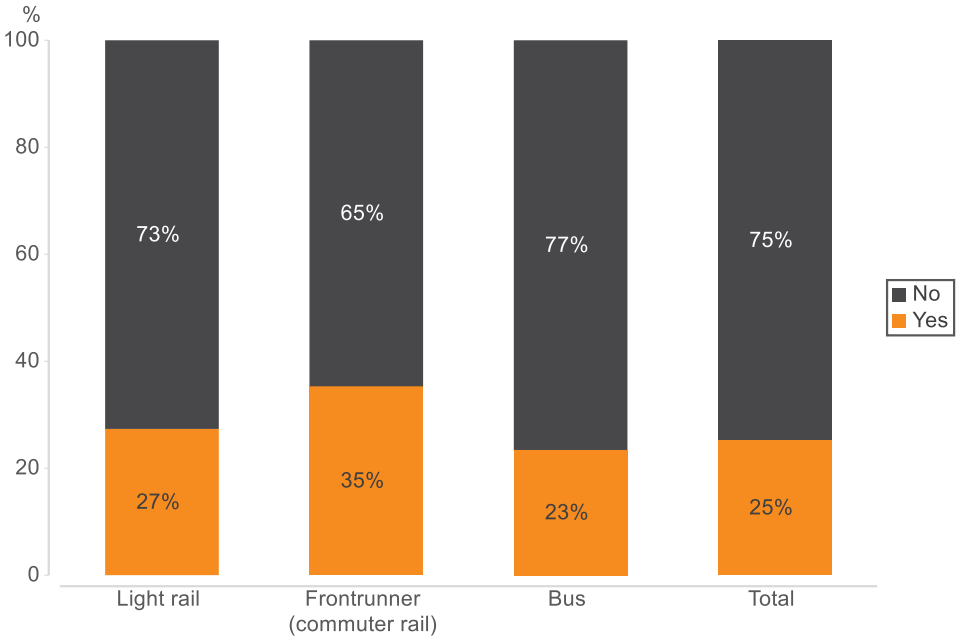
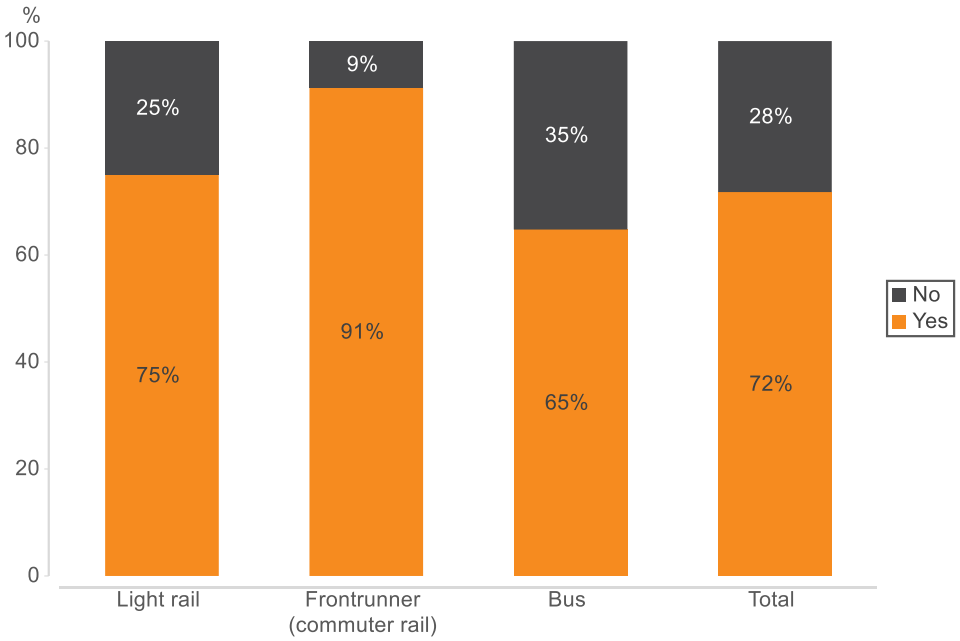
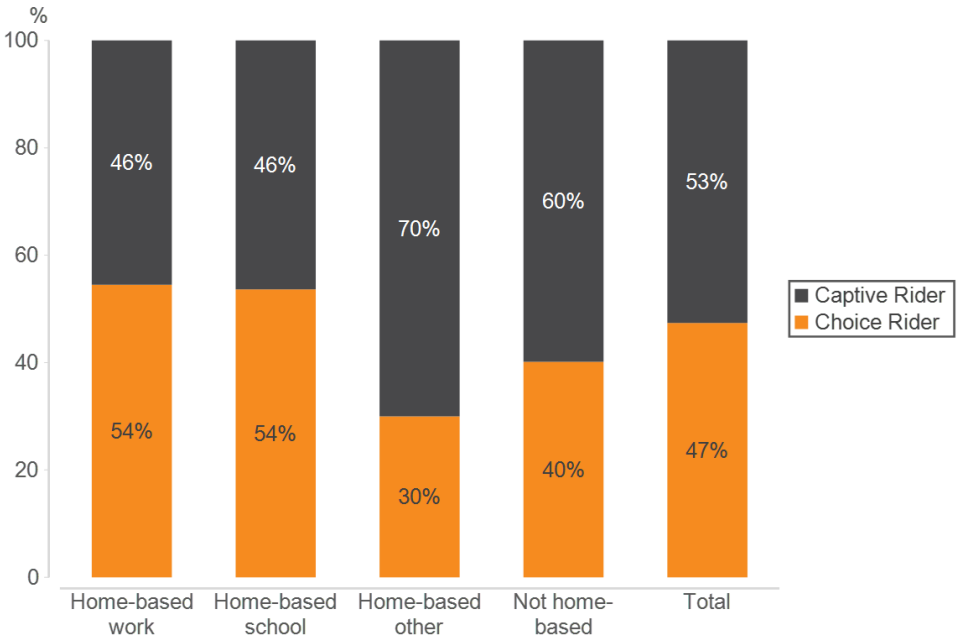


FIGURE 12: DRIVER'S LICENSE



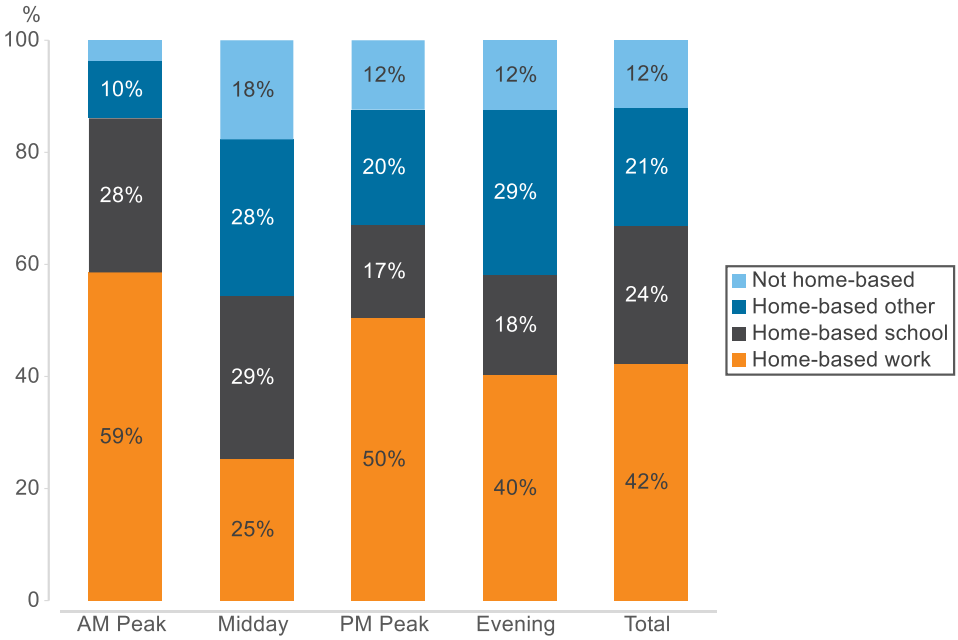
Choice riders are more likely to be commuting to work or school than traveling for any other purpose (Figure 13).

FIGURE 13: CHOICE RIDERSHIP BY TRIP PURPOSE



Most of the trips taken in the peak travel periods are to or from work. AM Peak and Midday time periods have a larger proportion of home-based school trips than the other time periods (Figure 14).

FIGURE 14: TRIP PURPOSE BY TIME PERIOD OF BOARDING



7.0 TRIP PROFILE

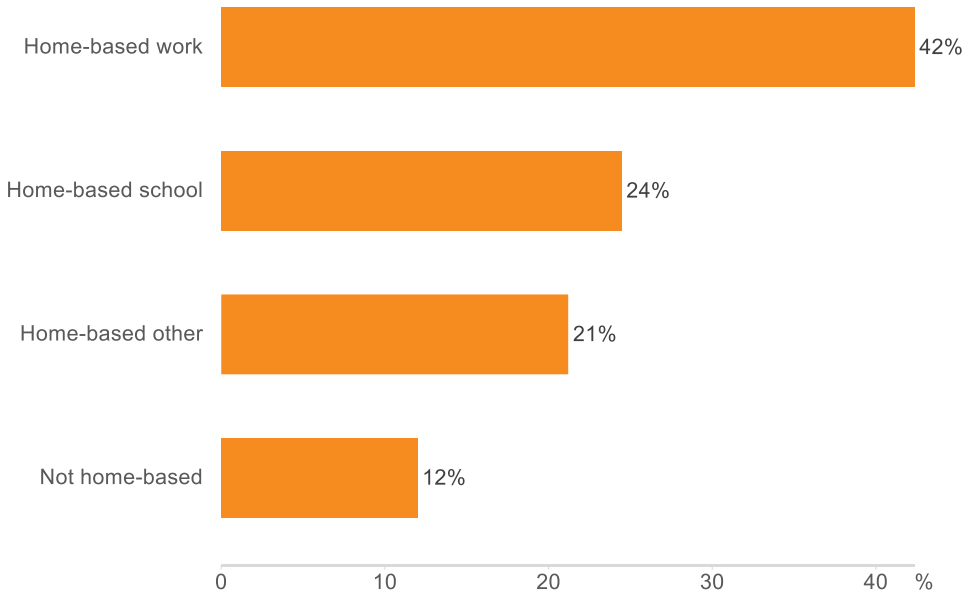
Below we present results on the nature of the trip rather than the characteristics of the riders themselves.

7.1 TRIP PURPOSE

Trip purpose was inferred by origin and destination type. In other words, in addition to the origin and destination addresses, riders were also asked about the type of the origin and destination, such as whether it was home, work, school, etc. From these answers, the trip purpose was inferred. Trip purpose was divided into four categories for the purposes of this report: home-based work trips (i.e., between home and work), home-based school trips (i.e., between home and a college or K-12 school), home-based non-work trips (i.e., between home and a place other than work or school), and trips that are not home-based (i.e., neither the origin nor destination is the respondent's home).

Forty-two percent of the sampled trips on the corridor were home-based work trips, with an additional 24% of home-based school trips. The vast majority of trips either begin or end at home (88%) (Figure 15).

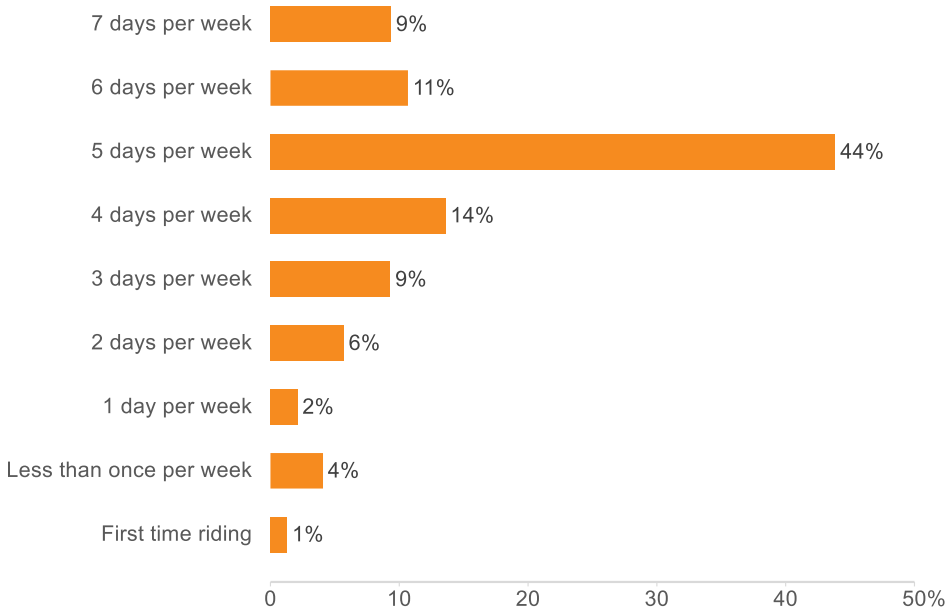
FIGURE 15: TRIP PURPOSE



7.2 TRIP FREQUENCY

With regards to trip frequency, a plurality of riders, 44%, use transit five days per week, and the overwhelming majority, 95% use transit at least once per week (Figure 16).

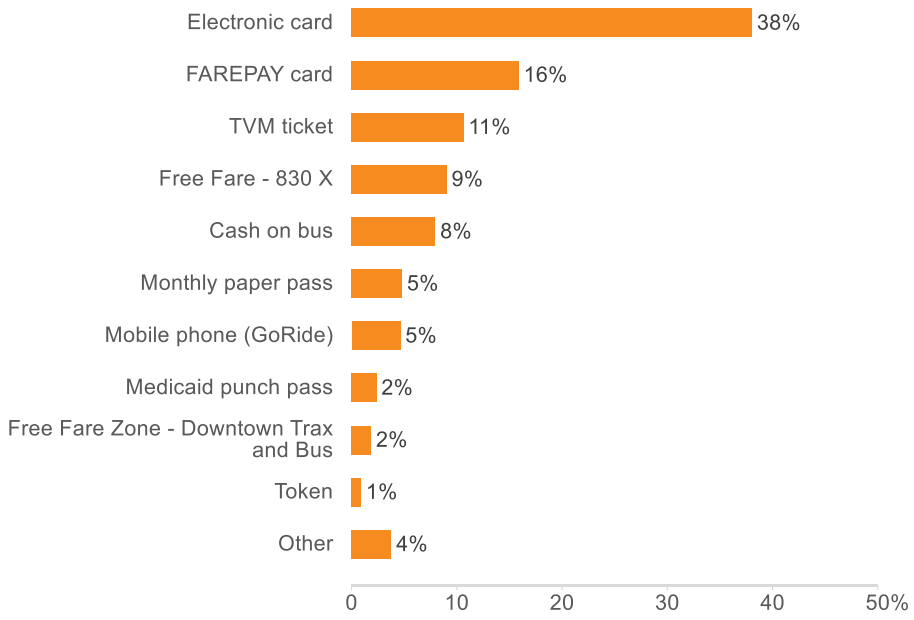
FIGURE 16: TRIP FREQUENCY



7.3 FARE PAYMENT

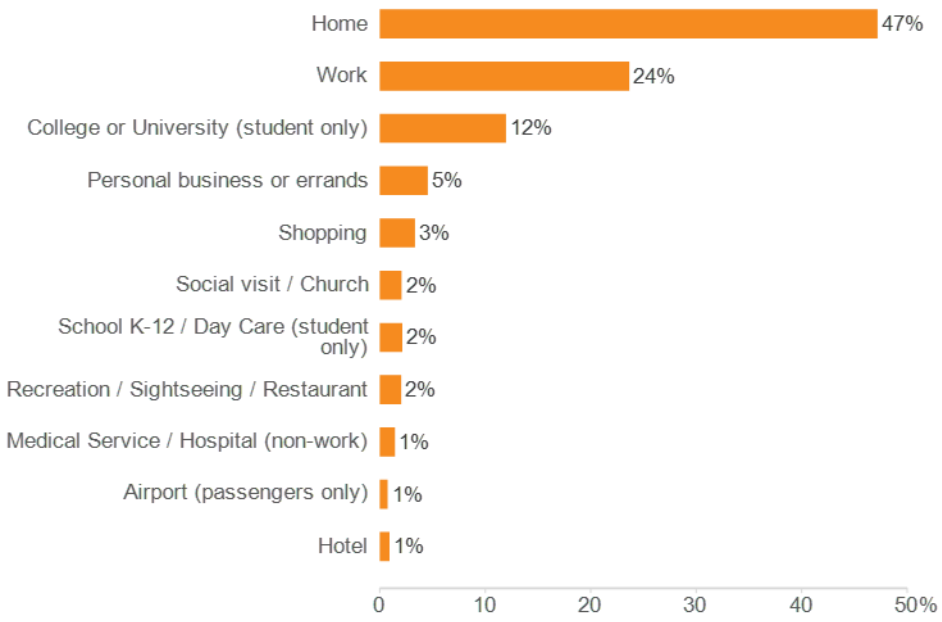
Tapping on, either with an electronic card or a FAREPAY card, is the most popular method to pay fare among respondents (38% and 16% respectively) (Figure 17).

FIGURE 17: FARE PAYMENT



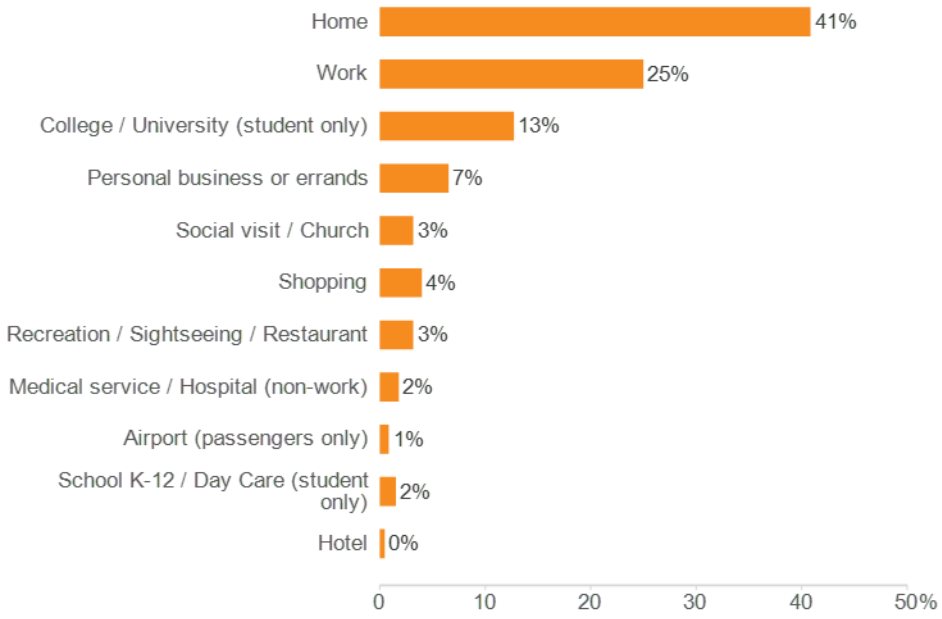
Nearly half of respondents are traveling from their home (47%) and nearly a quarter of respondents are traveling from work (24%) (Figure 18).

FIGURE 18: ORIGIN TYPE



The most reported trip destination among respondents was home (41%) while one in four reported work as their destination (25%) (Figure 19).

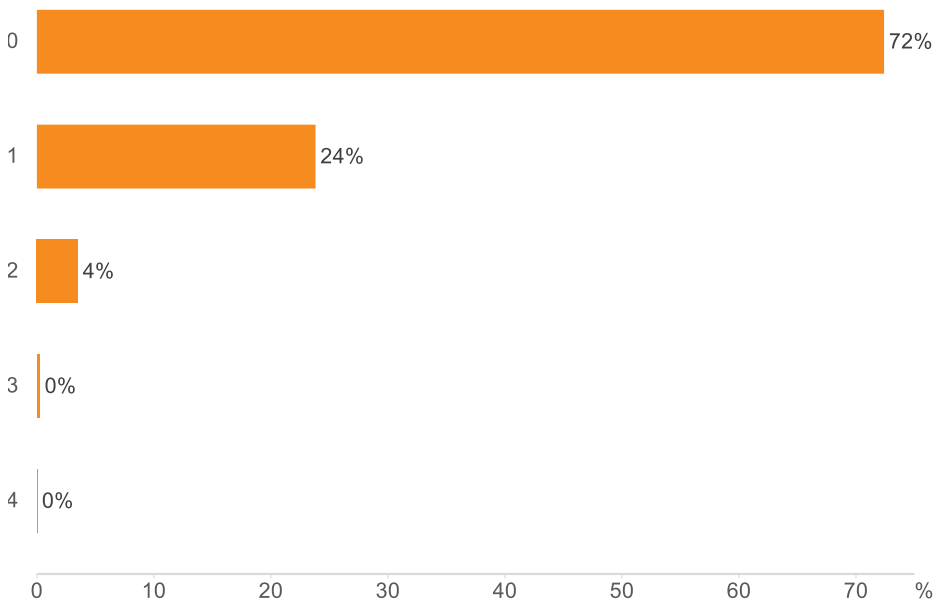
FIGURE 19: DESTINATION TYPE



7.4 TRANSFERS

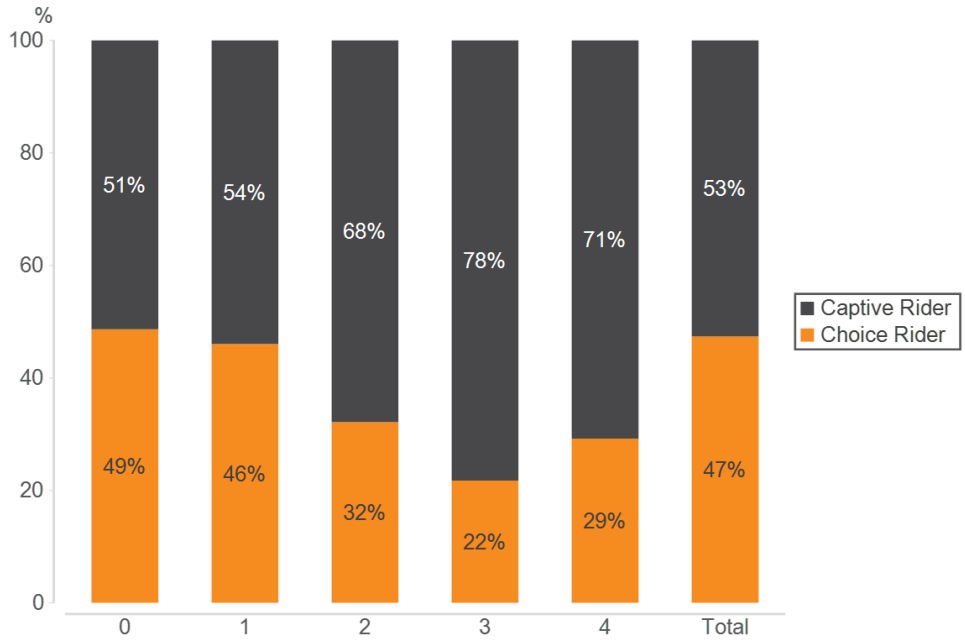
Nearly 70% of surveyed riders required no transfer and fewer than 6% of riders required more than one transfer (Figure 20).

FIGURE 20: TRANSFERS



Captive riders are more likely than choice riders to have more than one transfer on their trip (Figure 21).

FIGURE 21: CHOICE RIDERSHIP BY TOTAL NUMBER OF TRANSFERS



7.5 ACCESS AND EGRESS MODE

Most respondents access transit by walking to the stop or station (77%) (Figure 22). After alighting the bus or train, a slighter higher percentage of respondents walk to their destination (80%) (Figure 23).

FIGURE 22: ACCESS MODE

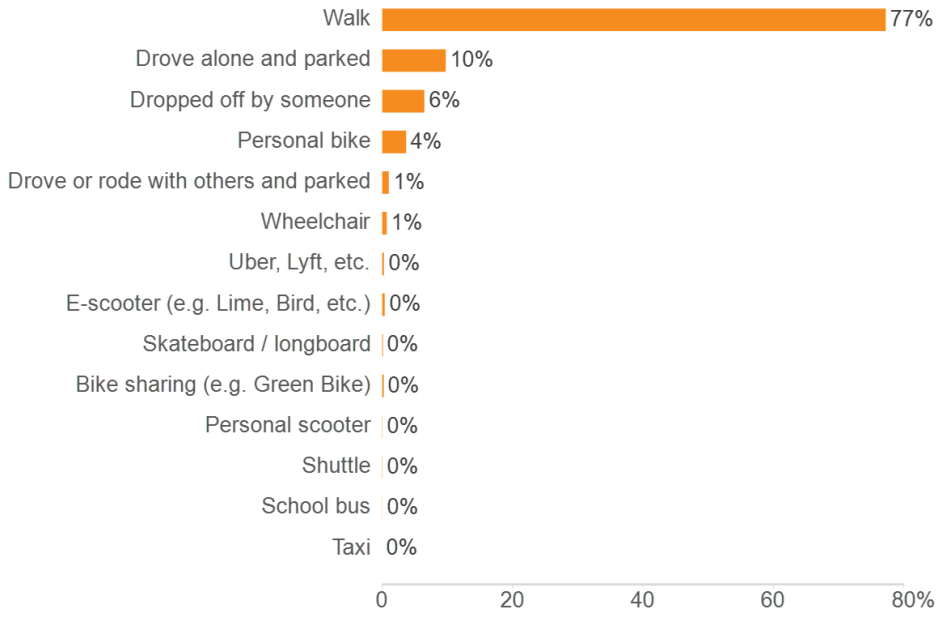
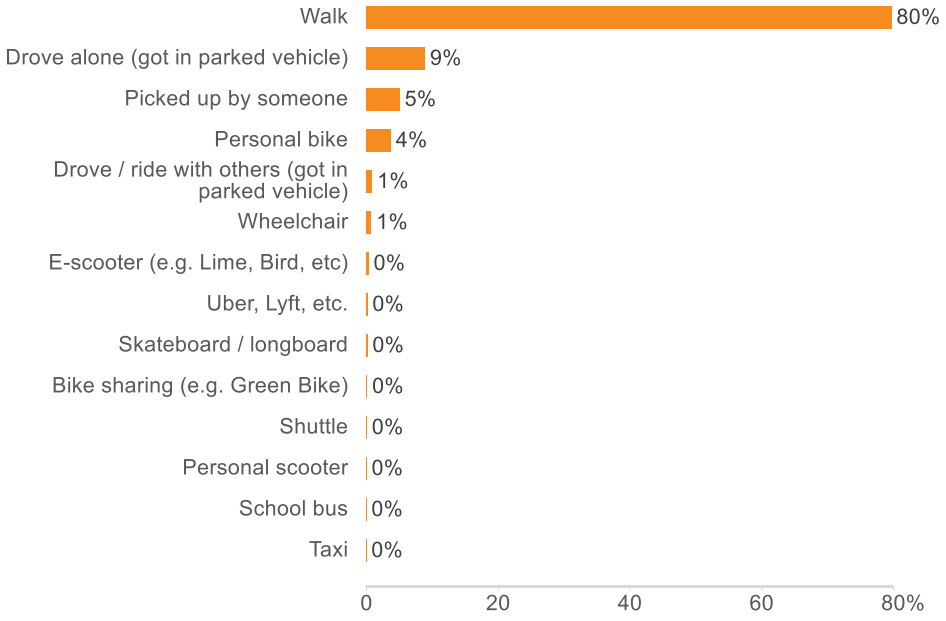


FIGURE 23: EGRESS MODE



Respondents traveling from their home are the most likely to report accessing transit by driving alone and parking at or near the station (Table 5). Respondents traveling to their home are similarly the most likely to get in a parked vehicle and drive alone after alighting from a bus or train (Table 6).

TABLE 5: ACCESS MODE BY ORIGIN TYPE

	HOME	WORK	COLLEGE / UNIVERSITY	PERSONAL BUSINESS OR ERRANDS	SHOPPING	OTHER
Walk	65%	87%	94%	86%	94%	83%
Drove alone and parked	19%	2%	1%	2%	0%	1%
Dropped off by someone	8%	6%	2%	5%	1%	9%
Personal bike	4%	4%	3%	5%	3%	4%
Drove or rode with others and parked	2%	1%	0%	0%	0%	1%
Other	2%	1%	1%	2%	2%	3%

TABLE 6: EGRESS MODE BY DESTINATION TYPE

	HOME	WORK	COLLEGE / UNIVERSITY	PERSONAL BUSINESS OR ERRANDS	SHOPPING	OTHER
Walk	65%	89%	95%	88%	90%	85%
Drove alone (got in parked vehicle)	21%	1%	0%	1%	1%	1%
Picked up by someone	7%	3%	1%	4%	3%	8%
Personal bike	4%	5%	2%	5%	2%	3%
Drove / ride with others (got in parked vehicle)	2%	0%	0%	0%	0%	1%
Other	1%	2%	1%	3%	5%	2%

8.0 ORIGIN-DESTINATION ANALYSIS

The two maps below illustrate trip production and attraction by medium TAZ district. Figure 24 shows that trip production is observed at significant rates from zones throughout the UTA service area, with the highest rates observed in the population centers of Salt Lake City, Provo, and Orem. Figure 25 shows that trip attractions are more confined to these core population and job centers in the region.

FIGURE 24: TRIP PRODUCTION MAP BY ZONE

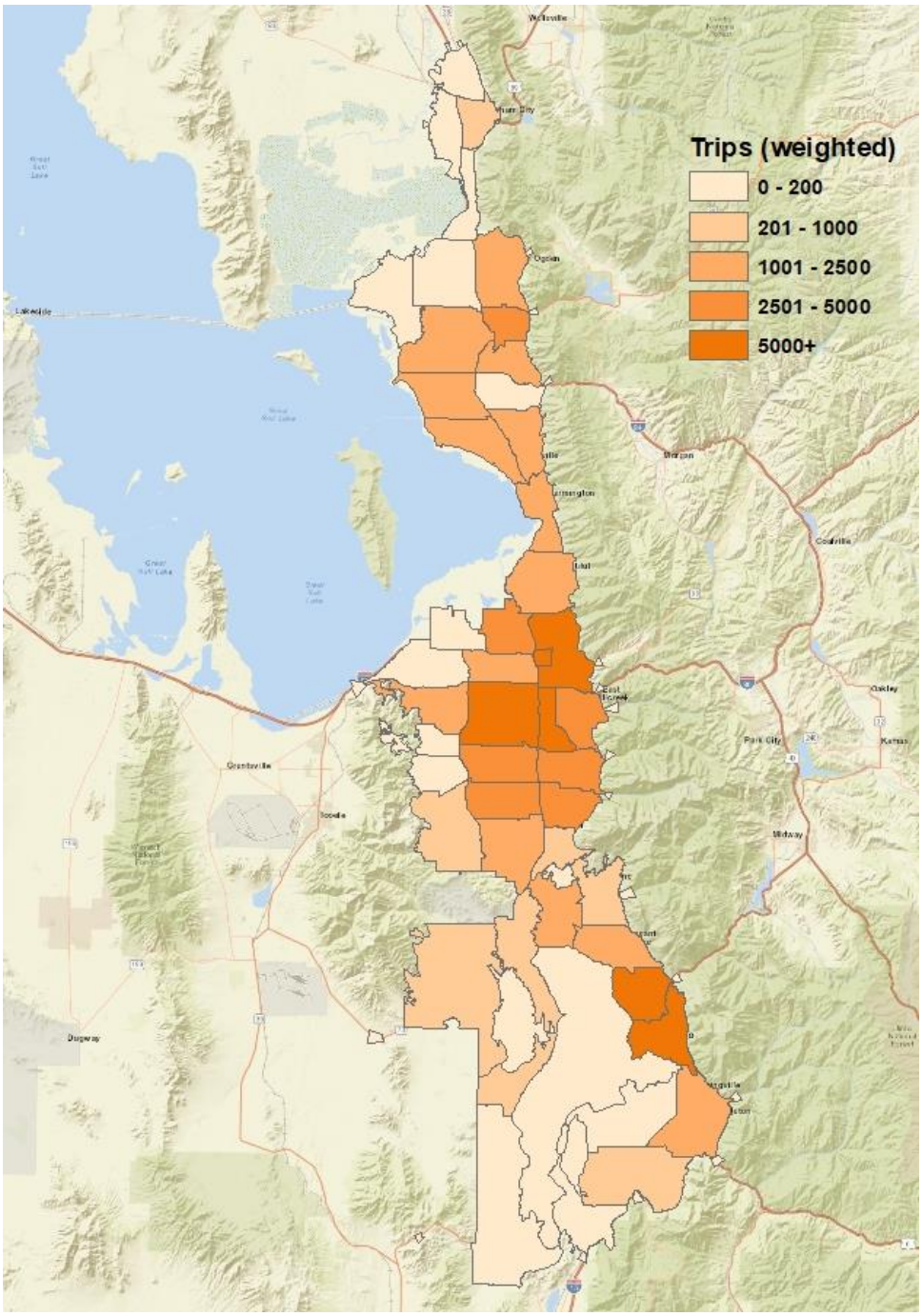
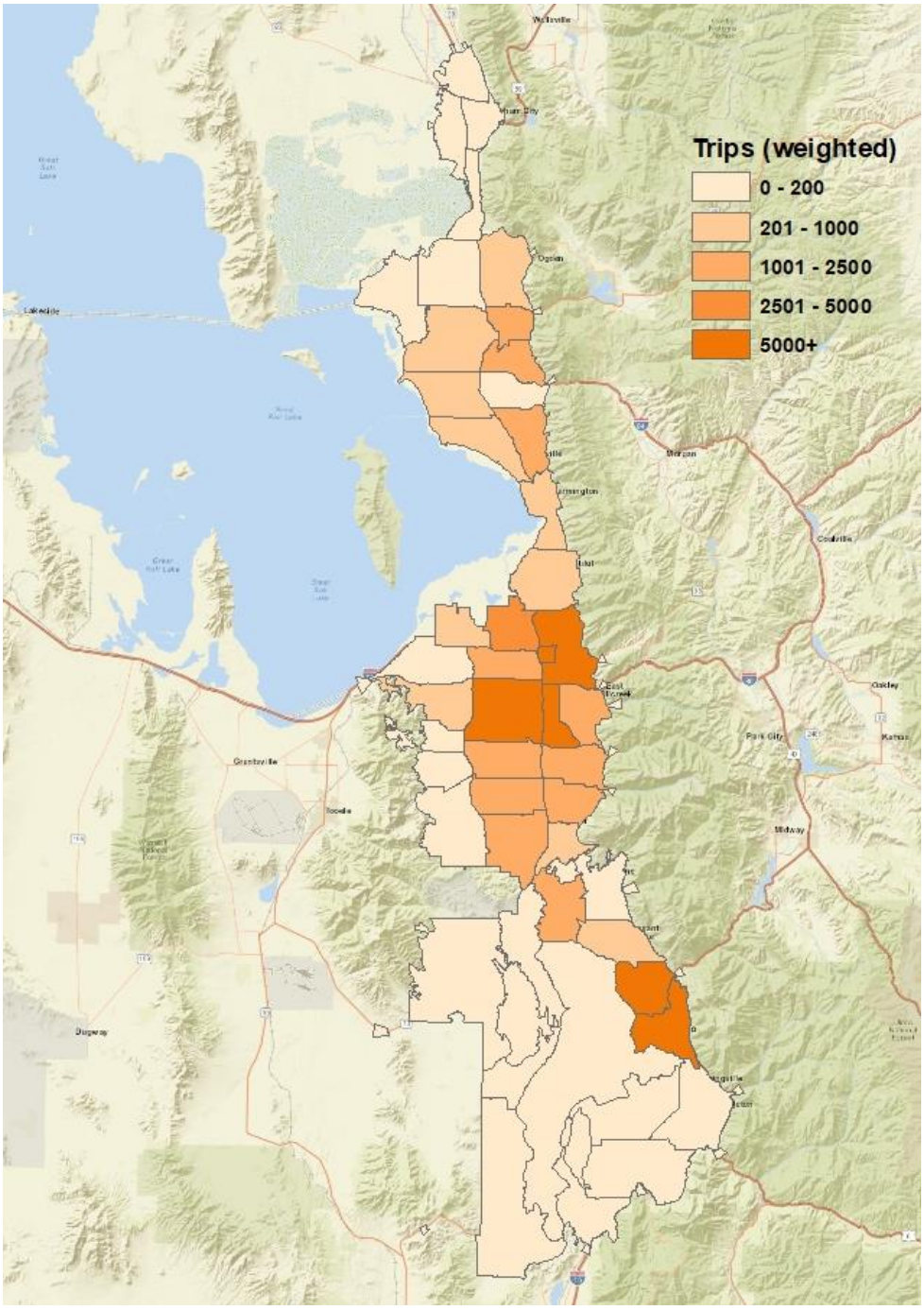


FIGURE 25: TRIP ATTRACTION MAP BY ZONE



The charts and table below detail trip production and attraction by zone (weighted and expanded). The geographical unit is again medium TAZ districts, which can be referenced in Figure 1 and Table 4. Figure 26 and Figure 27 show that SLC east of I-15 is the largest production and attraction zone in the UTA service area. Figure 28 shows the largest ten production-attraction zone pairs. Of over 2,000 total zone pairs, the top ten pairs encompass over one-third of all trips. Travel between and within SLC east of I-15 and SLC CBD accounts for nearly 20% of all trips while travel between and within Provo and Orem-Vineyard accounts for approximately 10% of total trips.

FIGURE 26: TRIP PRODUCTION BY MEDIUM TAZ DISTRICT

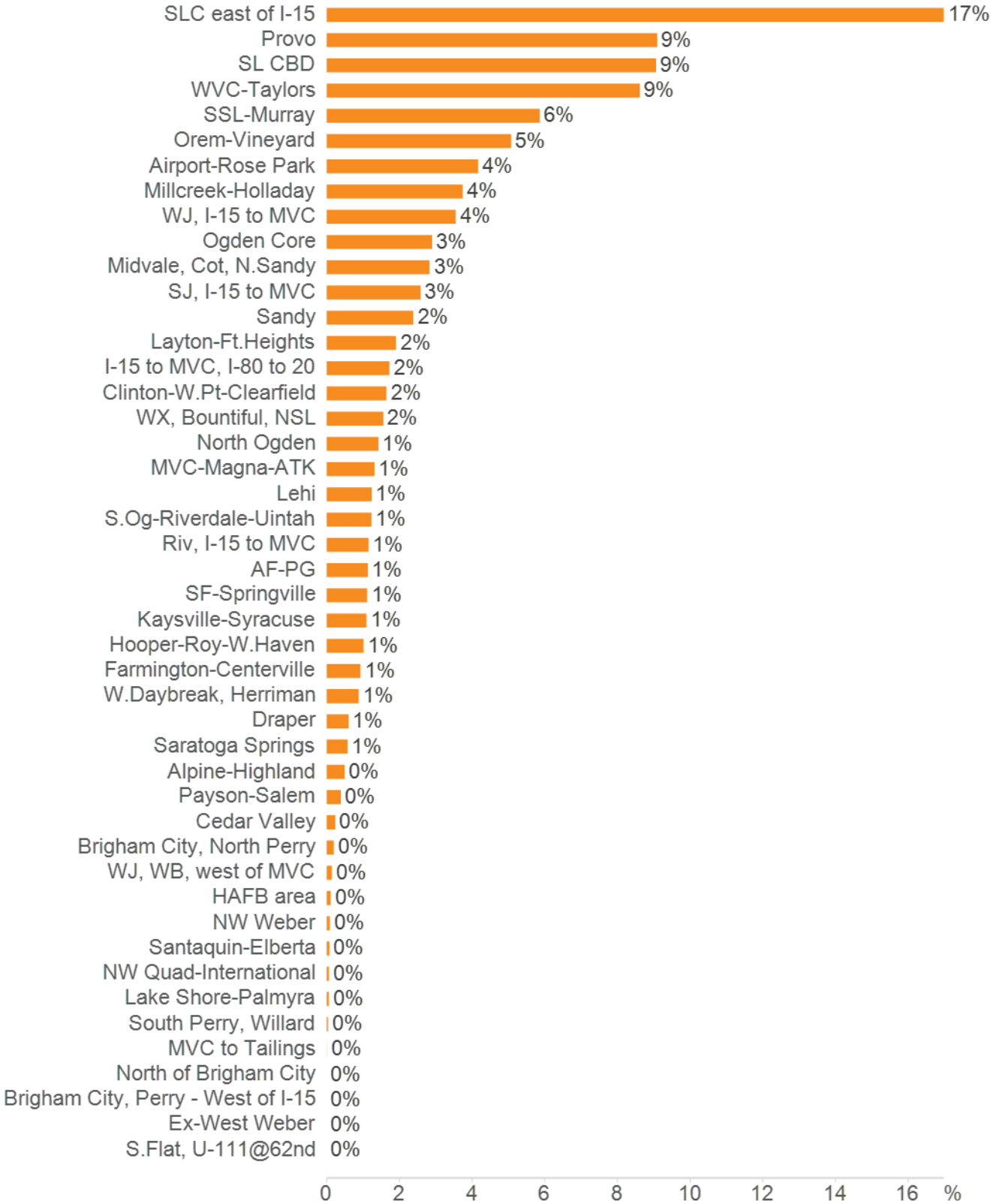


FIGURE 27: TRIP ATTRACTION BY MEDIUM TAZ DISTRICT

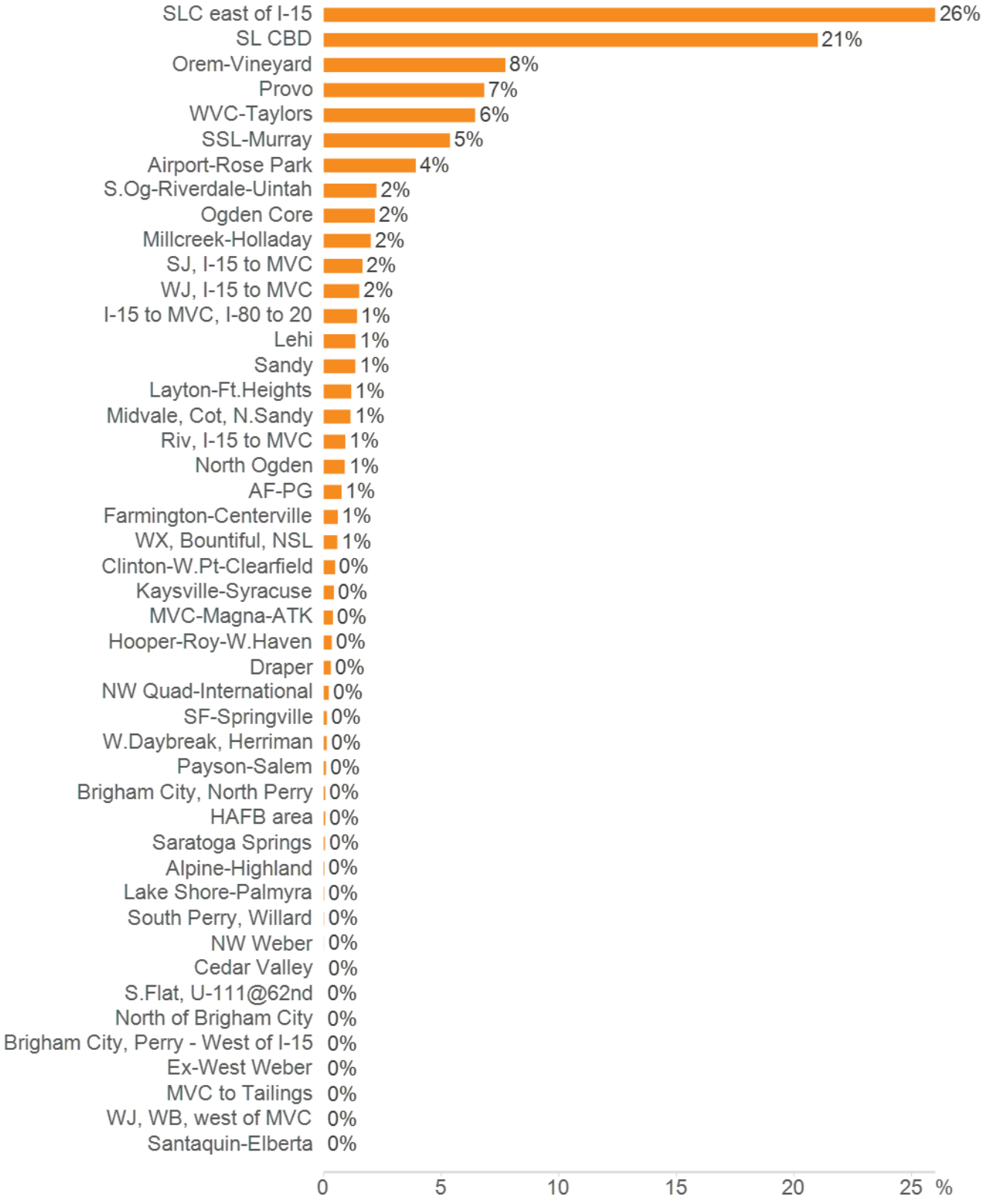
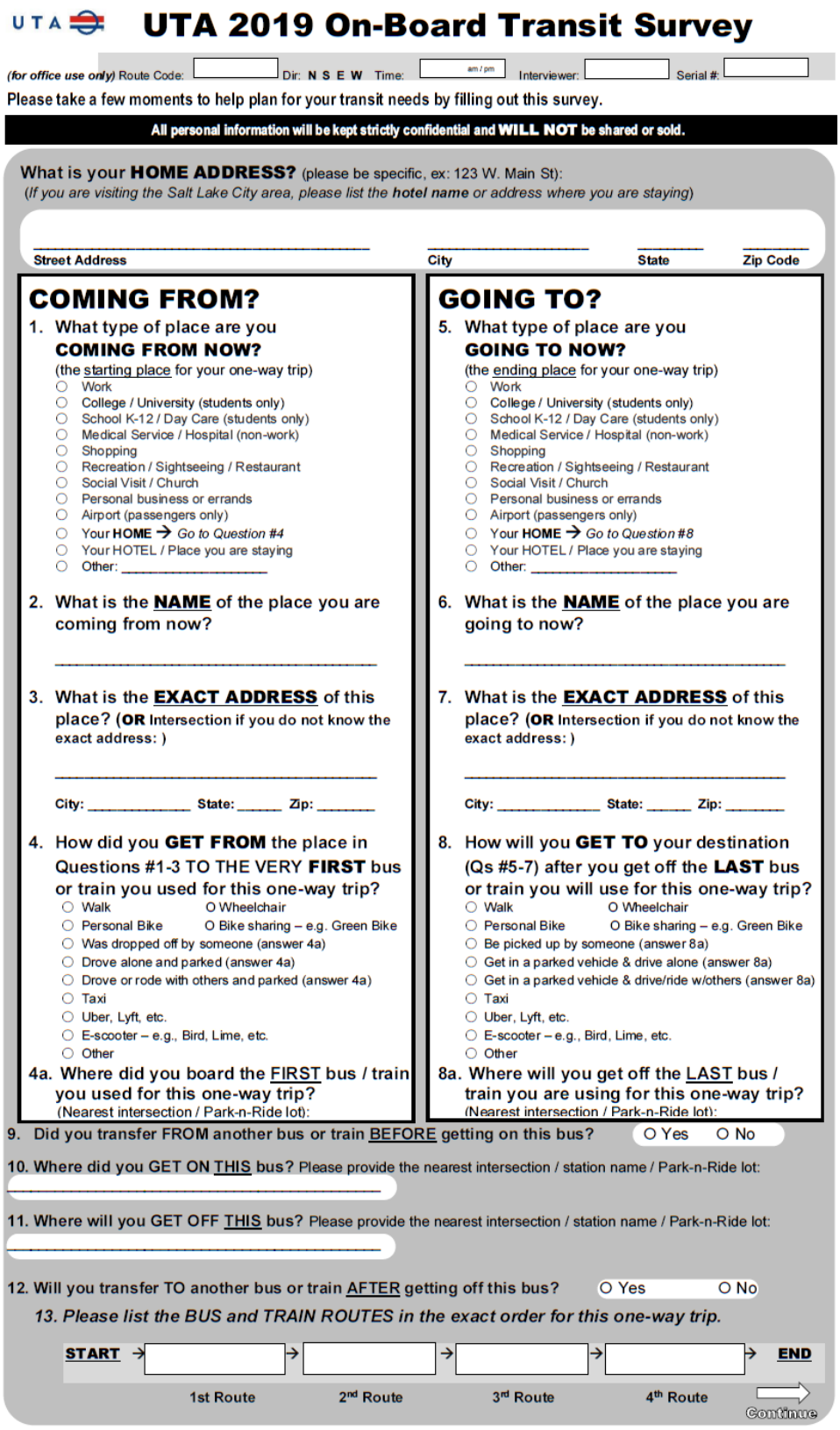


FIGURE 28: LARGETS UTA PRODUCTION-ATTRACTION ZONE PAIRS

RANK	PRODUCTION ZONE	ATTRACTION ZONE	% OF ALL TRIPS
1	SLC east of I-15	SLC east of I-15	8.4%
2	SLC east of I-15	SL CBD	4.4%
3	SL CBD	SLC east of I-15	3.9%
4	Provo	Provo	3.6%
5	Provo	Orem-Vineyard	3.0%
6	SL CBD	SL CBD	2.5%
7	WVC-Taylors	WVC-Taylors	2.5%
8	Orem-Vineyard	Orem-Vineyard	2.3%
9	SSL-Murray	SLC east of I-15	1.8%
10	WVC-Taylors	SLC east of I-15	1.7%

9.0 APPENDIX A: QUESTIONNAIRE



UTA

UTA 2019 On-Board Transit Survey

(for office use only) Route Code: ____ Dir: N S E W Time: ____ am / pm Interviewer: ____ Serial #: ____

Please take a few moments to help plan for your transit needs by filling out this survey.

All personal information will be kept strictly confidential and WILL NOT be shared or sold.

What is your **HOME ADDRESS?** (please be specific, ex: 123 W. Main St):
(*If you are visiting the Salt Lake City area, please list the **hotel name** or address where you are staying*)

Street Address _____ City _____ State _____ Zip Code _____

COMING FROM?

1. What type of place are you **COMING FROM NOW?**
(the starting place for your one-way trip)
- ○ Work
- ○ College / University (students only)
- ○ School K-12 / Day Care (students only)
- ○ Medical Service / Hospital (non-work)
- ○ Shopping
- ○ Recreation / Sightseeing / Restaurant
- ○ Social Visit / Church
- ○ Personal business or errands
- ○ Airport (passengers only)
- ○ Your **HOME** → *Go to Question #4*
- ○ Your HOTEL / Place you are staying
- ○ Other: _____

2. What is the **NAME** of the place you are coming from now?
_____

3. What is the **EXACT ADDRESS** of this place? (**OR** Intersection if you do not know the exact address:)
_____
City: _____ State: _____ Zip: _____

4. How did you **GET FROM** the place in Questions #1-3 TO THE VERY **FIRST** bus or train you used for this one-way trip?
- ○ Walk ○ Wheelchair
- ○ Personal Bike ○ Bike sharing – e.g. Green Bike
- ○ Was dropped off by someone (answer 4a)
- ○ Drove alone and parked (answer 4a)
- ○ Drove or rode with others and parked (answer 4a)
- ○ Taxi
- ○ Uber, Lyft, etc.
- ○ E-scooter – e.g., Bird, Lime, etc.
- ○ Other

4a. Where did you board the FIRST bus / train you used for this one-way trip?
(Nearest intersection / Park-n-Ride lot):

GOING TO?

5. What type of place are you **GOING TO NOW?**
(the ending place for your one-way trip)
- ○ Work
- ○ College / University (students only)
- ○ School K-12 / Day Care (students only)
- ○ Medical Service / Hospital (non-work)
- ○ Shopping
- ○ Recreation / Sightseeing / Restaurant
- ○ Social Visit / Church
- ○ Personal business or errands
- ○ Airport (passengers only)
- ○ Your **HOME** → *Go to Question #8*
- ○ Your HOTEL / Place you are staying
- ○ Other: _____

6. What is the **NAME** of the place you are going to now?
_____

7. What is the **EXACT ADDRESS** of this place? (**OR** Intersection if you do not know the exact address:)
_____
City: _____ State: _____ Zip: _____

8. How will you **GET TO** your destination (Qs #5-7) after you get off the **LAST** bus or train you will use for this one-way trip?
- ○ Walk ○ Wheelchair
- ○ Personal Bike ○ Bike sharing – e.g. Green Bike
- ○ Be picked up by someone (answer 8a)
- ○ Get in a parked vehicle & drive alone (answer 8a)
- ○ Get in a parked vehicle & drive/ride w/others (answer 8a)
- ○ Taxi
- ○ Uber, Lyft, etc.
- ○ E-scooter – e.g., Bird, Lime, etc.
- ○ Other

8a. Where will you get off the LAST bus / train you are using for this one-way trip?
(Nearest intersection / Park-n-Ride lot):

9. Did you transfer FROM another bus or train BEFORE getting on this bus? ○ Yes ○ No

10. Where did you GET ON THIS bus? Please provide the nearest intersection / station name / Park-n-Ride lot:
_____

11. Where will you GET OFF THIS bus? Please provide the nearest intersection / station name / Park-n-Ride lot:
_____

12. Will you transfer TO another bus or train AFTER getting off this bus? ○ Yes ○ No

13. Please list the BUS and TRAIN ROUTES in the exact order for this one-way trip.

START → [ ] → [ ] → [ ] → [ ] → END
1st Route 2nd Route 3rd Route 4th Route

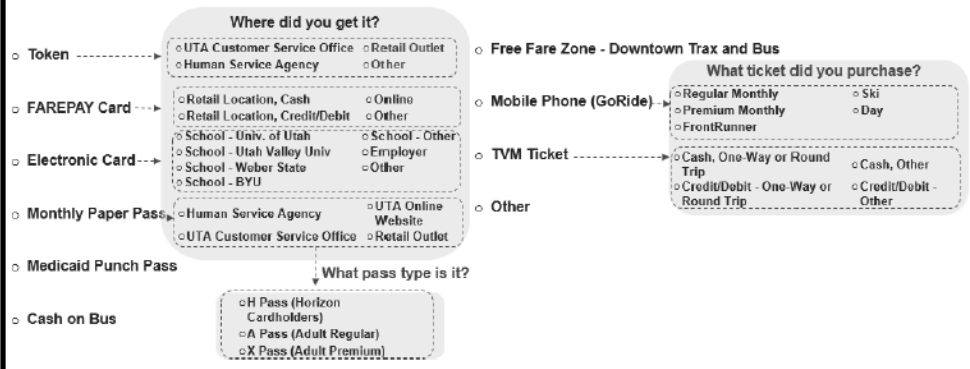
Continue

OTHER INFORMATION ABOUT THIS TRIP

14. What time did you BOARD this bus? _____ : _____ am / pm (circle one)

15. Will you (or did you) make this same trip using the same transit routes in exactly the opposite direction today? ○No ○Yes - At what time did/will you leave for this trip in the opposite direction? _____:_____ am/pm (circle one)

16. How did you pay your fare today?



17. How often do you ride UTA? ○ 7 days per week ○ 6 days per week ○ 5 days per week ○ 4 days per week ○ 3 days per week ○ 2 days per week ○ 1 day per week ○ Less than once per week ○ First time riding

18. Did you have another option to make this trip today?
○ Yes- I could have driven, carpooled, biked, taxi, Uber, E-scooter, bike share, etc.
○ No- Riding UTA or walking was my only option

ABOUT YOU AND YOUR HOUSEHOLD

19. How many vehicles (cars, trucks, or motorcycles) are available to your household? _____ vehicles

19a. [If #19 is more than NONE] Could you have used one of these vehicles for this trip? ○ Yes ○ No

19b. [If #19 is NONE] Are you planning to buy a car as soon as you are able? ○ Yes ○ No

20. Including YOU, how many people live in your household? _____ people

21. Including YOU, how many people (over age 15) in your household are employed full/part-time? ____ people

22. How many children under age 5 are you traveling with today? _____ people

23. What is your employment status? (check the one response that BEST describes you)

○ Employed full-time ○ Employed part-time ○ Self-Employed (full or part-time)
○ Homemaker ○ Retired ○ Not currently employed

24. What is your student status? (check the one response that BEST describes you)

○ Not a student ○ Yes – Full or Part-time College/university ○ Yes – K - 12th grade

25. Do you have a disability? ○ Yes ○ No

25a. [If #25 is Yes] Does your disability limit your access to transportation? ○ Yes ○ No ○ Prefer not to answer

26. Do you have a valid driver's license? ○Yes ○No

27. Do you have a smartphone *(e.g. iPhone, Android / Windows Phone, Blackberry, etc.)*? ○ Yes ○ No

28. What is your AGE? ○Under 16 ○ 16-17 ○ 18-24 ○ 25-34 ○ 35-44 ○ 45-54 ○ 55-64 ○ 65+

29. What is your race / ethnicity? *(check all that apply)*

○ American Indian / Alaska Native ○ Asian ○ Black/African American ○ Hispanic/Latino
○ Native Hawaiian / Pacific Islander ○ White ○ Other: _____

30. What is your gender? ○ Female ○ Male ○ Other

31. Do you speak a language other than English at home? ○ No ○Yes - Which language? _____

31a. [If #31 is Yes] How well do you speak English? ○ Very Well ○ Well ○ Less than well ○ Not at all

32. Which of the following BEST describes your TOTAL ANNUAL HOUSEHOLD INCOME in 2018 before taxes?

○ Less than $18,000 ○ $32,000 - $39,999 ○ $60,000 - $74,999 ○ $150,000 - $199,999
○ $18,000 - $24,999 ○ $40,000 - $44,999 ○ $75,000 - $99,999 ○ $200,000 - $249,999
○ $25,000 - $31,999 ○ $45,000 - $59,999 ○ $100,000 - $149,999 ○ $250,000 or above

Please provide your contact info in the event that we need to contact you to better understand your answers.

Your Name: _____

Phone Number: (_____) _____

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