Modal Shift in the Boulder Valley

2023 Travel Diary Study

Report of Results

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Executive Summary

BACKGROUND

The 2023 Travel Diary Study is the thirteen replication of an effort that began in 1990 to assess the Boulder Valley residents' travel patterns and choices of transportation modes. The study is intended to support transportation planning by providing information on travel patterns and report to City staff and council members on the effectiveness of City programs aimed at reducing single-occupancy vehicle (SOV) travel and related vehicle miles of travel (VMT) and greenhouse gas (GHG) emissions.

The four decades trend line helps measure the City's progress in encouraging a shift away from SOV trips, which was a major objective in the 1989 Transportation Master Plan's (TMP). Later updates of the TMP specified the objective of reducing the SOV modal share to 25% of all trips by the year 2025, and most recently to 20% by 2030 in the 2019 TMP. In 1990, the first year of the travel diary study, 44% of all trips were made by driving alone. Achieving an SOV modal share of 20% by the year 2030 would mean a 24% shift in the proportion of SOV trips made from 1990 to 2030, or a 0.6% shift per year.

As in previous iterations, Boulder Valley residents were defined as residents residing in ZIP codes 80301 through 80305. This delineation mirrors the criteria utilized in the Boulder Resident Survey, most recently administered in 2023. On the other hand, the Boulder Valley Employee Survey, last conducted in 2022, characterizes Boulder Valley employees as individuals employed by businesses with addresses falling within ZIP codes 80301 through 80310.

Participants in the Travel Diary Studies were asked to keep a log or "diary" of their travel for one randomly assigned day during the beginning of October 2023. For every trip made during the 24-hour period, respondents record the origin and destination of the travel, the travel mode used, the time of day, the number of people in the vehicle (if applicable), and the distance traversed. A trip was defined as any "one-way travel from one point to another that takes you farther than one city block (about 200 yards) from the original location."

The study members were also asked to complete a survey regarding their household characteristics including several items related to travel, such as vehicles, bicycles, e-bikes and e-scooters present in the household, receipt of deliveries, work location, possession of bus passes, memberships in bike, e-bike, e-scooter or car shares, and general socioeconomic demographic characteristics.

The 2023 Travel Diary Study results are based on 998 Boulder Valley residents' records of their travel. With a sample size of close to 1,000 in each study year, the margin of error around the results is ±1.3% per year. Thus, for a difference to be statistically significant between years there must be a shift of at least 2.6% (1.3% around each study year).

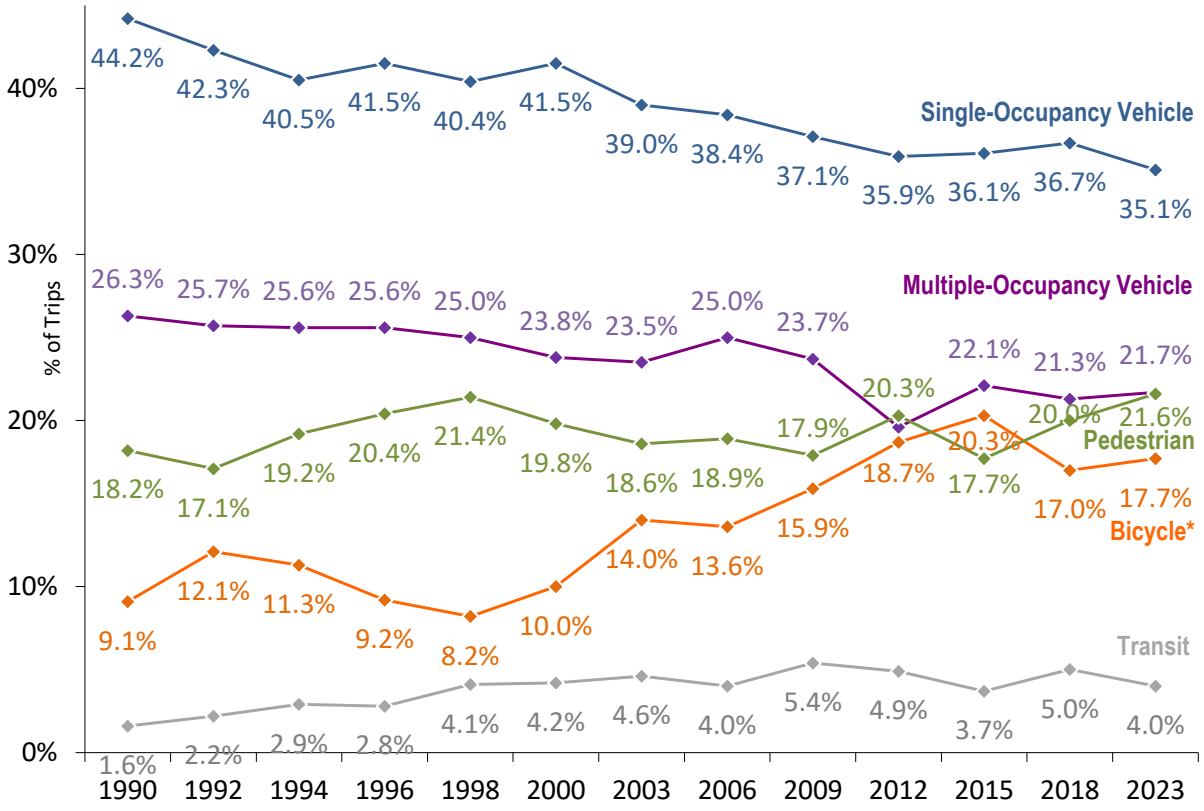
MODAL SHIFT OF ALL TRIPS

"Modal split" or "modal share," is a method of dividing travel into all available transportation modes and determining the percentage of trips made or miles traveled by each mode. For the Boulder Valley Travel Diary Study, the transportation modes are classified as single-occupancy vehicle (SOV), multiple-occupancy vehicle (MOV), transit or high-occupancy vehicle, school bus, foot and bicycle. A comparison of the mode choices from 1990 to 2023 provides information on modal "shift," that is, the shift of trips or miles traveled from one mode to another. This "shift" is measured as the difference between 1990 to 2023 in the percent of trips or miles by each mode.

The figure below shows the modal split of all trips made by respondents in every study year. Compared to 1990, significant shift in trips was observed in three categories:

- Single-Occupancy Vehicle, -9.1%
- Multiple-Occupancy Vehicle, -4.6%
- Bicycle +8.6%

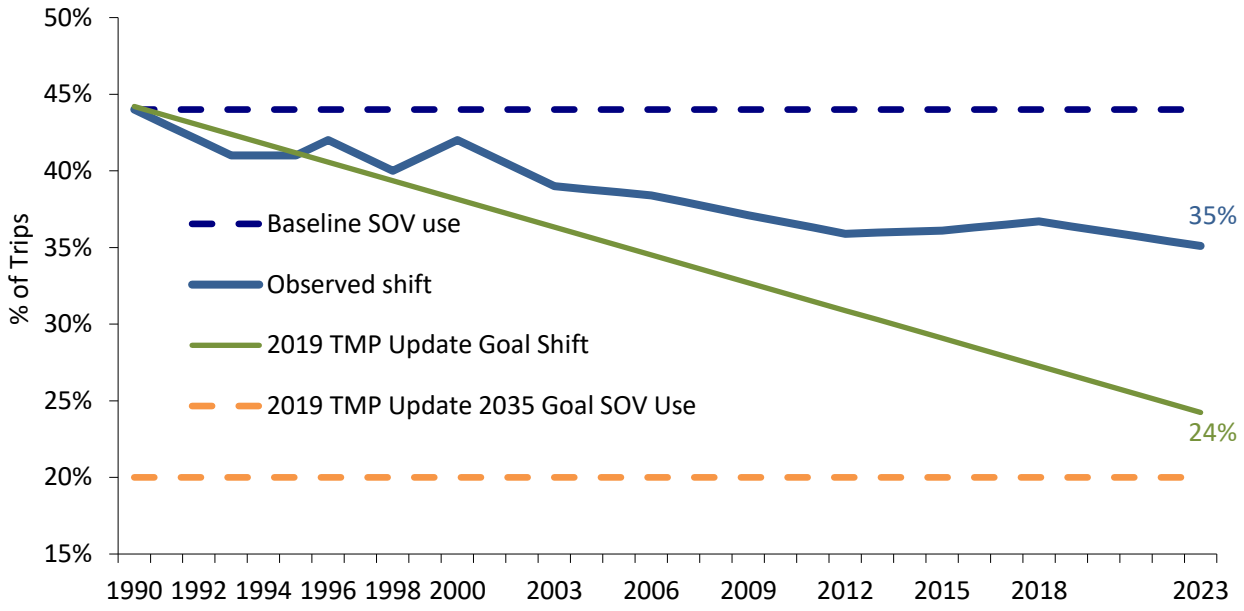
Figure 1: Modal Split of All Trips, 1990-2023



**In 2023 it included E-Bike and E-scooter: 4.4%.*

The 2019 TMP includes the objective of achieving an SOV modal share of 20% by the year 2030; this would mean a 24% shift in the proportion of SOV trips made from 1990 to 2030, or an average annual shift of 0.6%, assuming equal progress throughout the forty-year span. In the figure below, the 2019 TMP target is plotted with the observed shift. As can be seen, the observed modal shift in recent years has not quite kept pace with the 2019 TMP objective, with no significant change observed from 2012 to 2023.

Figure 2: Percent of SOV Trips: Observed Versus Desired Shift, 1990-2023



Changes in Boulder citizens' travel behavior cannot be solely attributed to the City's interventions, as regional and national transportation trends also impact travel behavior. The most recent national data comes from the National Household Travel Survey, conducted in 2022 by the Federal Highway Administration.

- Nationwide, there was a 0.04% annual shift away from trips made via private vehicles (87.7% in 1990, 86.8% in 2022) over the last two decades. However, among Boulder Valley residents, there was an annual average decrease of 0.60% from 1990 to 2023 (70.5% in 1990, 56.8% in 2023).
- The proportion of trips made by transit stayed relatively flat nationwide (1.8% in 1990; 1.9% in 2022). In Boulder there was a 2.4% shift toward public transit in the same period (1.6% in 1990; 4.0% in 2023).
- Examining the modal split of miles traveled, nationally there was a 5% decrease in the miles traveled per person by private vehicle from 1990 to 2022. In Boulder there was a 10% shift away from miles traveled via private vehicles (88% in 1990, 78% in 2023).
- The proportion of miles traveled via transit decreased nationwide, from 2.1% in 1990 to 1.2% in 2022, while in Boulder the percentage of miles traveled via transit increased, from 4.1% in 1990 to 7.7% in 2023.

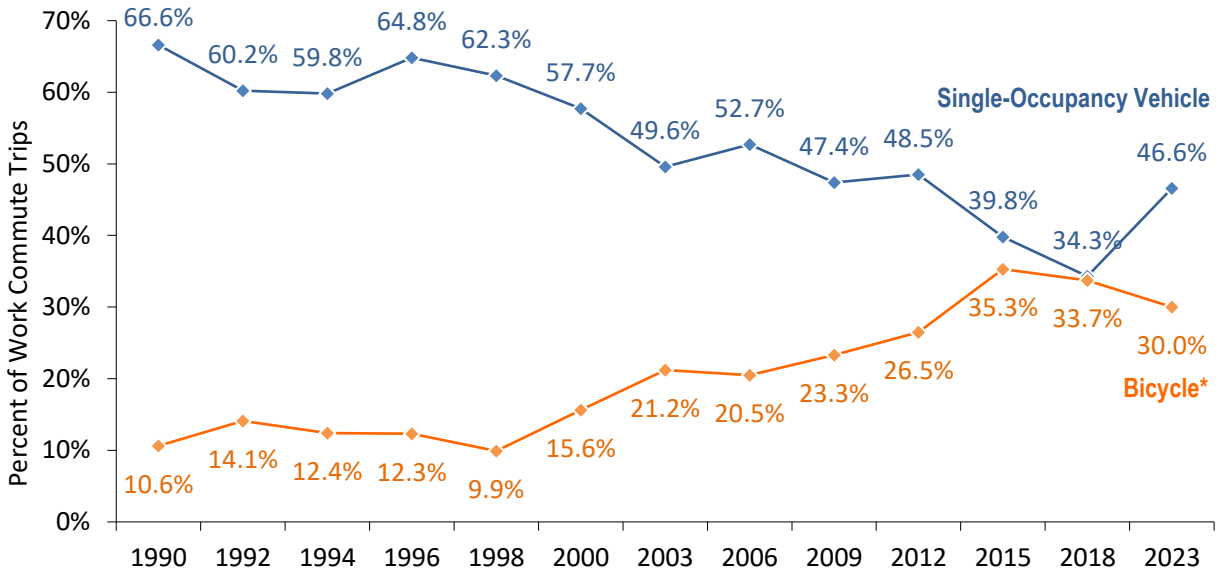
MODAL SPLIT OF THE WORK COMMUTE

The figure below shows the percentage of work commute trips made by respondents via SOV and bicycle in every study year. Smaller changes were observed over the study period in multiple-occupancy vehicle trips (between 10% in 1990 and 5% in 2023), transit (between 4% in 1990 and 8% in 2023) and pedestrian trips (between 9% in 1990 and 11% in 2023). Compared to 1990, significant shift was observed in two categories in 2023:

- Single-Occupancy Vehicle, -20.0%
- Bicycle, +19.4%

Bicycle trips showed a large increase in modal share from 2012 to 2015, dropped slightly in 2018 and moderately in 2023. Over these years SOV modal share experienced a large drop between 2012 and 2018 followed by a large increase between 2018 and 2023.

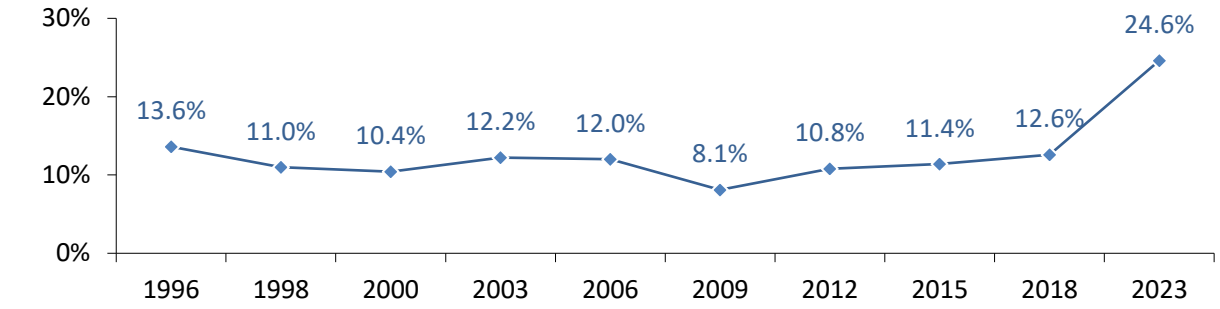
Figure 3: Modal Split of Work Commute Trips, SOV vs. Bicycle 1990-2023



**In 2023 it included E-Bike and E-scooter: 1.8%.*

The significant increase in SOV modal share between 2018 and 2023 may be linked to the rise in teleworking and impacts of COVID-19 pandemic. If respondents who transitioned to working from home were more likely to use alternative modes of transportation, the increase in SOV share among those who still commute to work could be attributed to the removal of individuals who previously used alternative modes.

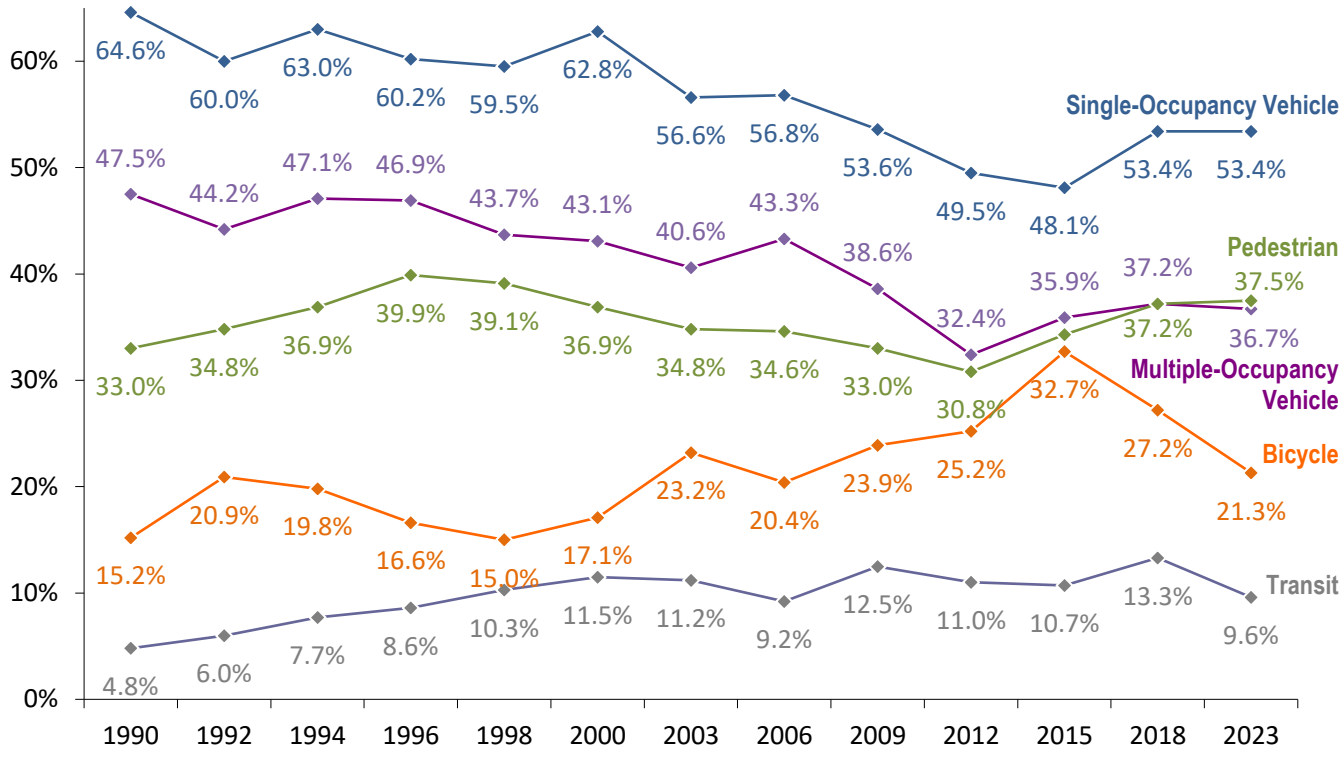
Figure 4: Telecommuting on Assigned Travel Day, 1996-2023



MODE USE

The proportion of people making at least one trip on the assigned travel day by each mode throughout the study period is shown below. Over the study period, the percentage of participants making any trips by SOV or MOV has declined, while the proportion making any trips via transit or by bicycle has increased. The proportion of people with at least one SOV trip on the assigned day remained stable in 2023 in comparison with 2018, while the proportion of people with at least one MOV slightly decreased from 5 years ago.

Figure 5: Study Participants Making At least One Trip by Mode, 1990-2023



TRIP CHARACTERISTICS

The information recorded on the travel diary can be used to characterize the trip-making behavior of Boulder residents. In 2023:

- The average number of trips per day per person was 5.1.
- The average number of miles traveled per day per person was 20.2 miles.
- The percent of people who did not leave the house on assigned travel day was 7.6%.
- The average estimated trip distance was 4.3 miles.
- The average estimated trip duration was 18.4 minutes.

Compared to national data, Boulder residents make shorter trips (4.3 miles for Boulder residents in 2023 compared to 12.5 miles in 2022 for U.S. residents).

The average work commute trip for Boulder residents in 2023 was 5.5 miles in distance and 20 minutes in duration. The average work commute for U.S. residents in 2022 was 13.7 miles and 28 minutes.

Study Results

BACKGROUND

The Travel Diary Study is a periodic survey of Boulder Valley residents' travel patterns and mode selection. The baseline study was conducted in 1990 and has been re-implemented every two to five years since then. The study is designed to report to City staff and Council members on the effectiveness of City programs aimed at reducing single-occupancy vehicle (SOV) travel, and to provide information on travel patterns useful for future transportation planning.

The 2023 Travel Diary Study is the thirteenth replication of the survey since the baseline study. This long trend line is useful in measuring the City's progress in mode shift away from SOV trips, as one of the original Transportation Master Plan's (TMP) major objectives was to shift "15% of all trips currently made by single-occupant autos to other forms of transportation, including ridesharing, transit, walking, and bicycling" by the year 2010. In 1990, the first year of the travel diary study, 44% of all trips were made by driving alone. The 1996 TMP modified the objective to a target of reducing the SOV modal share to only 25% of all trips by the year 2020 and the 2003 and 2008 update extended the target year to 2025. Reflecting the city's Sustainability Framework and Climate Commitment, the 2014 TMP established a more aggressive target of a 20% SOV mode share by 2035. More recently, the 2019 TMP modified the target year to 2030. This target is now the standard against which these study results are measured. Achieving an SOV modal share of 20% by the year 2030 would mean a 24% shift in the proportion of SOV trips made from 1990 to 2030, or a 0.6% shift per year.

Participants in the Travel Diary Studies were asked to keep a log or "diary" of their travel for one randomly assigned day during the beginning of October (or a replacement week if necessary). For every trip made during the 24-hour period, they recorded the origin and destination of the travel, the travel mode used, the time of day, the number of people in the vehicle (if applicable), and the number of miles or blocks traveled during each trip. A trip was defined as any "one-way travel from one point to another that takes you farther than one city block (about 200 yards) from the original location."

The participants were also asked to complete a survey regarding their adult household members' typical primary modes of travel, locations of work/school, number of vehicles, and general socioeconomic information about the household and the study participant (see *Appendix F. Data Collection Materials* for copies of the survey materials).

The 2023 Travel Diary Study results are based on 998 Boulder Valley residents' records of their travel. Study results were statistically weighted so that demographics of respondents matched population demographics. Details about the methodology used to select individuals to participate in the study and how they recorded their travel can be found in *Appendix E. Study Methodology*.

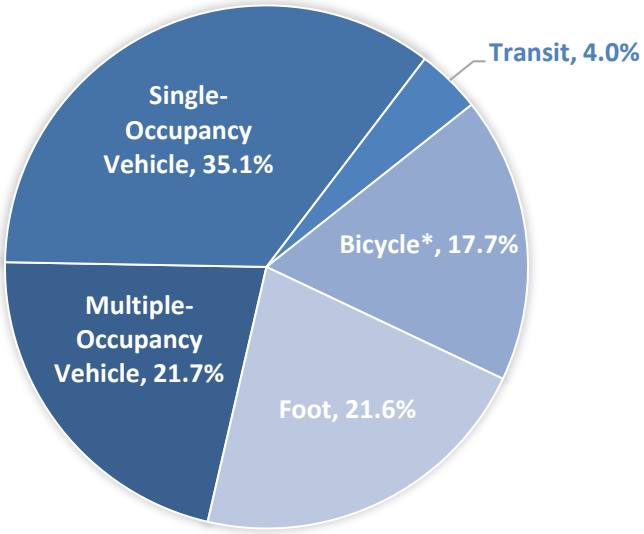
With a sample size of about 1,000 in each past study year, the margin of error around the results is ±1.3% per year. Thus, for a difference to be statistically significant between years there must be a shift of at least 2.6% (1.3% around each study year).

MODAL SHIFT OF ALL TRIPS

Transportation mode choice, referred to as "modal split" or "modal share," is a method of classifying all travel completed in a specified time into all available transportation modes. In this study "modal split" is reported two ways: the proportion of total trips and proportion of total miles by mode. The mode classifications are single-occupancy vehicle (SOV), multiple-occupancy vehicle (MOV)[1], transit or high-occupancy vehicle, school bus, foot and bicycle.

A comparison of the mode choices from 1990 to 2023 provides information on modal "shift," that is, the shift of trips or miles traveled from one mode to another. This "shift" was measured as the difference in the proportion of trips from 1990 to 2023 (change in percent). The modal split of trips as observed in the 2023 Travel Diary is shown in Figure 6 while the modal shift of trips from 1990 to 2023 by Boulder Valley residents is presented in Figure 7 on the next page.

Figure 6: Modal Split of All Trips, 2023



** In 2023 it included E-Bike and E-scooter: 4.4%.*

[1] *A single-occupancy vehicle refers to an automobile, van, truck or motorcycle which has only one occupant; a multiple-occupancy vehicle is an automobile, truck or motorcycle with more than one occupant (truck and motorcycle trips make up a very small proportion of the trips made.)*

Over the entire study period, the proportion of all trips made by driving alone has shifted 9%, about half of which occurred in the early 1990s. In 2023, SOV trips accounted for about 35% of all trips made by Boulder residents, down from about 44% in 1990 and like what had been observed since 2012. Transit trips have doubled over that same period, increasing from less than 2% in 1990 to about 4% in 2023. Large gains were observed in the proportion of trips made by bicycle over the previous 3 decades, from 9% in 1990 to 18% in 2023.

The proportion of trips made via MOV has remained fairly constant from 1990 until 2006. However, from 2006 to 2023 there was a 3% decrease in MOV trips. In 2023, 22% of all trips were made in personal vehicles with more than one person, down from 26% in 1990. Nearly a third of those MOV trips included at least one child in the vehicle, while just over two-thirds included only adults.

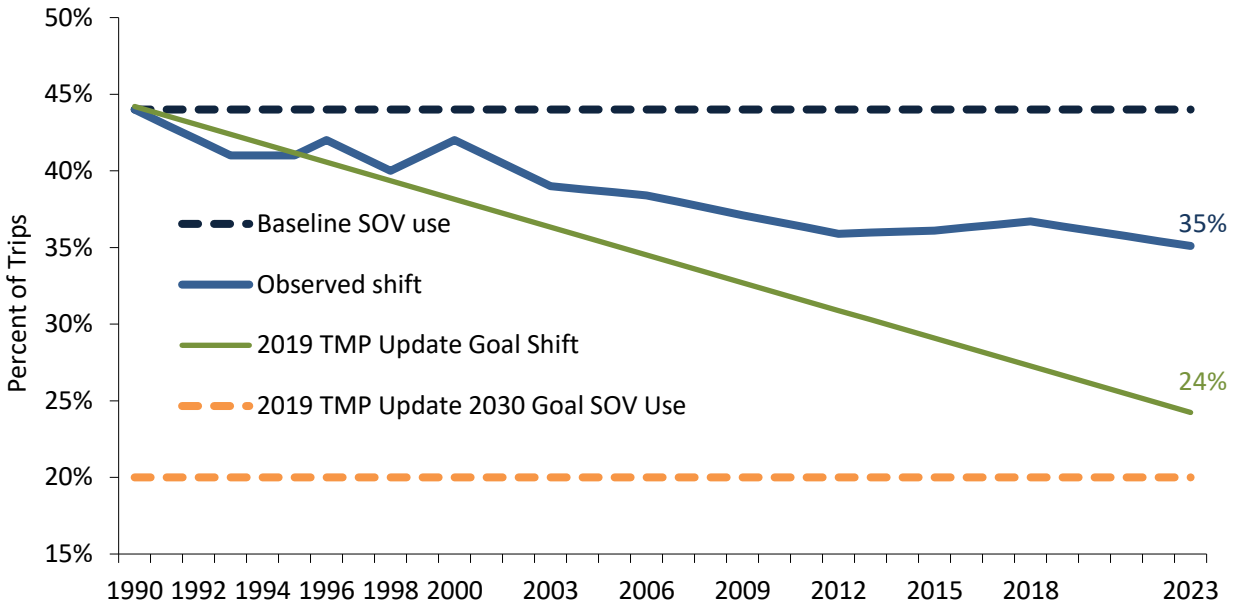
Figure 7: Modal Split of All Trips, 1990-2023

Travel Mode	Percent of Trips*													Change 1990 to 2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
SOV	35.1%	36.7%	36.1%	35.9%	37.1%	38.4%	39.0%	41.5%	40.4%	41.5%	40.5%	42.3%	44.2%	-9.1%
MOV	21.7%	21.3%	22.1%	19.6%	23.7%	25.0%	23.5%	23.8%	25.0%	25.6%	25.6%	25.7%	26.3%	-4.6%
Transit	4.0%	5.0%	3.7%	4.9%	5.4%	4.0%	4.6%	4.2%	4.1%	2.8%	2.9%	2.2%	1.6%	+2.2%
School Bus	0.0%	0.0%	0.0%	0.6%	0.1%	0.1%	0.3%	0.7%	0.7%	0.5%	0.5%	0.7%	0.6%	-0.6%
Bicycle**	17.7%	17.0%	20.3%	18.7%	15.9%	13.6%	14.0%	10.0%	8.2%	9.2%	11.3%	12.1%	9.1%	+8.6%
Foot	21.6%	20.0%	17.7%	20.3%	17.9%	18.9%	18.6%	19.8%	21.4%	20.4%	19.2%	17.1%	18.2%	+3.4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Number of Trips	*4,406*	*4,094*	*5,767*	*4,835*	*5,505*	*6,081*	*6,380*	*6,791*	*5,987*	*6,454*	*6,723*	*6,681*	*7,355*	

Modes with shifts that are statistically significantly different between 1990 and 2023 are shaded.
** These estimates have a margin of error of ±1.3% using a 95% confidence interval.*
*** In 2023 included 4.4% corresponding to E-bike and E-scooter.*

The 2019 TMP includes the objective of achieving an SOV modal share of 20% by the year 2030; this would mean a 24% shift in the proportion of SOV trips made from 1990 to 2030, or an average annual shift of 0.6%, assuming equal progress throughout the forty-year span. In the figure below, the 2019 TMP target is plotted with the observed shift. As can be seen, the observed modal shift has not quite kept pace with the 2019 TMP objective in recent years, with no significant change observed from 2012 to 2023.

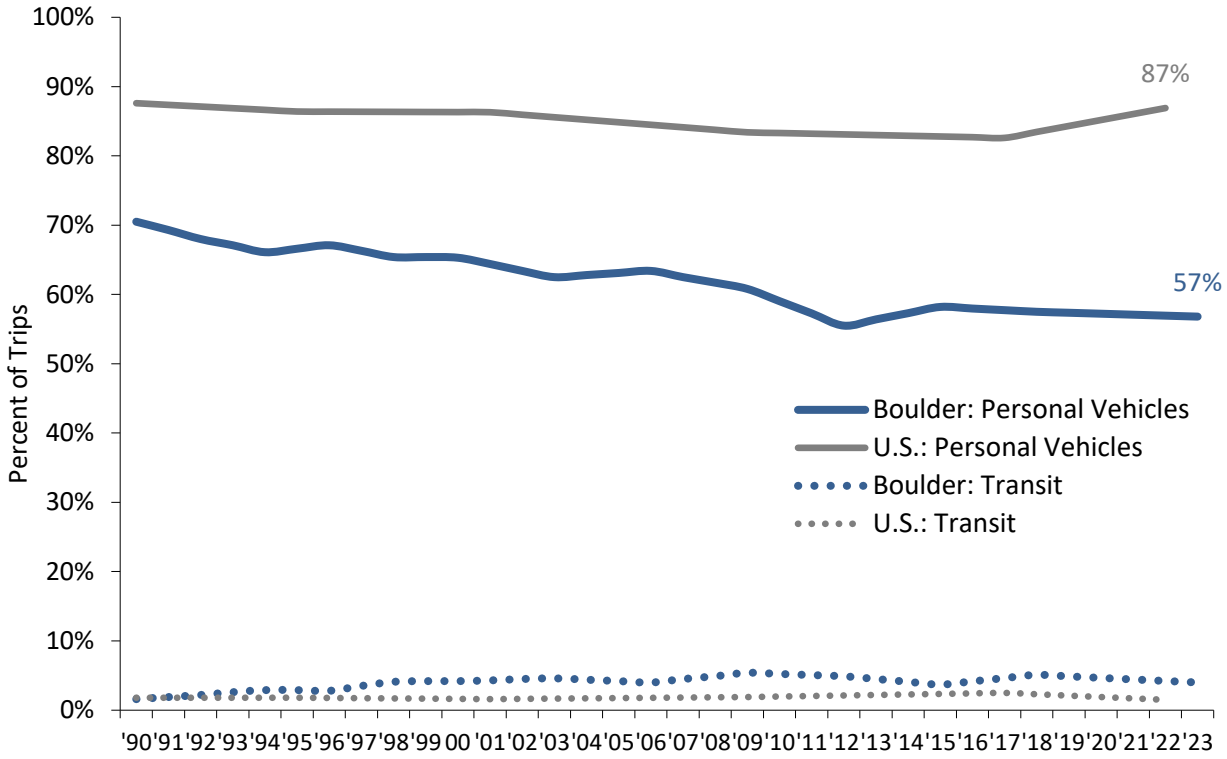
Figure 8: Percent of SOV Trips: Observed Versus Desired Shift, 1990-2023



Changes in Boulder citizens' travel behavior cannot be solely attributed to the City's interventions, as regional and national transportation trends also impact travel behavior. However, the national trends observed demonstrated only a slight reduction in "privately owned vehicle" (POV) use, which includes both SOVs and MOVs, between 1990 and 2009.[2] Figure 9 below compares the change observed in Boulder from 1990 to 2023 to that observed in the nation from 1990 to 2022. Nationwide, there was a 0.7% shift away from trips made via private vehicles (87.6% in 1990, 86.9% in 2022) over a 32-year period, which translates to an average annual decrease of 0.02%. However, among Boulder Valley residents, there was an 11% shift observed (70.5% in 1990, 56.8% in 2023) in POV use over a 33-year period, an average annual decrease of 0.42%.

The proportion of trips made on transit remained virtually unchanged nationally (1.8% in 1990; 1.5% in 2023), while in Boulder there was a 2.5% shift toward public transit (1.6% in 1990; 4.0% in 2023).

Figure 9: Percent of All Trips: Boulder Compared to the U.S., 1990-2023



[2] *Appendix A. National Travel Data contains additional detail on the comparisons made in Figure 9.These data come from the 1990 and 1995 Nationwide Personal Transportation Study and the 2001, 2009 and 2023 National Household Travel Study (NHTS).*

Modal share estimates using miles traveled show larger shares for the motorized vehicles because these vehicles are used to traverse greater distances. From 1990 to 2012, there had been no significant change observed in the SOV share of miles traveled, with some mild variation from year to year. However, in 2015 there was a decrease in the number of miles traveled by SOV which was maintained in 2018 and 2023. However, while MOV miles increased from 2012 to 2015, they dropped somewhat from 2015 to 2023.

There has been a shift of about 5% in the proportion of miles traveled by bicycles in the study period, increasing from 4.9% of miles in 1990 to 10.3% of miles in 2023. Likewise, the number of miles traveled by transit has also increased over the study period, about 3.5% from 1990 to 2023 (4.1% in 1990 to 7.6% in 2023).

Figure 10: Modal Split of All Miles, 1990-2023

Travel Mode	Percent of Miles*													Change 1990 to 2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
SOV	41.8%	41.6%	41.9%	49.6%	46.1%	46.9%	44.0%	49.1%	48.1%	45.2%	46.2%	48.0%	50.0%	-8.2%
MOV	36.1%	35.2%	38.7%	30.5%	35.9%	36.3%	39.5%	35.9%	35.6%	41.3%	38.6%	37.3%	37.7%	-1.6%
Transit	**7.6%**	**10.5%**	7.8%	6.6%	6.9%	5.7%	5.5%	6.5%	7.0%	5.7%	6.4%	6.2%	4.1%	3.5%
School Bus	0.1%	0.0%	0.0%	0.5%	0.5%	0.1%	0.2%	0.4%	0.6%	0.2%	0.2%	0.5%	0.2%	-0.1%
Bicycle**	10.3%	9.2%	8.5%	9.3%	8.1%	7.2%	7.7%	4.7%	4.6%	4.3%	5.6%	5.4%	4.9%	5.4%
Foot	4.1%	3.5%	3.1%	3.4%	2.5%	3.7%	3.0%	3.5%	4.1%	3.2%	2.9%	2.5%	3.0%	1.1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Number of Miles	*19,023*	*17,411*	*25,358*	*18,269*	*27,016*	*25,756*	*31,248*	*28,689*	*25,562*	*30,042*	*30,300*	*29,761*	*29,634*	

Modes with shifts that are statistically significantly different between 1990 and 2023 are shaded.
Modes with shifts that are statistically significant different between 2018 and 2023 are bolded.
** These estimates have a margin of error of ±1.3% using a 95% confidence interval.*
*** In 2023 included 1.8% corresponding to E-bike and E-scooter.*

As with the modal split of trips, the reduction in SOV miles can be compared to the 2019 TMP objective (Figure 11), assuming that the objective of a 24% shift in the proportion of trips made by SOV can be translated as an objective of a 24% shift in the proportion of miles traveled by SOV. When miles are used as the unit of analysis, it can again be observed that the modal shift of miles has not yet met the TMP objective. There tends to be more variability in the proportion of miles traveled by different modes than there is in the proportion of trips.

Figure 11: Percent SOV Miles: Observed Versus Expected Shift, 1990-2023

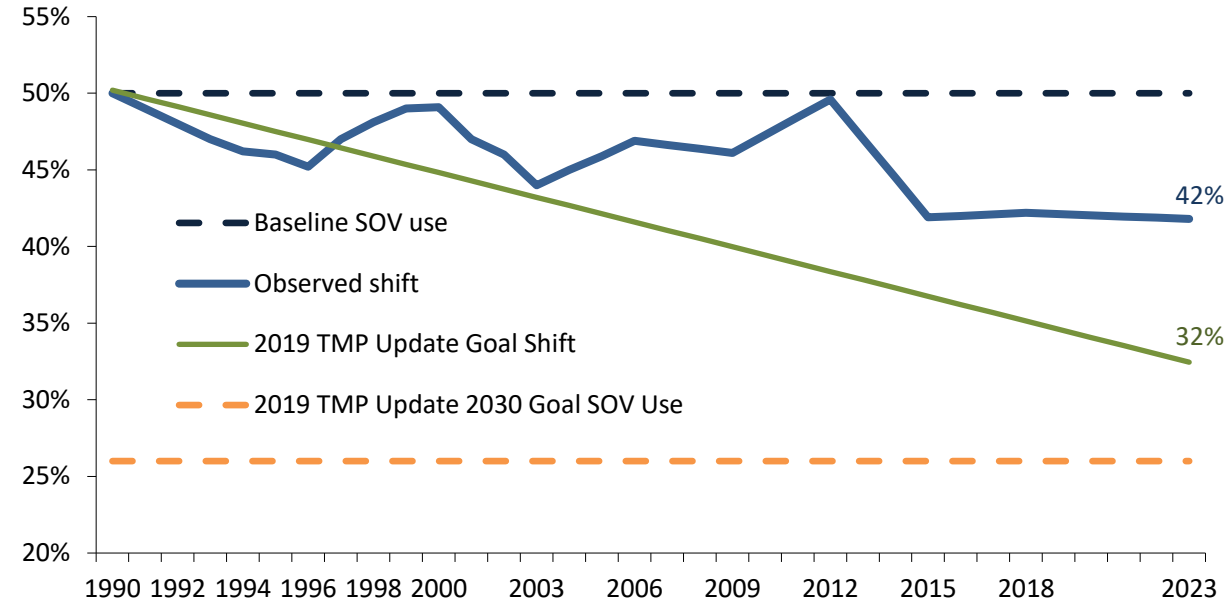
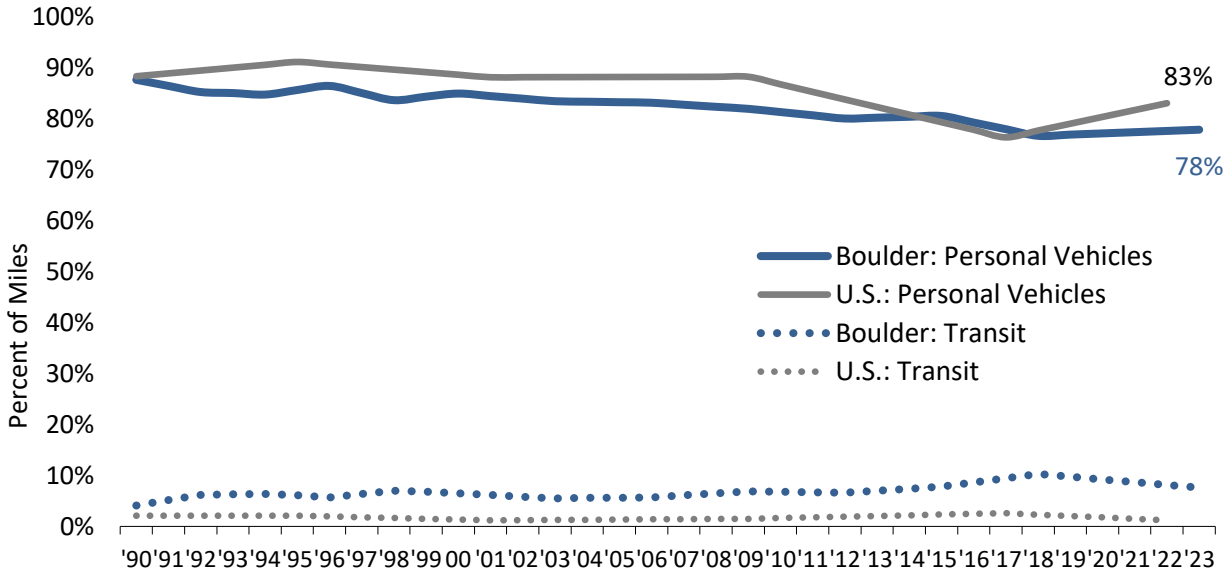


Figure 12 shows a comparison of the percent of miles traveled in the nation between 1990 and 2022, and in Boulder Valley between 1990 and 2023, by mode. The proportion of miles traveled by private vehicles dropped in the U.S., from 88% of miles in 1990 to 83% in 2022. The Boulder trend was also a declining one, from 88% of miles in 1990 to 78% in 2023. The proportion of miles traveled via transit decreased slightly nationwide, from 2.1% in 1990 to 1.2% in 2023, while in Boulder the percent of miles traveled via transit increased, from 4.1% in 1990 to 7.6% in 2023.

Figure 12: Percent of All Miles: Boulder Compared to the U.S., 1990-2023



MODAL SPLIT OF THE WORK COMMUTE

Trips made as part of the work commute were identified for special analysis, including trips directly between home and work and trips linked during the work commute.[3] As not all respondents had a work commute, the data in the following tables are based on a smaller number of respondents and trips, are less stable from year to year and have a higher margin of error (about ±4%).

The SOV modal share of work commute trips decreased from 1990 to 2023 by 20% (see Figure 13), with a large decrease from 2012 to 2018 of about 14% and a large increase of the same magnitude between 2018 and 2023 The transit share has varied over the years but has shown a more stable upward trend since 1996; peaking at 12.3% of trips in 2018. The proportion of work commute trips made by bicycling, which has increased over the study period, had a large increase from 2012 to 2015 followed by moderate decreases in 2018 and 2023.

Figure 13: Modal Split of Trips for the Work Commute, 1990-2023

Travel Mode	Percent of Trips*													Change 1990 to 2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
SOV	**46.6%**	**34.3%**	39.8%	48.5%	47.4%	52.7%	49.6%	57.7%	62.3%	64.8%	59.8%	60.2%	66.6%	-20.0%
MOV	4.9%	4.9%	6.7%	5.7%	8.5%	10.7%	9.2%	7.6%	8.2%	10.8%	10.1%	9.8%	9.9%	-5.0%
Transit	**7.5%**	**12.3%**	8.3%	10.1%	9.7%	5.1%	9.8%	8.7%	7.7%	3.9%	5.8%	6.1%	4.0%	3.5%
School Bus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.1%	0.2%	0.0%	0.0%
Bicycle*	**30.0%**	**33.7%**	35.3%	26.5%	23.3%	20.5%	21.2%	15.6%	9.9%	12.3%	12.4%	14.1%	10.6%	19.4%
Foot	**10.9%**	**14.8%**	10.0%	9.2%	11.1%	11.0%	10.3%	10.4%	11.8%	8.2%	11.8%	9.6%	8.9%	2.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Number of Trips	*383*	*749*	*910*	*754*	*1,021*	*1,101*	*951*	*1,161*	*947*	*1,192*	*1,146*	*1,111*	*1,302*	

Modes with shifts that are statistically significantly different between 1990 and 2023 are shaded.
Modes with shifts that are statistically significant different between 2018 and 2023 are bolded.
** In 2023 included 1.8% corresponding to E-bike and E-scooter.*

[3] *See page 32 for a description of how trips were categorized. Using the trip classification scheme displayed in Figure 52: Types of Trips, the "home-based work" commute trips could be determined. Still, a small percentage of the work commute would not be accounted for when a work trip was "linked," that is, a trip where the person makes a stop on the way to or from work. For example, if the participant stopped at the post office on the way to work, the first trip would be classified as "home-based other" and the second trip would be categorized as "non-home based". Neither of these legs of the trip would be counted as the work commute. Similarly, if a participant drove to the Park-n-Ride, and then took a bus to work, neither trip would be classified as "home-based work;" the first would be coded as "home-based other" the second as "non-home based." To be sure trips were identified as part of the work commute, another code was created which allowed the trips to be distinguished as "linked". All the linked trips are included in the analysis of "work commute" trips.*

From 1990 to 2023 a decrease was observed in the proportion of miles traveled by driving alone for the work commute. From 2012 to 2018 there has been a large decrease in the proportion of miles traveled by driving alone for the work commute follow up by a large increase in 2023.

The initial decreases observed in the proportion of work commute miles traveled via SOV, and the initial increases in transit miles may reflect the emphasis of GO Boulder's programs. At the time of GO Boulder's inception, a great deal of emphasis was placed on the work commute. The Eco-Pass program provided RTD bus passes to many employees in the Boulder Valley.

Over time additional emphases and programs were implemented to influence other mode uses. For example, the modal shift of miles traveled by bicycle for the work commutes has increased about 8% since 1990, with much of the change occurring between 2000 and 2003; and again from 2012 to 2015. This shift in bicycle travel (trip and miles) may be due to the addition of bike/pedestrian underpasses and the continued progress in completing the facilities of the Bicycle System Plan.

Figure 14: Modal Split of Miles for the Work Commute, 1990-2023

Travel Mode	Percent of Work Commute Miles													Change 1990 to 2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
SOV	66.9%	45.6%	56.9%	69.7%	59.7%	66.6%	63.6%	68.8%	66.7%	71.5%	66.6%	64.5%	71.9%	-5.0%
MOV	**9.0%**	**4.8%**	6.7%	10.9%	9.1%	10.3%	12.8%	6.3%	11.2%	11.9%	14.9%	10.1%	10.9%	-1.9%
Transit	**10.1%**	**33.6%**	20.6%	8.7%	19.5%	11.8%	12.6%	17.4%	16.2%	11.2%	12.7%	16.5%	11.2%	-1.1%
School Bus	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.6%	0.0%	+0.2%
Bicycle*	12.4%	14.0%	14.6%	9.6%	10.6%	10.2%	10.0%	6.0%	4.4%	4.3%	4.6%	6.9%	4.7%	+7.7%
Foot	1.4%	2.1%	1.3%	1.1%	1.1%	1.2%	1.0%	1.5%	1.3%	1.0%	1.2%	1.4%	1.3%	+0.1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of Work Commute Miles	*2,048*	*3,468*	*4,508*	*4,411*	*6,215*	*5,980*	*5,607*	*6,637*	*5,846*	*6,326*	*7,111*	*6,412*	*6,818*	

Modes with shifts that are statistically significantly different between 1990 and 2023 are shaded.
Modes with shifts that are statistically significant different between 2018 and 2023 are bolded.
** In 2023 included 0.7% corresponding to E-bike and E-scooter.*

Figure 15 compares the change in Boulder's modal split of the work commute to the national trends. Use of a private vehicle for the work trips which had remained constant across the U.S., experienced an increase in 2023, both measured in trips and miles; while Boulder which had experienced a decline in work trips and miles traveled for the work commute made via private vehicles, showed a sharp increase in 2023. The trend line for the proportion of work trips and miles made via transit has been volatile in Boulder. Nationally, little change has been observed in transit use for work trips or miles, although 2023 showed the lowest values since 1990.

Figure 15: Percent of Work Commute Trips and Miles: Boulder Compared to the U.S., 1990-2023

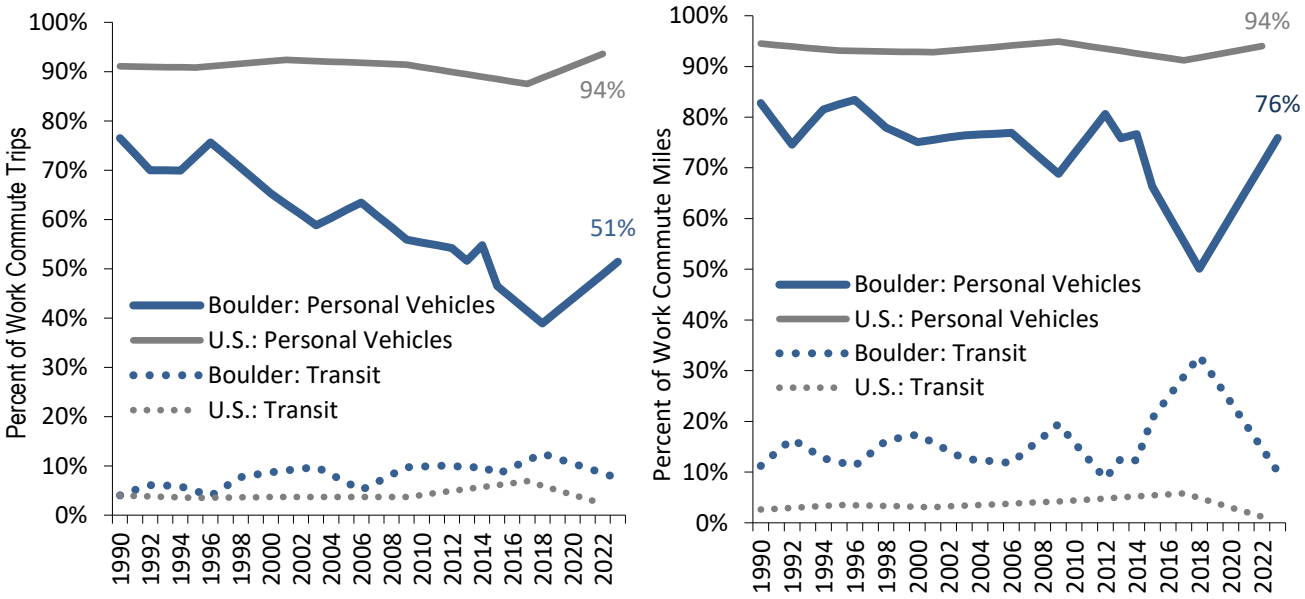


Figure 16 displays the work commute trips made on the assigned travel study day by study participants' workplace location. Those who worked in Boulder were least likely to have used an SOV for any part of their work commute compared to those who worked in other cities. A greater proportion of the work commute trips made by Boulder Valley residents who worked in Boulder were made by bicycle or by foot.

Among travel diary study participants who worked in Boulder, about 8% of the trips made for the work commute were made using transit. This represents a small decrease in transit use for the work commute since 2018 (see Figure 17).

Bicycle use for the work commute was again very high among Boulder residents who worked in Boulder, with 1 in 3 work commute trips reported as being made by bicycling. This represented about a 20% gain since 1990.

Caution should be used when considering the modal split of Denver work trips as few work commute trips captured on the diary day were made to Denver (N=24). While the response rate has decreased over the study years and fewer trips have been captured, these trips continue to be weighted to reflect the population and in Figure 17 we see that there has been a gradual trend toward more bike and walking commute trips in Boulder.

Figure 16: Modal Split of Work Commute Trips by Location of Workplace, 2023

Travel Mode	Location of Workplace		
	Boulder	Denver	Other
Single-Occupancy Vehicle	37.8%	64.8%	87.7%
Multiple-Occupancy Vehicle	3.5%	24.6%	1.7%
Transit	8.2%	10.6%	7.2%
Bicycle**	35.0%	0.0%	3.4%
Foot	15.6%	0.0%	0.0%
Total	100%	100%	100%
Number of Work Commute Trips	*269*	*24*	*51*

*** In 2023 included 1.8% corresponding to E-bike and E-scooter.*

Figure 17: Modal Split of Work Commute Trips for Boulder Residents Who Work in Boulder, 1990-2023

Travel Mode	Percent of Work Commute Trips for BV Residents Who Work in Boulder													Change 1990 to 2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
SOV	**37.8%**	**28.6%**	32.5%	40.2%	41.5%	48.9%	44.0%	55.0%	59.7%	61.8%	58.3%	59.5%	65.9%	-28.1%
MOV	3.5%	3.0%	6.0%	3.5%	5.7%	8.6%	7.1%	7.6%	8.3%	10.0%	11.1%	9.6%	9.7%	-6.2%
Transit	8.2%	9.5%	6.0%	11.5%	7.6%	3.5%	7.7%	5.4%	6.3%	2.8%	3.6%	3.7%	2.4%	5.8%
School Bus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%
Bicycle**	**35.0%**	**40.5%**	43.7%	33.3%	30.4%	26.6%	27.8%	21.6%	13.4%	16.0%	16.1%	16.0%	12.5%	22.5%
Foot	**15.6%**	**18.4%**	11.9%	11.5%	14.8%	12.4%	13.4%	10.4%	11.9%	9.4%	10.7%	11.3%	9.6%	6.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Number of Work Commute Trips	*269*	*528*	*705*	*575*	*648*	*758*	*646*	*786*	*647*	*874*	*856*	*810*	*1,048*	

Modes with shifts that are statistically significantly different between 1990 and 2023 (±4%) are shaded.
Modes with shifts that are statistically significant different between 2018 and 2023 (±4%) are bolded.
*** In 2023 included 1.8% corresponding to E-bike and E-scooter.*

TELECOMMUTING

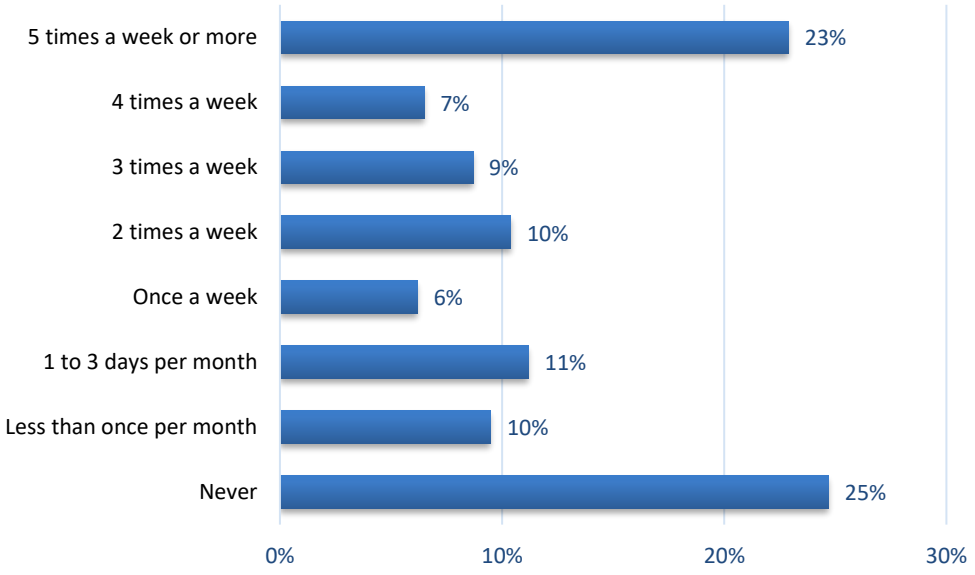
Respondents were asked whether they had telecommuted on the day assigned to them to record their travel. Since this question was first asked in 1996 and until 2015, in most years just over 10% of the respondents have said that they telecommuted on their assigned travel day. In 2023 that proportion doubled to 25%.

Figure 18: Telecommuting on Assigned Travel Day, 1996-2023

Did you telecommute on the day you completed the travel diary?	Percent of Respondents									
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996
Yes	24.6%	12.6%	11.4%	10.8%	8.1%	12.0%	12.2%	10.4%	11.0%	13.6%
No	75.4%	87.4%	88.6%	89.2%	91.9%	88.0%	87.8%	89.6%	89.0%	86.4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of Respondents	*658*	*563*	*930*	*742*	*829*	*882*	*890*	*1,160*	*1,010*	*1,056*

In 2023, the scale of how often workers telework was changed to give more granularity to the answers. About 1 in 4 respondents said they telework every day while 2 in 4 said they do it at least twice a week.

Figure 19: Teleworking Status[4] 2023



[4] *"On average, how often do you telework (work at home instead of going into the office)? Include only full days at home when you did not travel to your workplace."*

The new scale was re-coded into the previous scale for comparative purposes. As seen in Figure 20 the proportion of respondents who never telework decreased from 56% in 2009 to 25% in 2023. Most of that reduction happened between 2018 and 2023. Currently, 3 in 4 Boulder workers telework at least occasionally.

Figure 20: Teleworking Status 2009-2023

On average, how often do you telework (work at home instead of going into the office)? (Include only full days at home when you did not travel to your workplace.)	Percent of Respondents				
	2023	2018	2015	2012	2009
Every work day (I always work from my home)	22.9%	12.0%	12.0%	12.7%	7.9%
1 to 4 times per week	31.8%	10.1%	9.9%	8.2%	9.5%
Once or twice a month	11.2%	15.5%	15.1%	8.9%	9.8%
Occasionally	9.5%	19.9%	15.7%	21.1%	17.2%
Never	24.7%	42.5%	47.3%	49.1%	55.7%
Total	100%	100%	100%	100%	100%
Number of Respondents	*663*	*573*	*934*	*748*	*837*

MODAL SPLIT OF UNIVERSITY/COLLEGE STUDENTS

The modal split for this group is traditionally quite different than the rest of Boulder's population due to the students' high use of alternate modes. In all years, SOVs were used for about 20% to 30% of all university students' trips, and for 5% to 15% of the trips made to school. This low use may be attributed to the lower vehicle availability of students (in 2023, 0.74 vehicles per driver for students versus 0.88 vehicles per driver for non-students) and the scarcity and cost of parking on campus. It may also be due to the fact that some students must park more than a block from school, and thus recorded the purpose of the automobile portion of their trip as "change travel mode," and the walk from the car to school as "school".

Figure 21: Modal Split of All Trips Made by University/College Students, 1990-2023

Travel Mode	Percent of Trips Made by University / College Students													Change 1990 to 2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
SOV	**20.8%**	**28.2%**	21.1%	19.6%	22.9%	19.1%	26.0%	22.3%	21.0%	17.0%	19.8%	20.6%	24.8%	-4.0%
MOV	**11.4%**	**17.0%**	12.1%	9.6%	16.3%	17.0%	17.5%	13.3%	17.0%	19.2%	17.3%	19.3%	19.7%	-8.3%
Transit	9.5%	8.9%	6.6%	10.3%	10.2%	10.8%	9.7%	10.1%	12.2%	6.2%	5.9%	4.7%	5.7%	3.8%
Bicycle**	**25.8%**	**15.2%**	34.5%	26.5%	22.9%	25.1%	15.5%	17.0%	11.3%	18.2%	19.2%	23.1%	17.6%	8.2%
Foot	32.5%	30.8%	25.7%	33.9%	27.7%	27.8%	31.4%	37.3%	38.5%	39.3%	37.8%	32.4%	34.2%	-1.7%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Number of Trips	*753*	*699*	*1,230*	*1,168*	*1,140*	*1,072*	*1,747*	*1,696*	*1,400*	*1,379*	*1,572*	*1,734*	*1,901*	

No modes had statistically significant differences between 1990 and 2023.
Modes with shifts that are statistically significant different between 2018 and 2023 are bolded.
*** In 2023 included 3.8% corresponding to E-bike and E-scooter.*

Figure 22: Modal Split of School Commute Trips Made by University/College Students

Travel Mode	Percent of School Commute Trips Made by University/College Students													Change 1990 to 2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
SOV	**10.8%**	**4.4%**	6.8%	4.5%	11.0%	5.2%	13.0%	8.7%	12.6%	5.7%	7.9%	8.8%	10.1%	0.7%
MOV	7.6%	5.4%	0.0%	1.9%	7.3%	1.2%	1.2%	3.6%	5.1%	3.0%	3.0%	1.7%	3.2%	4.4%
Transit	16.9%	18.1%	4.6%	16.8%	12.8%	19.9%	18.9%	10.4%	20.3%	8.0%	7.5%	8.5%	8.9%	8.0%
Bicycle	**14.9%**	**29.7%**	52.5%	33.0%	35.3%	42.9%	22.8%	22.7%	15.4%	30.9%	25.9%	31.5%	24.2%	-9.3%
Foot	**49.7%**	**42.4%**	36.1%	43.8%	33.5%	30.8%	44.0%	54.6%	46.7%	52.4%	55.7%	49.5%	53.6%	-3.9%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Number of School Commute Trips	*112*	*84*	*219*	*267*	*218*	*181*	*259*	*341*	*296*	*241*	*299*	*364*	*334*	

Modes with shifts that are statistically significant different between 1990 and 2023 are shaded.
Modes with shifts that are statistically significant different between 2018 and 2023 are bolded.
*** In 2023 included 2.8% corresponding to E-bike and E-scooter.*

TRIP CHARACTERISTICS

Summary Characteristics of All Trips

This section of the report explores the characteristics of the trips made by Boulder Valley residents. Figure 23, below, displays summary trip characteristics for all trips, regardless of mode of travel. These trip characteristics have remained fairly steady over the study period, although the average number of miles traveled per day decreased slightly from 1990 to 2023.

On average, respondents traveled about 20 miles per day and made about 5 trips during the 24-hour period assigned to them in 2023, with an average trip length of about 4 miles. Both the average trip distance and the average trip time have slightly increased since 1990.

About 8% of respondents made no trips on their assigned travel day, an increase from the 4% who did so in 1990, but similar to what has been observed in recent years.

Figure 23: Summary Trip Characteristics, All Trips, 1990-2023

Summary Travel Characteristics	Year													Change 1990-2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Average number of trips per day per person	5.1	5.3	5.4	4.9	5.1	5.7	5.5	6.1	5.9	6.2	6.1	6.0	5.9	-0.8
Average number of miles per day per person	20.2	21.7	22.7	18.8	24.7	24.1	27.0	25.2	26.0	27.8	26.9	25.4	24.3	-4.1
Percent of people who did not leave the house on assigned travel day	7.6%	7.9%	5.7%	5.7%	5.8%	5.4%	5.2%	4.7%	4.9%	5.2%	4.1%	4.6%	4.1%	3.5%
Average estimated trip length in miles[5]	4.3	4.3	4.4	3.8	5.0	4.3	5.1	4.3	4.3	4.7	4.5	4.6	4.0	0.3
Average estimated trip time in minutes	18.4	19.4	19.6	15.8	17.0	16.0	15.4	13.5	11.4	13.3	11.8	14.9	14.4	4.0
Average miles per hour	14.0	13.6	13.8	13.8	15.7	15.7	16.0	15.4	15.5	15.2	15.9	15.7	15.1	-1.1

Characteristics with changes that are statistically significantly different between 1990 and 2023 are shaded.
Characteristics with changes that are statistically significant different between 2018 and 2023 are bolded.

[5] *Travel Diary Study participants are asked to record the estimated distance in miles or blocks of every trip they make. Thus, trip distance is not measured objectively, but is determined by the respondents' self-report. See Appendix E. Study Methodology for a note on the adjustments made to these figures.*

Trip Characteristics of the Work Commute

The travel characteristics of work commute trips are displayed in Figure 24. Figure 25 makes comparisons to the national commute. The average work commute for Boulder residents was 5.5 miles in 2023, while the average work commute duration was about 20 minutes. As with all trips, the work trips made by Boulder residents were shorter in length and duration than observed nationally.

Figure 24: Summary Work Commute Trip Characteristics, All Travel Modes, 1990-2023

Summary Travel Characteristics	Year													Change 1990-2023
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Average estimated trip length in miles	5.5	4.6	5.1	6.0	6.1	5.5	6.2	5.7	6.2	5.3	6.2	5.9	5.2	0.3
Average estimated trip time in minutes	19.7	19.7	22.3	17.7	17.1	17.1	16.7	16.3	12.1	13.7	20.4	16.7	15.1	4.6
Average miles per hour	15.5	13.5	14.4	17.1	18.3	17.8	18.6	17.9	18.6	18.1	18.9	19.6	18.4	-2.9

Characteristics with changes that are statistically significantly different between 1990 and 2023 are shaded.
Characteristics with changes that are statistically significant different between 2018 and 2023 are bolded.

Figure 25: Summary Work Commute Trip Characteristics, Boulder Compared to the U.S., 1990-2023

Summary Travel Characteristics	Boulder				U.S. (NHTS*)			
	2023	2018	1990	Annual Percent Change	2022	2017*	1990	Annual Percent Change
Average estimated trip length in miles	5.5	4.6	5.2	+20%	13.65	11.46	10.65	+19%
Average estimated trip time in minutes	19.7	19.7	15.1	+0%	27.75	26.58	19.60	+1%

** General commute patterns by mode of transportation.*
**2017 NHTS sample was address-based and among other changes included more urban and cell phone only households than prior years.*

A household travel survey that accompanied the diary asked respondents to identify where they worked if they were employed. Since 2003, about three in four employed respondents work in Boulder.

Figure 26: Location of Respondent's Workplace, 1990-2023

Location of Workplace	Percent of Respondents												
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Boulder	75.6%	78.5%	83.5%	80.6%	76.7%	73.2%	77.4%	62.9%	78.7%	81.7%	80.4%	81.5%	83.1%
Denver	7.8%	4.5%	6.0%	6.3%	6.2%	6.3%	6.2%	5.4%	8.7%	8.3%	8.3%	1.0%	8.3%
Longmont	1.6%	2.1%	2.0%	2.3%	3.4%	4.8%	3.8%	1.8%	2.5%	1.9%	1.8%	2.2%	1.2%
Broomfield	2.4%	3.3%	1.9%	4.1%	2.5%	3.9%	2.4%	2.2%	1.3%	2.5%	2.3%	3.3%	1.3%
Louisville	3.8%	2.4%	0.9%	0.8%	2.5%	3.0%	2.3%	2.0%	3.3%	2.2%	2.2%	0.5%	1.8%
Lafayette	1.5%	1.9%	0.8%	0.8%	1.8%	1.6%	1.0%	1.0%	0.6%	0.6%	1.7%	2.1%	0.7%
Other location	7.3%	7.3%	5.0%	5.1%	6.7%	7.1%	6.8%	24.6%	4.8%	2.9%	3.2%	9.5%	3.6%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of Employed Respondents	*529*	*538*	*799*	*710*	*787*	*897*	*911*	*1,182*	*839*	*895*	*942*	*973*	*1,109*

Automobile Trip Characteristics

Figure 27 and Figure 28 summarize the trip characteristics for automobile trips. The proportion of respondents making at least one SOV trip on their assigned travel day has decreased from 65% in 1990 to 53% in 2023; the proportion making at least one MOV trip decreased from 48% in 1990 to 37% in 2023. On average, participants in the 2023 study made 1.7 SOV trips per day; those who made at least one SOV trip made 3.3 trips on average. The average number of carpool trips per respondent in 2023 was about 1.

The average trip distance was about 5 miles for SOV trips and about 7 miles for MOV trips. The average trip duration in minutes was about 16 minutes for SOV trips, and about 18 minutes for MOV trips.

Figure 27: Summary Trip Characteristics, SOV Trips, 1990-2023

Summary Travel Characteristics	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of SOV trips per day per person	1.74	1.80	1.75	1.65	1.80	2.03	2.00	2.36	2.28	2.41	2.37	2.34	2.49
Percent of people making at least one SOV trip	53.4%	53.4%	48.1%	49.5%	53.6%	56.8%	56.6%	62.8%	59.5%	60.2%	63.0%	60.0%	64.6%
Average number of SOV trips per day per person who made at least one SOV trip	3.27	3.37	3.64	3.34	3.36	3.57	3.52	3.76	3.83	4.00	3.77	3.90	3.85
Average estimated trip length in miles	5.0	4.8	5.2	5.3	6.1	5.2	5.7	5.0	5.1	5.1	5.2	5.2	4.6
Average estimated trip time in minutes	15.8	18.2	17.2	15.8	16.3	14.6	13.3	11.5	9.6	12.6	11.4	13.7	12.9
Average miles per hour of SOV trips	18.5	17.6	18.2	19.5	21.1	20.3	21.0	19.7	20.0	19.4	20.5	20.2	19.3

Characteristics with changes that are statistically significantly different between 1990 and 2023 are shaded.
Characteristics with changes that are statistically significant different between 2018 and 2023 are bolded.

Figure 28: Summary Trip Characteristics, MOV Trips, 1990-2023

Summary Travel Characteristics	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of MOV trips per day per person	1.05	1.10	1.11	0.94	1.14	1.40	1.26	1.38	1.44	1.52	1.49	1.44	1.52
Percent of people making at least one MOV trip	36.7%	37.4%	35.9%	32.4%	38.6%	43.3%	40.6%	43.1%	43.7%	46.9%	47.1%	44.2%	47.5%
Average number of MOV trips per day per person who made at least one MOV trip	2.87	2.94	3.09	2.90	2.95	3.23	3.10	3.20	3.30	3.23	3.16	3.26	3.19
Average estimated trip length in miles	7.0	7.0	7.8	6.0	7.5	6.2	8.6	6.4	6.1	7.5	6.8	6.6	5.8
Average estimated trip time in minutes	18.3	17.5	19.9	18.1	17.6	16.4	18.4	14.5	9.8	13.4	12.3	17.1	16.0
Average miles per hour of MOV trips	20.4	19.9	20.2	19.6	21.0	20.9	21.4	20.1	19.9	19.9	20.3	19.2	18.5

Characteristics with changes that are statistically significantly different between 1990 and 2023 are shaded.
Characteristics with changes that are statistically significant different between 2018 and 2023 are bolded.

Vehicle Miles Traveled per Capita

An estimate was created of per capita vehicle miles traveled (VMT) per adult Boulder Valley resident. This estimate includes miles traveled in a single-occupancy vehicle and in a multiple occupancy vehicle (this means that some of the MOV miles are "double-counted" because the miles traveled are being assigned to all those in the vehicle.) There is some volatility in these estimates, because there is a certain amount of error around each of the estimates that goes into the calculation. However, the estimated number of vehicle miles traveled per capita has ranged for most of the time from about 5,000 to 7,500.

Figure 29: Vehicle Miles Traveled per Capita, 1990-2023

Calculating per capita VMT	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of SOV trips per day per person	1.74	1.80	1.75	1.65	1.80	2.03	2.00	2.36	2.28	2.41	2.37	2.34	2.49
Average estimated SOV trip length in miles	5.0	4.8	5.2	5.3	6.1	5.2	5.7	5.0	5.1	5.1	5.2	5.2	4.6
Estimated SOV VMT per capita per day (average number of trips x average trip length)	8.70	8.64	9.10	8.75	10.98	10.56	11.40	11.80	11.63	12.29	12.32	12.17	11.45
Average number of MOV trips per day per person	1.05	1.10	1.11	0.94	1.14	1.40	1.26	1.38	1.44	1.52	1.49	1.44	1.52
Average estimated MOV trip length in miles	7.0	7.0	7.8	6.0	7.5	6.2	8.6	6.4	6.1	7.5	6.8	6.6	5.8
Estimated MOV VMT per capita per day (average number of trips x average trip length)	7.35	7.70	8.66	5.64	8.55	8.68	10.84	8.83	8.78	11.40	10.13	9.50	8.82
TOTAL VMT per capita per day (SOV VMT + MOV VMT)	16.05	16.34	17.76	14.39	19.53	19.24	22.24	20.63	20.41	23.69	22.46	21.67	20.27
TOTAL annual VMT per capita per day (assumes 48 weeks a year, 336 days)	5,393	5,490	5,967	4,833	6,562	6,463	7,471	6,932	6,858	7,960	7,545	7,282	6,811

Figure 30: Vehicle Miles Traveled per Capita taking into account vehicle occupancy of MOV trips, 1990-2023

Calculating per capita VMT'	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Estimated MOV VMT' per capita per day (average trip length divided the average Vehicle Occupancy for Autos with at Least Two Passengers)	3.10	2.81	3.35	2.55	3.01	2.54	3.52	2.61	2.47	3.10	2.80	2.66	2.35
TOTAL VMT' per capita per day (SOV VMT + MOV VMT')	11.80	11.45	12.45	11.30	13.99	13.10	14.92	14.41	14.10	15.39	15.12	14.83	13.80
TOTAL annual VMT' per capita per day (assumes 48 weeks a year, 336 days)	3,964	3,848	4,182	3,798	4,701	4,402	5,015	4,843	4,737	5,171	5,080	4,983	4,636

Vehicle Occupancy

The average number of people in an automobile has not changed significantly from 1990 to 2023 (see Figure 31). The average vehicle occupancy for all automobile trips was about 1.5 persons; for MOV trips the average vehicle occupancy was about 2.3 persons. Just over 60% of all automobile trips were made with only one person in the vehicle.

Figure 31: Vehicle Occupancy, 1990-2023

Number of Occupants	Percent of Total Auto Trips												
	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
1	62.7%	63.4%	63.1%	64.6%	61.5%	61.2%	63.7%	63.7%	62.0%	61.7%	61.0%	62.3%	62.6%
2	30.7%	25.3%	28.2%	26.9%	26.2%	27.9%	26.0%	25.6%	26.5%	27.4%	27.7%	26.4%	25.6%
3	4.0%	6.4%	6.1%	5.7%	7.0%	6.6%	6.7%	6.7%	6.7%	7.1%	7.3%	6.6%	7.6%
4	2.2%	4.0%	2.0%	2.1%	4.3%	3.1%	2.2%	3.2%	3.6%	3.2%	2.9%	3.4%	2.8%
5 or more	0.3%	0.9%	0.6%	0.7%	1.0%	1.2%	1.4%	0.9%	1.2%	0.8%	1.1%	1.4%	1.3%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Average Vehicle Occupancy for all Automobiles	1.47	1.54	1.44	1.45	1.55	1.54	1.48	1.51	1.54	1.54	1.56	1.56	1.55
Average Vehicle Occupancy for Autos with at Least Two Passengers	2.26	2.49	2.33	2.35	2.49	2.44	2.44	2.45	2.47	2.42	2.43	2.48	2.47
Number of Trips	*2,613*	*2,369*	*3,355*	*2,640*	*3,326*	*3,822*	*4,425*	*4,397*	*3,892*	*4,251*	*4,358*	*4,414*	*5,086*

Vehicle Ownership and Availability

Vehicle availability and ownership for all study years are shown in Figure 32. Vehicle availability has declined slightly since 1990, when the average was 1.0 vehicle for every household member aged 16 and over to 0.85 vehicles per household member aged 16 and older in 2023. The average number of motorized vehicles per household has also declined, from 1.83 vehicles per household in 1990 to 1.55 vehicles per household in 2023. Bicycles per household has remained stable while in 2023 e-scooter availability was asked for first time.

Figure 32: Vehicle Availability, Vehicles per Household 1990-2023

Vehicle and Bicycle Availability	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average vehicle availability (per person in household 16 or older)	0.85	0.90	0.89	0.89	0.93	0.90	0.89	0.96	0.92	0.89	0.99	0.98	1.00
Average number of motorized vehicles per household	1.55	1.61	1.77	1.59	1.66	1.60	1.69	1.79	1.73	1.63	1.78	1.83	1.83
Average number of bicycles per household	2.05	2.59	2.78	2.48	2.26	2.19	2.21	2.09	2.04	2.00	2.00	1.98	*not asked*
Average number of e-bikes per household	.17	.04	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*
Average number of e-scooters per household	.02	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*	*not asked*

About 1 in 4 residents said they never bike, while 3 in 4 residents said the same about e-bikes. Also, 9 in 10 respondents said they never use E-scooters (Figure 33). For biking, users mainly use private bikes, while e-bikes and e-scooters are mostly accessed through apps or memberships (Figure 34).

Figure 33: Bicycles, E-bikes and E-scooters frequency of use, 2023

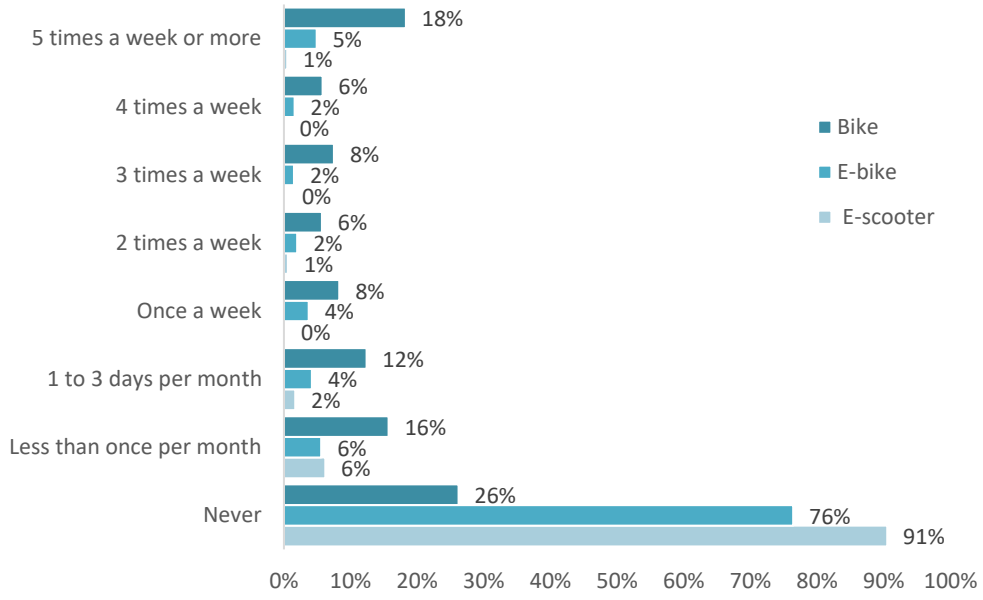
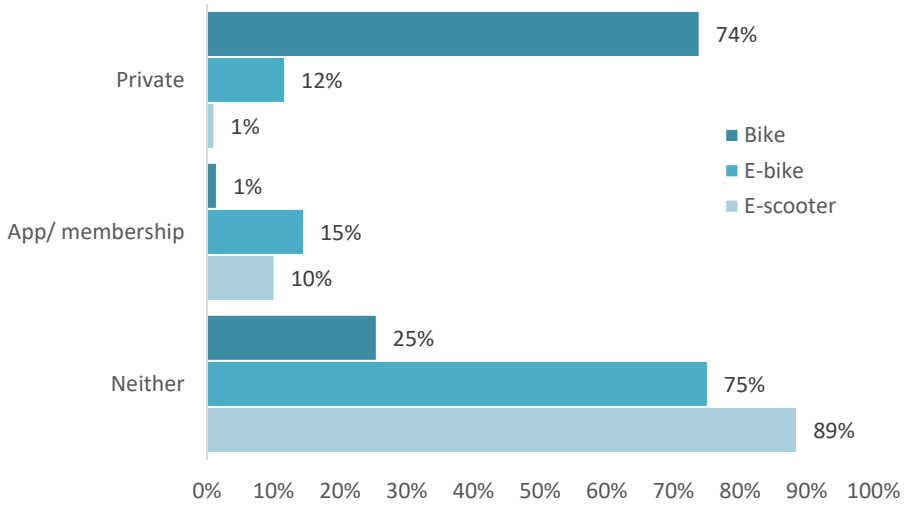


Figure 34: Type of Bicycle, E-bike and E-scooter used, 2023



Transit Trip Characteristics

The characteristics of trips made on the assigned travel day via transit are shown in Figure 35. The proportion of people who made at least one trip on the bus increased from about 5% in 1990 to about 10% in 2023. The average bus trip was about 8 miles. The estimated trip duration was 27 minutes.

Figure 35: Summary Trip Characteristics, Transit Trips, 1990-2023

Summary Travel Characteristics	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of bus trips per day per person	0.19	0.25	0.19	0.22	0.26	0.21	0.24	0.25	0.25	0.17	0.17	0.13	0.09
Percent of people making at least one bus trip	9.6%	12.8%	10.7%	11.0%	12.5%	9.2%	11.2%	11.5%	10.3%	8.6%	7.7%	6.0%	4.8%
Average number of bus trips per day per person who made at least 1bus trip	1.95	1.98	1.80	2.02	2.06	2.29	2.12	2.18	2.44	1.96	2.18	2.10	1.85
Average estimated trip length in miles	7.8	8.8	9.5	5.5	6.5	6.2	6.4	6.6	7.2	9.7	10.1	13.2	10.4
Average estimated trip time in minutes	26.5	27.1	29.0	21.8	16.4	21.1	21.2	16.6	18.1	18.4	28.3	29.7	29.7
Average miles per hour of transit trips	14.5	15.6	15.3	13.5	15.6	15.6	15.5	14.9	17.1	17.9	18.1	24.5	18.9

Characteristics with changes that are statistically significantly different between 1990 and 2023 are shaded.

Eco-Pass Status

In previous implementations of the travel diary, study participants were asked whether they had an Eco-Pass, and what kind they held. Starting in 2009, participants were first asked if they were eligible to have an Eco-Pass. About half of respondents said they were eligible for an Eco-Pass in 2023 (see Figure 36). However, 7% of those eligible for a pass in 2023 had not picked up or activated their pass (see Figure 37).

Figure 36: Eco-Pass Eligibility, 2009-2023

Are you eligible to have an Eco-Pass, an annual pass that allows you unlimited bus rides?	2023	2018	2015	2012	2009
Yes, through my employer	17.0%	24.4%	21.8%	20.2%	17.6%
Yes, through my neighborhood	12.2%	13.2%	10.2%	11.4%	12.0%
Yes, a CU Boulder student Buff One pass	15.6%	15.8%	20.3%	20.2%	18.0%
Yes, CU Boulder faculty/staff Buff One pass	4.0%	4.5%	5.4%	5.2%	7.1%
Yes, other pass	1.2%	1.0%	0.9%	1.6%	1.7%
No, I am not eligible for an Eco-Pass	52.4%	46.3%	45.2%	46.1%	47.6%
Number of Respondents	*892*	*765*	*1,117*	*1,036*	*1,112*

** Percents may add to more than 100% as respondents could give more than one answer.*

Figure 37: Eco-Pass Pick-up Status, 2009-2023

Did you pick up a pass (or passes)?* **	2023	2018	2015	2012	2009
Yes	91.5%	79.3%	88.2%	79.7%	82.8%
No	8.5%	20.7%	11.8%	20.3%	17.2%
Total	100%	100%	100%	100%	100%
Number of Respondents	*445*	*412*	*620*	*561*	*588*

** Only asked of those eligible for an Eco-Pass.*
*** In 2023 this question was not asked. Instead, an option "haven't picked-up or activated the pass" was offered while inquiring about the frequency of Eco-Pass use. Both questions were re-coded for comparative purposes.*

To compare Eco-Pass possession over time, those who were eligible for an Eco-Pass and reported that they had picked one up were considered to have an Eco-Pass. As shown in Figure 38, about 43% of study participants in 2023 held an Eco-Pass, a proportion that has been similar over the years. In 2023, about 19% of respondents had an Eco-Pass through their employer (including a university faculty/staff transit pass), while 15% had a university student transit pass. Finally, about 9% held an Eco-Pass through their neighborhood.

Figure 38: Eco-Pass Status, 1998-2023

Do you have an Eco-Pass?	2023†	2018†	2015†	2012†	2009†	2006	2003	2000	1998
No	56.7%	57.4%	51.4%	56.9%	56.4%	61.9%	53.9%	60.7%	61.0%
Yes, through employer	14.7%	16.9%	15.9%	13.1%	12.4%	12.3%	12.6%	11.2%	10.2%
Yes, a university faculty/staff transit pass	4.0%	4.1%	5.3%	4.7%	6.5%	3.7%	4.6%	2.9%	4.2%
Yes, a university student transit pass	14.9%	13.2%	19.8%	17.2%	15.4%	15.9%	23.2%	20.4%	21.2%
Yes, through neighborhood	8.9%	7.8%	7.0%	6.9%	8.1%	4.7%	2.6%	3.9%	3.5%
Yes, other pass	0.7%	0.6%	0.6%	1.2%	1.2%	1.4%	3.1%	0.9%	0.0%
Total	100	100%	100%	100%	100%	100%	100%	100%	100%
Number of Respondents	*883*	*766*	*1122*	*1040*	*1118*	*1,154*	*1,278*	*1,191*	*1,035*

† This percent is an estimate, based on respondent's Eco-Pass eligibility and pick-up status. Since the question asked in 1998 through 2006 was changed in 2009, results prior 2009 may not be directly comparable to those of 2009 and later.

Beginning in 2009, survey participants with an Eco-Pass were asked how often, on average, they used their Eco-Pass. About two in three of those with an Eco-Pass used it at least once a month during 2023.

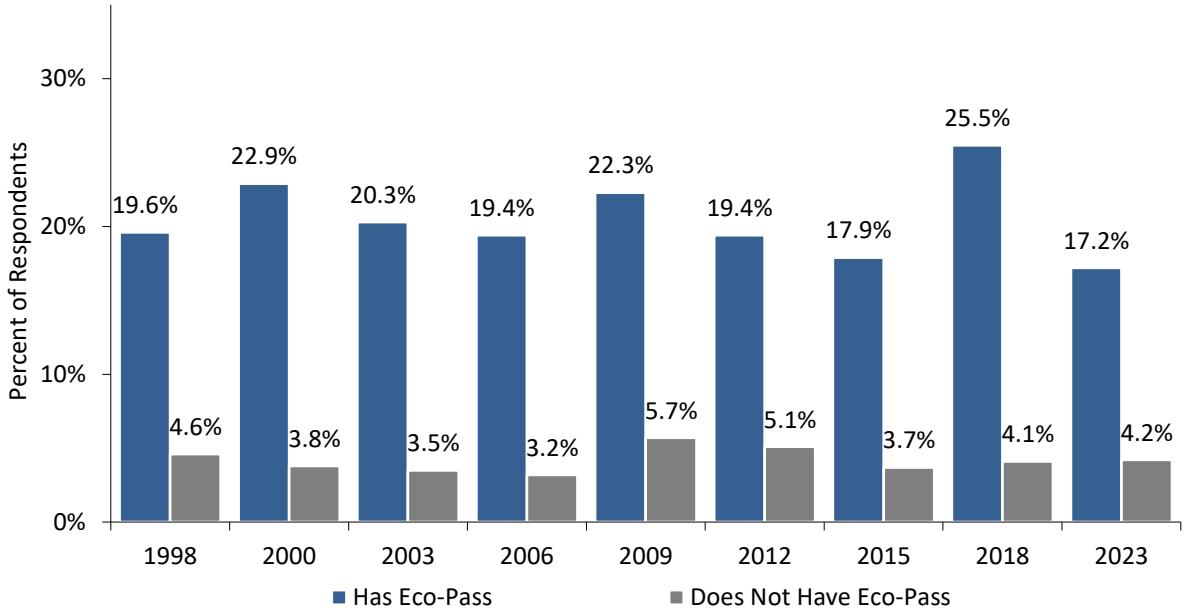
Figure 39: Use of the Eco-Pass, 2009-2023

About how often, on average, do you use your Eco-Pass?*	2023	2018	2015	2012	2009
More than once a week	22.1%	32.6%	31.2%	33.0%	41.4%
About once a week	10.8%	12.5%	11.1%	11.8%	15.4%
About once every two weeks	10.8%	16.1%	16.8%	15.1%	10.2%
About once a month	20.2%	19.2%	16.7%	17.8%	10.7%
Less often than once a month	27.0%	19.6%	24.3%	22.3%	22.3%
Haven't used	9.1%	-	-	-	-
Total	100%	100%	100%	100%	100%
Number of Respondents	*407*	*345*	*552*	*449*	*488*

** Only asked of who have an Eco-Pass.*
*** The option "Haven't used" was added in 2023.*

Bus ridership has been positively associated with having an Eco-Pass. Since 1998, between 3% and 6% of non-Eco-Pass holders made at least one bus trip compared to 17% to 26% of Eco-Pass holders (Figure 40).

Figure 40: Bus Ridership by Eco-Pass Status: Percent Who Made at Least 1 Trip on the Bus. 1998-2023



Non-Vehicle Trip Characteristics: Walking and Biking

In all study years about a third of respondents made at least one walking trip on their assigned travel day (see Figure 41). Walking trips have tended to be quite short in distance; the average trip length was 0.8 miles in 2023.

Figure 41: Summary Trip Characteristics, Pedestrian Trips, 1990-2023

Summary Travel Characteristics	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of pedestrian trips per day per person	1.01	1.03	0.90	0.92	0.86	0.99	0.98	1.15	1.21	1.21	1.11	0.97	1.04
Percent of people making at least one pedestrian trip	37.5%	36.8%	34.3%	30.8%	33.0%	34.6%	34.8%	36.9%	39.1%	39.9%	36.9%	34.8%	33.0%
Average number of pedestrian trips per day per person who made at least one pedestrian trip	2.69	2.80	2.61	2.99	2.62	2.85	2.81	3.11	3.09	3.04	3.00	2.78	3.16
Average estimated pedestrian trip length in miles	0.8	0.8	0.8	0.7	0.7	0.9	0.9	0.7	0.8	0.7	0.7	0.7	0.7
Average estimated pedestrian trip time in minutes	19.4	19.4	17.4	13.2	14.9	17.3	13.6	14.8	15.3	15.1	15.1	13.6	14.4
Average miles per hour of pedestrian trips	3.4	3.5	3.3	3.7	3.2	3.6	3.9	2.8	3.5	3.3	3.6	3.4	3.3

The proportion of respondents making one or more trips by bicycle on their assigned travel day increased from 15% in 1990 to 21% in 2023 (see Figure 42). In 2023 the average distance of a bike trip was about 2.6 miles and took about 20 minutes to complete.

Figure 42: Summary Trip Characteristics, Bicycle Trips, 1990-2023

Summary Travel Characteristics	2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of bicycle trips per day per person	0.60	0.82	0.97	0.84	0.72	0.70	0.70	0.55	0.45	0.52	0.65	0.66	0.50
Percent of people making at least one bicycle trip	**21.3%**	**27.0%**	32.7%	25.2%	23.9%	20.4%	23.2%	17.1%	15.0%	16.6%	19.8%	20.9%	15.2%
Average number of bicycle trips per day per person who made at least one bike trip	2.84	3.05	2.95	3.31	3.01	3.44	3.02	3.24	3.00	3.16	3.28	3.14	3.28
Average estimated bicycle trip length in miles	2.6	2.3	1.8	1.9	2.5	2.2	2.8	2.0	2.4	2.2	2.3	2.0	2.1
Average estimated bicycle trip time in minutes	20.5	22.4	23.5	14.6	18.3	16.3	16.9	15.4	13.6	14.3	9.5	14.1	15.1
Average miles per hour	8.5	8.0	7.7	7.8	8.1	8.1	8.8	8.2	8.7	8.4	8.4	7.7	8.2

Characteristics with changes that are statistically significantly different between 1990 and 2018 are shaded.
Characteristics with changes that are statistically significant different between 2018 and 2018 are bolded.

In 2023, the Travel Diary incorporated trips made by E-Bike and E-scooter for the first time. As seen in Figure 43, nearly 5% of respondents reported making one or more trips by e-bike on their designated travel day, whereas the proportion of respondents using e-scooters was below 1%. It's important to interpret the characteristics of E-scooter rides cautiously due to the limited number of respondents recording such trips in their travel diaries.

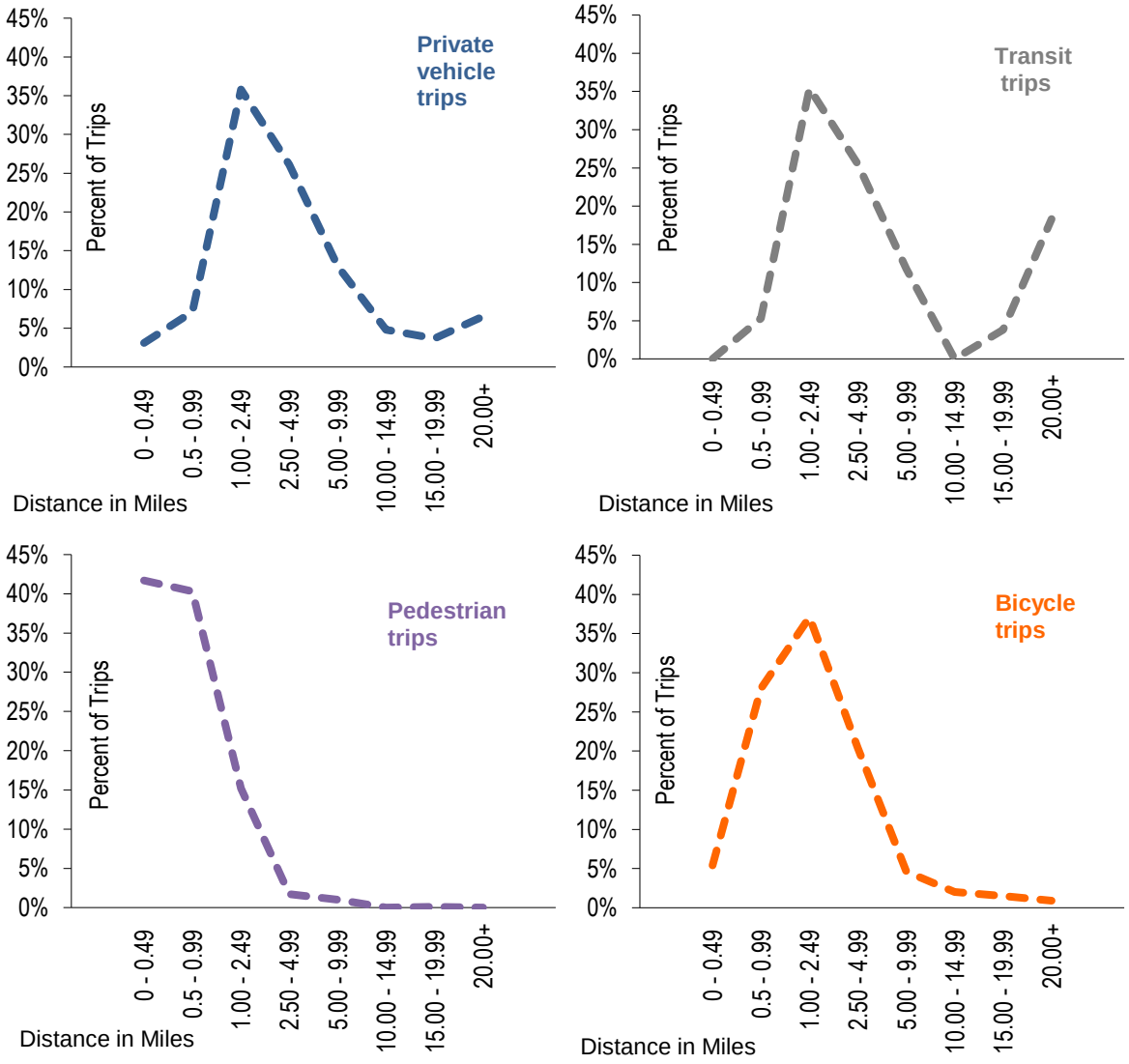
Figure 43: Summary Trip Characteristics, E-bike and E-scooter Trips, 2023

Summary Travel Characteristics	E-bike	E-scooter
Average number of trips per day per person	0.19	0.01
Percent of people making at least one trip	5.6%	0.5%
Average number of trips per day per person who made at least one trip	3.46	1.52
Average estimated trip length in miles	1.6	5.5
Average estimated trip time in minutes	16.8	16.5
Average miles per hour	7.7	18.4

Trip Distance

In Figure 44, trip distances are exhibited by mode of travel. For motorized vehicle trips, private vehicle and transit trips distances tend to be either middle distance, between one and two-and-a-half miles, or over a longer length (20 or more miles). These "peaks" are even more evident for bus trips than for drive alone or carpool trips. Bike and walking trips, on the other hand, tend to be much shorter, especially for walking trips.

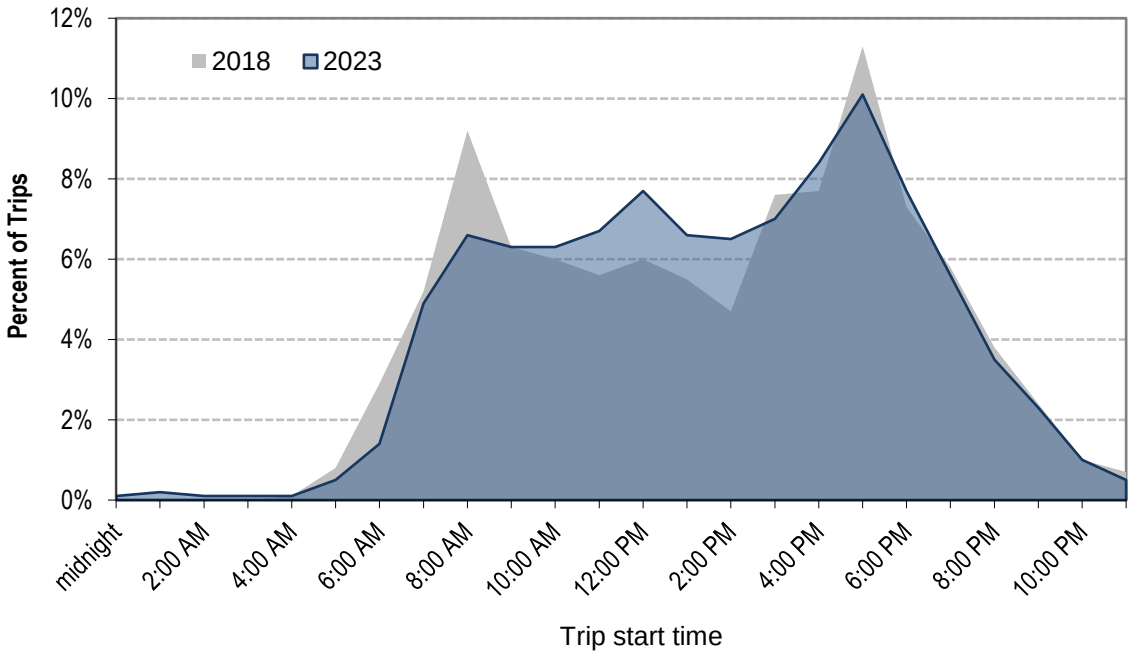
Figure 44: Trip Distance by Mode of Travel, 2023



Trip Start Times

Trip start and end times were recorded by respondents as they kept track of their travel throughout their assigned travel day. The graph in Figure 45 shows when travel activity took place. Most travel occurred between 6:00 am and 8:00 pm, with a large spike during the afternoon commute time (about 4:00 pm to 6:00 pm), and smaller peaks for the morning commute time and the noontime lunch hour.

Figure 45: Time When Trip Began, 2018-2023



Deliveries to the Home or Office

Beginning in 1998, study participants were asked about certain behaviors which might replace trips. They were asked whether they had any goods or services delivered to their work or home and whether they had telecommuted on their assigned travel day (see page 12 for information on telecommuting).

About 8% of respondents in 1998 had received at least one delivery on their assigned travel day, and about 20% received a delivery in 2023 (see Figure 46). About one-third of the respondents who received a delivery in 2023 felt that the delivery took the place of a travel trip they might have made to seek the good or service (see Figure 47).

As simple calculation (the percent of those who received a delivery times the percentage of deliveries that replace a trip) shows that 7.6% of respondents received a delivery that substituted for travel in 2023, compared to about 2.5% in the previous 20 years (see las row in Figure 47).

Figure 46: Deliveries Received by Respondents, 1998-2023

Percent of Respondents Who Received Any Deliveries On Their Assigned Travel Day	2023	2018	2015	2012	2009	2006	2003	2000	1998
No, did not receive deliveries	79.8%	89.1%	90.4%	93.7%	94.9%	93.6%	93.8%	94.6%	92.1%
Yes, received deliveries	20.2%	10.9%	9.6%	6.3%	5.1%	6.4%	6.2%	5.4%	7.9%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of respondents	*900*	*762*	*1,109*	*1,036*	*1,107*	*1,130*	*1,262*	*1,150*	*1,008*

Figure 47: Did Deliveries Replace Any Drive Alone Trips, 2000-2023

Did the delivery substitute for a travel trip you might have made to seek the good or service?*	2023	2018	2015	2012	2009	2006	2003	2000
Yes	37.5%	22.1%	51.0%	36.4%	46.3%	41.8%	43.7%	44.2%
No	62.5%	77.9%	49.0%	63.6%	53.7%	58.2%	56.3%	55.8%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Number of respondents	178	84	104	67	54	72	81	97
Percent of respondent who had a delivery that replaced a travel trip	*7.6%*	*2.4%*	*4.9%*	*2.3%*	*2.4%*	*2.7%*	*2.7%*	*NA*

**Question only asked of those who had received deliveries.*

PURPOSE OF TRAVEL

In addition to recording information about the time of day and mode of transportation used for each trip, respondents were also asked to document the purpose of each trip they made. Figure 48 and Figure 49 show the reasons for travel by trips made and by miles traveled, respectively. Patterns of trip purpose were fairly similar over the entire study period. Aside from the "go home" trips (about a third of all trips and miles) and work-related trips (11% of trips and 12% of miles), recreational trips account for one of the largest proportion of trip purposes; 20% of trips and 26% of miles in 2023. These figures represent the highest values since the inception of the study.

Figure 48: Purpose of Trips, 1990-2023

Trip Purpose		2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Go Home		34.5%	34.2%	35.0%	34.7%	33.7%	33.1%	33.3%	33.7%	32.0%	31.6%	32.8%	32.3%	33.6%
Work	All	10.5%	13.3%	14.3%	13.8%	13.9%	13.9%	13.2%	13.1%	13.1%	15.5%	14.4%	14.1%	15.1%
	Work Commute	9.0%	7.7%	8.8%	9.2%	8.6%	8.5%	9.2%	9.0%	8.8%	-	-	-	-
	Other Work/Business	1.5%	5.6%	5.5%	4.6%	5.3%	5.4%	4.0%	4.1%	4.3%	-	-	-	-
Social/Recreation		19.8%	17.0%	16.4%	13.4%	16.2%	14.8%	16.2%	12.9%	14.4%	13.9%	13.5%	12.6%	12.3%
Shopping		12.4%	11.1%	9.6%	11.1%	10.3%	11.5%	10.8%	11.0%	10.2%	11.3%	10.6%	11.7%	11.0%
Personal Business		5.8%	6.5%	7.3%	6.3%	6.5%	8.6%	8.1%	8.7%	9.5%	10.1%	9.4%	11.1%	11.9%
School		3.1%	3.0%	4.7%	6.3%	4.6%	3.8%	5.5%	5.5%	6.0%	4.6%	5.4%	6.5%	5.6%
Eat a Meal		4.8%	4.7%	5.6%	7.1%	6.3%	5.4%	5.0%	5.3%	5.9%	6.1%	3.5%	5.4%	4.6%
Drive a Passenger		3.5%	3.8%	3.5%	4.8%	3.9%	4.7%	4.5%	5.0%	4.7%	4.3%	4.4%	3.8%	4.0%
Change Travel Mode		2.4%	6.3%	3.1%	2.5%	4.2%	3.5%	3.1%	4.8%	4.2%	2.7%	5.4%	2.0%	1.7%
Other		3.1%	0.1%	0.4%	0.0%	0.4%	0.7%	0.2%	0.0%	0.1%	0.0%	0.5%	0.6%	0.1%
Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of trips		*4,620*	*4,088*	*5,762*	*4,831*	*5,496*	*6,076*	*6,373*	*6,773*	*5,981*	*6,446*	*6,711*	*6,672*	*7,350*

Figure 49: Purpose of Trips Miles, 1990-2023

Trip Purpose		2023	2018	2015	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990
Go Home		33.3%	36.6%	35.7%	35.4%	34.3%	35.5%	30.3%	32.5%	31.7%	32.1%	32.7%	33.8%	34.3%
Work	All	12.0%	12.4%	16.4%	18.6%	15.6%	15.6%	15.6%	18.3%	18.10%	16.6%	19.2%	18.1%	18.1%
	Work Commute	9.8%	8.5%	10.0%	14.9%	10.7%	11.1%	11.0%	11.8%	10.5%	-	-	-	-
	Other Work/Business	2.2%	3.9%	6.4%	3.7%	4.9%	4.5%	3.80%	7.3%	7.6%	-	-	-	-
Social/Recreation		25.8%	20.7%	19.9%	15.0%	21.4%	15.2%	25.8%	16.4%	18.3%	18.6%	17.9%	18.1%	16.8%
Shopping		7.9%	6.1%	6.3%	8.4%	6.9%	8.5%	7.0%	8.7%	6.6%	7.0%	5.7%	7.3%	7.8%
Personal Business		5.6%	7.4%	6.8%	5.7%	6.3%	7.6%	7.5%	6.9%	7.5%	10.2%	7.9%	8.4%	11.1%
School		2.2%	1.0%	1.3%	3.4%	1.6%	2.6%	2.8%	1.8%	2.8%	1.6%	2.4%	3.1%	2.5%
Eat a Meal		3.7%	3.1%	4.5%	4.0%	3.1%	4.2%	2.8%	3.4%	3.3%	3.6%	5.9%	3.4%	2.7%
Drive a Passenger		4.2%	4.3%	5.0%	6.6%	5.4%	5.5%	4.7%	5.6%	5.8%	6.2%	4.8%	3.8%	3.8%
Change Travel Mode		2.2%	8.2%	3.7%	2.7%	5.0%	4.2%	3.4%	6.4%	5.9%	4.2%	3.1%	3.4%	3.0%
Other		3.2%	0.1%	0.4%	0.0%	0.4%	1.1%	0.1%	0.0%	0.1%	0.0%	0.4%	0.5%	0.1%
Total		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of trips		*18,649*	*17,405*	*25,303*	*18,251*	*26,983*	*25,742*	*31,195*	*28,657*	*25,538*	*30,033*	*30,282*	*29,710*	*29,587*

Trip purpose by travel mode is shown in Figure 50, while Figure 51 displays the modal split of trips by the trip purpose. The types of trips most likely to have been made by driving alone in 2023 were shopping trips, recreation trips and work-related trips. The trips most likely to be made by transit were work, school and "change travel mode". Work commute was a popular choice for traveling by bicycle while 'social/recreation' was a popular choice for traveling by foot.

Figure 50: Purpose of Trips by Travel Mode, 2023

Trip Purpose	Percent of Trips by Travel Mode				
	Single-Occupancy Vehicle	Multiple-Occupancy Vehicle	Transit	Bicycle	Foot
Go home	36.8%	35.4%	28.7%	35.1%	30.5%
Shopping	15.9%	13.7%	5.9%	10.5%	8.3%
Social/recreation	13.0%	20.3%	10.5%	19.1%	32.0%
Personal business	8.8%	4.0%	3.8%	5.9%	3.2%
Work or work commute	10.2%	2.7%	20.8%	15.6%	6.0%
Other work/business	2.0%	0.8%	1.9%	2.2%	1.0%
Eat a meal	4.2%	8.2%	0.6%	2.9%	4.8%
Drive a passenger	2.5%	10.4%	0.0%	2.1%	0.2%
Change travel mode	0.5%	0.6%	13.9%	2.5%	5.0%
School	1.1%	1.7%	13.0%	2.8%	6.4%
Other	5.0%	2.3%	0.8%	1.2%	2.7%
Total	100%	100%	100%	100%	100%
Number of trips	*1,617*	*1,001*	*184*	*815*	*997*

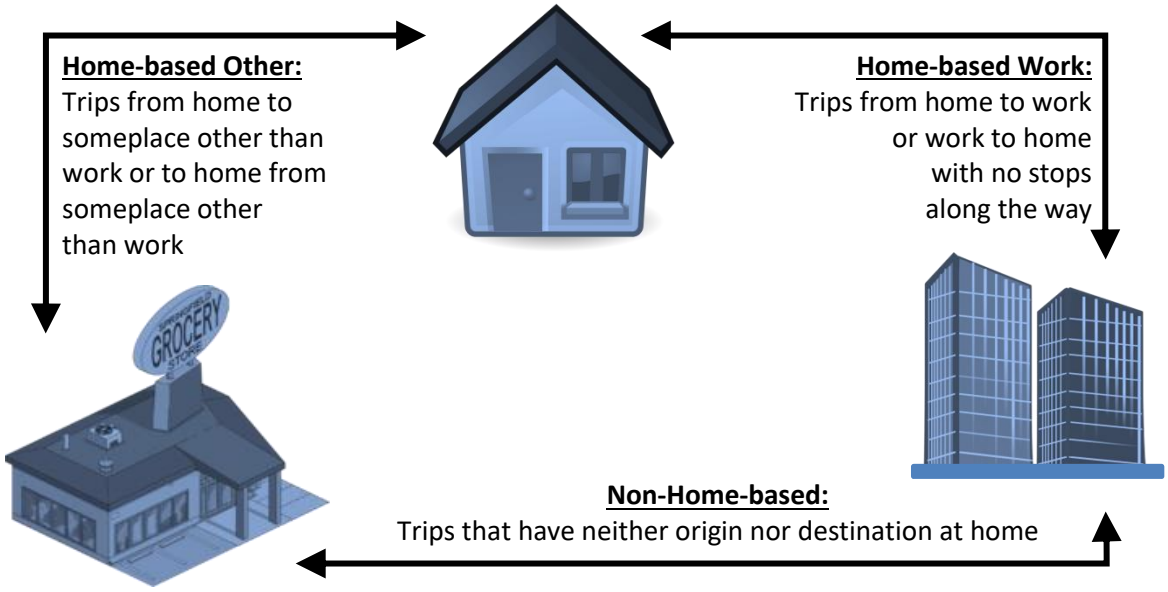
Figure 51: Modal Split of All Trips by Trip Purpose, 2023

Modal Split of All Trips	Percent of Trips by Trip Purpose									
	go home	personal business	shopping	School	work or work commute	other work/business	social/ recreation	change travel mode	drive a passenger	eat a meal
SOV	37.3%	53.0%	44.8%	12.6%	39.6%	45.3%	23.1%	6.9%	24.6%	30.2%
MOV with adults	15.0%	11.0%	19.9%	0.0%	4.0%	8.3%	17.3%	5.9%	24.5%	32.0%
MOV with children	7.2%	3.7%	4.0%	11.5%	2.4%	2.4%	5.0%	0.0%	39.0%	5.1%
Transit	3.3%	2.6%	1.9%	16.5%	9.2%	4.9%	2.1%	23.3%	0.0%	0.5%
Bicycle*	18.0%	18.0%	15.0%	15.9%	30.6%	25.3%	17.1%	18.8%	10.6%	10.5%
Foot	19.1%	11.7%	14.5%	43.6%	14.2%	13.8%	34.9%	45.2%	1.4%	21.7%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	1,594	*269*	*573*	*145*	*417*	*72*	*913*	*109*	*163*	*222*

** It also includes E-bike and E-scooter.*

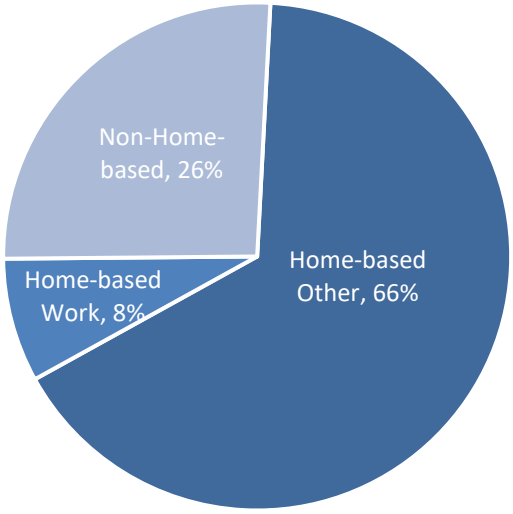
Traditional transportation planning has often focused on origins and destinations of trips, particularly those based at home or work. Thus, trips have often been classified in more aggregated categories of purpose depicting "home-based work" trips, "home-based other" trips and "non-home" trips. The following figure describes the classification scheme.[6]

Figure 52: Types of Trips



Boulder residents' trips were categorized using this model. The proportion of trips made with origins and destinations of "home-work", "home-other" and "non-home" was similar for all study years. Most trips were made between respondents' homes and a destination other than work. One in four trips neither began nor ended at home. About 8% of trips were direct travel between work and home.

Figure 53: Types of Trips Made, 2023



[6] *This coding scheme was taken from the Puget Sound Council of Governments Travel Study, 1985. Some small alterations were made to the scheme.*

The typology of trips by travel mode used is presented in Figure 54, while Figure 55 shows the modal split of all trips by the trip type category. Among all modes, home-other trips were the most common, except for the transit trips, which were often non-home based (likely due to the use of another mode to get to or from the bus).

Figure 54: Type of Trips by Mode of Trip, 2023

Trip Type	Percent of Trips by Travel Mode				
	Single-Occupancy Vehicle	Multiple-Occupancy Vehicle	Transit	Bicycle	Foot
Home-based Other	65.6%	72.1%	32.9%	64.2%	68.8%
Home-based Work	10.0%	1.5%	15.7%	13.0%	4.2%
Non-home Based	24.4%	26.4%	51.4%	22.8%	27.0%
Total	100%	100%	100%	100%	100%
Number of trips	*1,620*	*1,002*	*184*	*816*	*995*

Figure 55: Modal Split of All Trips by Type of Trip, 2023

Modal Split of All Trips	Percent of Trips by Type of Trip		
	Home-based Other	Home-based Work	Non-home Based
SOV	34.8%	45.7%	32.6%
MOV with adults	15.9%	1.9%	16.8%
MOV with children	7.7%	2.4%	5.0%
Transit	2.0%	8.1%	7.8%
Bicycle	17.2%	29.8%	15.3%
Foot	22.4%	11.7%	22.2%
Total	100%	100%	100%
Number of trips	*3,053*	*355*	*1,214*

Appendix A. National Travel Data

This appendix contains data from other sources about travel behavior in the nation as whole, to which the travel behavior of Boulder Valley residents can be compared. The data sources included are the National Household Transportation Survey and the U.S. Census.

The National Household Transportation Survey (NHTS, formerly the National Personal Transportation Study (NPTS)), commissioned by the U.S. Department of Transportation, is a study of the travel patterns of the nation as a whole using a diary methodology similar to the one used in this research project.

The NHTS was conducted previously in 2001, 2009, 2017 and 2022 and the NPTS in 1995, 1990, 1983, 1977 and 1969. Comparisons are made in this report between the 1990 NPTS and the 2022 NHTS to the Boulder Travel Diary Study of 1990 and 2023 so that the time periods between the national study and the Boulder study largely overlap. This way, comparisons can be made between temporal trends and point-in-time observations, to understand how Boulder's travel patterns may differ from those seen nationally.

In general, Boulder Valley residents made more trips per day compared to the U.S. population. The average trip distance of Boulder Valley residents was about a third of that observed among residents in the nation. Work commute distances were also much shorter for Boulder residents compared to U.S. residents, but the duration of the work commute was only somewhat shorter. The number of personal vehicles per household decreased among Boulder residents from 1.83 in 1990 to 1.55 in 2023, while it increased slightly among U.S. residents.

Figure 56: Household and Travel Characteristics, Boulder Compared to the U.S.

Characteristic	Boulder					U.S. NHTS/NPTS*				
	2023	2018	2009	2000	1990	2022[1]	2017*	2009	2001	1990
Average number of trips	5.1	5.3	5.1	6.1	5.9	2.08	3.37	3.79	3.74	3.76
Average trip distance, all trips	4.3	4.3	5.0	4.3	4.0	12.54	10.70	9.75	10.04	9.47
Average work-related trip distance	5.5	4.6	6.1	5.7	5.2	13.65	11.46	11.79	12.11	10.65
Average work-related trip duration	19.7	19.7	17.1	16.3	15.1	27.75	26.58	23.85	23.32	19.60
Personal vehicles per household	1.55	1.61	1.66	1.79	1.83	1.81	1.88	1.86	1.89	1.77

**Daily trip rates and person miles of travel per person, general commute patterns by mode of transportation and major travel indicators.*

**2017 NHTS sample was address-based and among other changes included more urban and cell phone only households than prior years. This and other methods changes in the data series are outlined in the 2017 NHTS report.*

[1] Federal Highway Administration. (2022). 2022 NextGen National Household Travel Survey Core Data, U.S. Department of Transportation, Washington, DC. Available online: http://nhts.ornl.gov.

Over the period of 1990 to 2023, the proportion of trips made by Boulder Valley residents in a private vehicle have decreased from 70.5% to 56.8%, an average annual decrease of 0.41%. In the U.S. as a whole, the proportion of trips made in a private vehicle stayed mostly unchanged from 1990 to 2022.

Figure 57: Modal Split of All Trips, Boulder Compared to the U.S.

Travel Mode	Boulder						U.S. NHTS/NPTS*		
	2023		2009		1990		2022	2009	1990
SOV	35.1%	56.8%	37.1%	60.8%	44.2%	70.5%	87.3%	83.4%	87.7%
MOV	21.7%		23.7%		26.3%				
Public Transportation/ Transit	4.0%		5.4%		1.6%		1.5%	1.9%	1.8%
Walk	21.6%		17.9%		18.2%		6.8%	10.4%	7.2%
School Bus	0.0%	17.7%	0.1%	16.0%	0.6%	9.9%	4.4%	4.2%	3.3%
Bike	17.7%		15.9%		9.1%				
Total	100%		100%		100%		100%	100%	100%

**Percent of person trips by mode of transportation.*
**2017 NHTS sample was address-based and among other changes included more urban and cell phone only households than prior years.*

The proportion of miles traveled by private vehicle was lower in Boulder than in the nation as a whole (see Figure 58). Miles traveled by public transit was higher among Boulder residents compared to national residents in 1990, and increased significantly in Boulder over the time period, while remaining relatively stable in the nation.

Figure 58: Modal Split of All Miles, Boulder Compared to the U.S.

Travel Mode	Boulder						U.S. NHTS/NPTS*		
	2023		2009		1990		2022	2009	1990
SOV	41.8%	77.9%	46.1%	82.0%	50.0%	87.7%	83.1%	88.3%	88.4%
MOV	36.1%		35.9%		37.7%				
Public Transportation/Transit	7.6%		6.9%		4.1%		1.2%	1.5%	2.1%
Walk	4.1%	14.5%	2.5%	11.1%	3.0%	8.1%	15.7%	10.2%	9.5%
School Bus	0.1%		0.5%		0.2%				
Bike	10.3%		8.1%		4.9%				
Total	100%		100%		100%		100%	100%	100%

** Distribution of daily person miles of travel per person by mode of transportation.*
**2017 NHTS sample was address-based and among other changes included more urban and cell phone only households than prior years.*

A large decrease in the proportion of work commute trips made by personal vehicle was observed among Boulder Valley residents; from 76.5% in 1990 to 51.5% in 2023, representing an average annual decrease of 0.76%. However, in the U.S., from 1990 to 2022, the proportion of work commute trips made by personal vehicle increased by 5.8.

Figure 59: Modal Split of Work Commute Trips, Boulder Compared to the U.S.

Travel Mode	Boulder						U.S. NHTS/NPTS*		
	2023		2009		1990		2022	2009	1990
SOV	46.6%	51.5%	47.4%	55.9%	66.6%	76.5%	93.6%	89.4%	87.8%
MOV	4.9%		8.5%		9.9%				
Public Transportation/Transit	7.5%		9.7%		4.0%		2.7%	5.1%	5.3%
Walk	10.9%		11.1%		8.9%		2.5%	2.8%	4.0%
Bike/Other	30.0%		23.3%		10.6%		1.1%	2.7%	2.9%
Total	100%		100%		100%		100%	100%	100%

** This is not mode used on travel day it is the distribution of workers by usual commute mode (percent of workers).*
**2017 NHTS sample was address-based and among other changes included more urban and cell phone only households than prior years.*

Likewise, in examining the number of miles traveled for the work commute by personal vehicle, an average annual decrease of 0.21% was observed among Boulder Valley residents from 1990 to 2023, while the proportion of miles traveled for the work commute by personal vehicle remained stable in the same time frame among the U.S. as a whole.

Figure 60: Modal Split of Work Commute Miles, Boulder Compared to the U.S.

Travel Mode	Boulder						NHTS/NPTS		
	2023		2009		1990		2022	2009	1990
SOV	66.9%	75.9%	59.7%	68.8%	71.9%	82.8%	94.1%	94.9%	94.5%
MOV	9.0%		9.1%		10.9%				
Public Transportation/ Transit	10.1%		19.5%		11.2%		2.2%	4.2%	2.6%
Walk	1.4%	13.8%	1.1%	11.7%	1.3%	6.0%	3.7%	0.9%	2.9%
Bike	12.4%		10.6%		4.7%				
Total	100%		100%		100%		100%	100%	100%

**Distribution of daily person miles of travel per person by mode of transportation and trip purpose (calculated from miles traveled to work)*
**2017 NHTS sample was address-based and among other changes included more urban and cell phone only households than prior years.*

Appendix B. Modal Split by Characteristics

This section contains breakdowns of modal split of all trips, and modal split of work commute trips by respondent characteristics. It also displays the percentage of respondents making at least one trip by each mode on the assigned travel day by respondent characteristics. Figure 61 below displays the proportions of survey participants in each of the categories displayed on the following pages.

Where differences between subgroups are statistically significant, they are marked with an upper-case letter. an uppercase letter denoting significance is shown in the cell with the larger column proportion. The letter denotes the subgroup with the smaller column proportion from which it is statistically different. Subgroups that have no uppercase letter denotation in their column and that are also not referred to in any other column were not statistically different.

Figure 61: Respondent Characteristics

Survey Respondent Characteristic		Percent of Respondents
Sex of Respondent[1]	Male	52%
	Female	48%
Age of Respondent	16-34	57%
	35-54	25%
	55+	19%
CU Student Status	CU student	18%
	Not a student	82%
Tenure	Owner-Occupied	47%
	Renter-Occupied	53%
Type of Housing Unit	Attached housing unit	60%
	Single family, detached	40%
Children in Household	No children	77%
	Have children	23%
Vehicles to Driver Ratio	Less than 1 vehicle per driver	42%
	1 or more vehicles per driver	58%
Bikes in household	Yes, at least one bike	70%
	No bikes	30%
Eco-Pass Status	No, don't have	55%
	Yes, have Eco-Pass	45%
Type of Day	Weekend	25%
	Weekday	75%
Race/Ethnicity[2]	White alone, not Hispanic	84%
	Hispanic and/or other race	16%

1. The gender variable excludes "Identify another way' and 'Prefer not to say'. 2. Race/Ethnicity combines two different questions. For full frequencies see Figure 62 on next page.

Figure 62: Full Frequencies for Gender, Ethnicity and Race Questions

Survey Respondent Characteristic		Percent of Respondents
Sex of Respondent	Male	50%
	Female	47%
	Identify another way	1%
	Prefer not to say	2%
Ethnicity	Hispanic, Latino, or Spanish origin	8%
	Not Hispanic, Latino, or Spanish origin	92%
Race	American Indian or Alaskan Native	0%
	Asian	6%
	Black or African American	1%
	Native Hawaiian or Other Pacific Islander	0%
	White	90%
	Not listed	3%
	Prefer not to say	3%

Figure 63: Modal Split of All Trips by Respondent Characteristics, part 1

Modal Split of All Trips	Sex of Respondent		Age of Respondent			CU Student?	
	Female (A)	Male (B)	16-34 (A)	35-54 (B)	55+ (C)	NOT a student (A)	CU student (B)
Single-Occupancy Vehicle	37.8% B	31.8%	29.2%	35.7% A	46.4% A B	37.6% B	20.7%
Multiple-Occupancy Vehicle with Adults Only	16.2% B	13.7%	14.4% B	10.7%	21.2% A B	16.5% B	7.4%
Multiple-Occupancy Vehicle with Children	8.4% B	5.2%	3.4%	16.1% A C	4.1%	7.3% B	3.9%
Bus (Transit), including School Bus	3.6%	4.3%	6.0% B C	2.3%	1.8%	2.9%	10.0% A
Bicycle	8.9%	16.6% A	14.7% C	15.1% C	5.8%	11.0%	21.8% A
E-bike	2.8%	3.5%	3.5% C	3.7% C	1.0%	2.9%	3.8%
E-scooter	0.0%	0.2%	0.1%	0.0%	0.0%	0.1%	0.0%
Foot	22.3%	24.7%	28.6% B C	16.4%	19.7%	21.7%	32.3% A
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=1920	*N=2054*	*N=2273*	*N=991*	*N=758*	*N=3325*	*N=753*

Figure 64: Modal Split of All Trips by Respondent Characteristics, part 2

Modal Split of All Trips	Have Children?		Tenure Status		Type of Housing Unit	
	No children (A)	Have children (B)	Owner-Occupied (A)	Renter-Occupied (B)	Attached (Multi-Family Housing) (A)	Detached (Single-Family) (B)
Single-Occupancy Vehicle	37.6% B	32.2%	41.6% B	28.0%	30.5%	40.5% A
Multiple-Occupancy Vehicle with Adults Only	15.5% B	6.0%	14.9%	15.0%	15.0%	14.1%
Multiple-Occupancy Vehicle with Children	3.0%	30.8% A	11.0% B	2.8%	2.8%	12.4% A
Bus (Transit), including School Bus	4.5% B	1.8%	2.2%	6.1% A	5.2% B	2.8%
Bicycle	13.1% B	9.8%	9.4%	16.1% A	14.5% B	10.8%
E-bike	1.9%	5.2% A	3.0%	3.1%	2.4%	4.1% A
E-scooter	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
Foot	24.5% B	14.1%	18.0%	28.8% A	29.5% B	15.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=2131	*N=598*	*N=1874*	*N=2056*	*N=2356*	*N=1565*

Figure 65: Modal Split of All Trips by Respondent Characteristics, part 3

Modal Split of All Trips	Ratio of Autos to Drivers		HH own any bikes?		Race/Ethnicity	
	Less than 1 vehicle per driver (A)	1 or more vehicles per driver (B)	Yes (A)	No (B)	White alone, not Hispanic (A)	Hispanic and/or other race (B)
Single-Occupancy Vehicle	25.5%	42.5% A	33.0%	39.8% A	33.7%	34.0%
Multiple-Occupancy Vehicle with Adults Only	12.6%	16.6% A	15.4%	14.1%	15.5% B	12.2%
Multiple-Occupancy Vehicle with Children	7.1%	6.3%	7.1% B	5.5%	6.5%	7.8%
Bus (Transit), including School Bus	5.5% B	2.9%	4.0%	4.3%	3.7%	8.0% A
Bicycle	17.4% B	10.2%	15.5%	8.0%	13.1%	10.7%
E-bike	7.7% B	1.4%	2.7%	8.0% A	2.9%	4.5% A
E-scooter	0.1%	0.1%	0.0%	0.4% A	0.0%	0.5% A
Foot	24.0% B	19.8%	22.2%	19.9%	24.5%	22.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=1950	*N=2641*	*N=3247*	*N=1380*	*N=3316*	*N=610*

Figure 66: Modal Split of All Trips by Respondent Characteristics, part 4

Modal Split of All Trips	Have an Eco-Pass?		Day of the Week		Telework Status	
	No, don't have (A)	Yes, have Eco-Pass (B)	Weekend (A)	Weekday (B)	Do not telework (A)	Do telework (B)
Single-Occupancy Vehicle	41.3% B	26.0%	25.5%	37.7% A	38.4% B	30.8%
Multiple-Occupancy Vehicle with Adults Only	17.7% B	11.4%	23.5% B	12.5%	11.3%	15.0% A
Multiple-Occupancy Vehicle with Children	6.9%	6.6%	9.4% B	5.5%	4.8%	7.4% A
Bus (Transit), including School Bus	2.1%	7.0% A	2.7%	4.7% A	4.9%	4.5%
Bicycle	7.8%	19.0% A	14.3%	12.4%	11.1%	15.4% A
E-bike	2.4%	3.9% A	2.0%	3.5% A	7.2% B	2.2%
E-scooter	0.0%	0.2%	0.0%	0.1%	0.4%	0.0%
Foot	21.7%	26.0% A	22.5%	23.6%	21.8%	24.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=2202	*N=1813*	*N=1071*	*N=3138*	*N=783*	*N=2390*

Figure 67: Modal Split of Work Commute Trips by Respondent Characteristics, part 1

Modal Split of Work Commute Trips	Sex of Respondent		Age of Respondent			CU Student?	
	Female (A)	Male (B)	16-34 (A)	35-54 (B)	55+ (C)	NOT a student (A)	CU student (B)
Single-Occupancy Vehicle	60.0% B	36.0%	44.4%	48.1%	65.7%	56.5% B	11.2%
Multiple-Occupancy Vehicle with Adults Only	2.9%	1.7%	1.0%	5.0%	3.1%	1.9%	3.2%
Multiple-Occupancy Vehicle with Children	0.6%	4.2% A	2.6%	1.1%	3.4%	3.1%	0.0%
Bus (Transit), including School Bus	6.5%	10.4%	8.4%	9.7%	5.4%	8.3%	9.1%
Bicycle	15.1%	35.0% A	29.3% C	26.0% C	2.4%	17.2%	61.2% A
E-bike	1.4%	1.5%	0.0%	3.8%	6.0%	1.8%	0.0%
Foot	13.5%	11.3%	14.3%	6.4%	14.1%	11.2%	15.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=153	*N=181*	*N=227*	*N=87*	*N=24*	*N=272*	*N=70*

Figure 68: Modal Split of Work Commute Trips by Respondent Characteristics, part 2

Modal Split of Work Commute Trips	Have Children?		Tenure Status		Type of Housing Unit	
	No children (A)	Have children (B)	Owner-Occupied (A)	Renter-Occupied (B)	Attached (Multi-Family Housing) (A)	Detached (Single-Family) (B)
Single-Occupancy Vehicle	53.0%	65.5%	50.3%	45.7%	40.8%	59.7% A
Multiple-Occupancy Vehicle with Adults Only	2.8%	6.9%	3.8%	1.1%	2.2%	2.1%
Multiple-Occupancy Vehicle with Children	0.9%	2.9%	6.2%	0.0%	0.0%	7.0%
Bus (Transit), including School Bus	5.6%	8.9%	6.9%	9.5%	11.0% B	3.7%
Bicycle	28.2% B	10.7%	23.3%	27.5%	29.4%	19.9%
E-bike	1.7%	5.1%	2.8%	0.5%	0.5%	3.2% A
Foot	7.7%	0.0%	6.6%	15.8% A	16.2% B	4.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=188	*N=34*	*N=138*	*N=207*	*N=225*	*N=121*

Figure 69: Modal Split of Work Commute Trips by Respondent Characteristics, part 3

Modal Split of Work Commute Trips	Ratio of Autos to Drivers		HH own any bikes?		Race/Ethnicity	
	Less than 1 vehicle per driver (A)	1 or more vehicles per driver (B)	Yes (A)	No (B)	White alone, not Hispanic (A)	Hispanic and/or other race (B)
Single-Occupancy Vehicle	34.0%	54.0% A	48.5%	41.2%	46.7%	46.3%
Multiple-Occupancy Vehicle with Adults Only	5.3% B	0.7%	1.1%	5.9% A	2.8%	0.5%
Multiple-Occupancy Vehicle with Children	1.2%	3.2%	2.8%	1.7%	0.7%	8.2% A
Bus (Transit), including School Bus	7.0%	8.3%	9.3%	3.9%	6.4%	16.1% A
Bicycle	37.8% B	22.3%	29.5%	24.5%	31.7% B	7.8%
E-bike	2.9%	1.1%	1.6%	2.3%	1.3%	2.1%
Foot	11.6%	10.5%	7.2%	20.6% A	10.4%	19.0% A
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=144	*N=239*	*N=278*	*N=105*	*N=251*	*N=82*

Figure 70: Modal Split of Work Commute Trips by Respondent Characteristics, part 4

Modal Split of Work Commute Trips	Have an Eco-Pass?		Day of the Week		Telework Status	
	No, don't have (A)	Yes, have Eco-Pass (B)	Weekend (A)	Weekday (B)	Do not telework (A)	Do telework (B)
Single-Occupancy Vehicle	75.2% B	26.2%	53.9%	46.3%	59.6% B	40.8%
Multiple-Occupancy Vehicle with Adults Only	2.0%	1.5%	3.4%	2.6%	3.8%	1.4%
Multiple-Occupancy Vehicle with Children	4.5% B	0.9%	20.7% B	0.8%	6.7% B	0.4%
Bus (Transit), including School Bus	4.4%	11.7% A	11.1%	8.4%	3.6%	10.5% A
Bicycle	7.4%	40.6% A	9.5%	27.2% A	14.2%	32.5% A
E-bike	2.0%	1.0%	1.3%	1.4%	1.5%	1.4%
Foot	4.6%	18.1% A	0.0%	13.1%	10.6%	13.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=152	N=192	N=28	N=318	N=114	N=228

Figure 71: Modal Split of All Trips by CU Student Characteristics

Modal Split of All Trips	Sex of Respondent		Race/Ethnicity	
	Female (A)	Male (B)	White alone, not Hispanic (A)	Hispanic and/or other race (B)
Single-Occupancy Vehicle	25.8% B	17.7%	19.1%	21.1%
Multiple-Occupancy Vehicle with Adults Only	6.9%	8.3%	7.5%	8.9%
Multiple-Occupancy Vehicle with Children	8.7% B	0.9%	4.1%	4.0%
Bus (Transit), including School Bus	9.9%	9.3%	10.2%	12.0%
Bicycle	15.7%	25.2% A	23.4% B	7.3%
E-bike	0.9%	6.1% A	4.6%	1.0%
Foot	32.0%	32.6%	31.1%	45.9% A
Total	100.0%	100.0%	100.0%	100.0%
	N=290	*N=430*	*N=597*	*N=125*

Figure 72: Modal Split of Work Commute Trips by CU Student Characteristics

Modal Split of Work Commute Trips	Sex of Respondent		Race/Ethnicity	
	Female (A)	Male (B)	White alone, not Hispanic (A)	Hispanic and/or other race (B)
Single-Occupancy Vehicle	15.8%	6.5%	4.9%	35.7% A
Multiple-Occupancy Vehicle with Adults Only	0.0%	5.9%	4.5%	0.0%
Multiple-Occupancy Vehicle with Children	0.0%	0.0%	0.0%	0.0%
Bus (Transit), including School Bus	0.0%	16.4%	12.8%	0.0%
Bicycle	47.6%	65.4%	67.5%	0.0%
Foot	36.6% B	5.9%	10.3%	64.3% A
Total	100.0%	100.0%	100.0%	100.0%
	N=23	*N=39*	*N=50*	*N=9*

Figure 73: Percent of Respondents Making at Least One Trip Using Each Mode by Respondent Characteristics, part 1

Travel Mode	Sex of Respondent		Age of Respondent			CU Student?	
	Female (A)	Male (B)	16-34 (A)	35-54 (B)	55+ (C)	NOT a student (A)	CU student (B)
Single-Occupancy Vehicle	54.4%	48.0%	45.7%	60.4% A C	50.4%	55.0% B	30.4%
Multiple-Occupancy Vehicle with Adults Only	33.5%	28.3%	30.5%	32.4%	28.5%	32.4% B	20.6%
Multiple-Occupancy Vehicle with Children	13.5%	9.7%	7.1%	27.6% A C	5.0%	12.6% B	5.5%
Bus (Transit), including School Bus	8.1%	11.4%	15.6% B C	6.0%	2.6%	6.9%	25.0% A
Bicycle	14.9%	27.9% A	27.0% C	24.3% C	8.4%	18.7%	34.7% A
E-bike	3.6%	3.8%	3.8%	5.6% C	1.6%	3.4%	4.6%
E-scooter	0.1%	0.7%	0.7%	0.0%	0.1%	0.5%	0.0%
Foot	41.6%	41.5%	51.5% B C	34.2%	29.1%	39.4%	50.5% A
Number	*N=427*	*N=451*	*N=463*	*N=209*	*N=218*	*N=752*	*N=154*

Note: Numbers in each cell represent the proportion of respondents who made at least ONE trip by that mode

Figure 74: Percent of Respondents Making at Least One Trip Using Each Mode by Respondent Characteristics, part 2

Travel Mode	Have Children?		Tenure Status		Type of Housing Unit	
	No children (A)	Have children (B)	Population in Owner-Occupied Home (A)	Population in Renter-Occupied Home (B)	Attached (Multi-Family Housing) (A)	Detached (Single-Family) (B)
Single-Occupancy Vehicle	49.5%	72.7% B	60.7% B	42.5%	45.5%	59.6% A
Multiple-Occupancy Vehicle with Adults Only	28.6%	44.0% B	30.7%	30.5%	28.8%	32.1%
Multiple-Occupancy Vehicle with Children	7.0%	66.6% B	17.5% B	5.9%	6.0%	19.1% A
Bus (Transit), including School Bus	9.9%	8.8%	6.3%	13.7% A	12.3% B	7.0%
Bicycle	21.8%	13.8%	15.6%	27.0% A	23.9%	18.5%
E-bike	5.6%	5.7%	4.2%	3.1%	2.1%	5.8% A
E-scooter	0.5%	0.0%	0.1%	0.7%	0.6%	0.0%
Foot	38.2%	28.7%	33.8%	48.6% A	49.5% B	30.5%
Number	*N=962*	*N=74*	*N=432*	*N=465*	*N=528*	*N=368*

Note: Numbers in each cell represent the proportion of respondents who made at least ONE trip by that mode

Figure 75: Percent of Respondents Making at Least One Trip Using Each Mode by Respondent Characteristics, part 3

Travel Mode	Ratio of Autos to Drivers		HH own any bikes?		Race/Ethnicity	
	Less than 1 vehicle per driver (A)	1 or more vehicles per driver (B)	Yes (A)	No (B)	White alone, not Hispanic (A)	Hispanic and/or other race (B)
Single-Occupancy Vehicle	35.7%	59.2% A	52.2%	48.9%	50.7%	47.6%
Multiple-Occupancy Vehicle with Adults Only	25.0%	32.8% A	31.6% B	25.4%	31.3%	26.3%
Multiple-Occupancy Vehicle with Children	11.6%	11.4%	13.1% B	7.2%	10.6%	16.6% A
Bus (Transit), including School Bus	14.2% B	7.4%	9.1%	11.5%	8.4%	21.5% A
Bicycle	27.3% B	18.0%	26.3% B	10.0%	22.0%	17.1%
E-bike	5.9% B	2.0%	3.5%	10.2% A	3.3%	6.3%
E-scooter	0.0%	0.6%	0.0%	1.6% A	0.0%	2.3% A
Foot	49.0% B	36.8%	40.9% B	30.0%	42.6%	37.4%
Number	*N=313*	*N=589*	*N=715*	*N=321*	*N=731*	*N=137*

Note: Numbers in each cell represent the proportion of respondents who made at least ONE trip by that mode

Figure 76: Percent of Respondents Making at Least One Trip Using Each Mode by Respondent Characteristics, part 4

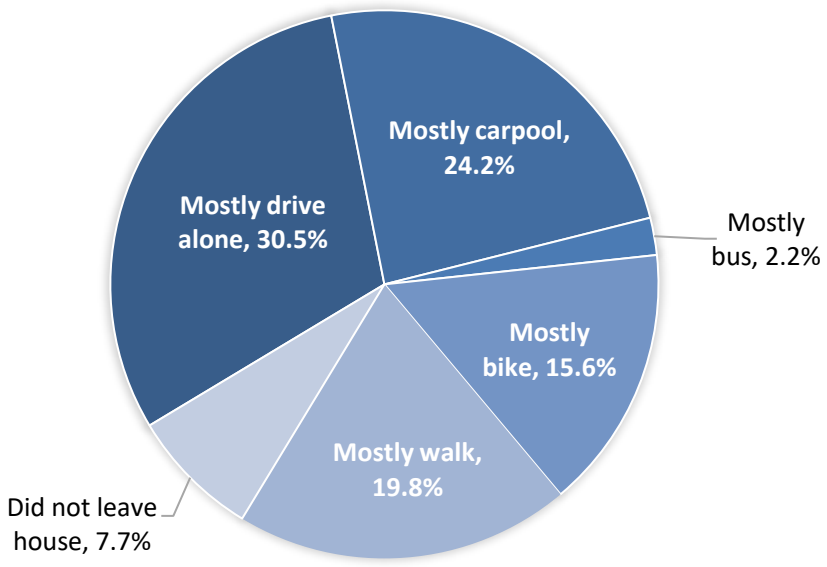
Travel Mode	Have an Eco-Pass?		Day of the Week		Telework Status	
	No, don't have (A)	Yes, have Eco-Pass (B)	Weekend (A)	Weekday (B)	Do not telework (A)	Do telework (B)
Single-Occupancy Vehicle	43.4%	56.6% A	42.9%	54.7% A	51.4%	51.4%
Multiple-Occupancy Vehicle with Adults Only	26.4%	33.1% A	36.5% B	28.0%	27.4%	32.4%
Multiple-Occupancy Vehicle with Children	11.0%	12.0%	12.7%	10.3%	13.0%	12.3%
Bus (Transit), including School Bus	17.6% B	4.2%	6.3%	11.3% A	11.6%	11.5%
Bicycle	28.9% B	14.9%	23.0%	20.5%	20.8%	26.5%
E-bike	4.7%	2.8%	2.5%	4.0%	7.9% B	2.7%
E-scooter	0.8%	0.0%	0.0%	0.5%	1.9% B	0.0%
Foot	44.9% B	37.9%	36.4%	42.1%	38.9%	45.6%
Number	*N=394*	*N=501*	*N=269*	*N=674*	*N=164*	*N=499*

Note: Numbers in each cell represent the proportion of respondents who made at least ONE trip by that mode

Appendix C. Transportation Market Segmentation

In order to better understand the types of "markets" in respect to Boulder residents' transportation mode choices, the 2023 travel diary dataset was analyzed using an analysis technique referred to as cluster analysis or market segmentation. This analysis sorted respondents into the "clusters," that is, groups in which respondents' responses were most similar to other respondents within the same group and different from respondents' responses in other groups. A brief description of the analysis procedure can be found in Appendix E. Study Methodology. For this analysis, the variables used were the percent of trips made on the Travel Diary by each of five modes: drive alone (single-occupancy vehicle), carpool (multiple-occupancy vehicle), bus (transit and school bus), bicycle and walk. Five groups emerged, with the preponderance of trips being made by each of the five modes in each of the five groups. A sixth group was formed of those study participants who had not left the house on their assigned travel day. These six groups were:

Figure 77: Percent of Respondents in Each Transportation Segment



KEY CHARACTERISTICS OF THE TRANSPORTATION SEGMENTS

The key characteristics of the six transportation segments are shown in the following table. Detailed tables showing selected survey results by transportation segment are presented on the pages following.

Figure 78: Key Characteristics of the Transportation Segments

Segment	Percent of Population	Average Percent of Trips Made Via Each Mode	Other Characteristics
Mostly drive alone	31%	SOV, 86% MOV, 7% Bus, 0% Bike, 2% Foot, 5%	• Highest proportion of households with one or more vehicles per driver (83%). • Highest proportion of those who do not have an Eco-Pass (69%). • Highest proportion of home owners (60%). • Highest proportion of those who substituted a trip with a delivery (55%). • Highest proportion of those who do not telework or do it occasionally (45%).
Mostly carpool	24%	SOV, 15% MOV, 71% Bus, 1% Bike, 3% Foot, 10%	• Lowest proportion of those who work on Boulder (40%). • Highest proportion of residents who telecommute every day (32%). • Highest proportion of households that received any goods/services by delivery (28%). • Close to highest in households with one or more vehicles per driver (72%). • Close to highest of employees who work full-time (62%).
Mostly walk	20%	SOV, 12% MOV, 5% Bus, 7% Bike, 2% Foot, 74%	• High proportion of those who use Eco-pass more than once a week (32%). • High proportion of those aged 18-34 (67%). • High proportion of those who live in attached places (74%). • Lowest proportion of employees who telecommuted on the day of the survey (25%).
Mostly bike	16%	SOV, 8% MOV, 3% Bus, 2% Bike, 76% Foot, 11%	• Highest of employees who work full-time (64%). • High proportion of employed people who work in Boulder (73%). • Low proportion of households that received goods/services by delivery (10%). • High proportion of residents that have an Eco-Pass (66%). • Highest proportion of households that owned a bicycle (99%). • Highest proportion of male members (68%).
Mostly bus	2%	SOV, 0% MOV, 2% Bus, 94% Bike, 0% Foot, 5%	• Highest proportion of members with an Eco-Pass (74%). • Highest proportion of CU students (64%). • Highest proportion of members aged 18 to 34 (85%). • Highest proportion of renters (80%). • Highest proportion of weekdays (85%). • Highest proportion of household with less than one vehicles per driver (78%).
Did not leave house	8%	No trips made	• Least likely to be employed (53% were not employed). • Less likely to have an Eco-pass (39%). • Least likely to have a bike in their household (66% had one). • Highest proportion of members aged 55+ (53%). • Highest proportion of people with annual household below $50,000 (39%).

Figure 79: Percent of Trips Made on Assigned Travel Day by Transportation Segment

Percent of Trips Made by:	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
SOV	86%	15%	0%	8%	12%	0%	33%
MOV	7%	71%	2%	3%	5%	0%	21%
Bus	0%	1%	94%	2%	7%	0%	4%
Bike	2%	3%	0%	76%	2%	0%	14%
Foot	*5%*	*10%*	*5%*	*11%*	*74%*	*0%*	*20%*

Figure 80: Employment Status by Transportation Segment

Are you employed?	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
No	29%	24%	14%	14%	26%	53%	26%
Yes, part-time	13%	14%	43%	22%	18%	16%	16%
Yes, full-time	58%	62%	43%	64%	57%	30%	57%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 81: City of Employment by Transportation Segment

City where respondent works	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Boulder	57%	48%	73%	73%	59%	76%	60%
Other	43%	52%	27%	27%	41%	24%	40%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 82: Frequency of Telecommuting by Transportation Segment

How often, if ever, do you telecommute for work? (Among those who are employed.)	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Every work day (I always work from my home)	20%	32%	2%	20%	21%	25%	23%
2 to 4 times per week	28%	37%	42%	28%	35%	28%	32%
Once or twice a month	7%	9%	19%	21%	13%	3%	11%
Occasionally	11%	5%	0%	13%	10%	7%	9%
Never	34%	17%	38%	18%	21%	37%	24%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 83: Telecommuting Status on Assigned Travel Day by Transportation Segment

Telecommuted on the day of the survey? (Among those who are employed and at least occasionally telework.)	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
No	67%	63%	45%	71%	75%	47%	68%
Yes	33%	37%	55%	29%	25%	53%	32%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 84: Receipt of Goods or Services via Delivery by Transportation Segment

Receive any goods or services by delivery?	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
No	80%	72%	96%	90%	79%	77%	80%
Yes	20%	28%	4%	10%	21%	23%	20%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 85: Substitution of Travel by Deliveries by Transportation Segment

Did deliveries substitute for travel?	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
No	45%	75%	100%	67%	59%	82%	62%
Yes	55%	25%	0%	33%	41%	18%	38%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 86: Eco-Pass Status by Transportation Segment

Eco-Pass status	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Yes, have an Eco-Pass	31%	37%	74%	66%	53%	39%	44%
No, don't have an Eco-Pass	69%	63%	26%	34%	47%	61%	56%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 87: Frequency of Use of Eco-Pass by Transportation Segment

Number of times use Eco-pass	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
More than once a week	6%	20%	52%	18%	32%	14%	20%
About once a week	2%	9%	20%	18%	10%	9%	10%
About once every two weeks	11%	9%	0%	15%	6%	12%	10%
About once a month	14%	9%	28%	33%	19%	11%	18%
Less than once a month	42%	29%	0%	10%	20%	30%	25%
Haven't used	14%	6%	0%	4%	7%	15%	8%
Haven't picked-up or activated	11%	18%	0%	1%	6%	9%	9%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 88: Ratio of Autos to Drivers by Transportation Segment

Ratio of Autos to Drivers	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Less than 1 vehicle per driver	17%	28%	78%	52%	46%	42%	35%
1 or more vehicles per driver	83%	72%	22%	48%	54%	58%	65%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 89: Household Bicycle Ownership by Transportation Segment

Household own any bicycles?	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Yes	61%	74%	60%	86%	70%	56%	69%
No	39%	26%	40%	14%	30%	44%	31%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 90: Sex of Respondent by Transportation Segment

Sex of Respondent	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Male	47%	47%	43%	68%	53%	49%	52%
Female	53%	53%	57%	32%	47%	50%	48%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 91: Age of Respondent by Transportation Segment

Age of Respondent	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
18-34	44%	44%	85%	66%	67%	32%	52%
35-54	26%	32%	10%	25%	15%	14%	23%
55+	31%	24%	5%	9%	19%	53%	24%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 92: CU Student Status by Transportation Segment

Student Status	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
NOT a student	91%	93%	36%	67%	77%	84%	83%
Student	9%	7%	64%	33%	23%	16%	17%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 93: Housing Tenure by Transportation Segment

Tenure	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Rent	40%	44%	80%	69%	60%	54%	52%
Own	60%	56%	20%	31%	40%	46%	48%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 94: Type of Housing Unit by Transportation Segment

Type of Housing Unit	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Attached (Multi-Family)	51%	48%	80%	64%	74%	65%	59%
Detached (Single-Family)	49%	52%	20%	36%	26%	35%	41%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 95: Annual Household Income by Transportation Segment

Annual Household Income	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Less than $10,000	2%	3%	19%	3%	4%	7%	4%
$10,000 to $19,999	2%	0%	9%	3%	2%	9%	2%
$20,000 to $29,999	3%	1%	0%	3%	1%	10%	2%
$30,000 to $39,999	2%	3%	0%	13%	6%	3%	5%
$40,000 to $49,999	6%	0%	1%	5%	3%	10%	4%
$50,000 to $74,999	10%	4%	13%	8%	12%	8%	8%
$75,000 to $99,999	10%	9%	0%	3%	9%	11%	8%
$100,00 to $149,999	18%	23%	15%	19%	21%	17%	20%
$150,000 or more	33%	43%	26%	34%	29%	12%	33%
Prefer not to say	14%	13%	18%	11%	13%	13%	13%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 96: Day of Assigned Travel by Transportation Segment

Day of the Week	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Weekend	22%	42%	15%	24%	23%	40%	29%
Weekday	78%	58%	85%	76%	77%	60%	71%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 97: Gender by Transportation Segment

Gender	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
Female	53%	53%	57%	32%	47%	50%	49%
Male	47%	47%	43%	68%	53%	50%	51%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 98: Race/Ethnicity by Transportation Segment

Race/Ethnicity	Mostly drive alone	Mostly carpool	Mostly bus	Mostly bike	Mostly walk	Did not leave house	Overall
White alone, not Hispanic	83%	86%	77%	84%	85%	84%	84%
Hispanic and/or other race	17%	14%	23%	16%	15%	16%	16%
Total	100%	100%	100%	100%	100%	100%	100%

Appendix D. References

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Appendix E. Study Methodology

The 2023 travel diary study used similar materials to that used in the previous implementations of the study (1990, 1992, 1994, 1996, 1998, 2000, 2003, 2006, 2009, 2012, 2015 and 2018). In 2015 and 2018 a travel diary app that could be downloaded by survey recipients and used to record trips made during the day was employed. However, in 2023 the use of the app was discontinued.

STUDY DESIGN

The Travel Diary Study is designed to capture all trips made during a 24-hour period by a random selection of adults within households in the Boulder Valley. Each selected household is assigned a specific day on which to complete the travel diary. The study is always scheduled to take place during the end of September or the beginning of October, as that time period has historically had mild weather allowing people to use all modes of transportation.

The traditional data collection methodology for the Travel Diary Study is to send a study packet with the materials needed to complete in the study accompanied by instructions on how to participate to 10,000 randomly selected households within the Boulder Valley. For households in which more than one adult resides, an adult is randomly selected for the study by requesting that the adult who most recently had a birthday (regardless of year of birth) complete the study.

In 2015, the City of Boulder invested in developing a new app to simplify tracking for participants and improve accuracy of route data. The app was used in 2015 and 2018. In 2023 the use of the app was discontinued for the low responses rate the methodology yielded in 2015 and 2018.

In 2023, 10,000 households were assigned travel days in the first week of October. A packet with a cover letter explaining the purpose of the study, the diary and household survey and instructions for the study were mailed to the household several days before their assigned travel day. A postcard notification was mailed a week before the packet.

Copies of the various travel diary study materials can be found in Appendix F. Data Collection Materials.

Selecting Survey Recipients

A total of 10,000 households within Boulder Valley were invited to participate in the travel study, as described above. This number was selected based on the number of people desired to eventually participate, factoring for the probable non-response and drop-out rates of households. The goal was to obtain about 1,000 completed travel diaries.

All households located in the Boulder Valley boundaries, defined as zip codes 80301, 80302, 80303, 80304 and 80305 were eligible for the survey. Because local governments generally do not have inclusive lists of all the residences in the jurisdiction (tax assessor and utility billing databases often omit rental units), lists from the United States Postal Service (USPS) Delivery Sequence File (DSF), updated every three months, usually provide the best representation of all households in a specific geographic location. NRC used the DSF data to select the sample of households. Selected addresses were processed for certification and verification using CASS™/NCOA software that relies on the USPS National Directory information to verify and standardize the address elements and assign each a complete, nine-digit zip code where possible.

Response Rates

Figure 99 displays the response rates for the 2023 study. If the undeliverable addresses are eliminated from the sample, about 9,499 households were contacted to participate in the study. Of these, 998 returned a usable travel diary and/or household survey, representing 11% of everyone contacted.

Figure 99: Response Rate for the 2023 Travel Diary Study

Number of Recipients	Returned with Undeliverable Address	Eligible to Participate	Returned a Usable Travel Diary	Response Rate
10,000	501	9,499	998	10.5%

Figure 100: Comparison of Response Rates Across Study Years

Response Rates	2023	2018	2015*	2012	2009	2006	2003	2000	1998	1996	1994	1992	1990*
Percent of entire sample who completed a travel diary	11%	9%	11%	15%	15%	18%	18%	19%	19%	18%	20%	20%	25%

**Note: 1990 response rates are for households only, and do not include the response rates of students in group quarters (dormitories and Greek houses). Response rates among these groups are much lower than among those in households, and thus 1990 response rates are probably inflated compared to the other years. In 2015, the response rate for the entire sample was 11%, but for the recipients who were surveyed in the same was as recipients were from 2003 to 2012, the response rate was 16%.*

***Not applicable starting in 2003.*

ANALYSIS OF RESULTS

Cleaning and Coding of Data

Once received, the diaries were prepared for analysis. Every diary was examined to ensure that it was filled out correctly with accurate trip descriptions. A very common mistake in all study years was to count round trips as one trip rather than two. For ease in keypunch the diary data were transferred to coding sheets, disregarding origin and destination data which would not be used for this report. Three other variables were coded at this time: 1) the type of trip made (HW, HO or NH), 2) if the trip was a "link" in the work commute, and 3) if the trip had both origin and destination outside the Valley boundaries (see *Appendix F. Data Collection Materials*).

In 1996, a few changes were made to the survey instruments. It was felt that respondents were not using the "truck" category correctly in previous study years, and quite often trips recorded as having been made in a truck were changed to automobile, because staff believed respondents were using the truck category to record trips made in their sports utility vehicle or pick-up truck.

In 2023, a new wave of edits was included in the survey instruments. Car o light track was re-worded as *private vehicle*, bus as *bus/rail/transit*; taxi as *Lyft, Uber, Taxi* and bicycle was divided into three categories: *bicycle*, *E-bike* and *E-scooter*. A new travel mode named *Via/paratransit* was included for the first time. This changes can be seen in the table on the following page.

Figure 101: Changes in the Travel Diary methods across Study Years

1990-1994	1996-2018	2023
1. car (driver)	1. car or light truck (driver)	1. private vehicle (driver)
2. car (passenger)	2. car or light truck (passenger)	2. private vehicle (passenger)
3. bus (transit)	3. bus (transit)	3. bus/rail/transit
4. school bus	4. school bus	4. school bus
		5. car share
6. taxi (passenger)	7. taxi (passenger)	6. Lyft, Uber, Taxi
5. motorcycle	6. motorcycle	7. motorcycle
7. truck (driver)	5. large truck	
8. truck (passenger)		
9. bicycle	8. bicycle	8. bicycle
		9. E-bike
		10. E-scooter
10. walk only	9. walk only	11. walk
		12. Via/paratransit
11. other _____	10. other _____	13. other _____

Estimating Trip Length

An important element in travel studies such as this one is the length of the trips. Early in the study's history, elaborate and expensive geocoding schemes were most often used by coding origins and destinations by Census tract or transportation zone and inputting these codes into a complex database which calculates mileage. In the 1990 Diary Study, after researching previous studies and discerning the difficulties and large expense associated with database systems, the research staff devised a geocoding scheme which was more attractive in price as well as accuracy. On the diary document the participants were asked to estimate how many miles each trip had taken them. At baseline (1990), uncertain of how accurate people are at estimating miles traveled, the research staff geocoded a random subset of 400 trips, 300 in motorized vehicles and 50 on bike and foot each. The geocoding was performed with rulers and Boulder Valley maps, where the staff member literally measured the journey by hand. A rule of thumb derived from transportation planning was used to save the effort of deciphering which path the participant made to a various destination: multiplying the distance calculated between locations as the crow flies by 1.5. This formula was believed to work fairly accurately 90% of the time.[7]

The geocoded miles were then correlated with the miles estimated by the participants. The estimates were found to be extremely accurate;[8] on average the people overestimated the trips by only .12 miles or 17% of the trip distance. To correct for this overestimation, data extracted from the regression equation was used to reduce the estimates.[9] The adjusted estimates were used for all analyses using trip length. The same statistical adjustments were made in subsequent years.

Prior to 2000, when trip distance was missing, it was estimated, when possible, by study staff using the same hand geocoding methodology described above. Beginning in 2000, however, the internet-

7 Chuck Green, DRCOG
8 Simple Correlation of 0.9, p < .001.
9 Equation used to adjust motorized vehicles: adjusted miles = (.88 x estimated miles) + .20 Equation used to adjust non-motorized vehicles: adjusted miles = (.86 x estimated miles) + .10

based program "MapQuest" (www.mapquest.com/directions) was used to estimate trip distances, replaced by Google Maps in 2009.

Data Entry, Weighting and Analysis

The data from the travel diary coding sheets and household travel surveys were data entered into electronic datasets using a key and verify methodology. This means that the data were entered twice, and the two datasets compared. Where there were discrepancies, the results were compared to the hard copy survey and keyed correctly. These plain-text datasets were then imported into SPSS®, a statistical software package, for analysis.

Using the assigned unique identifier, the household travel survey responses were matched with the travel diary information. Two types of datasets were created: a trip-level dataset, where every record in the dataset represented a single trip, and a person-level dataset, where every record in the dataset represented a single person.

Due to the differences in travel behavior by various sociodemographic groups, the participants' responses were statistically weighted. Using the data from the Census, the results were adjusted to give more weight to the travel of those who were under represented in the sample. Figure 102 below displays the sociodemographic profile of the 2023 study participants using unweighted and weighted data compared to the Census data for comparison.

Figure 102: Comparison of 2023 Weighted and Unweighted Data to Census Population Estimates

Characteristic	Population Profile*	Unweighted Data	Weighted Data
Day of Week			
Sunday	14%	13%	14%
Monday	14%	16%	14%
Tuesday	14%	17%	14%
Wednesday	14%	15%	14%
Thursday	14%	13%	14%
Friday	14%	13%	14%
Saturday	14%	13%	14%
Gender by Age			
Female 16-34	24%	8%	24%
Female 35-54	12%	13%	11%
Female 55+	12%	35%	13%
Male 16-34	29%	10%	28%
Male 35-54	12%	11%	12%
Male 55+	11%	23%	11%
Housing Type			
Attached	60%	45%	59%
Detached	40%	55%	41%
Housing Tenure			
Owner	48%	70%	48%
Renter	52%	30%	52%

* *ACS 2020 5-year estimates, total population*

For the most part, simple descriptive statistics (e.g., averages and frequencies) are reported in the body of the report. Crosstabulations and crossbreak analyses (e.g., chi-square and anova) are shown in *Appendix B. Modal Split by Characteristics*. In that appendix, differences between subgroups were considered "statistically significant" if the p-value from the statistical test was less than 0.05; that is, that there was a less than 5% probability that differences observed were due to chance alone.

A market segmentation analysis was performed on the data. The results of this analysis are shown in *Appendix C. Transportation Market Segmentation*. The statistical technique most commonly used to derive segments from survey data is cluster analysis. The analysis itself sorts cases (respondents) into the "clusters," that is, groups in which cases are most similar to other cases within the same group and different from cases in other groups.

The SPSS procedure "K-Means Cluster Analysis" was used to perform this analysis. The algorithm employed by this procedure allows larger datasets to be analyzed into "clusters." Clusters are formed by comparing responses to a set of selected variables. The procedure seeks patterns of response that are shared by a number of individuals and that are distinct from other groups of individuals. These groups are the clusters. This procedure uses continuous (numeric) variables. For this analysis, the variables used were the percent of trips made by the respondent on the assigned travel day by each mode: percent of trips made by driving alone, percent of trips made by carpooling, percent of trips made by transit, percent of trips made by bicycling, and percent of trips made by walking.

Appendix F. Data Collection Materials

This appendix contains the instruments and materials used for the data collection of the 2023 Travel Diary Study. Included are:

- Pre-notification postcard
- Diary packet cover letter to Boulder Valley residents
- Travel Diary instructions
- Travel Diary card
- Travel Diary Overflow sheet
- Household Survey

Dear Boulder Valley Resident:

Travel is something we all do and it can be challenging at times. I am inviting a member of your household to log your travel on a simple diary for a single day the week of October 2, 2023. These travel diaries show how Boulder residents travel and help us plan to better meet your transportation needs.

This travel diary survey is conducted every few years by a professional research firm and is the major tool to help the city better understand existing travel patterns. The results will be used in the current Transportation Master Plan update and to improve our community.

Your household was chosen at random and your participation will be completely confidential. We are only mailing the diaries to a small number of Boulder Valley residents, so your participation is extremely important and greatly appreciated.

Your diary packet will arrive in about a week at which time you'll receive your assigned tracking day.

Many thanks in advance for your help.

Sincerely,

Aaron Brockett, Mayor
City of Boulder

c/o National Research Center, Inc.
2955 Valmont Rd., Suite 300
Boulder, CO 80301-1360

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City of Boulder

September 2023

Dear Boulder Valley Resident:

Transportation is a key part of everyone's life. Whether for getting to school or work, shopping, the grocery store or a local park, access to convenient, safe and affordable transportation is a critical part of any community. It is the City of Boulder's responsibility to plan, build, maintain and operate this people-first transportation system — one where everyone can get where they need to go, no matter how they choose to travel. To accomplish this, we need your help understanding how people travel in our community.

Every few years, we turn to you to understand how our community currently travels and how long it takes, so we can further improve your travel experience. This survey is the primary data source for understanding the travel patterns of Boulder Valley residents. This research is being conducted by a professional research firm, Polco/National Research Center. The firm has randomly chosen your household to participate. **Your participation will be completely confidential.**

Because we want to understand travel for all of the Boulder Valley community, we need a representative sample of Boulder residents. **That's why it's so important that the person in your household who participates in this travel survey be:**

- **In town on that day.**
- **Age 16 or older and who most recently had a birthday.**

If this person is willing to help with this simple but very important project, their response will be much appreciated.

Please complete the survey and write your travel habits using the materials in this packet. Completed surveys and travel diaries should be mailed to Polco/National Research Center using the enclosed postage-paid envelope. If you have questions or would like support, please contact Nicolas Solari at 608-690-3233 or at nicolas@polco.us and he'll be happy to help you.

Thank you very much! Your participation will be helpful to our community and future transportation planning efforts.

Sincerely,

Aaron Brockett, Mayor
City of Boulder

2023 Travel Diary Study
INSTRUCTIONS

Please review the materials briefly before continuing to read the instructions. If any materials are missing, please contact Nicolas of Polco, at 608-690-3233 or at nicolas@polco.us, and materials will be mailed to you. This packet contains:

☐ Cover letter & these instructions ☐ Travel Diary ☐ Postage paid return envelope
☐ Household Travel Survey ☐ Travel Diary overflow sheet

COMPLETE THE TRAVEL DIARY ON YOUR ASSIGNED DAY

- Complete the travel diary on **Xweekday, OCTOBER Xday, 2023**, regardless of the weather or the number and type of activities planned for that day.
- Take the Travel Diary with you on your assigned day. It is the 8½" x 11" card included in this packet.
- If you will be out of town or forgot to complete the diary on assigned day, you may complete the diary on the same day of the next week *(Xweekday, October Xreplace)*.
- Report every trip segment you make that is longer than a city block:
  - Whether you are a passenger, driver or pedestrian.
  - Whether it is recreational (e.g. going for a run) or has a specific destination.
- Start the diary after 12:01 am (right after midnight) and continue until 12:00 midnight on your assigned day.
- Do not change your travel behavior because you are keeping this diary.
- In addition to completing the Diary, please complete the attached short household survey.
- Completed surveys and travel diaries should be mailed to Polco using the enclosed postage-paid envelope.

WHAT IS A "TRIP SEGMENT"?

- **A trip segment is all or part of a one-way journey.**
- **Round-trips count as two trip segments**. If you drive to the grocery store and back, record two trip segments on your diary. The purpose of the first is "shopping," the second is "return home."
- In addition to round trips, you may need to record one journey as more than one trip segment if:
  - **You make multiple stops.** For example, if you walk your child to school, then catch the bus outside the school to the grocery store, and then return home, stopping to pick up a prescription at the drugstore, this would count as four trip segments with the following destinations: the school, the grocery store, the drugstore and then home.
  - **You change travel method** (not including bus transfers). For instance, if you walk more than one block to a bus stop to take the bus to work, count the bus stop as the first destination and the purpose of that trip segment as "change travel mode". The next trip segment destination is work and the purpose is "work commute."
  - **You pick up or drop off a passenger.** This should be treated as at least two trip segment s. The purpose of the first trip segment is "drive passenger."
  - If you are on a recreational or exercise **loop** (walk, run or bike ride) then your "destination" is the half-way point and you record two trip segments. The purpose of the first is "social/recreation," the second is "return home."

QUICK TIPS

- For your destination, you may **use an address, nearest intersection or commonly recognized buildings**, stores or other specific and unique locations (e.g. "McGuckin Hardware", or "Table Mesa Park and Ride")
- Keep good estimates of the **start and end times**. Use the times you started and ended travel and don't include the time you spend at the destination. For example, if you go to the store, don't count the time you are in the store. When you arrived is the end of the first trip and when you left the store is the start of the second trip.
- If using a car for your trip, don't forget to **mark if you were a passenger or driver** and fill in the number of adults (include yourself, those 16 or older with drivers licenses and those over age 18) and the number of children in the vehicle.
- To **record mileage**, use a vehicle odometer if possible at the beginning and end of each trip. If you wish, you can record the number of blocks instead of miles if it is easier, but PLEASE write in "blocks" on your form, so we don't mistake it for miles.

(continued on reverse side)

HOW DO I DESCRIBE THE TRIP TYPE?

Go Home	Travel from some location other than your workplace to your usual place of residence.
Work Commute	Travel to or from your workplace.
Other Work/ Business	Travel done for work, to someplace other than the workplace. (E.g., sales calls, trips to purchase office supplies for work.)
Personal Business	Travel which is made to obtain services, not products. (E.g. bank, post office, doctor, auto repair.)
Shopping	Travel to shop or to purchase products.
School	Travel by a student to college or school. *Travel to school by a teacher or other school employee is a work commute trip.* If you are driving a student to school, the trip should be classified as "drive a passenger."
Social/ Recreation	Travel when no business is transacted. (E.g., parties, participatory sports, cultural or athletic events, church activities, visits to friends.)
Eat a Meal	Examples include going to a restaurant, going to a friend's house for dinner, or home from work for lunch. Stops for snacks or refreshments should be classified as "social/recreation".
Drive a Passenger	Use this category for trips or stops to pick up or deliver someone to a specific location. (E.g., taking a friend to the store, picking up a child from school.)
Change Travel Mode	If you drive your car, walk more than one block, or ride your bike to catch the bus, this is a "change travel mode" trip. However, if you transfer from one bus to another, it should not be included in this category because you traveled in buses without changing travel modes. (Be sure to record all the routes you used to make the trip.)
Other	Travel that does not seem to fit in the categories listed should be put in the "other" category. Please list what the trip purpose was in the blank provided. Also, if you have a question as to where to put a certain trip because you can't decide between two categories, list it in the "other" category.

SPECIAL CIRCUMSTANCES

What if you don't go anywhere during the day assigned to you? On the travel diary, fill out your name, address and the assigned diary date, check the box to indicate that you made no trips. Please continue on the Household Survey. It is important that we get an accurate picture of travel patterns within Boulder, including the number of people who make no trips.

What if you have more than 9 trip segments during the day assigned to you? The Travel Diary has space to record up to 9 trip segments. If you have more than 9 trip segments on your assigned day, please use the overflow sheet. If you have more than the 21 trip segments than can be recorded on the Diary and overflow sheet, call Nicolas and he will record your trips over the phone or send you more overflow sheets, or make a copy of the overflow sheet and use that.

What if you work a job that requires frequent travel on the day assigned to you? If you work a job that requires you to make many trips during the 24-hour period (e.g., cab driver, pizza delivery driver, sales person), please call National Research Center to receive special instructions for completing your Travel Diary.

The **EXAMPLE OF A COMPLETED TRAVEL DIARY** on the following page, gives a detailed example that may help you in completing your form.

If you have ANY questions, please contact Nicolas at Polco at nicolas@polco.us

Thank you very much for your participation in this study.

EXAMPLE OF A COMPLETED PAPER TRAVEL DIARY

In the first half of her day, Jane Smith drove from her home at 3523 N. 16th Street to work at CU, first dropping her 9 year old daughter at University Hill Elementary School.

At noon, Jane walked to the Hill for lunch (5 blocks from the building on campus where she works).

The Travel Diary example shows how Jane's form would be completed. Please note the following:

1. Jane's travel to work with her daughter is counted as **two** trips; the first is with her daughter to the elementary school -- this trip is designated as "drive a passenger"; the second is from the school to work.
2. Although Jane is going to a "school" (CU), it is for the purpose of work, and is designated as a "work commute" trip.
3. Jane records her trip (walking) **to** lunch as well as her trip **from** lunch back to work (two trips). Her trip back to the school is recorded as "work commute", because she is returning to her workplace, although she did not come straight from home.

EXAMPLE OF A COMPLETED TRAVEL DIARY, Page 1

2023 Travel Diary

Please record all of your trip segments, whether you are a passenger, driver, cyclist, or pedestrian.
The information on the first row is included only as an example. Please refer to the instructions if you are not sure how to record your trips.

Name:	Jane Smith	STARTING POINT ADDRESS	I did not leave the house today: ❑
Address:	3523 N.16th Street	Street Address: Same	
City/State/Zip:	Boulder, CO 80302	City/State/Zip:	If using motor vehicle, list odometer reading:
DIARY DATE:	10/2/2023	Nearest Cross Streets: 16th & Kalmia	at beginning of day: 79645
			at end of day: 79661

Trip segment #	DESTINATION (Address, building or nearest cross streets)	trip segment start time hour: min	am/pm	trip segment end time hour: min	am/pm	trip segment purpose	travel method	est. trip segment miles	number of people in vehicle (inc. yourself) children	adults
1	Uni. Hills School Broadway & 16th Street	7:30	AM	7:50	AM	9. drive passenger	6. Lyft, Uber, Taxi	4	1	1
2	CU – Old Main &	7:55	AM	8:05	AM	5. work commute	1. private vehicle (driver)	1	0	1
3	The Hill (Abo's) College & 13th Street	12:00	Noon	12:10	PM	8. eat a meal	11. walk	5 blocks		
4	CU – Old Main &	12:55	PM	01:05	PM	5. work commute	11. walk	5 blocks		

Record the location at which you are beginning your travel for the day. If it is your home (the same address as in the information box), you may just write "SAME" however be sure to include the Nearest Cross Streets.

Please remember to fill in the date of the day you complete the travel diary!

Don't include the amount of time you were at the destination.

You can also select that you were a passenger in a car, if appropriate.

Don't forget to include yourself as an adult in the vehicle.

(example continued on reverse side)

In the second part of Jane's day, she finished work and picked up her daughter and drove home.

She jogged for two miles in her neighborhood before dinner.

When dinner was over, Jane and her family rode their bikes to the Willow Springs Shopping Center for ice cream.

On the example form, note the following:

1. After work, Jane's trip to pick up her daughter (even though the daughter is not in the car) is designated as a trip to "drive a passenger".
2. Jane counts her jog in the neighborhood as **two** trips, even though she made no stops between leaving home and returning home. "Jogging" and "running" are considered "walking" for the purposes of this travel diary.
3. When the family rides their bikes to the shopping center for an ice cream, this is a "snack" and is designated as "social/recreation" rather than eating a meal.

EXAMPLE OF A COMPLETED TRAVEL DIARY, Page 2

Trip segment #	DESTINATION (Address, building or nearest cross streets)	trip segment start time		trip segment end time		trip segment purpose		travel method		est. trip segment miles	number of people in vehicle (inc. yourself)	
		hour: min	am/pm	hour: min	am/pm						children	adults
5	Uni. Hills School Broadway & 16th Street	5:05	PM	5:15	PM	1. go home 3. shopping 5. work commute 7. social/recreation **9. drive passenger** 11. other →	2. personal business 4. school 6. other work/business 8. eat a meal 10.change travel mode	**1. private vehicle (driver)** 2. private vehicle (passenger) 3. bus/rail/transit 4. school bus 5. car share 6. Lyft, Uber, Taxi 13. other →	7. motorcycle 8. bicycle 9. E-bike 10. E-scooter 11. walk 12. Via/paratransit	1	0	1
6	Home &	5:20	PM	5:35	PM	**1. go home** 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other →	2. personal business 4. school 6. other work/business 8. eat a meal 10.change travel mode	**1. private vehicle (driver)** 2. private vehicle (passenger) 3. bus/rail/transit 4. school bus 5. car share 6. Lyft, Uber, Taxi 13. other →	7. motorcycle 8. bicycle 9. E-bike 10. E-scooter 11. walk 12. Via/paratransit	4	1	1
7	Orchad & 19th Street	5:50	PM	6:05	PM	1. go home 3. shopping 5. work commute **7. social/recreation** 9. drive passenger 11. other →	2. personal business 4. school 6. other work/business 8. eat a meal 10.change travel mode	1. private vehicle (driver) 2. private vehicle (passenger) 3. bus/rail/transit 4. school bus **5. car share** 6. Lyft, Uber, Taxi 13. other →	7. motorcycle 8. bicycle 9. E-bike ~~10. E-scooter~~ **11. walk** 12. Via/paratransit	1		
8	Home &	6:05	PM	6:20	PM	**1. go home** 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other →	2. personal business 4. school 6. other work/business 8. eat a meal 10.change travel mode	1. private vehicle (driver) 2. private vehicle (passenger) 3. bus/rail/transit 4. school bus **5. car share** 6. Lyft, Uber, Taxi 13. other →	7. motorcycle 8. bicycle 9. E-bike ~~10. E-scooter~~ **11. walk** 12. Via/paratransit	1		
9	Willow Springs Shopping Iris & 28th	7:15	PM	7:40	PM	1. go home 3. shopping 5. work commute **7. social/recreation** 9. drive passenger 11. other →	2. personal business 4. school 6. other work/business 8. eat a meal 10.change travel mode	1. private vehicle (driver) **2. private vehicle (passenger)** 3. bus/rail/transit 4. school bus 5. car share 6. Lyft, Uber, Taxi 13. other →	~~7. motorcycle~~ **8. bicycle** 9. E-bike 10. E-scooter 11. walk 12. Via/paratransit	10 blocks		
10	Home &	8:05	PM	8:30	PM	**1. go home** 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other →	2. personal business 4. school 6. other work/business 8. eat a meal 10.change travel mode	1. private vehicle (driver) **2. private vehicle (passenger)** 3. bus/rail/transit 4. school bus 5. car share 6. Lyft, Uber, Taxi 13. other →	~~7. motorcycle~~ **8. bicycle** 9. E-bike 10. E-scooter 11. walk 12. Via/paratransit	10 blocks		

If you have ANY questions, please contact Nicolas at nicolas@polco.us
Thank you very much for your participation in this study.

2023 Travel Diary

Please record all of your trip segments, whether you are a passenger, driver, cyclist, scooter-rider, or pedestrian.
The information on the first row is included only as an example. Please refer to the instructions if you are not sure how to record your trips.

Name: _____

Address: _____

City/State/Zip: _____

DIARY DATE: _____

STARTING POINT ADDRESS

Street Address: _____

City/State/Zip: _____

Nearest Cross Streets: _____ **&** _____

I did not leave the house today: ❑

If using motor vehicle, list odometer reading:

at beginning of day: _____

at end of day: _____

Trip segment #	DESTINATION (address, building or nearest cross streets)	trip segment start time		trip segment end time		trip segment purpose	travel method	est. trip segment miles	number of people in vehicle (inc. yourself)	
		hour:min	am/pm	hour:min	am/pm				children	adults
example	Foothill Elementary Broadway & Grape	7:13	AM	7:22	AM	1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other →	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other: →	3 miles	1	1
1	_____ & _____	__ : __		__ : __		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other →	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other →			
2	_____ & _____	__ : __		__ : __		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other →	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other →			
3	_____ & _____	__ : __		__ : __		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other →	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other →			

Trip segment #	DESTINATION (address, building or nearest cross streets)	trip segment start time		trip segment end time		trip segment purpose	travel method	est. trip segment miles	number of people in vehicle (inc. yourself)	
		hour:min	am/pm	hour:min	am/pm				children	adults
4	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
5	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
6	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
7	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
8	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
9	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			

2023 Overflow Sheet

Trip segment #	DESTINATION (address, building or nearest cross streets)	trip segment start time		trip segment end time		trip segment purpose	travel method	est. trip segment miles	number of people in vehicle (incl. yourself)	
		hour:min	am/pm	hour:min	am/pm				children	adults
10	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
11	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
12	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
13	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
14	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
15	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			

Trip segment #	DESTINATION (address, building or nearest cross streets)	trip segment start time		trip segment end time		trip segment purpose	travel method	est. trip segment miles	number of people in vehicle (incl. yourself)	
		hour:min	am/pm	hour:min	am/pm				children	adults
16	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
17	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
18	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
19	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
20	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			
21	_____ _____ & _____	___ : ___		___ : ___		1. go home 2. personal business 3. shopping 4. school 5. work commute 6. other work/business 7. social/recreation 8. eat a meal 9. drive passenger 10.change travel mode 11. other → _____	1. private vehicle (**driver**) 7. motorcycle 2. private vehicle (**passenger**) 8. bicycle 3. bus/rail/transit 9. E-bike 4. school bus 10. E-scooter 5. car share 11. walk 6. Lyft, Uber, Taxi 12. Via/paratransit 13. other → _____			

c/o National Research Center, Inc.
2955 Valmont Rd., Suite 300
Boulder, CO 80301-1360
303-444-7863

2023 Travel Diary Study
HOUSEHOLD TRAVEL SURVEY

Please complete the following survey regarding your household and return it with your Travel Diary in the enclosed postage-paid envelope. The survey should take only a few minutes. It is important because it will help research staff gauge how representative the people who participate in the diary study are in relation to Boulder Valley residents as a whole. It also provides additional information on the travel patterns of Boulder Valley residents. Your answers to this survey will be anonymous and will be reported in group form only. Thank you for your time and help.

GENERAL TRAVEL INFORMATION

1. On the day you completed the travel diary, did you have any goods or services delivered to your work or home?

- ❑ no → *Go to question #3*
- ❑ yes → From how many different sources did you receive services/deliveries? [ ] sources

2. Did the delivery or deliveries substitute for a travel trip you might have made to seek the good or service?

- ❑ no
- ❑ yes

3. Are you eligible to have an annual transit pass (Eco-Pass or University Transit Pass) that allows you unlimited bus rides?
(Please check all that apply.)

- ❑ yes, Eco-Pass through my employer
- ❑ yes, Eco-Pass through my neighborhood
- ❑ yes, a university student transit pass
- ❑ yes, a university faculty/staff transit pass
- ❑ yes, other pass: _____
- ❑ no, I am not eligible for an Eco-Pass or College Pass → *go to #5*

4. About how often, on average, do you use your transit pass?

- ❑ more than once a week
- ❑ about once a week
- ❑ about once every two weeks
- ❑ about once a month
- ❑ less often than once a month
- ❑ haven't used
- ❑ haven't picked-up or activated

5. Are you employed?

- ❑ no → *Go to question #10*
- ❑ yes, part-time
- ❑ yes, full-time

6. Please indicate the city in or nearest to your primary work place.

- ❑ Boulder
- ❑ Denver
- ❑ Broomfield
- ❑ Louisville
- ❑ Longmont
- ❑ Lafayette
- ❑ I work from my home
- ❑ Other city, specify: _____

7. Please write in the address, building and/or nearest cross streets of your primary work place.

Building or address: _____
Nearest cross streets: _____
& _____

8. On average, how often do you telework (work at home instead of going into the office)? (Include only full days at home when you did not travel to your workplace.)

- ❑ Never
- ❑ Less than once a month
- ❑ 1 to 3 days per month
- ❑ Once a week
- ❑ 2 times a week
- ❑ 3 times a week
- ❑ 4 times a week
- ❑ 5 times a week or more

9. Did you telecommute on the day you completed the travel diary?

- ❑ no
- ❑ yes

HOUSEHOLD INFORMATION

10. How many passenger vehicles does your household own or normally have use of?

[ ] Cars, SUVs, vans and light trucks [ ] Motorcycles / motor scooters

11. How many usable bicycles, e-bikes or e-scooters does your household have?

[ ] Regular bicycles [ ] E-Bikes [ ] E-scooter

12. Please check the one choice below which best describes the kind of residence in which you live.

- ❑ a detached single-family home
- ❑ a duplex or triplex
- ❑ an apartment
- ❑ a condominium or townhouse
- ❑ a mobile home
- ❑ group quarters (e.g., dormitory, nursing home) → *go to question #14*
- ❑ other: _____

13. Do you rent or own your residence?

- ❑ rent
- ❑ own

14. About how much was the TOTAL 2022 income before taxes for your household as a whole? In the total, please include income before taxes as well as money from all sources for all persons living in your household. (For example, include everyone's income from self-employment, gifts, interest on savings, social security, AFDC, the value of food stamps received, pension or disability benefits, child support, as well as wages, tips and salary.)

- ❑ Less than $10,000
- ❑ $10,000 to $19,999
- ❑ $20,000 to $29,999
- ❑ $30,000 to $39,999
- ❑ $40,000 to $49,999
- ❑ $50,000 to $74,999
- ❑ $75,000 to $99,999
- ❑ $100,000 to $149,999
- ❑ $150,000 or more
- ❑ Prefer not to say

15. Please record the number of household members in each of the following age categories. (Please remember to include yourself.)

Age category	**Number in household**
0 to 6 years	_____
7 to 14 years	_____
15 to 17 years	_____
18 to 24 years	_____
25 to 34 years	_____
35 to 44 years	_____
45 to 54 years	_____
55 to 64 years	_____
65 or older	_____

16. Are any of the household members students at the University of Colorado, Boulder campus?

❑ no ❑ yes → How many are:

full-time students	part time students

INDIVIDUAL INFORMATION

17. How frequently do you use the following mobility devices?

	Bike	E-bike	E-scooter
Never	❑	❑	❑
Less than once a month	❑	❑	❑
1 to 3 days per month	❑	❑	❑
Once a week	❑	❑	❑
2 times a week	❑	❑	❑
3 times a week	❑	❑	❑
4 times a week	❑	❑	❑
5 times a week or more	❑	❑	❑

18. Which of the following do you use?

	Private	App / membership	Neither
Bike	❑	❑	❑
E-bike	❑	❑	❑
E-scooter	❑	❑	❑

19. Are you a member of any car share program (e.g., Colorado CarShare or Zipcar)?

❑ no ❑ yes

20. How many years have you lived in Boulder? *(Please write "0" if less than 6 months.)*

[ ] Years

21. Are you a student at a university or a community college?

❑ no ❑ yes

22. What is your gender?

- ❑ man
- ❑ identify another way
- ❑ woman
- ❑ prefer not to say

23. Which category contains your age?

- ❑ 16 to 24 years old
- ❑ 25 to 34 years old
- ❑ 35 to 44 years old
- ❑ 45 to 54 years old
- ❑ 55 to 64 years old
- ❑ 65 years or older
- ❑ Prefer not to say

24. Are you of Hispanic, Latino, or Spanish origin?

❑ no ❑ yes

25. What is your race? (Mark one or more races to indicate what race you consider yourself to be.)

- ❑ American Indian or Alaskan Native
- ❑ Asian
- ❑ Black or African American
- ❑ Native Hawaiian or Other Pacific Islander
- ❑ White
- ❑ A race not listed
- ❑ Prefer not to say

26. If you drive, what is the year, make and model of the vehicle you usually drive?

Year: _____

Make: _____

Model: _____

Please email hagelinc@bouldercolorado.gov if you would like to receive a summary of the results, once the study is complete.

Thank you very much for taking the time to complete this survey. Please return this with your travel diary in the postage-paid envelope provided