



2023 UTAH MOVES TRANSPORTATION SURVEY: FINAL REPORT



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Prepared for UDOT, UTA, CMPO, Dixie MPO, MAG, and WFRC



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2023 Utah Moves Transportation Survey: Final Report

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CONTENTS

This table of contents is navigable in Microsoft Word by clicking “Ctrl” and the section of interest. Users can also use the navigation pane in Microsoft Word or most PDF viewers.

1.0 EXECUTIVE SUMMARY	4
1.1 PROGRAM OBJECTIVES AND HIGHLIGHTS	4
1.2 SURVEY RESULTS	7
2.0 HOUSEHOLD TRAVEL SURVEY	9
2.1 METHODOLOGY	9
2.2 SURVEY SAMPLING	9
SAMPLING FRAME AND METHOD	10
SAMPLE GEOGRAPHIES	10
SAMPLE STRATA	12
SAMPLE RATES	12
2.3 SURVEY DESIGN	14
PARTICIPATION GROUP ASSIGNMENTS	14
TRAVEL DATE ASSIGNMENTS	14
STUDY COMPONENTS	14
PROXY REPORTING FOR CHILD TRIPS	14
LANGUAGE OPTIONS	14
SURVEY INCENTIVES	14
2.4 SURVEY BRANDING	15
2.5 SURVEY INVITATION MATERIALS	15
2.6 SURVEY WEBSITE	17

2.7 PARTICIPANT SUPPORT	17
OUTBOUND PARTICIPANT SUPPORT	17
INBOUND PARTICIPANT SUPPORT	18
2.8 DATASET PREPARATION	18
2.9 SURVEY WEIGHTING.....	19
2.10 SURVEY RESULTS.....	20
NOTES FOR DATA USERS	20
TRIP RATE AND TRAVEL DAY ANALYSIS.....	21
3.0 UNIVERSITY SURVEY.....	33
3.1 SURVEY DESIGN.....	33
3.2 SURVEY RESULTS.....	34
4.0 FOLLOW-ON & LONG-DISTANCE SURVEY	37
4.1 SURVEY DESIGN.....	37
4.2 FOLLOW-ON SURVEY RESULTS	38
4.3 LONG-DISTANCE SURVEY RESULTS	46
5.0 CONCLUSION	48

LIST OF FIGURES

FIGURE 1: MAP OF THE SURVEY REGION, SHOWING SAMPLE GEOGRAPHIES BY BLOCK GROUP	11
FIGURE 2: 2023 SURVEY LOGO.....	15
FIGURE 3: 2023 SURVEY POSTCARDS (FRONT AND BACK).....	16
FIGURE 4: SURVEY WEBSITE HOME PAGE	17
FIGURE 5: WEIGHTING TARGETS	20

LIST OF TABLES

TABLE 1: STUDY TIMELINE.....	7
TABLE 2: RESULTS OVERVIEW (UNWEIGHTED)	8
TABLE 3: STUDY REGION HOUSEHOLDS AND PERSONS, BY SAMPLE GROUP	12
TABLE 4: SAMPLE RATES BY SAMPLE GEOGRAPHY	13
TABLE 5: TOTAL HOUSEHOLD & PERSON TRIP RATE BY COUNTY GROUP	22
TABLE 6: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND PURPOSE.....	22
TABLE 7: PERSON TRIP RATE BY COUNTY GROUP AND PURPOSE	23
TABLE 8: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND MODE	24
TABLE 9: PERSON TRIP RATE BY COUNTY GROUP AND MODE.....	24
TABLE 10: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND HOUSEHOLD SIZE	25
TABLE 11: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND NUMBER OF VEHICLES	25
TABLE 12: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND INCOME.....	25
TABLE 13: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND LIFECYCLE	26
TABLE 14: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND NUMBER OF KIDS	26
TABLE 15: PERSON TRIP RATE BY COUNTY GROUP AND AGE	27
TABLE 16: AVERAGE TRIP DURATION (MINS) BY COUNTY GROUP AND TRIP TYPE.....	28
TABLE 17: AVERAGE TRIP DISTANCE (MILES) BY COUNTY GROUP AND TRIP TYPE.....	28
TABLE 18: MODE SHARE BY COUNTY GROUP.....	29
TABLE 19: AUTOMOBILE MODE SHARE BY COUNTY GROUP	29
TABLE 20: NUMBER OF TRAVELERS	30
TABLE 21: TRANSIT MODE SHARE BY COUNTY GROUP	30
TABLE 22: TRANSIT MODE SHARE BY COUNTY GROUP AND NUMBER OF VEHICLES	30

TABLE 23: TIME SPENT TELEWORKING ON A TYPICAL WEEKDAY (TOTAL & BY COUNTY GROUP)	31
TABLE 24: GOODS AND SERVICES DELIVERED TO HOUSEHOLD ON A TYPICAL WEEKDAY (TOTAL & BY COUNTY GROUP).....	32
TABLE 25: UNIVERSITY SURVEY RESPONSES BY UNIVERSITY.....	34
TABLE 26: UNIVERSITY SURVEY (WEEKDAY) TRIP RATE BY PURPOSE.....	35
TABLE 27: UNIVERSITY SURVEY (WEEKDAY) TRIP RATE BY MODE	35
TABLE 28: UNIVERSITY SURVEY TIME SPENT TELEWORKING ON A TYPICAL WEEKDAY.....	35
TABLE 29: UNIVERSITY SURVEY GOODS AND SERVICES DELIVERED TO HOUSEHOLD ON A TYPICAL WEEKDAY.....	36
TABLE 30: DOLLARS INVESTED OUT OF 100 TOTAL PER CATEGORY.....	38
TABLE 31: PREFERRED HOME LOCATION BY CURRENT HOME LOCATION.....	39
TABLE 32: PREFERRED HOME TYPE BY CURRENT HOME TYPE.....	40
TABLE 33: TIMES ONLINE SERVICE USED IN PAST WEEK.....	41
TABLE 34: INTERNET SATISFACTION BY INTERNET PROVIDER.....	42
TABLE 35: PURPOSE OF MOST RECENT FORSAKEN TRIP.....	43
TABLE 36: REASONS FOR NOT USING MODE ON MOST RECENT FORSAKE TRIP.....	44
TABLE 37: FACTORS TO ENCOURAGE TRANSIT TO TRAVEL TO WORK	45
TABLE 38: FACTORS TO ENCOURAGE BIKE USE TO TRAVEL TO WORK	46
TABLE 39: LONG-DISTANCE TRIP DISTANCE BY LOCATION.....	46
TABLE 40: LONG DISTANCE TRIPS BY MODE	47
TABLE 41: LONG-DISTANCE TRIPS BY PURPOSE	47
TABLE 42: PERSON-LEVEL DAILY LONG-DISTANCE TRIP RATE BY HOUSEHOLD INCOME	47

LIST OF ABBREVIATIONS

ABS	Address-based sample
ACS	American Community Survey
BIPOC	Black, Indigenous, or Persons of Color
CMPO	Cache Metropolitan Planning Organization
HH	Household
HTS	Household travel survey
MAG	Mountainland Association of Governments
UDOT	Utah Department of Transportation
UTA	Utah Transit Authority
WFRC	Wasatch Front Regional Council

1.0 EXECUTIVE SUMMARY

1.1 PROGRAM OBJECTIVES AND HIGHLIGHTS

The 2023 Utah Moves Transportation Survey used a modern research approach to collect demographic and travel pattern information from residents throughout Utah. This data collection program was comprised of three separate but related efforts:

- **A household travel survey (HTS)** designed to collect typical travel information from residents on at least one weekday in the Spring of 2023. This effort excluded residents living in group quarters (e.g., dorms on college campuses).
- **A university survey** designed to collect typical travel information from college and university students on at least one weekday in the Spring of 2023. This survey targeted students from eight colleges and universities throughout the state.
- **A supplemental & long-distance survey** to collect additional attitudinal information and long-distance travel patterns from survey respondents.

This type of data was last collected in 2012. The 2023 program built on the 2012 work by applying the latest methods (e.g., smartphone app data collection) and tailoring the survey goals to current data needs in the state. The sections below highlight the key elements of each data collection effort included in the 2023 program.

HTS Key Elements

- **Two-part study:**
 - Part one (the “recruit survey”) gathered data on the household’s demographic composition and typical travel behaviors.
 - Part two (the “travel diary”) gathered individual travel data during a specified travel period for all members of the household (HH).
- **Multiple modes of data collection:**
 - Households with smartphones had the option to complete their travel diaries using the rMove™ smartphone app for up to seven consecutive days.
 - Households without smartphones (or who preferred not to use smartphones) participated by completing their travel diary online (rMove for Web) or by calling into the survey call center. These households reported travel for one day (Tuesday, Wednesday, or Thursday).
- **A primarily address-based sample (ABS) and mailed survey invitations:**
 - The study primarily used ABS to select households for participation. ABS involves drawing a random sample of addresses from all residential addresses in that area. Using this probability-based method, all households within each

defined area have an equal chance of selection for the sample. This approach improves confidence in the weighted data results.

- The ABS included oversampling to improve the representativeness and quality of the final dataset. Oversampling focused on low-income households, higher minority populations areas, and persons who were more likely to use active transportation and transit modes.
 - Invited households received a letter packet with comprehensive details about the survey and a “reminder” postcard over the course of approximately two weeks.
 - The project team also targeted a small share of the sample through non-probability-based methods using transit rider lists and partnering with community health workers. These methods were ultimately less effective in securing sample than the ABS methods and yielded a small sample.
- **Advanced technologies and aligned questionnaires:**
 - The rMove app was the primary mode for travel data collection, which offered significant benefits for data quality and quantity (e.g., detailed trip paths, and lower degrees of underreporting).
 - The smartphone-based (rMove) and online-based (rMove for Web) questionnaires were largely consistent to ensure a single, consistent dataset at the end of the survey. The call center also used the rMove for Web instrument to facilitate participation.
 - Integration of maps and placename search (via the Bing Maps API) helped capture and validate location and travel data.
 - **Minimized respondent burden and increased engagement:**
 - The survey offered gift card incentives to households that completed the survey to improve the response rates (and thereby lower the overall mailing costs) and representativeness of the dataset.
 - Survey respondents received customized reminders by email, telephone, or within the rMove smartphone app to encourage survey completion.
 - Survey respondents could also contact user support by telephone, email, or within the rMove smartphone app. RSG and user support teams generally provided responses within one business day.
 - The survey branding included an engaging logo and customized website to legitimize the survey and encourage response.



University Survey Key Elements

The university survey largely followed the HTS in design. Elements that differed between the surveys are included below.

- **Recruitment and Invitations**
 - RSG worked with each college or university to determine the best method to invite students. Options included a direct-from-RSG email invitation, an email invitation directly from the school, or advertisement in a school newsletter or email blast.
 - Survey invitations included a brief explanation of the survey’s purpose, its relevance to students, and the gift card raffle incentive (one of forty \$100 Amazon gift cards).
- **Questionnaire**
 - The questionnaire for the university segment was kept largely consistent with the general HTS questionnaire ensure a single, consistent dataset at the end of the survey.
 - Slight differences included any language related to incentives and data elements required for weighting the university survey sample separately (e.g., additional questions about on-campus and off-campus housing).

Follow-on & Long-Distance Key Elements

The follow-on survey, which included a long-distance survey, was a follow-up to the HTS and University surveys described above.

- **Recruitment and Invitations**
 - RSG invited respondents who participated in the original HTS and University surveys and responded that they would be willing to be contacted again for future transportation studies.
 - These email invitations included a short description of the follow-up survey and a unique link to the web-based survey. The invitations also advertised a \$10 digital gift card after completing the survey.
- **Questionnaire**
 - The project team developed a new questionnaire to survey respondents about their mode accessibility, internet connectivity and use, long-distance travel patterns, and residential preferences.
 - The residential questions were designed to align with questions asked in 2012 while the remaining questions were newly designed in 2023.

Changes Compared to Prior Data Collection Effort

While the 2023 survey was designed to allow comparisons to the 2012 survey data, there were several key changes in the survey design, administration, and analysis. These included:

- **The introduction of multi-day smartphone GPS travel diary data collection.** Smartphone data collection results in much larger volumes of data because respondents are less likely to forget or underreport certain types of trips (e.g., short walk trips) and trips are collected over multiple days per person / household. Smartphone data collection also allows more precise location data collection, which can be used for route analysis.
- **Trip rate adjustment in weighting.** The introduction of smartphone data collection also allows for more advance trip rate correction based on travel reporting mode after accounting for differences in demographics and travel behaviors across the reporting modes.
- **Add-on survey design.** The 2012 survey included several add-on survey efforts, including a long-distance diary, college diary, bicycle & pedestrian survey, attitude survey, transit on-board survey, and residential choice survey. The 2023 survey maintained many of these add-on themes but scaled back the number of questions and separate surveys. For this reason, the data collection methods (e.g., recruitment approach and timing) also varied between 2012 and 2023.

Project Timeline

Table 1 documents the project's schedule.

TABLE 1: STUDY TIMELINE

Phase	Timeline
Scope the project goals and key components	July – October 2022
Design the survey questionnaires, sampling plan, and invitations	October 2022 – January 2023
Program and test survey instruments	December 2022 – January 2023
Conduct HTS & university survey	February – June 2023
Conduct follow-on & long-distance survey	November 2023
Clean and weight survey data	August 2023 – January 2024
Finalize study documentation	December 2023 – March 2024
Project closure	March 2024

1.2 SURVEY RESULTS

The 2023 Utah Moves Transportation Survey collected a rich set of demographic and travel behavior data from a representative sample of 11,183 households in the state of Utah including

university households. The survey collected data from 29,873 persons, representing 389,089 trips across 56,633 complete person-days from February 15 to June 30, 2023. Table 2 summarizes the dataset composition by survey type.

TABLE 2: RESULTS OVERVIEW (UNWEIGHTED)¹

Survey Type	Households	Persons	Trips	Travel Days
HTS	9,799	25,811	378,033	87,582
University	1,384	4,062	11,056	37,598
Follow-on & Long-Distance*	3,250	-	6,396	-

* Note that follow-on & long-distance survey respondents were invited directly from the HTS and University surveys.

The remainder of this report details the methods and results for each survey. Data users may also visit the survey data explorer for more information and analysis here:

<https://wfrc.shinyapps.io/2023-utah-household-travel-survey/>.

¹ After the survey data was collected, RSG weighted the data to represent the demographic and high-level (PUMA-level) geographic distribution of the county. The weighting process is described further in Section 2.9 below.

2.0 HOUSEHOLD TRAVEL SURVEY

2.1 METHODOLOGY

Overview

The Household Travel Survey collected complete household data from 9,799 households across the state of Utah. The project team invited respondents via mailed invitations as well as UTA and Community Health Worker email lists. Respondents had the option to participate using the rMove™ smartphone app, rMove for Web™, or through a call center.

Survey Questionnaire

RSG used its industry best-practice questionnaire template as the starting point for the survey instrument design and worked with the project team to address the project's specific data needs and customize answer choices (e.g., to align with current travel options while allowing comparability with the 2012 survey). The questionnaire captured all essential household travel survey data needed for use in four-step, hybrid, and activity-based models. The survey questionnaire was additionally translated from English into Spanish for increased accessibility.

Survey Instruments

After determining the final questionnaire, RSG programmed the survey instruments to enable smartphone, web, or phone participation. Households that participated in the survey via smartphone collected travel data for seven days through RSG's smartphone-based travel survey app, rMove. The remaining participants provided their responses through rMove for Web, which asked respondents to report travel for a single Tuesday, Wednesday, or Thursday. Call center interviewers use rMove for Web to collect responses over the telephone to ensure consistent real-time data validation and survey alignment regardless of participation method. By using integrated survey platforms (rMove and rMove for Web), survey responses from all three participation modes are processed using identical logic, validation, and real-time quality assurance checks.

Child Proxy Reporting

In households with children (ages 17 and under), one adult household member reported children's trips where an adult was not present (e.g., walked home from soccer practice with friends), and provided summary-level data for that day (e.g., child went to school).

2.2 SURVEY SAMPLING

The HTS portion of the survey aimed to collect 9,000 responses through address-based sampling (ABS) and convenience (email list) methods. The HTS ultimately collected 9,799 complete household surveys, exceeding the sample target by 9%. The final sample equates 0.9% sample rate, which is typical of HTS in the United States.

Sampling Frame and Method

Address-Based Sample (ABS)

The sampling frame for this survey was the list of all households in Utah, excluding any households living in group quarters (e.g., university dorms). Using this probability-based method, all households within each of nine geographically-defined area have an equal chance of selection for the sample. Using probability-based sampling also allows for greater confidence in the final weighted² results. RSG purchased household mailing addresses from Marketing Systems Group, which maintains the Computer Delivery Sequence file from the US Postal Service. RSG stratified the sample using Census block group (BG) data from the 2015–2019 ACS.³

Convenience Sample

To complement the ABS, RSG added email-based recruitment to improve the sample composition among populations that typically respond to surveys at rates lower than are ideal for analysis. RSG leveraged UTA transit rider email lists and Community Health Worker contacts to reach additional respondents. Overall, this effort yielded 123 additional complete responses. Given this small sample, the remainder of this document groups the ABS and convenience sample together for analysis.

Sample Geographies

To ensure sufficient sample throughout the state, the project team identified 10 geographic groups, aligned with counties, to stratify the sample based on data and analysis needs in the state. These geographies are shown in Figure 1 below. These groups were:

1. Northwest Counties (Box Elder, Tooele, and Juab Counties)
2. Cache County
3. Davis County
4. Iron County
5. Wasatch Back (E. Weber, Morgan, Summit, and Wasatch Counties)⁴
6. Salt Lake County
7. Utah County

² Weighting is the process of comparing selected demographics in the survey to external control data, like the census or the ACS, and adjusting the profile of the survey dataset to improve the representativeness of the population in the survey area.

³ RSG used the 2015-2019 ACS data to avoid the uncertainty associated with the 2016-2020 ACS data, which included irregular COVID-19 observations. While the 2017-2021 data was not available at the time of sampling, RSG scaled the 2015-2019 household estimates to match county-level estimates in the one-year 2021 ACS data to ensure sample rates are representative of the state's recent growth.

⁴ This group contained all block groups within Morgan, Summit, and Wasatch Counties and the 5 easternmost block groups of Weber County, which were included based on their similar travel patterns.

- 8. Washington County
- 9. W. Weber County⁵
- 10. Rural Core (All other counties)

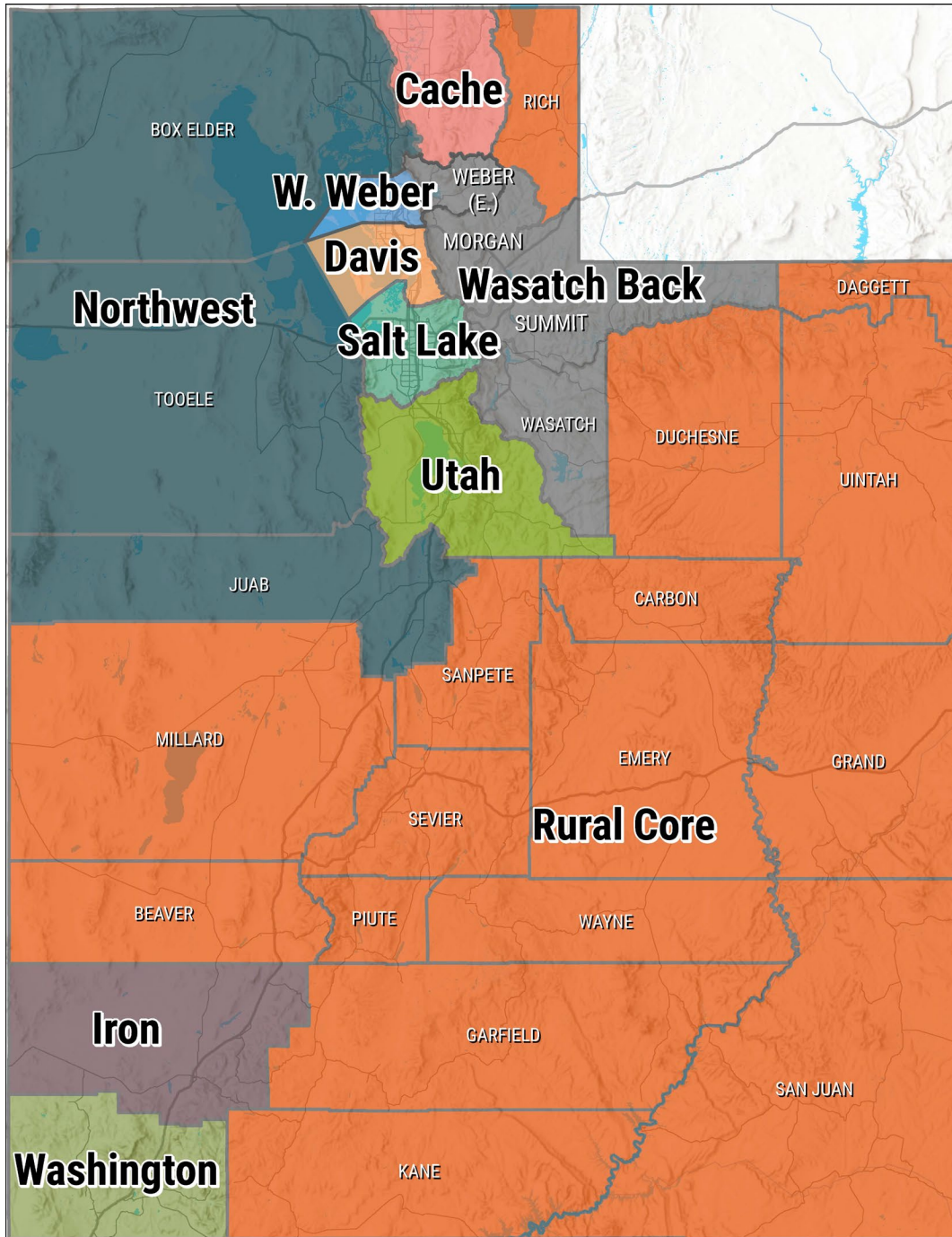


FIGURE 1: MAP OF THE SURVEY REGION, SHOWING SAMPLE GEOGRAPHIES BY BLOCK GROUP

⁵ This group contains the block groups in Weber County west of the primary Wasatch mountain ridgeline.

Sample Strata

Within each geography, the project team used the following mutually exclusive and collectively exhaustive ABS sample strata to ensure representation of groups that are typically hard to reach and provide a larger sample of groups of particular interest. The criteria for oversample strata were designed to improve participation among the hard-to-survey populations and to improve statistical error margins for less-frequently used travel modes ⁶.

- 1) **General population:** Comprised of block groups that did not qualify for oversampling strata below.
- 2) **Hard-to-survey Oversample:** Comprised of block groups in the sample frame with at least 25% of households earning less than \$25,000 per year (“low-income”)⁷ or at least 40% of the households identified as Hispanic or Black, Indigenous, or Persons of Color (BIPOC)⁸.
- 3) **Walk/Bike/Transit Oversample:** Comprised of block groups in the sample frame with at least 25% of persons reporting walk, bicycle, or public transportation as their means of transportation to work⁹ or at least 10% of households owning zero vehicles¹⁰.

Block groups that qualified for both the Hard-to-survey and Walk/Bike/Transit segments were classified as Walk/Bike/Transit. The households and persons by sample group are listed below.

TABLE 3: STUDY REGION HOUSEHOLDS AND PERSONS, BY SAMPLE GROUP

SAMPLE STRATA	NUMBER OF BGS	TOTAL HOUSEHOLDS	TOTAL ADULTS	ADULTS PER HOUSEHOLD
Walk/Bike/Transit	207	132,212	262,567	1.99
Hard-to-survey	276	164,671	359,183	2.18
General	1,198	799,495	1,713,063	2.14
Total	1,681	1,096,378	2,334,813	2.13

Sample Rates

Table 4 shows the resulting ABS sample rates by sample geography. Note that the table includes “responses” (prior to final trip path cleaning) and “completes” (following trip path cleaning). The “response rate” calculation relies on the former while the “sample rate” relies on the latter. Section 2.8 describes the trip path cleaning process and justification in more detail.

⁶ <https://wfrc.org/public-involvement/equity-planning/>

⁷ Based on 2019 – 2015 ACS table B19001

⁸ Based on 2019 – 2015 ACS table B03002

⁹ Based on 2019 – 2015 ACS table B08301

¹⁰ Based on 2019 – 2015 ACS table B25044

TABLE 4: SAMPLE RATES BY SAMPLE GEOGRAPHY

SAMPLE GEOGRAPHY	TOTAL HOUSEHOLDS	INVITED	TARGET	RESPONSES	COMPLETES	RESPONSE RATE ¹¹	SAMPLE RATE ¹²
Box Elder, Tooele, Juab	46,659	17,818	469	449	423	2.5%	0.9%
Cache	43,102	19,466	665	784	755	4.0%	1.8%
Davis	114,118	29,455	829	862	800	2.9%	0.7%
Iron	20,108	15,872	219	370	342	2.3%	1.7%
Morgan, Summit, Wasatch	32,690	17,007	306	360	347	2.1%	1.1%
Salt Lake	420,299	136,704	3,523	3,554	3,310	2.6%	0.8%
Utah	194,257	46,155	1,473	1,689	1,614	3.7%	0.8%
Washington	68,092	26,058	524	633	576	2.4%	0.8%
Weber	90,012	30,957	730	731	688	2.4%	0.8%
All other counties	67,041	11,358	262	244	224	2.1%	0.3%
Total	1,096,378	350,850	9,000	9,676	9,079	2.8%	0.8%

¹¹ Response rate = Responses / Invited.

¹² Sample rate = Completes / Total Households.

2.3 SURVEY DESIGN

Participation Group Assignments

Part 1 of the survey asked adults (age 18+) to share whether they had Apple or Android smartphones. Households in which all adults had Apple or Android smartphones were offered the option to report their travel in the rMove app for seven consecutive days. All other households and those who opted out of rMove app participation reported their travel online or to the call center, for one day; this data was input using rMove for Web.

Travel Date Assignments

rMove app households were assigned to a seven-day travel period beginning 1 – 4 days after completing part 1 (depending on household size and the day on which they completed part 1). rMove for Web households were assigned to the next Tuesday, Wednesday, or Thursday, assigned roughly proportionally across each of the three weekdays.

Study Components

Part 1 collected general demographic information (e.g., household size and person age) and established information to facilitate part 2 (e.g., home/school/work addresses and number of vehicles). Part 2 collected all trip and travel day information and any person-level information (e.g., how often the participant teleworks or uses transit).

Proxy Reporting for Child Trips

Among rMove households, only adults related to the main respondent were required to use the app on their smartphones. One rMove adult in each household was also designated to proxy report travel information for all children (under 18) in the household on a single travel day. This adult was asked to add trips to a child's roster if the child made an independent trip (e.g., riding the bus to school) or made a trip with someone outside of the household (e.g., getting a ride with a friend's parents). The app also accounted for children accompanying adults in the survey household.

Among online households, one adult (unassigned) was required to complete a full one day travel diary for the children of the household. Like rMove, adult proxy reporters could copy children's trips from other adults and report new trips that the children made on their own.

Language Options

The invitation materials and survey were available in both English and Spanish. The call center was also available in both languages.

Survey Incentives

RSG offered \$15–\$35 Amazon, Walmart, or Visa gift card incentives to all households that completed the survey. Travel surveys offer incentives to boost response rates and the quality of

respondent data, and to decrease the overall project cost by reducing the number of mailed invitations. Without incentives, the number of required households to invite increases, and this increased mailing cost is greater than the cost of providing incentives. rMove app households were offered one \$25-\$35 gift card per adult after all related adults had completed the survey. Online households were offered one \$15-\$25 gift card per household. Households could also choose to receive no gift card. The gift card amount was dependent on the sampling segment and reported demographic information. Households with incomes below \$35,000, five or more household members, persons reporting non-White race, or persons reporting Hispanic ethnicity as well as households in the hard-to-reach sampling segment were offered a higher incentive upfront to encourage participation.

2.4 SURVEY BRANDING

RSG developed the survey branding collaboratively with project team to ensure that the design fit the various regions in Utah. The complete branding package included the survey name, logo, color scheme, and font selections. The final 2023 survey logo is shown in Figure 2.

FIGURE 2: 2023 SURVEY LOGO



2.5 SURVEY INVITATION MATERIALS

Each invited household received two mailings:

- **Invitation Packet:** The cover letter explained the survey purpose and described the steps necessary to complete the survey. The invitation packet also included a frequently asked questions sheet.
- **Reminder Postcard:** The reminder postcard arrived at each household approximately one week after the invitation packet. These cards included the survey phone number, website address, and participant login information.

Figure 3 below shows the postcard invitations. Materials were available in both English and Spanish.

FIGURE 3: 2023 SURVEY POSTCARDS (FRONT AND BACK)



2.6 SURVEY WEBSITE

RSG developed a website to describe the survey and facilitate participation. This site was simple, intuitive, and easy to navigate on desktop computers and mobile devices. The website was available in both English and Spanish. Participants could access the survey by entering their access code on the website's home page. Figure 4 shows a screenshot from the survey website.

FIGURE 4: SURVEY WEBSITE HOME PAGE



2.7 PARTICIPANT SUPPORT

The survey used both inbound and outbound participant support. “Inbound” refers to communications that participants initiated, and “outbound” refers to communications that RSG initiated.

Outbound Participant Support

RSG used several types of outbound participant support (beyond the previously mentioned website and invitation materials) to aid survey administration. The primary sources of outbound support were automated email reminders, reminder phone calls, and in-app reminders or notifications (rMove participants only).

Email Reminders and Phone Calls

RSG required all rMove and rMove for Web participants to provide email addresses. Respondents could also provide an optional phone number. Any household that provided an email address received email reminders, while households that only provided a phone number were reminded by phone.

The call center conducted all phone reminders. These reminders occurred on the following schedule:

- One day before each household's travel date.
- One day after each household's travel date.
- Three to five days after each household's travel date (if the household had not yet completed the survey).

Reminder emails occurred on a similar schedule, although more frequently. RSG sent email reminders/notifications throughout the travel period to all households that provided an email address during part 1 of the survey. Households received emails on the following schedule:

- Within an hour of completing part 1.
- Prior to the rMove travel periods (reminding participants to activate the app).
- The day before the travel period began.
- The day after each travel period ended.
- 3–5 days after the end of the travel period if the household had not yet completed the survey.

In-App Reminders (rMove)

rMove participants also had in-app reminders to encourage them to complete all travel days during their survey period. Participants received notifications as soon as a new trip- or day-level survey was available to complete. rMove participants reporting their children's trips by proxy also received reminders to review and add to their children's trip rosters.

Inbound Participant Support

In addition to all outbound participant support, RSG provided three primary means through which participants could contact survey administrators. All participants could call a toll-free number to reach the survey call center or submit questions via email. rMove participants also had the option to submit feedback directly through the app.

2.8 DATASET PREPARATION

Throughout the survey, RSG implemented strict dataset preparation and quality control checks to ensure data was properly collected and stored. Before survey fielding, survey instrument testing confirmed that survey responses were recorded correctly. During data collection, all survey instruments employed real-time validations and logic checks to ensure consistent coding and logical response combinations and to prevent skipped questions. After the data collection period ended, RSG reviewed, cleaned, and processed the raw data to prepare the unweighted dataset for weighting and analysis (described further below). The full steps and details of data processing are provided in the separate dataset user's guides ([Core](#) and [Follow-On](#)).

Initial Data Review

Before reviewing the data for completion, RSG removed households from the dataset that met the following exclusion criteria:

1. Household reported a primary home location outside the survey region. Most households dropped during initial review were excluded for this reason.
2. Household reported contact information that matches other households (indicating duplicates). In these cases, RSG kept the first “household” to report their travel diary and removed the subsequent records.

Completion and Exclusion Criteria

Following the initial data review, households were then further reviewed for survey completion. Households were considered complete if they met the following conditions:

1. The household completed the recruit survey by answering all required questions.
2. The household completed a travel diary for all participating household members on at least one concurrent weekday (Tuesday, Wednesday, or Thursday).

All online households had a single complete travel day. rMove households had at least one complete travel day and up to seven completed travel days. RSG included partially complete rMove travel days in the final dataset but flagged them accordingly. Only complete weekdays were weighted.

rMove Trip Path Review

On March 27, 2023, Apple released iOS 16.4, which included changes to background location tracking. This release impacted many apps like rMove that collect location information in the background. In some cases, iPhone users with iOS 16.4 or later collected irregular trip traces in rMove. RSG updated the rMove app to resolve these inconsistencies, but a portion of the data still included irregularities.

RSG coordinated with the project team to review these traces and exclude suspect data based on trip trace attributes like point density and distribution. The dataset user’s guide details this cleaning process more thoroughly.

2.9 SURVEY WEIGHTING

HTSs cover a fraction of the population, yet the resulting datasets help analyze and make inferences about the population at large. Weighting is the process of comparing selected demographics in the survey to external control data, like the census or the ACS, and adjusting the profile of the survey dataset to improve the representativeness of the population in the survey area.

RSG provided household, person, day, and trip weights for analysis. The full [weighting memo](#) describes the weighting process and outcomes. The targets used for weighting are summarized in Figure 5.

FIGURE 5: WEIGHTING TARGETS

Household-level:	Person-level:
<ul style="list-style-type: none">• Total households• Household size• Number of household workers• Household income• Household vehicle sufficiency• Presence of children	<ul style="list-style-type: none">• Total persons• Gender• Age• Worker status• Race• Ethnicity• Educational attainment• University student status• Commute mode to work

The full weighting process is delineated in a separate [weighting memo](#) provided with the final dataset delivery.

2.10 SURVEY RESULTS

The final HTS dataset included the following survey tables:

- A household table with all household-level attributes (one row per household).
- A person table with all person-level attributes (one row per person).
- A vehicle table with all household vehicle attributes (one row per vehicle).
- A day table with all travel day attributes (one row per travel day).
- A trip table with all trip-level attributes (one row per unlinked trip¹³).
- A location table with trip trace information for all rMove app trips.

Data users can interact with the data and create custom analyses using the survey data explorer here: <https://wfrc.shinyapps.io/2023-utah-household-travel-survey/>. This dashboard allows users to create custom one-way and two-way variable summaries (i.e., crosstabs) and visualize data summaries on a map. All information is aggregated to protect respondents' privacy. Data users who wish to analyze custom geographies or custom-filtered datasets may still need to interact directly with the data files.

RSG separately provided a dataset user's guide, which includes an overview of the dataset, dataset preparation, general tips to use and interpret the data (e.g., how to join tables), and all variable and value labels. The weighting memo describes the process to weight the data to represent the population of Utah.

Notes for Data Users

¹³ Trip records in survey data are generally "unlinked" trips, meaning that they can contain sub-segments for certain trip journeys. For example, the access and egress modes on a transit trip might be split into separate trips for walking/driving to transit, riding transit, then walking to the primary destination.

Although HTS data provide opportunities for many types of analysis, data users should always consider the context when applying the data. The 2023 Utah Moves Transportation Survey was designed to collect typical weekday data from residents in Utah. Therefore, the HTS dataset is not useful for understanding visitor analysis, for example.

Data users should always use weighted data in any analysis intended to draw conclusions about the region (as opposed to the unweighted responses).

Finally, data users should ensure sufficient sample size in any analysis. The smaller the sample size, the larger the margin of error. A typical rule of thumb is to ensure at least 30 observations of a behavior to draw reasonable conclusions.

Data users who would like to calculate error margins or confidence intervals in survey data can use the following tools (among others):

- The **survey** package in R.
- The **SAMPLICS** package in Python.
- Standard functions available in **SAS** and **SPSS**.

The [survey data explorer](#) also includes a tool to calculate error margins for specific data summaries.

Trip Rate and Travel Day Analysis

This section provides an overview of the survey results with a focus on trip attributes and travel replacement activities that inform travel demand models. **All figures represent a typical weekday (Tuesday – Thursday).**

Table 5 shows the household- and person-level trip rates among residents in six county groups and throughout the state as a whole. The 2012 total household and person trip rates were 11.3 and 3.7, respectively, indicating an increase in 2023. This may be in part due to the added smartphone GPS data collection, which tends to collect more trips per day than traditional methods by which respondents are more likely to forget or underreport trips. The full weighting memo, provided separately, demonstrates the difference between unweighted trip rates across reporting modes after correcting for demographic and behavioral differences.

TABLE 5: TOTAL HOUSEHOLD & PERSON TRIP RATE BY COUNTY GROUP

Geography	Household Trip Rate	Person Trip Rate
Cache County	14.4	5.1
Iron County	15.9	5.6
Wasatch Front	12.2	4.6
Summit + Wasatch County	10.3	4.2
Washington County	12.6	5.1
Rest of Utah	13.5	4.8
Total	12.5	4.7

Table 6 and Table 7 show the household and person trip rate, respectively, by purpose category.¹⁴ While the total trip rates have increased since 2012, the relative share of trips by purpose have remained largely consistent.

TABLE 6: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND PURPOSE

Geography	Home-based-work (HBW)	Home-Based-Other (HBO)	Non-Home-Based (NHB)
Cache County	1.70	7.31	4.89
Iron County	1.67	8.43	5.37
Wasatch Front	1.51	6.60	3.69
Summit + Wasatch County	1.51	5.78	2.62
Washington County	1.48	6.79	4.02
Rest of Utah	1.68	6.88	4.64
Total	1.53	6.69	3.86

¹⁴ Note that the sum of trips by purpose equal slightly less than the total trip rate due to a small share of imputed trips with unimputable purposes. For analysis purposes, data users may choose to categorize this share as “non-home-based.”

TABLE 7: PERSON TRIP RATE BY COUNTY GROUP AND PURPOSE

Geography	HBW	HBO	NHB
Cache County	0.60	2.60	1.74
Iron County	0.58	2.94	1.88
Wasatch Front	0.56	2.47	1.38
Summit + Wasatch County	0.62	2.37	1.07
Washington County	0.60	2.73	1.62
Rest of Utah	0.59	2.42	1.64
Total	0.57	2.50	1.44

Table 8 and Table 9 show the household and person trip rate, respectively, by travel mode. Residents in all regions travel primarily by car. However, the transit, walk, bike, and other modes vary notably by region. Like 2012, the Cache and Wasatch Front regions have the highest share of transit travel while Washington County has the highest share of bike travel.

TABLE 8: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND MODE

Geography	Drive Alone	Shared Ride 2	Shared Ride 3+	Transit	Walk	Bike	Other
Cache County	5.16	3.21	3.36	0.14	1.24	0.12	1.14
Iron County	5.29	4.45	4.03	0.03	0.85	0.10	1.20
Wasatch Front	4.47	2.88	2.68	0.12	1.12	0.07	0.88
Summit + Wasatch County	4.51	1.45	2.58	0.05	0.50	0.04	1.15
Washington County	4.69	2.92	2.42	0.06	1.36	0.26	0.92
Rest of Utah	5.52	2.84	2.89	0.01	1.02	0.18	1.07
Total	4.63	2.90	2.74	0.10	1.11	0.09	0.93

TABLE 9: PERSON TRIP RATE BY COUNTY GROUP AND MODE

Geography	Drive Alone	Shared Ride 2	Shared Ride 3+	Transit	Walk	Bike	Other
Cache County	1.83	1.14	1.20	0.05	0.44	0.04	0.41
Iron County	1.85	1.55	1.41	0.01	0.30	0.03	0.42
Wasatch Front	1.67	1.08	1.00	0.05	0.42	0.02	0.33
Summit + Wasatch County	1.85	0.60	1.06	0.02	0.21	0.02	0.47
Washington County	1.89	1.18	0.98	0.02	0.55	0.11	0.37
Rest of Utah	1.95	1.00	1.02	0.00	0.36	0.06	0.38
Total	1.73	1.08	1.02	0.04	0.41	0.03	0.35

Table 10 through Table 14 show household trip rates by household demographics. Key findings include the following:

- Like 2012, household trip rates increase with household size and household vehicles. There is also a noticeable difference in household trip rates among households with incomes above and below \$50,000. The increase in trip rate by household vehicles and household income is due in part to a correlation with household size.
- Children have a big impact on household trip rates (again partially due to correlation with household size), though presence of children also increases trip rates among household adults. Households with more children also make more trips across all geographies.

TABLE 10: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND HOUSEHOLD SIZE

Geography	1 Person	2 Person	3 Person	4 Person	5 Person	6+ Person
Cache County	4.95	11.46	11.42	20.76	24.78	30.86
Iron County	4.92	11.78	15.48	16.20	38.81	33.19
Wasatch Front	4.67	8.94	12.52	17.12	21.77	31.04
Summit + Wasatch County	3.66	7.57	8.95	16.18	20.31	47.37
Washington County	4.74	9.87	14.11	20.83	21.39	38.24
Rest of Utah	6.26	8.07	15.77	19.38	20.28	30.79
Total	4.80	9.12	12.87	17.66	22.05	31.58

TABLE 11: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND NUMBER OF VEHICLES

Geography	0 Vehicles	1 Vehicle	2 Vehicles	3+ Vehicles
Cache County	3.56	8.21	14.39	21.81
Iron County	3.81	8.27	18.38	20.11
Wasatch Front	4.69	7.56	14.10	16.15
Summit + Wasatch County	3.87	5.02	11.50	13.71
Washington County	4.41	7.83	12.93	17.24
Rest of Utah	2.36	7.96	16.47	15.26
Total	4.50	7.60	14.27	16.36

TABLE 12: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND INCOME

Geography	Under \$25,000	\$25,000-\$49,999	\$50,000-\$100,000	\$100,000 or more
Cache County	10.92	9.15	16.73	17.48
Iron County	7.49	11.94	19.62	19.75
Wasatch Front	8.12	7.92	12.64	14.47
Summit + Wasatch County	1.60	6.38	13.20	11.02
Washington County	8.17	9.29	13.94	15.32
Rest of Utah	7.45	9.90	15.44	15.52
Total	8.12	8.43	13.37	14.66

TABLE 13: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND LIFECYCLE¹⁵

Geography	HH with no children and no retirees	HH with children and no retirees	HH with retirees, and potentially children
Cache County	9.54	23.36	8.50
Iron County	11.19	26.17	8.81
Wasatch Front	7.81	20.12	8.89
Summit + Wasatch County	6.26	20.56	5.71
Washington County	8.93	21.80	9.37
Rest of Utah	8.43	21.28	9.21
Total	8.03	20.62	8.89

TABLE 14: HOUSEHOLD TRIP RATE BY COUNTY GROUP AND NUMBER OF KIDS

Geography	0 Children	1 Child	2 Children	3+ Children
Cache County	9.29	14.14	23.07	27.68
Iron County	10.25	16.86	18.39	36.31
Wasatch Front	7.79	14.88	18.47	27.82
Summit + Wasatch County	6.08	9.45	17.84	37.79
Washington County	8.75	13.58	24.65	28.95
Rest of Utah	8.51	14.70	24.94	24.11
Total	8.00	14.70	19.57	27.88

¹⁵ In 2012, “retirees” were directly reported. In 2023, this is approximated from respondents that are unemployed, not looking for work, and age 65 or older.

Table 15 shows person trip rates on an average weekday by age and county group. As in 2012, those under 18 and those 85 and older make notably fewer trips than those between age 18 – 85. Trip collection for children is often challenging in travel surveys because many parents may have concerns about reporting information about their children’s travel and, in the case of older children, not be aware of the trips they make. In 2023, RSG introduced a joint trip imputation process to fill this gap based on known travel details from other members in the household. For this reason, the discrepancy between child and adult travel is less stark than in 2012.

TABLE 15: PERSON TRIP RATE BY COUNTY GROUP AND AGE

Age	Cache County	Iron County	Wasatch Front	Summit + Wasatch County	Washington County	Rest of Utah	Total
Under 5	3.28	4.09	3.03	3.30	4.29	3.75	3.21
5-15	4.05	4.24	3.92	4.88	3.81	3.36	3.89
16-17	4.92	3.45	3.59	5.11	3.08	3.50	3.63
18-24	5.52	5.59	4.61	1.50	5.10	4.77	4.71
25-34	4.67	5.99	4.72	3.14	6.11	5.09	4.82
35-44	7.10	7.67	5.61	4.86	6.39	7.78	5.91
45-54	5.11	6.82	5.22	4.57	6.02	5.59	5.32
55-64	6.23	5.26	4.53	3.82	5.14	4.41	4.63
65-74	5.33	5.20	4.70	4.11	4.63	3.86	4.61
75-84	5.93	6.08	4.38	2.81	5.19	4.21	4.54
85 or older	1.36	2.35	3.06	5.83	4.23	5.24	3.29

Table 16 and Table 17 show the average trip duration and distance, respectively, by county group and trip type. Residents are generally spending more time traveling for work and traveling further distances than in 2012, though the composition of those who travel for work has also changed since 2012 given the rise of teleworking.

TABLE 16: AVERAGE TRIP DURATION (MINS) BY COUNTY GROUP AND TRIP TYPE

Geography	HBW	HBO	NHB	Total
Cache County	19.9	13.4	15.6	15.0
Iron County	25.5	18.3	20.2	19.7
Wasatch Front	25.1	15.5	19.6	18.0
Summit + Wasatch County	22.1	14.0	29.0	19.2
Washington County	18.8	18.1	24.1	20.1
Rest of Utah	22.9	18.4	24.9	21.3

TABLE 17: AVERAGE TRIP DISTANCE (MILES) BY COUNTY GROUP AND TRIP TYPE

Geography	HBW	HBO	NHB	Total
Cache County	7.7	4.4	7.7	5.9
Iron County	8.2	18.5	7.6	13.6
Wasatch Front	12.8	8.6	13.7	10.7
Summit + Wasatch County	13.6	10.2	21.9	13.8
Washington County	7.8	9.8	13.4	10.7
Rest of Utah	13.6	8.9	21.0	13.7

Table 18 shows the mode share in each region. As in 2012, car travel is the predominate mode in every region. The walking mode share is generally higher in regions with more transit due to walking to and from transit stops. (Note that these trips were reported separately in 2023 while the walk segments were not captured in 2012.) Table 19 shows the share of auto trips overall and among HBW trips, which are more likely to use auto modes. Table 20 shows the number of travelers among all trips and HBW trips. HBW trips are much more likely to have a smaller number of travelers than other types of trips.

TABLE 18: MODE SHARE BY COUNTY GROUP

Geography	Drive Alone	Shared Ride 2	Shared Ride 3+	Transit	Walk	Bike	Other
Cache County	35.9%	22.3%	23.4%	1.0%	8.6%	0.8%	8.0%
Iron County	33.2%	27.9%	25.3%	0.2%	5.3%	0.6%	7.5%
Wasatch Front	36.6%	23.6%	21.9%	1.0%	9.2%	0.5%	7.2%
Summit + Wasatch County	43.8%	14.1%	25.1%	0.5%	4.9%	0.4%	11.2%
Washington County	37.1%	23.1%	19.2%	0.5%	10.8%	2.1%	7.3%
Rest of Utah	40.8%	21.0%	21.3%	0.1%	7.5%	1.3%	7.9%
Total	37.0%	23.2%	21.9%	0.8%	8.9%	0.7%	7.4%

TABLE 19: AUTOMOBILE MODE SHARE BY COUNTY GROUP

Geography	All Trips	HBW
Cache County	85.8%	91.7%
Iron County	88.8%	96.3%
Wasatch Front	85.8%	91.2%
Summit + Wasatch County	86.0%	94.6%
Washington County	81.4%	92.7%
Rest of Utah	86.3%	97.8%

TABLE 20: NUMBER OF TRAVELERS

Number of Travelers	All Trips	HBW
1	45%	86%
2	28%	10%
3	13%	2%
4	7%	1%
5+	7%	1%
Total	100%	100%

Table 21 shows the transit mode share by region overall and among HBW trips. Table 22 shows the transit mode share by region and household vehicle ownership. In all geographies, households with zero vehicles are far more likely to use transit than households with one or more vehicles.

TABLE 21: TRANSIT MODE SHARE BY COUNTY GROUP

Geography	All Trips	HBW
Cache County	1.0%	1.1%
Iron County	0.2%	0.0%
Wasatch Front	1.0%	1.6%
Summit + Wasatch County	0.5%	0.1%
Washington County	0.5%	3.2%
Rest of Utah	0.1%	0.0%
Total	0.8%	1.4%

TABLE 22: TRANSIT MODE SHARE BY COUNTY GROUP AND NUMBER OF VEHICLES

Geography	0 vehicles	1 vehicle	2+ vehicles	Total
Cache County	12.1%	1.2%	0.9%	1.0%
Iron County	11.3%	0.0%	0.0%	0.2%
Wasatch Front	13.3%	1.4%	0.6%	1.0%
Summit + Wasatch County	7.0%	1.2%	0.2%	0.5%
Washington County	6.9%	0.0%	0.5%	0.5%
Rest of Utah	0.0%	0.2%	0.1%	0.1%

After each travel day, respondents were asked a handful of day-level questions to better understand their travel replacement activities. These included asking about deliveries received on their travel day, and time spent teleworking (if employed). Table 23 shows the share of employed residents who report teleworking on a typical weekday. The share of full-time (8+ hour) teleworkers varies by region with the highest share in the Wasatch Front.

TABLE 23: TIME SPENT TELEWORKING ON A TYPICAL WEEKDAY (TOTAL & BY COUNTY GROUP)¹⁶

Geography	0 min	0-2 hours	2-4 hours	4-8 hours	8+ hours
Cache County	67.6%	3.6%	3.0%	10.8%	15.1%
Iron County	67.1%	5.2%	4.8%	7.8%	15.1%
Wasatch Front	54.3%	4.6%	3.8%	9.1%	28.2%
Summit + Wasatch County	51.5%	10.6%	5.6%	9.9%	22.4%
Washington County	62.6%	9.8%	3.8%	7.1%	16.8%
Rest of Utah	67.6%	4.0%	3.7%	5.4%	19.2%
Total	56.7%	4.9%	3.8%	8.8%	25.8%

¹⁶ This question was asked of all employed respondents each travel day. The shares reflected here include all responses regardless of reported job location or trips reported on the travel day.

Table 24 shows the share of residents by region who report receiving delivered goods and services. The share of deliveries by region is fairly consistent with 30% of residents reporting at least one delivery on a typical weekday.

TABLE 24: GOODS AND SERVICES DELIVERED TO HOUSEHOLD ON A TYPICAL WEEKDAY (TOTAL & BY COUNTY GROUP)¹⁷

Geography	Takeout/pre prepared food delivered to home	Someone came to do work at home	Groceries delivered to home	Received package at home	Received personal packages at work	Received packages at another location	Other item delivered to home	No items delivered to home
Cache County	2.2%	1.2%	1.0%	20.6%	0.5%	0.1%	0.4%	75.6%
Iron County	1.1%	2.2%	1.2%	22.5%	0.1%	0.1%	0.0%	74.6%
Wasatch Front	2.1%	2.0%	1.4%	25.8%	0.3%	0.6%	0.3%	70.4%
Summit + Wasatch County	0.1%	2.4%	2.0%	39.1%	0.1%	0.1%	0.2%	58.4%
Washington County	1.3%	3.9%	2.3%	28.5%	0.1%	0.7%	0.4%	65.3%
Rest of Utah	2.5%	0.8%	1.2%	28.7%	0.3%	1.0%	0.5%	68.4%
Total	2.0%	2.0%	1.4%	26.2%	0.3%	0.6%	0.3%	70.0%

¹⁷ Respondents could select more than one delivery type on each travel day, so totals may exceed 100%.

3.0 UNIVERSITY SURVEY

University students are commonly underrepresented in typical HTS because they comprise a harder-to-reach population of young, transient residents who lack a permanent address or live in group quarters. To address this important data gap, the university survey targeted on-campus students (e.g., in dorms) and off-campus students (e.g., in off-campus housing). On-campus students are not generally included in ABS while the other categories may overlap with ABS invitations and were deduplicated following data collection (both in data cleaning and data weighting).

The university survey largely followed the household travel survey methodology. This section highlights the key differences between the two surveys.

3.1 SURVEY DESIGN

Survey Questionnaire

The survey questionnaire was kept nearly identical to the questionnaire developed for the HTS to ensure consistent data at the end of the survey. Differences included:

- An additional question to confirm whether the student lived on or off-campus.
- Revised incentive language. University respondents were offered one of forty \$100 Amazon e-gift cards (whereas HTS respondents were offered direct gift card incentives).

Survey Sampling & Recruitment

RSG and the project team coordinated with eight colleges and universities (Table 25) throughout the state to invite students to the survey. Recruitment methods varied by school using the following methods:

- The University of Utah provided a list of student email addresses to RSG and WFRC to invite students to the survey directly with unique access codes.
- Brigham Young University and Utah Valley University advertised the survey via their newsletter and directed students to a pre-survey by which RSG could screen for validity and provide unique access codes.
- Southern Utah University, Utah State University, Weber State University, and Westminster College advertised the survey via email and directed students to the same pre-survey.
- RSG provided Snow College with a list of unique access codes, and the school invited students to the survey directly.

The project team also reached out to Utah Tech University and Salt Lake Community College to invite students but ultimately could not proceed based on school requirements and outreach limitations.

The survey ultimately collected 1,384 complete responses. The significantly smaller and more varied response rates, compared to those for the 2012 HTS, largely reflect the more restrictive student body email dissemination policies set by the higher education institutions over the past decade. Table 25 shows the survey response by university.

TABLE 25: UNIVERSITY SURVEY RESPONSES BY UNIVERSITY

University	Responses	Share (%)
Brigham Young University	340	24.6
Snow College	80	5.8
Southern Utah University	133	9.6
University of Utah	392	28.3
Utah State University	376	27.2
Utah Valley University	10	0.7
Weber State University	43	3.1
Westminster College	10	0.7
Total	1,384	100.0

Survey Incentives

As noted above, university survey respondents could enter a prize drawing for one of forty \$100 Amazon e-gift cards. RSG distributed the incentives on a monthly basis throughout data collection.

3.2 SURVEY RESULTS

This section includes a high-level summary of the university survey results. Overall, university survey respondents reported slightly higher person trip rates than the HTS but lower household trip rates (primarily due to the smaller household size) (Table 26). By mode, one of the most notable differences between university students and other residents is the high share of walk trips. Overall, university students make about three times as many walk trips as other Utah residents (Table 27).

TABLE 26: UNIVERSITY SURVEY (WEEKDAY) TRIP RATE BY PURPOSE¹⁸

Purpose	Household Trip Rate	Person Trip Rate
Home-Based Work	1.49	0.79
Home-Based Other	5.75	3.04
Non-Home-Based	2.10	1.11
Total	10.00	5.32

TABLE 27: UNIVERSITY SURVEY (WEEKDAY) TRIP RATE BY MODE

Mode	Household Trip Rate	Person Trip Rate
Drive Alone	3.33	1.76
Shared Ride 2	2.22	1.17
Shared Ride 3+	1.07	0.57
Transit	0.43	0.23
Walk	2.30	1.22
Bike	0.07	0.04
Other	0.62	0.33
Total	10.00	5.32

Table 28 shows time spend teleworking among university students. Compared to other employed residents, university students spend less time teleworking on an average day (primarily due to different job types and student statuses).

TABLE 28: UNIVERSITY SURVEY TIME SPENT TELEWORKING ON A TYPICAL WEEKDAY

Time Spent Teleworking on Travel Day	Percent (%)
0 min	60.0
0-2 hours	6.0
2-4 hours	5.6
4-8 hours	16.3
8+ hours	12.2
Total	100.0

¹⁸ Note that the sum of trips by purpose equal slightly less than the total trip rate due to a small share of imputed trips with unimputable purposes. For analysis purposes, data users may choose to categorize this share as “non-home-based.”

Table 29 shows the goods and services university students receive on a typical weekday. University students are slightly less likely to receive deliveries than other Utah residents, although they're more likely to receive takeout/prepared food deliveries at home.

TABLE 29: UNIVERSITY SURVEY GOODS AND SERVICES DELIVERED TO HOUSEHOLD ON A TYPICAL WEEKDAY¹⁹

Deliveries on Travel Day	Percent (%)
Takeout/prepared food delivered to home	3.9
Someone came to do work at home	1.3
Groceries delivered to home	0.4
Received package at home	20.0
Received personal packages at work	0.0
Received packages at another location	1.3
Other item delivered to home	0.1
No items delivered to home	75.3

¹⁹ Respondents could select more than one delivery type on each travel day, so totals may exceed 100%.

4.0 FOLLOW-ON & LONG-DISTANCE SURVEY

Following the HTS, the survey respondents who provided an email address and agreed to be recontacted to a follow-on survey. This survey included additional attitudinal and long-distance travel questions to support modeling and other analysis priorities. This section summarizes the follow-on and long-distance survey approach.

4.1 SURVEY DESIGN

Survey Questionnaire and Instrument

The survey used an online platform, designed by Jibunu (a programming vendor). The survey included both the follow-on and long-distance questions as noted below.

Follow-on Survey Questions

The project team developed the follow-on survey questions based on planning priorities that were not covered in the HTS, including questions asked in 2012. The final questions covered topics including mode accessibility, barriers to travel, factors to increase transit and bike use, broadband access, and residential attitudes.

Long-Distance Survey Questions

Long-distance travel is important for modeling and planning but not sufficiently captured in core HTS trip diaries because of the lower frequency of long-distance trip-making. To fill this gap, the project team also included a long-distance survey component in the follow-on survey. The survey asked respondents to report the number of long-distance, round trip, non-commute trips they had made over the past 28 days (4 weeks). Long-distance trips were defined as any trips that were 50 miles or greater in distance.

Respondents then reported the purpose of each long-distance trip. For the most recent trip, respondents also provided information about the travel mode, number of travelers, destination location, and travel times.

Survey Recruitment

RSG invited respondents to the survey by selecting the list of HTS and University Survey respondents who provided an email address and agreed to be recontacted. RSG sent email invitations to this group in batches throughout the fall of 2023 to control for response. Only one person per household was invited to respond to the survey.

Survey Incentives

Respondents who completed the survey received \$10 e-gift cards (distributed weekly throughout the survey period).

Dataset Preparation and Weighting

Following data collection, RSG prepared the data for weighting by appending all relevant demographics from the HTS and splitting the variables across household-, person-, and trip-level tables based on the level of question in the survey.

The weighting methodology followed the demographic and geographic expansion approach described in the HTS weighting memo, provided separately. The trip weights inherited the person weights but were adjusted to represent an average travel day over the survey period (number of trips / 28 days x the person weight).

4.2 FOLLOW-ON SURVEY RESULTS

This section summarizes key results from the follow-on survey.

The survey asked respondents to prioritize spending based on how they would allocate \$100 across several categories (Table 30). On average, residents put the highest share of funds toward roadway maintenance projects with new and expanded roadways following slightly behind.

TABLE 30: DOLLARS INVESTED OUT OF 100 TOTAL PER CATEGORY

Category	Mean	Median
Roadway maintenance projects	17.6	15
New and expanded roadways	14.3	10
Expand transit system's geographic coverage including on-demand transit service	12.8	10
Roadway safety and efficiency projects	12.2	10
Expand local, neighborhood network bike and pedestrian trails and pathways	9.3	7
Offer more frequent transit service	8.9	5
Eliminate transit fares to grow ridership	8.5	5
Neighborhood sidewalks and crosswalks	8.3	5
Expand regional network of bike and pedestrian trails and pathways	7.8	5

The survey also asked respondents about their current and preferred home location and home types. Key findings included the following:

- Residents in rural areas were least likely to prefer a different home location while suburban residents in areas with only homes were most likely to prefer a different location (Table 31).
- Residents living in single-family houses were most likely to prefer their current home type.
- Roughly one-quarter or fewer residents in all other home types prefer their current home type. Single-family homes are the most desired across all current home types (Table 33).

TABLE 31: PREFERRED HOME LOCATION BY CURRENT HOME LOCATION

Current Home Location	City, downtown	City residential	Suburban with homes, shops, and businesses	Suburban (houses only)	Small town	Rural area	Total
City downtown	32.9%	20.9%	21.9%	9.2%	7.8%	7.3%	100.0%
City residential	13.2%	37.8%	22.1%	11.4%	10.6%	5.0%	100.0%
Suburban with homes, shops, and businesses	7.3%	6.2%	60.5%	8.8%	6.7%	10.4%	100.0%
Suburban (Houses only)	4.0%	2.4%	46.0%	30.2%	11.0%	6.5%	100.0%
Small town	8.5%	3.0%	11.6%	1.6%	59.7%	15.6%	100.0%
Rural	2.8%	0.4%	7.3%	3.5%	11.5%	74.5%	100.0%

TABLE 32: PREFERRED HOME TYPE BY CURRENT HOME TYPE

Current Home Type	Single-family house	Townhouse	Building with 3 or fewer units	Building with 4 or more units	Mobile home or trailer	Dormitory or institutional housing	Other (e.g., RV, van, tiny home, etc.)	Total
Single-family house	90.8%	4.2%	1.9%	1.6%	0.8%	0.0%	0.8%	100.0%
Townhouse	67.8%	25.4%	1.2%	3.0%	0.0%	0.6%	1.9%	100.0%
Building with 3 or fewer units	76.8%	7.1%	12.5%	0.8%	2.6%	0.0%	0.3%	100.0%
Building with 4 or more units	57.8%	14.1%	8.7%	16.4%	0.7%	0.0%	2.3%	100.0%
Mobile home or trailer	86.6%	2.0%	0.0%	0.0%	11.4%	0.0%	0.0%	100.0%
Dormitory or institutional housing	58.4%	6.3%	1.0%	27.0%	0.0%	5.9%	1.3%	100.0%
Other (e.g., RV, van, tiny home, etc.)	38.9%	0.0%	0.0%	43.1%	0.0%	0.0%	18.0%	100.0%

Table 33 shows the weighted count of online services respondents reported using in the past week and the expected trips that would have occurred had those online services not been available. Meal and grocery delivery is most likely to replace trip-making while retail delivery is least likely to replace trip-making.

TABLE 33: TIMES ONLINE SERVICE USED IN PAST WEEK²⁰

	Meals or grocery delivery	Retail delivery	College or university	Telehealth
Times used online service in past week	520,896	2,474,965	707,765	259,233
Expected trips that would have been made if online service did not exist	382,654	1,168,339	366,625	168,099
Share of online services that replaced trips	73.5%	47.2%	51.8%	64.8%

²⁰ “10 or more” responses are valued at 10 trips.

Table 34 shows residents' internet satisfaction by internet provider. Most residents are somewhat or very satisfied with their internet service across all categories. This information (particularly when cross with other demographics or travel attributes) can indicate the suitability of travel replacement activities, like teleworking.

TABLE 34: INTERNET SATISFACTION BY INTERNET PROVIDER

Internet provider	Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Strongly dissatisfied	Don't know	Total
Cable	30.6%	42.6%	13.6%	8.7%	4.2%	0.2%	100.0%
Fiber optic	60.6%	29.4%	4.6%	4.2%	1.2%	0.0%	100.0%
DSL from landline phone company	19.0%	47.3%	15.8%	11.4%	6.5%	0%	100.0%
Mobile phone provider (for example: LTE, 4G, 5G)	44.8%	27.0%	16.8%	6.7%	2.9%	1.8%	100.0%
Fixed wireless provider (for example: point-to-point antenna)	37.6%	24.0%	20.0%	14.3%	4.1%	0%	100.0%
Other	31.1%	34.0%	15.6%	7.5%	9.8%	1.9%	100.0%

The survey asked respondents to think about a recent trip that they wanted to make and weren't able to make. Table 35 shows the share of these forsaken trips by trip purpose. Nearly 70% of residents reported recalling at least one recent trip they wanted to make but couldn't. The most frequently forsaken trips are grocery shopping trips, following by trips to dine out or get coffee or takeout.

TABLE 35: PURPOSE OF MOST RECENT FORSAKEN TRIP

Purpose	Percent (%)
N/A – I was able to make all the trips I wanted to make in the past week	29.8
Grocery shopping	18.4
Dine out, get coffee, or takeout	11.5
Social activity (for example: visit friends or relatives)	7.8
Other routine shopping (for example: pharmacy)	7.7
Leisure, entertainment, or cultural activity (for example: cinema, museum, park)	7.5
Other errand	6.3
Work related activity	3.9
Family activity (for example: watch child's game)	1.7
Medical visit (for example: doctor, dentist)	1.6
Other purpose	1.6
Religious, civic, volunteer activity	1.2
Pick someone up or drop someone off	0.8

After residents reported their forsaken trips, the survey asked which modes they considered and why they were unable to make the trip. Table 36 summarizes these reasons by mode. Convenience and cost are high concerns for TNC and Taxi modes while convenience and travel time are high concerns for transit travel. Safety and weather are primary concerns for e-bike and bike travel.

TABLE 36: REASONS FOR NOT USING MODE ON MOST RECENT FORSAKE TRIP²¹

Reason	Vehicle	E-bike	Bike	Walk	Transit	TNC	Taxi
Not available	3.2%	15.2%	12.8%	-	5.4%	22.3%	7.8%
Other household member using all vehicles or bikes	10.0%	0.0%	0.1%	-	-	-	-
Not convenient	-	-	-	-	49.7%	64.5%	-
Cost too high	15.6%	2.7%	4.6%	-	5.9%	13.7%	74.0%
Travel time too long	34.6%	12.0%	25.7%	58.10%	48.9%	5.0%	37.5%
Disability	2.4%	2.5%	0.3%	4.90%	6.6%	0.0%	10.7%
Safety concerns	3.1%	49.6%	33.4%	13.70%	2.6%	0.2%	0.0%
Weather	11.0%	33.7%	25.5%	33.60%	12.1%	8.9%	6.0%
Other	33.4%	15.1%	14.1%	15.10%	15.0%	64.5%	9.0%

²¹ The survey also collected responses about shared e-scooters and e-bikes. These modes are not reflected here due to very low sample sizes.

The survey asked respondents to share the factors that would encourage them to use transit or bike to work (Table 37 and Table 38, respectively). Proximity of transit stops, more frequent transit service, and faster arrival at the destination were the top three factors to increase transit travel to work. Factors to increase bike commuting were less concentrated, though the top factor was safer biking conditions.

TABLE 37: FACTORS TO ENCOURAGE TRANSIT TO TRAVEL TO WORK

Factor	%
Transit stops closer to my home/work	44.5
More frequent transit service	37.0
Faster arrival at my destination	35.2
Lower cost of transit or free transit pass	26.6
N/A - I do not commute to a workplace outside the home	26.1
More reliable transit service	25.5
Transit service provided during different times of the day/week	18.4
Safer environment at the stops and stations	14.8
User-friendly transit mobile app	14.3
Safer environment in the vehicles	10.5
Higher gas or parking prices	8.5
Other	4.0

TABLE 38: FACTORS TO ENCOURAGE BIKE USE TO TRAVEL TO WORK

Factor	%
N/A - I do not commute to a workplace outside the home	34.2
Safer physical riding conditions for bicyclists (e.g., bike paths separated from motor vehicles)	27.1
An expanded bike network with more routes between my origin and destination	16.7
Better knowledge of the best bike route to work	16.5
Amenities like showers and a place to change clothes at work	14.5
Secure bike storage at work	13.7
More attractive routes (visually pleasing, improve non-traffic related safety)	12.5
Lower cost electric bikes or similar equipment (e.g., electric scooters)	12.3
Expanded bike share system	12.3
Better maintenance of existing bicycle infrastructure (e.g., clearing paths of debris or snow during the winter)	10.3
Transportation back-up option while at work (e.g., reimbursement for taxi or ride-hailing in case of needing to pick up a family member in case of emergency)	9.9
Don't have access to a bike, but may in the future	9.0
Don't have access to a bike and will not in the future	7.5
Other	4.8

4.3 LONG-DISTANCE SURVEY RESULTS

This section summarizes the long-distance trips collected in the survey by distance, mode, purpose, and daily trip rate. Though the trends observed in the 2023 long-distance survey generally align with the trends captured in the 2012 survey, the methods to collect and weight the data differed greatly and should be kept in mind when comparing data across years.

TABLE 39: LONG-DISTANCE TRIP DISTANCE BY LOCATION

Location	<100 Miles	100-300 Miles	300-500 Miles	500-1,000 Miles	1,000+ Miles
Destination in Utah	54.0%	43.8%	2.2%	0.0%	0.0%
Destination outside Utah	6.5%	30.7%	20.4%	23.1%	19.3%

TABLE 40: LONG DISTANCE TRIPS BY MODE

Mode	Share (%)
Personal vehicle (auto, truck, SUV, etc.)	83.7
Airplane	15.5
Train/Rail	0.5
Bus/Shuttle	0.1
Other	0.1
Total	100.0

TABLE 41: LONG-DISTANCE TRIPS BY PURPOSE

Purpose	Share (%)
Recreational (hiking, sporting event, etc.)	49.7
Social (visit family/friends)	33.1
Company business (meeting, sales call, etc.)	6.6
Personal business	4.8
Attend college or university	0.4
Other	5.5
Total	100.0

TABLE 42: PERSON-LEVEL DAILY LONG-DISTANCE TRIP RATE BY HOUSEHOLD INCOME

MPO	Under \$50,000	\$50,000 - \$99,999	\$100,000 or more
Cache County	0.04	0.03	0.03
Iron County	0.02	0.02	0.06
Wasatch Front	0.02	0.02	0.02
Summit + Wasatch County	0.04	0.02	0.05
Washington County	0.02	0.03	0.02
Rest of Utah	0.02	0.04	0.03
Total	0.02	0.02	0.02

5.0 CONCLUSION

The methods used in the 2023 Utah Moves Transportation Survey provided higher-quality and more versatile data compared to traditional methods and the prior survey in 2012. Oversampling techniques resulted in a more representative sample than conventional random sampling would have allowed while still maintaining a primarily probability-based sample, which allows for greater confidence in the final weighted data. Coherent, professional study branding and modern, user-friendly survey tools communicated expectations with participants achieving overall participation rates that exceeded project goals. The high proportion of smartphone-collected data allowed for more precise trip rates and greater quantity of trip information captured across multiple days. Overall, these methods will greatly aid travel modeling and other analytical support to future regional and statewide decision-making in transportation and related fields.

