

Modal Shift in the Boulder Valley

1990 to 2009



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Prepared for the
City of Boulder

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Modal Shift in the Boulder Valley: 1990-2009



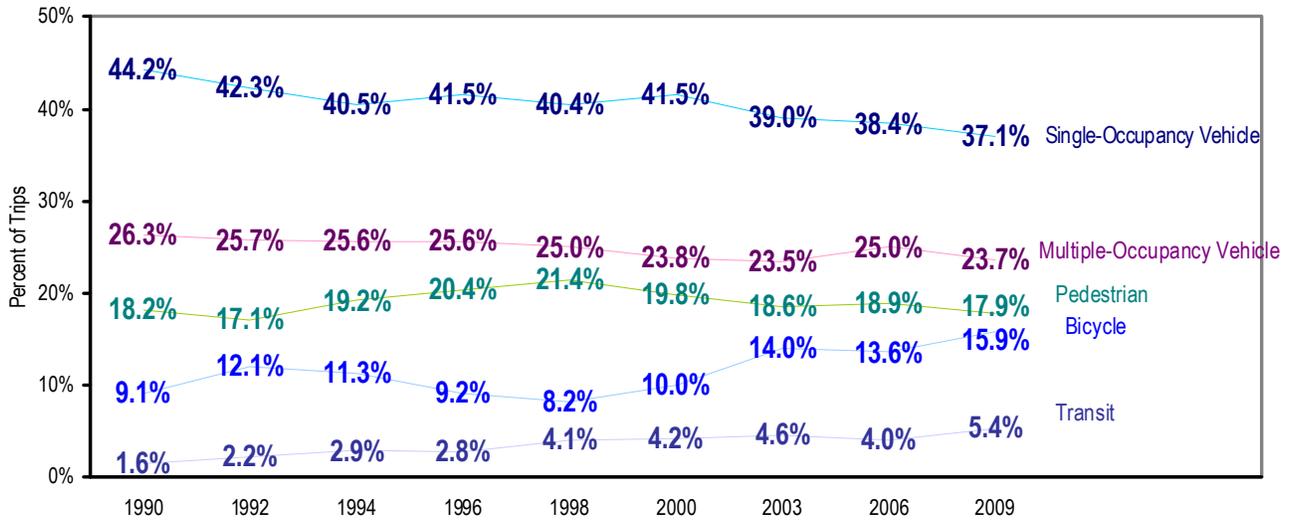
Executive Summary

Background

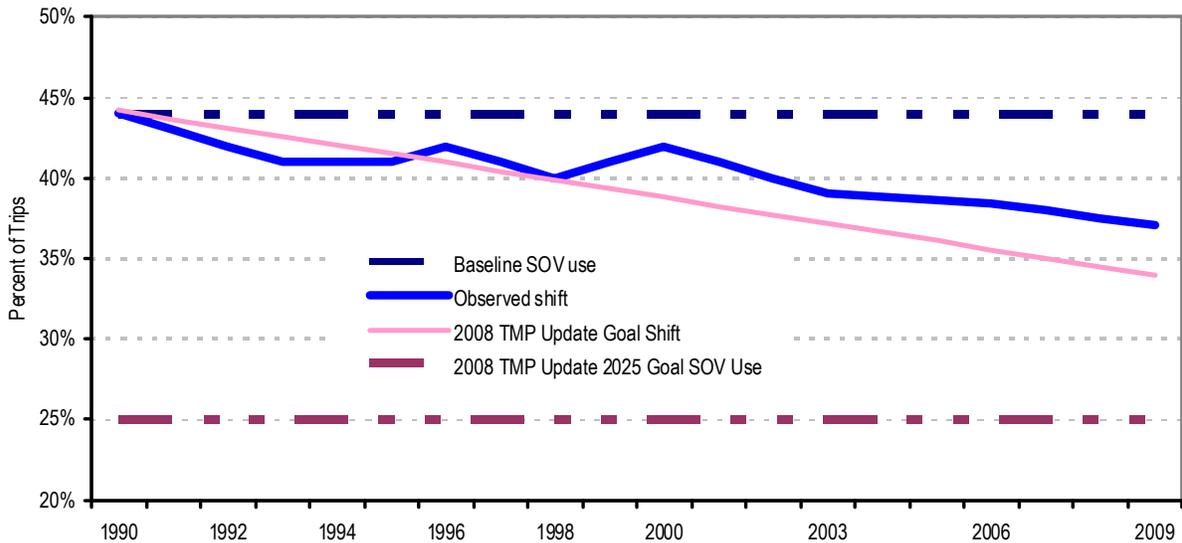
- The 2009 Travel Diary Study is the eighth replication of the survey since the 1990 baseline survey. This study is a periodic survey of Boulder Valley residents' travel patterns and mode selection, and is designed to provide feedback to City staff and Council members on the effectiveness of City programs aimed at reducing single-occupancy vehicle (SOV) travel, and to provide information on travel patterns useful for future transportation planning.
- The long trend line generated by the multiple implementations of the study is useful in measuring the City's progress towards the TMP objective to reduce the SOV modal share to 25% of all trips by the year 2025. Achieving an SOV modal share of 25% by the year 2025 would mean a 19% shift in the proportion of SOV trips made from 1990 to 2025, or a 0.54% shift per year.
- Participants in the Travel Diary Study are asked to keep a log or "diary" of their travel for one randomly assigned day during the third week of September (or a replacement week if necessary). 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 number of miles or blocks traversed during the 24 hour period. A trip is defined for participants 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 such as number of vehicles and bicycles present in the household, receipt of deliveries, work location, and other general socioeconomic demographics.
- The 2009 Travel Diary Study results are based on approximately 1,200 Boulder Valley residents' records of their travel. With a sample size of 1,000 or more in each study year, the margin of error around the results is $\pm 1.3\%$ 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," can be defined as a method of dividing travel into all available transportation modes and determining the percent 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 2009 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 2009 (change in percents).
- 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, -7.1%
 - ◆ Multiple-Occupancy Vehicle, -2.6%
 - ◆ Transit, +3.8%
 - ◆ Bicycle, +6.8%



➤ The 2008 TMP includes an objective of achieving an SOV modal share of 25% by the year 2025; this would mean a 19% shift in the proportion of SOV trips made from 1990 to 2025, or an average annual shift of 0.54%, assuming equal progress throughout the thirty-five year span. In the figure below, the 2008 TMP target is plotted with the observed shift. As can be seen, the observed modal shift has not quite kept pace with the 2008 TMP objective in recent years.

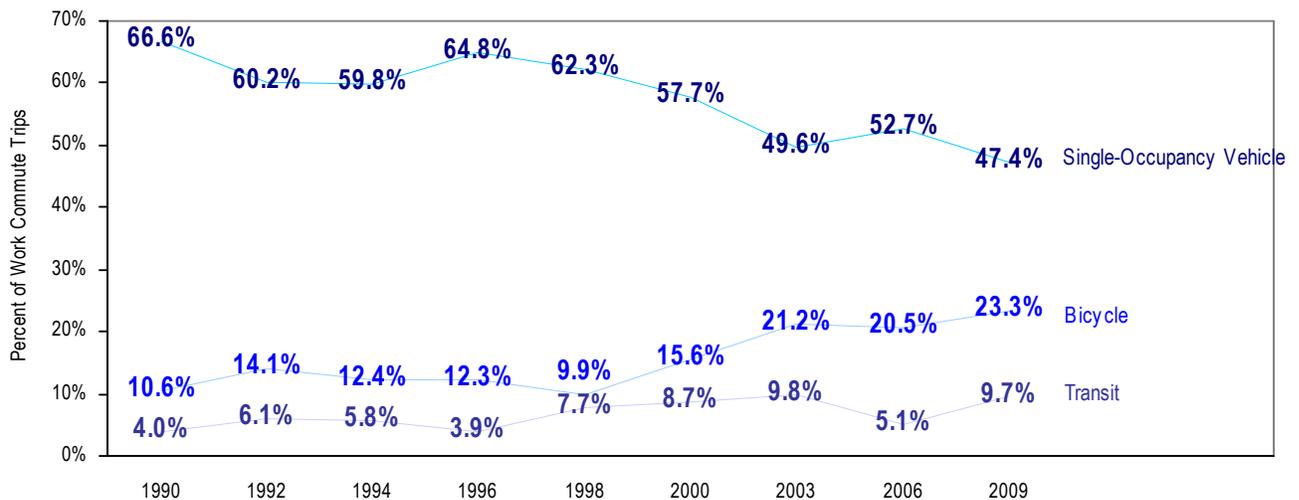


- Changes in Boulder citizens' travel behavior cannot be solely attributed to the City's interventions, as regional and national transportation trends also impact travel behavior.
 - ◆ Nationwide, there was a 0.6% shift away from trips made via private vehicles (87.6% in 1990, 87.0% in 2001) over an 11 year period, which translates to an average annual decrease of 0.05%. However, among Boulder Valley residents, there was a 9.7% shift observed (70.5% in 1990, 60.8% in 2009), an average annual decrease of 0.51%.
 - ◆ The proportion of trips made on transit remained virtually unchanged nationally, (2.0% in 1990; 1.7% in 2001) while in Boulder there was a 3.8% shift toward public transit (1.6% in 1990; 5.4% in 2009), representing an average annual increase of 0.2%.
 - ◆ When the modal split of miles traveled is examined, there was a 1.2% shift *towards* miles traveled via private vehicles nationally (95.3% in 1990, 96.5% in 2001), while in Boulder there was a 4.5% shift *away* from miles traveled via private vehicles (87.7% in 1990, 82.0% in 2009).
 - ◆ The proportion of miles traveled via transit stayed flat nationwide, 1.5% in 1990 to 1.2% in 1995, while in Boulder the percent of miles traveled via transit increased, from 4.1% in 1990 to 6.9% in 2009.

Modal Split of the Work Commute

- The figure below shows the percent of work commute trips made by respondents via SOV, bicycle and transit in every study year. Little change was observed over the study period in multiple-occupancy vehicle trips (between 8% and 11%) or pedestrian trips (also between 8% and 11% of work commute trips). Compared to 1990, significant shift was observed in three categories:
 - ◆ Single-Occupancy Vehicle, -19.2%
 - ◆ Transit, +5.7%
 - ◆ Bicycle, +12.7%

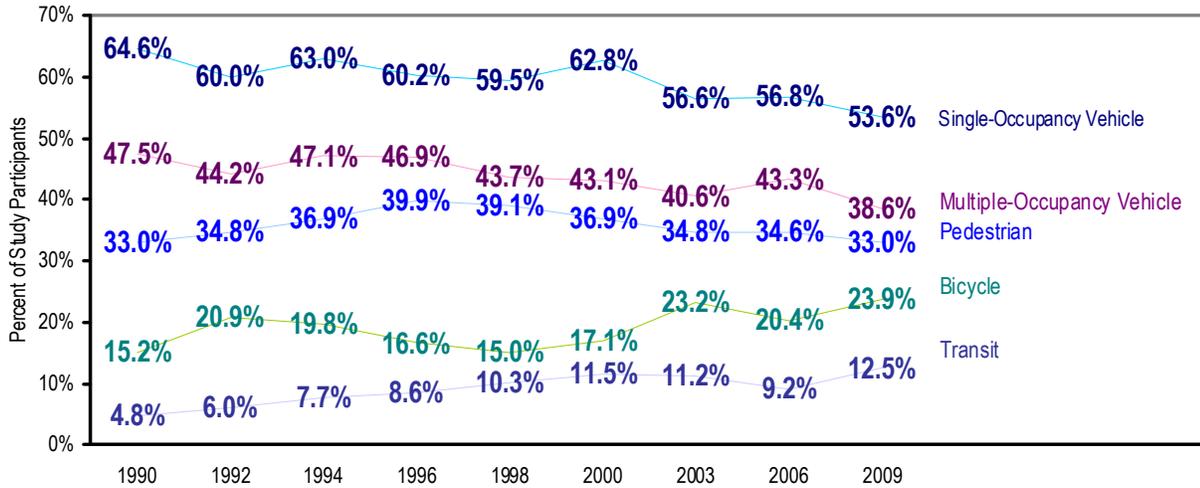
- Transit trips, which had been increasing in modal share of work commute trips, have remained relatively flat since 2003, with a decline in 2006 and a rebound in 2009 to 2003 levels.



- Use of a private vehicle for the work trips has remained constant across the U.S., as measured in trips and miles, while Boulder has experienced a decline in work trips made via private vehicles.

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 percent of participants making any trips by SOV or MOV has declined, while the proportion making any trips via transit or by bicycle has increased.



Trip Characteristics

- The information recorded on the travel diary can be used to characterize the trip-making behavior of Boulder residents. Most trip characteristics have not changed much over the study period. In 2009:
 - ◆ The average number of trips per day per person was 5.1.
 - ◆ The average number of miles traveled per day per person was 24.7 miles.
 - ◆ The percent of people who did not leave the house on assigned travel day was 5.8%
 - ◆ The average estimated trip distance was 5.0 miles.
 - ◆ The average estimated trip duration in was 17.0 minutes.
- Compared to national data, Boulder residents make shorter trips (5.1 miles for Boulder residents compared to 9.9 miles in 2001 for U.S. residents). Trip duration is also shorter for Boulder residents (17.0 minutes) compared to U.S. residents in 2001 (18.7 minutes).
- The average work commute trip for Boulder residents in 2009 was 6.1 miles in distance and 17.1 minutes in duration. The average work commute for U.S. residents in 2001 was 14.6 miles and 24.8 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 three years since then. The study is designed to provide feedback 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 2009 Travel Diary Study is the ninth implementation of the survey since the baseline study was first conducted in 1990. This long trend line is useful in measuring the City's progress towards one of the original Transportation Master Plan's (TMP) major objectives: 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 the most recent TMP update, this objective was modified to a target of 25% of trips being made by single-occupant vehicles by the year 2025. This target is now the standard against which these study results are measured. Achieving an SOV modal share of 25% by the year 2025 would mean a 19% shift in the proportion of SOV trips made from 1990 to 2025, or a 0.54% shift per year.

Participants in the study were asked to keep a log or "diary" of their travel for one randomly assigned day during the third week of September (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 traversed during the 24 hour period. 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 2009 Travel Diary Study results are based on approximately 1,200 Boulder Valley residents' records of their travel. About 7,000 randomly selected households were contacted to participate in the study. About 400 of the packets were returned as undeliverable, resulting in about 6,589 eligible households. From these eligible households, 1,144 completed household surveys and/or travel diaries were returned, for a response rate of 17.4%.

In addition, survey packets were sent to 600 addresses of affordable housing units managed by Boulder Housing Partners. From these, 26 completed returns were obtained, for a response rate of 4.3%. Finally, 700 students in dormitories and 100 students in Greek residences (sororities and fraternities) were contacted to participate in the study; completed surveys were returned from 21 of them for a response rate of 3.0%. In addition, 29 surveys were returned for which the type ("regular", affordable housing or student group quarters) could not be determined. All told, 1,220 surveys were received.

Results were statistically weighted so that demographics of respondents matched population demographics. More information about the study methodology is contained in *Appendix E. Study Methodology*.

With a sample size of 1,000 or more in each study year, the margin of error around the results is $\pm 1.3\%$ 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,” can be defined as a method of dividing travel into all available transportation modes and can refer to the number of modes, number of trips or number of miles traveled. This study uses the number of trips and number of miles when calculating modal split, and classifies the modes as 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 2009 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 2009 (change in percents). The modal split of trips as observed in the 2009 Travel Diary is shown in Figure 2 on the next page, while the modal shift of trips from 1990 to 2009 by Boulder Valley residents is presented in Figure 1.

Over the entire study period, the proportion of all trips made by driving alone has shifted 7%, over half of which occurred in the early 1990s. In 2009, SOV trips accounted for about 37% of all trips made by Boulder residents, down from about 44% in 1990. Transit trips have tripled, increasing from less than 2% in 1990 to just over 5% in 2009. The proportion of trips made by bicycle has increased nearly 7% over the study period.

The proportion of trips made via MOV has remained fairly constant since 1990. In 2009, about a quarter of all trips were made in personal vehicles with more than one person. About a third of those MOV trips included at least one child in the vehicle, while about two-thirds included only adults (see Figure 2 on the next page).

Figure 1: Modal Split of Trips for Boulder Valley: 1990 to 2009

Travel Mode	Percent of Trips*									Change 1990 to 2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Single-Occupancy Vehicle	37.1%	38.4%	39.0%	41.5%	40.4%	41.5%	40.5%	42.3%	44.2%	-7.1%
Multiple-Occupancy Vehicle	23.7%	25.0%	23.5%	23.8%	25.0%	25.6%	25.6%	25.7%	26.3%	-2.6%
Transit	5.4%	4.0%	4.6%	4.2%	4.1%	2.8%	2.9%	2.2%	1.6%	+3.8%
School Bus	0.1%	0.1%	0.3%	0.7%	0.7%	0.5%	0.5%	0.7%	0.6%	-0.5%
Bicycle	15.9%	13.6%	14.0%	10.0%	8.2%	9.2%	11.3%	12.1%	9.1%	+6.8%
Foot	17.9%	18.9%	18.6%	19.8%	21.4%	20.4%	19.2%	17.1%	18.2%	-0.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Number of Trips	5,505	6,081	6,380	6,791	5,987	6,454	6,723	6,681	7,355	

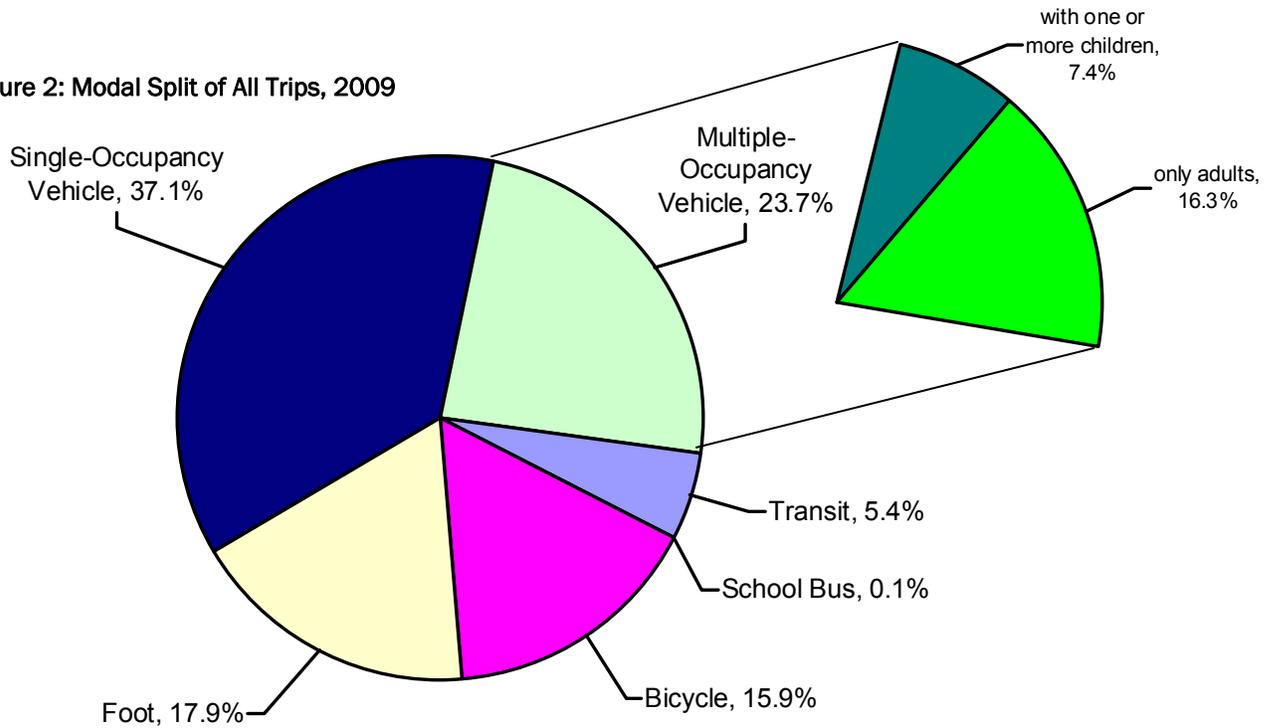
Modes with shifts that are statistically significantly different between 1990 and 2009 are shaded.

Modes with shifts that are statistically significant different between 2006 and 2009 are bolded.

** These estimates have a margin of error of ±1.3% using a 95% confidence interval.*

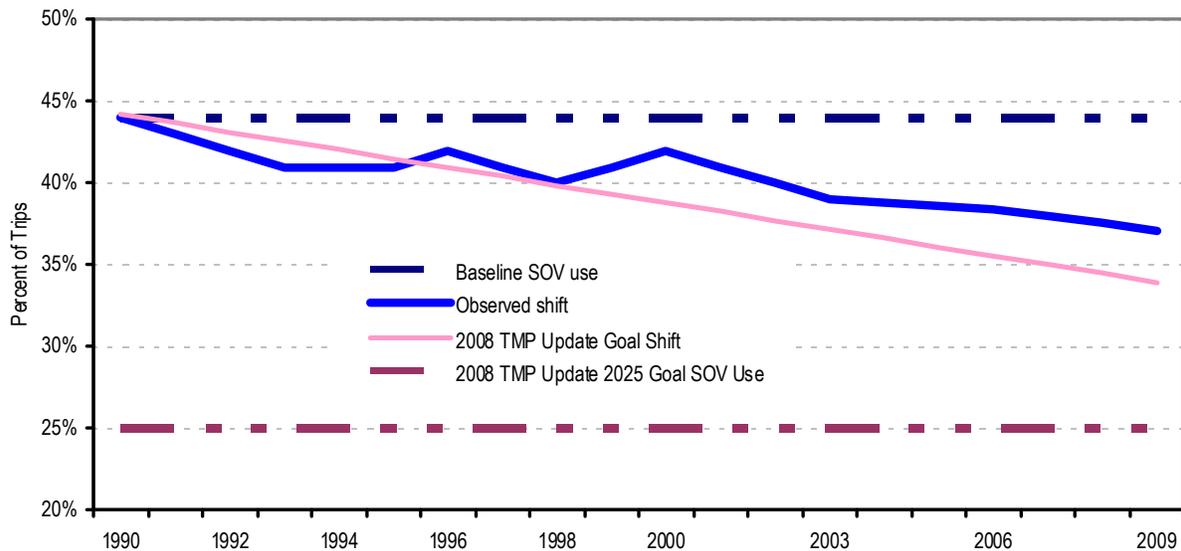
¹ A single-occupancy vehicle refers to an automobile, van, truck or motorcycle which has only one occupant; a multiple-occupancy vehicle is an automobile, truck or motorcycle with more than one occupant. (Truck and motorcycle trips make up a very small proportion of the trips made.)

Figure 2: Modal Split of All Trips, 2009



The 2008 TMP update includes an objective of achieving an SOV modal share of 25% by the year 2025; this would mean a 19% shift in the proportion of SOV trips made from 1990 to 2025, or an average annual shift of 0.54%, assuming equal progress throughout the thirty-five year span. In Figure 3, the 2008 TMP target is plotted with the observed shift. As can be seen, the observed modal shift has not quite kept pace with the 2008 TMP objective in recent years.

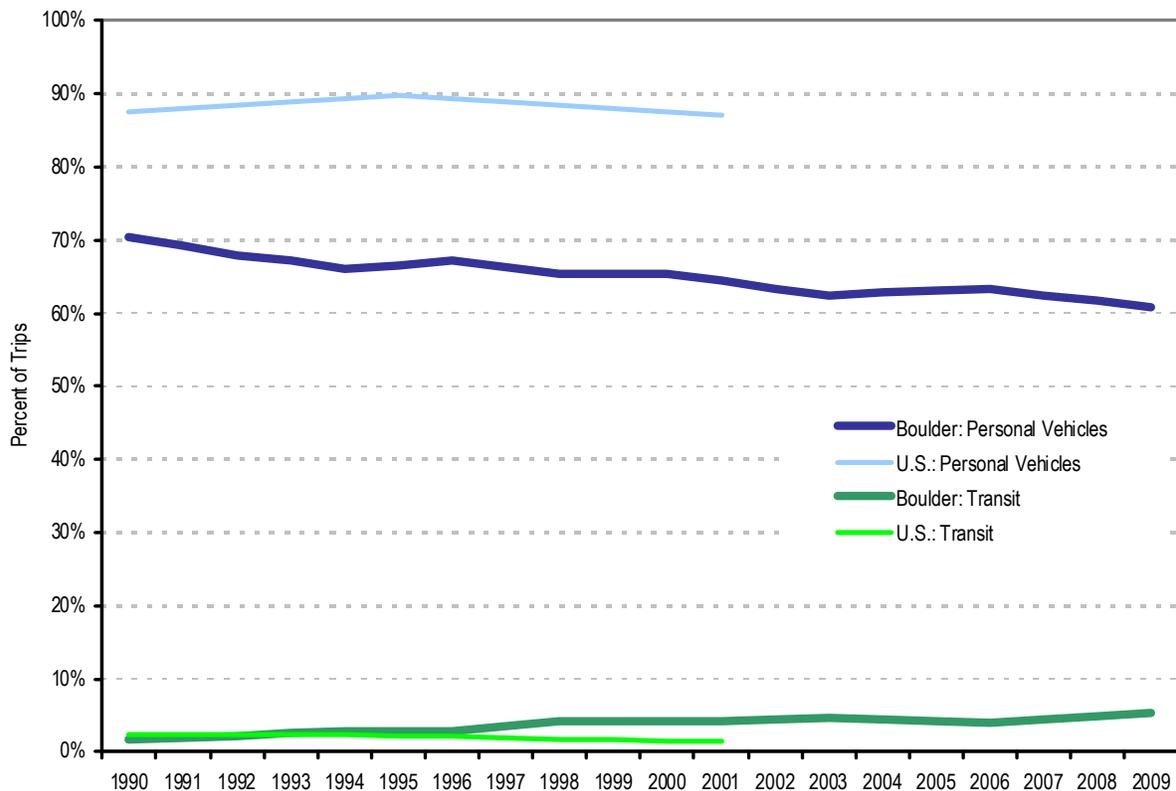
Figure 3: Percent of SOV Trips from 1990-2009: Observed Versus Desired Shift



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 demonstrate little reduction in “privately owned vehicle” (POV) use, which includes both SOVs and MOVs, between 1990 and 2001.² Figure 4 below compares the change observed in Boulder from 1990 to 2009 to that observed in the nation from 1990 to 2001. Nationwide, there was a 0.6% shift away from trips made via private vehicles (87.6% in 1990, 87.0% in 2001) over an 11 year period, which translates to an average annual decrease of 0.05%. However, among Boulder Valley residents, there was a 9.7% shift observed (70.5% in 1990, 60.8% in 2009), an average annual decrease of 0.51%.

The proportion of trips made on transit remained virtually unchanged nationally, (2.0% in 1990; 1.7% in 2001) while in Boulder there was a 3.8% shift toward public transit (1.6% in 1990; 5.4% in 2009), representing an average annual increase of 0.2%.³

Figure 4: Percent of All Trips from 1990 to 2009/2001: Boulder Compared to the U.S.



² These data come from the 1990 and 1995 Nationwide Personal Transportation Study and the 2001 National Household Travel Study (NHTS). However, the 1995 report of results warns against making comparisons between the 1990 and 1995 studies, as methodologies changed somewhat between 1990 and 1995, resulting in somewhat more trips being reported in 1995; additionally, greater effort was made in 2001 to capture walking trips, probably thus reducing artificially the proportion of trips made via other modes when compared to past survey years. A 2009 NHTS has been completed; however, the data for this type of comparison are not yet available.

³ Appendix A. National Travel Data contains additional detail on the comparisons made in Figure 4.

Modal share estimates using miles of travel show larger shares for the motorized vehicles because these vehicles are used to traverse greater distances. From 1990 to 2009, there has been a 3.9% decrease in the SOV share of miles traveled. There has been an increase of about 3.2% in the proportion of miles traveled by bicycles in the study period, growing from 4.9% of miles in 1990 to 8.1% of miles in 2009. The share of transit miles has also increased (2.8%), but not as much as the share of total trips, perhaps indicating that much of the increase in the modal share of transit trips is on shorter rides, such as those that would be taken on Community Transit Network buses (such as the HOP, SKIP or JUMP). Little change in the modal split of trips was observed from 2006, the last time the study was implemented, to 2009.

Figure 5: Modal Split of Miles for Boulder Valley: 1990 to 2009

Travel Mode	Percent of Miles*									Change 1990 to 2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Single-Occupancy Vehicle	46.1%	46.9%	44.0%	49.1%	48.1%	45.2%	46.2%	48.0%	50.0%	-3.9%
Multiple-Occupancy Vehicle	35.9%	36.3%	39.5%	35.9%	35.6%	41.3%	38.6%	37.3%	37.7%	-1.8%
Transit	6.9%	5.7%	5.5%	6.5%	7.0%	5.7%	6.4%	6.2%	4.1%	+2.8%
School Bus	0.5%	0.1%	0.2%	0.4%	0.6%	0.2%	0.2%	0.5%	0.2%	+0.3%
Bicycle	8.1%	7.2%	7.7%	4.7%	4.6%	4.3%	5.6%	5.4%	4.9%	+3.2%
Foot	2.5%	3.7%	3.0%	3.5%	4.1%	3.2%	2.9%	2.5%	3.0%	-0.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Number of Miles	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 2009 are shaded.

Modes with shifts that are statistically significant different between 2006 and 2009 are bolded.

* These estimates have a margin of error of $\pm 1.3\%$ at a 95% confidence interval.

As with the modal split of trips, the reduction in SOV miles can be compared to the 2008 TMP objective (Figure 6), assuming that the objective of a 19% shift in the proportion of trips made by SOV can also be translated as an objective of a 19% 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.

Figure 6: Percent SOV Miles from 1990 to 2009: Observed Versus Expected Shift

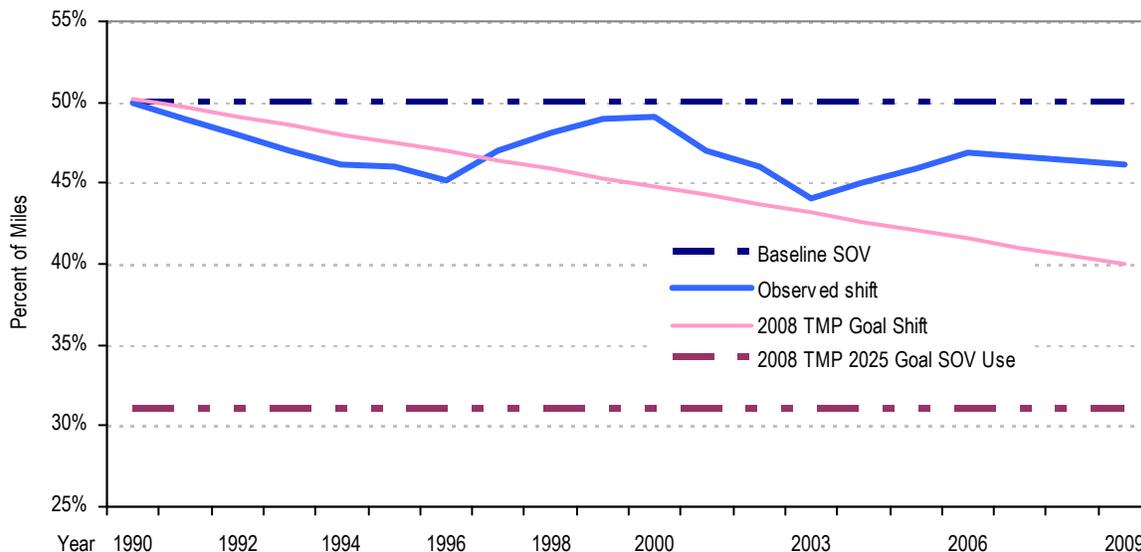
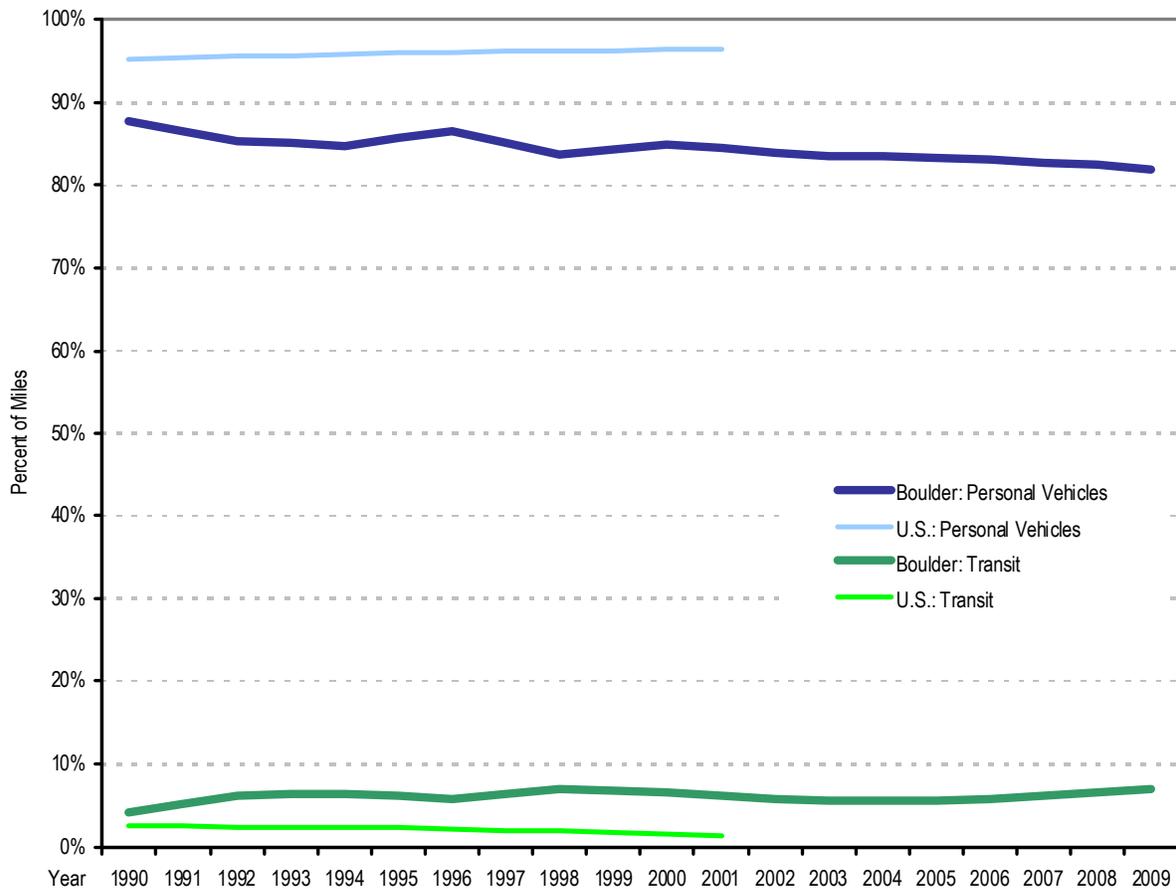


Figure 7 shows a comparison of the percent of miles traveled in the nation between 1990 and 2001, and in Boulder Valley between 1990 and 2009, by mode. The proportion of miles traveled by private vehicles stayed about the same in the U.S., from 95.3% to 96.5% of miles⁴, while in Boulder the trend was a declining one, from 87.7% of miles in 1990 to 82.0% in 2009. The proportion of miles traveled via transit actually decreased nationwide, from 2.5% in 1990 to 1.4% in 2001, while in Boulder the percent of miles traveled via transit increased slightly, from 4.1% in 1990 to 6.9% in 2009.

Figure 7: Percent of All Miles from 1990 to 2009/2001: Boulder Compared to the U.S.



⁴ These data come from the 1990 and 1995 Nationwide Personal Transportation Study and the 2001 National Household Travel Study. However, the 1995 report of results warns against making comparisons between the 1990 and 1995 studies, as methodologies changed somewhat between 1990 and 1995, resulting in somewhat more trips being reported in 1995; additionally, greater effort was made in 2001 to capture walking trips, probably thus reducing artificially the proportion of trips made via other modes when compared to past survey years.

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.⁵ 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 (margin of error = ±4%).

The SOV modal share of work commute trips decreased from 1990 to 2009 by 19% over the study period (see Figure 8), with a decrease of 5.3% from 2006 to 2009. The transit share, which had been increasing from 1990 to 2003, declined in 2006 to levels not statistically significantly higher than 1990 levels, but increased again in 2009 to 9.7%. The proportion of work commute trips made by bicycling remained high, at about 23% of all work commute trips, about 12% higher than what had been observed in 1990, and similar to levels observed in 2006.

Figure 8: Modal Split of Trips for the Work Commute: 1990 to 2009

Travel Mode	Percent of Work Commute Trips									Change 1990 to 2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Single-Occupancy Vehicle	47.4%	52.7%	49.6%	57.7%	62.3%	64.8%	59.8%	60.2%	66.6%	-19.2%
Multiple-Occupancy Vehicle	8.5%	10.7%	9.2%	7.6%	8.2%	10.8%	10.1%	9.8%	9.9%	-1.4%
Transit	9.7%	5.1%	9.8%	8.7%	7.7%	3.9%	5.8%	6.1%	4.0%	+5.7%
School Bus	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.1%	0.2%	0.0%	0.0%
Bicycle	23.3%	20.5%	21.2%	15.6%	9.9%	12.3%	12.4%	14.1%	10.6%	+12.7%
Foot	11.1%	11.0%	10.3%	10.4%	11.8%	8.2%	11.8%	9.6%	8.9%	+2.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
<i>Number of Work Commute Trips</i>	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 2009 are shaded.
 Modes with shifts that are statistically significant different between 2006 and 2009 are bolded.*

⁵ See page 31 for a description of how trips were categorized. Using the trip classification scheme displayed in *Figure 48: 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.

The modal shift in miles for the work commute traveled by SOV was about 12% lower in 2009 compared to 1990, and about 7% lower than in 2006 (although only about 4% lower than in 2003, indicating some volatility in the trend line). 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, though, additional emphases and programs were implemented, which may have led to other changes in trip-making behavior. For example, the modal shift of miles traveled by bicycle for the work commutes has increased about 6% since 1990, with much of the change occurring between 2000 and 2003. 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 9: Modal Split of Miles for the Work Commute: 1990 to 2009

Travel Mode	Percent of Work Commute Miles									Change 1990 to 2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Single-Occupancy Vehicle	59.7%	66.6%	63.6%	68.8%	66.7%	71.5%	66.6%	64.5%	71.9%	-12.2%
Multiple-Occupancy Vehicle	9.1%	10.3%	12.8%	6.3%	11.2%	11.9%	14.9%	10.1%	10.9%	-1.8%
Transit	19.5%	11.8%	12.6%	17.4%	16.2%	11.2%	12.7%	16.5%	11.2%	+8.3%
School Bus	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.6%	0.0%	0.0%
Bicycle	10.6%	10.2%	10.0%	6.0%	4.4%	4.3%	4.6%	6.9%	4.7%	+5.9%
Foot	1.1%	1.2%	1.0%	1.5%	1.3%	1.0%	1.2%	1.4%	1.3%	-0.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Number of Work Commute Miles	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 2009 are shaded.
 Modes with shifts that are statistically significant different between 2006 and 2009 are bolded.

Figure 10 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 has remained constant across the U.S., as measured in trips and miles, while Boulder has experienced a decline in work trips and miles traveled for the work commute made via private vehicles. The trend line for the proportion of work trips made via transit has been volatile in Boulder, but the overall trend is an increasing one. Nationally, no change has been observed in transit use.

Figure 10 :Percent of Work Commute Trips and Miles from 1990 to 2009/2001: Boulder Compared to the U.S.

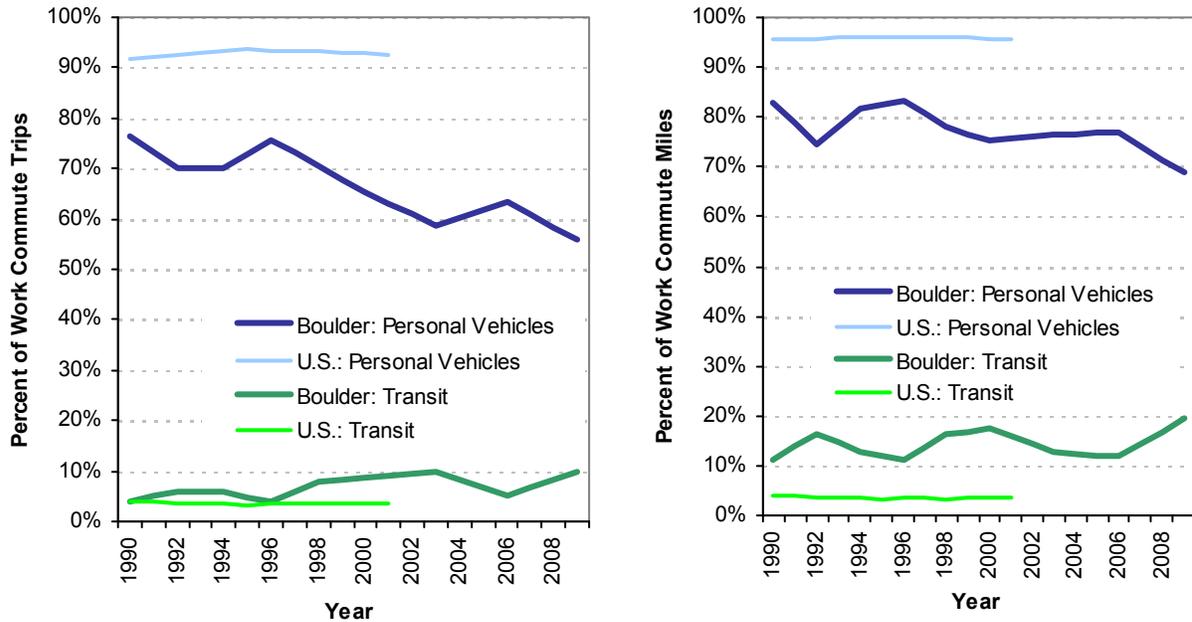


Figure 11 displays the work commute trip made on the assigned travel study day by study participants' workplace location. Those who worked in Boulder were least likely to have used an SOV for any part of their work commute compared to those who worked in other cities. A third of the work commute trips made by Boulder Valley residents who worked in Denver were made via transit, indicating the high availability of service between Boulder and Denver, and within Denver. 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 an increase transit use for the work commute since the study inception in 1990 among employed study participants who worked in Boulder (see Figure 12).

Figure 11: 2009 Modal Split of Work Commute Trips by Location of Workplace

Travel Mode	Location of Workplace		
	Boulder	Denver	Other
Single-Occupancy Vehicle	41.5%	53.6%	58.1%
Multiple-Occupancy Vehicle	5.7%	5.2%	18.6%
Transit	7.6%	33.0%	7.4%
Bicycle	30.4%	7.2%	11.2%
Foot	14.8%	1.0%	4.7%
Total	100.0%	100.0%	100.0%
Number of Work Commute Trips	648	97	215

The modal split of the work commute trips of study participants from all study years who worked in Boulder is shown in Figure 12. The shift of these workers away from drive alone trips for the work commute was 24% since 1990. Three large shifts occurred in 1992, 2000 and 2003, while the proportion of Boulder Valley residents who work in Boulder using an SOV for the work commute remained fairly constant between 1992 and 1998, and increased slightly from 2003 to 2006 before decreasing again in 2009. Transit use had increased from 1990 to 2003, but declined in 2006 then rose again in 2009. Bicycle use for the work commute among study participants employed in Boulder increased over the study period, with some additional increase observed in 2009.

Figure 12: 2009 Modal Split of Work Commute Trips for Boulder Valley Residents Who Work in Boulder

Travel Mode	Year									Change 1990 to 2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Single-Occupancy Vehicle	41.5%	48.9%	44.0%	55.0%	59.7%	61.8%	58.3%	59.5%	65.9%	-24.4%
Multiple-Occupancy Vehicle	5.7%	8.6%	7.1%	7.6%	8.3%	10.0%	11.1%	9.6%	9.7%	-4.0%
Transit	7.6%	3.5%	7.7%	5.4%	6.3%	2.8%	3.6%	3.7%	2.4%	+5.2%
School Bus	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%
Bicycle	30.4%	26.6%	27.8%	21.6%	13.4%	16.0%	16.1%	16.0%	12.5%	+17.9%
Foot	14.8%	12.4%	13.4%	10.4%	11.9%	9.4%	10.7%	11.3%	9.6%	+5.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Number of Work Commute Trips	648	758	646	786	647	874	856	810	1,048	

Modes with shifts that are statistically significantly different between 1990 and 2009 are shaded.

Modes with shifts that are statistically significant different between 2006 and 2009 are bolded.

Telecommuting

Telecommuting was defined as follows: “Employees telecommute when they fulfill their job responsibilities at home by substituting telecommunications (computer, modem and/or telephone) for work-related travel.” 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, about 10% of the respondents in every study year reported that they telecommuted on their assigned travel day (see Figure 14). Of those who telecommuted, only about a quarter indicated that telecommuting reduced the number of SOV trips they made on the day they completed the travel diary (see Figure 15).

Figure 13: Teleworking Status 2009

Employees telecommute when they fulfill their job responsibilities at home by substituting telecommunications (computer, Internet/Web and/or phone) for work-related travel. How often, if ever, do you telecommute for work? (Note: do not include times you take work home to do in the evenings, only times you work from home instead of traveling to a workplace.)	Percent of Respondents
Every work day (I always work from my home)	7.9%
3 to 4 times per week	3.9%
2 to 3 times per week	5.6%
Once or twice a month	9.8%
Occasionally	17.2%
Never	55.7%
Total	100.0%
<i>Number of Respondents</i>	839

Figure 14: Telecommuting on Assigned Travel Day

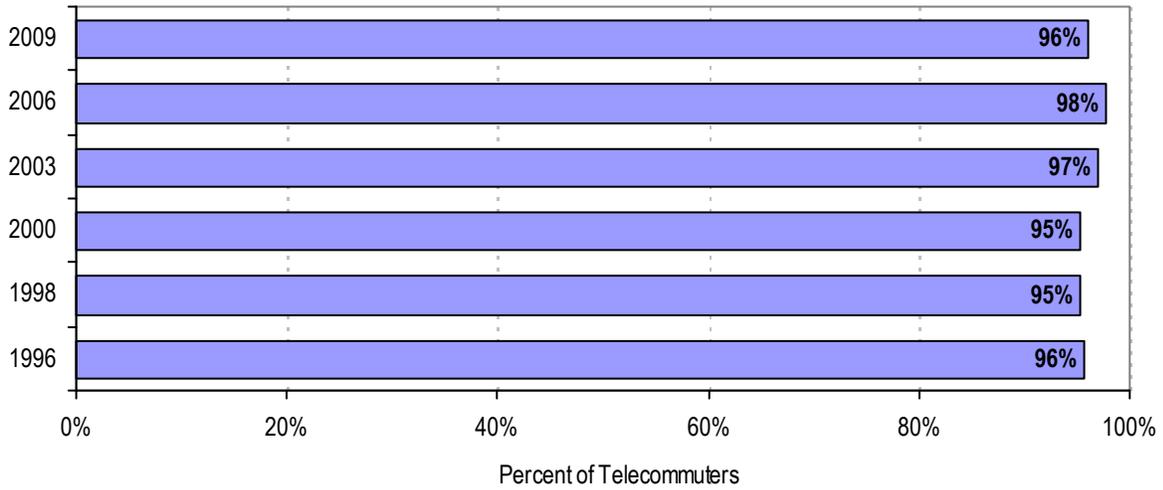
Did you telecommute on the day you completed the travel diary?	Percent of Respondents					
	2009	2006	2003	2000	1998	1996
Yes	8.1%	12.0%	12.2%	10.4%	11.0%	13.6%
No	91.9%	88.0%	87.8%	89.6%	89.0%	86.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Number of Respondents</i>	829	882	890	1,160	1,010	1,056

Figure 15: Did Telecommuting Replace Drive Alone Trips

Did working at home reduce the number of single-occupancy vehicle (drive alone) trips you made on the day you completed the travel diary compared to days you do not telecommute? (2009 wording)	Did telecommuting reduce the number of single-occupancy vehicle trips you made on the day you completed the travel diary? (2000-2006 wording)	Percent of Respondents Who Telecommuted				
		2009	2006	2003	2000	
Yes, reduced about 2 drive-alone trips	Yes	17.8%	38.0%	44.8%	44.0%	36.9%
		10.2%				
Yes, reduced more than 2 drive-alone trips	No	72.0%	55.2%	56.0%	63.1%	
No, I made the same number of drive alone trips		100.0%	100.0%	100.0%	100.0%	
Total		100.0%	100.0%	100.0%	100.0%	
<i>Number of Respondents</i>		156	106	106	144	

Almost all respondents who reported telecommuting on their assigned travel day and who made any trips on their assigned travel day made at least one work-related trip (Figure 16). Given that only 38% thought telecommuting replaced SOV trips, telecommuting may not yet be a big replacement of work day trips. However, of the 6% of 2009 study participants who had not left the house on their assigned travel day, 23% had telecommuted that day (data not shown). Among those who had not left the house, 11% had telecommuted that day (data not shown).

Figure 16: Percent of Telecommuters Who Made Any Trip Who Made a Work-Related Trip on the Day They Completed Their Travel Diary



Modal Split of University of Colorado Students

In fall 2009, 30,196 on-campus degree-seeking students were enrolled at CU-Boulder. Students accounted for just under 21,000, or about 20%, of Boulder Valley residents during the school year. About 6,000 students, primarily freshmen, live in 22 campus residence halls, while approximately another 1,500 live in a sorority or fraternity, and the remainder live in residential units within the Valley. The transportation choices made by the students for all trips are displayed in Figure 17 and for the school commute in Figure 18 on the next page.⁶

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 25% of all CU students’ trips (Figure 17), and for 5% to 10% of the trips made to school (Figure 18 on the next page). This low use may be attributed to the lower vehicle availability of students (in 2009, 0.78 vehicles per driver for CU students versus 0.97 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” (see footnote 6 below).

In 1998, there was a large increase in the proportion of trips made by students via transit. This may be due to the introduction of the SKIP service, which directly serves the campus along Broadway. Bicycle use has also increased, with a marked increase in 2006 compared to 2003, followed by a decline in 2009, but still at levels higher than observed in 1990 and 2003. The proportion of pedestrian trips has declined somewhat, perhaps due to the increase in bicycle and transit use.

Figure 17: Modal Split of All Trips Made by CU Students: 1990 to 2009

Travel Mode	Percent of Trips Made by CU Students									Change 1990 to 2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Single-Occupancy Vehicle	22.9%	19.1%	26.0%	22.3%	21.0%	17.0%	19.8%	20.6%	24.8%	-1.9%
Multiple-Occupancy Vehicle	16.3%	17.0%	17.5%	13.3%	17.0%	19.2%	17.3%	19.3%	19.7%	-3.4%
Transit or School Bus	10.2%	10.8%	9.7%	10.1%	12.2%	6.2%	5.9%	4.7%	5.7%	+4.5%
Bicycle	22.9%	25.1%	15.5%	17.0%	11.3%	18.2%	19.2%	23.1%	17.6%	+5.3%
Foot	27.7%	27.8%	31.4%	37.3%	38.5%	39.3%	37.8%	32.4%	34.2%	-6.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Number of Trips	1,140	1,072	1,747	1,696	1,400	1,379	1,572	1,734	1,901	

Modes with shifts that are statistically significantly different between 1990 and 2009 are shaded.

Modes with shifts that are statistically significant different between 2006 and 2009 are bolded.

⁶ Included in this table are trips for which the recorded purpose was “school”. School trips were not linked as work commute trips were, so parts of the trip that were linked would not be included. For example, if a student walked 2 blocks to the bus, rode the bus for 1 mile, and then walked 3 blocks to school, only the last leg of that trip would be recorded as “school”. The other two legs would be recorded as “change travel mode.”

In 2009, an increase was observed in the proportion of school commute trips made by MOV. The Boulder CU campus started a carpool matching program (Zimride) in August 2009, which may have contributed to this increase. A decrease was observed in transit bus trips; the university had observed a significant drop in transit ridership by key-counts in 2009. It may be that after the high fuel price spike in 2008 there was an increased return to the use of personal automobiles. It should also be noted that the sample size of trips made by CU students for the school commute is fairly small, and thus results have less precision and trendlines have greater volatility.

Figure 18: Modal Split of School Commute Trips Made by CU Students: 1990 to 2009

Travel Mode	Percent of School Commute Trips Made by CU Students									Change 1990 to 2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Single-Occupancy Vehicle	11.0%	5.2%	13.0%	8.7%	12.6%	5.7%	7.9%	8.8%	10.1%	+0.9%
Multiple-Occupancy Vehicle	7.3%	1.2%	1.2%	3.6%	5.1%	3.0%	3.0%	1.7%	3.2%	+4.1%
Transit or School Bus	12.8%	19.9%	18.9%	10.4%	20.3%	8.0%	7.5%	8.5%	8.9%	+3.9%
Bicycle	35.3%	42.9%	22.8%	22.7%	15.4%	30.9%	25.9%	31.5%	24.2%	+11.1%
Foot	33.5%	30.8%	44.0%	54.6%	46.7%	52.4%	55.7%	49.5%	53.6%	-20.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Number of School Trips	218	181	259	341	296	241	299	364	334	

Modes with shifts that are statistically significantly different between 1990 and 2009 are shaded.

Modes with shifts that are statistically significant different between 2006 and 2009 are bolded.

Trip Characteristics

Summary Characteristics of All Trips

This section of the report explores the characteristics of the trips made by Boulder Valley residents. Figure 19, below, displays summary trip characteristics for all trips, regardless of mode of travel. These trip characteristics have remained fairly steady over the study period.

On average, respondents traveled about 25 miles per day and made about 5 trips during the 24-hour period assigned to them, with an average trip length of five miles. While the average trip distance has not changed much since 1990, the average trip duration has increased 2.6 minutes on average, from 14.4 minutes in 1990 to 17.0 minutes in 2009, an 18% increase. About 6% of respondents made no trips on their assigned travel day, an increase from the 4% who did so in 1990.

Figure 19: Summary Trip Characteristics, All Trips

Summary Travel Characteristics	Year									Change 1990-2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Average number of trips per day per person	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	24.7	24.1	27.0	25.2	26.0	27.8	26.9	25.4	24.3	+0.4
Percent of people who did not leave the house on assigned travel day	5.8%	5.4%	5.2%	4.7%	4.9%	5.2%	4.1%	4.6%	4.1%	+1.7%
Average estimated trip length in miles ⁷	5.0	4.3	5.1	4.3	4.3	4.7	4.5	4.6	4.0	+1.0
Average estimated trip time in minutes	17.0	16.0	15.4	13.5	11.4	13.3	11.8	14.9	14.4	+2.6
Average miles per hour	15.7	15.7	16.0	15.4	15.5	15.2	15.9	15.7	15.1	+0.6

Figure 20 compares the characteristics of trips made by Boulder residents to those made within the United States, as observed in the National Household Transportation Study. Trips made by Boulder residents were much shorter in length, and somewhat shorter in duration than were trips made by the U.S. population. Trip distances and durations have been increasing in Boulder and the U.S., although the average time it took for Boulder residents to make a trip increased at a slower rate compared to the nation.

Figure 20: Summary Trip Characteristics, Boulder Compared to the U.S.

Summary Travel Characteristics	Boulder			U.S.*		
	2009	1990	Annual Percent Change	2001	1995	Annual Percent Change
Average estimated trip length in miles	5.0	4.0	+1.3%	9.9	9.1	+1.5%
Average estimated trip time in minutes	17.0	14.4	+1.0%	18.7	16.6	+2.1%

* From the 1995 National Personal Transportation Study and 2001 National Household Transportation Study.

⁷ 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 21. Figure 22 makes comparisons to the national commute. The average work commute of Boulder residents was 6.1 miles in 2009, while the average work commute duration was about 17 minutes. As with all trips, the work trips made by Boulder residents were shorter in length and duration than observed nationally, and the rate of increase was slower than that seen nationwide.

Figure 21: Summary Work Commute Trip Characteristics, All Travel Modes

Summary Travel Characteristics	Year									Change 1990-2009
	2009	2006	2003	2000	1998	1996	1994	1992	1990	
Average estimated trip length in miles	6.1	5.5	6.2	5.7	6.2	5.3	6.2	5.9	5.2	+0.9
Average estimated trip time in minutes	17.1	17.1	16.7	16.3	12.1	13.7	20.4	16.7	15.1	+2.0
Average miles per hour	18.3	17.8	18.6	17.9	18.6	18.1	18.9	19.6	18.4	-0.1

Figure 22: Summary Work Commute Trip Characteristics, Boulder Compared to the U.S.

Summary Travel Characteristics	Boulder			U.S.*		
	2009	1990	Annual Percent Change	2001	1995	Annual Percent Change
Average estimated trip length in miles	6.1	5.2	+0.9%	14.6	13.4	+1.5%
Average estimated trip time in minutes	17.1	15.1	+0.7%	24.8	21.9	+2.2%

* From the 1995 National Personal Transportation Study and 2001 National Household Transportation Study.

A household travel survey that accompanied the diary asked respondents to identify where they worked if they were employed. About three-quarters of those surveyed worked within Boulder (see Figure 23). This figure has declined somewhat over the study period, from about 83% in 1990 to about 77% in 2009.

Figure 23: Location of Respondent's Workplace

Location of Workplace	Percent of Respondents								
	2009	2006	2003	2000	1998	1996	1994	1992	1990
Boulder	76.7%	73.2%	77.4%	62.9%	78.7%	81.7%	80.4%	81.5%	83.1%
Denver	6.2%	6.3%	6.2%	5.4%	8.7%	8.3%	8.3%	1.0%	8.3%
Longmont	3.4%	4.8%	3.8%	1.8%	2.5%	1.9%	1.8%	2.2%	1.2%
Broomfield	2.5%	3.9%	2.4%	2.2%	1.3%	2.5%	2.3%	3.3%	1.3%
Louisville	2.5%	3.0%	2.3%	2.0%	3.3%	2.2%	2.2%	.5%	1.8%
Lafayette	1.8%	1.6%	1.0%	1.0%	.6%	.6%	1.7%	2.1%	.7%
Other location	6.7%	7.1%	6.8%	24.6%	4.8%	2.9%	3.2%	9.5%	3.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number of Employed Respondents	1,109	897	911	1,182	839	895	942	973	1,109

Automobile Trip Characteristics

Figure 24 and Figure 25 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 54% in 2009; the proportion making at least one MOV trip decreased from 48% in 1990 to 39% in 2009. On average, participants in the 2009 study made 1.8 SOV trips per day; those who made at least one SOV trip made 3.4 trips on average. The average number of carpool trips per respondent in 2009 was 1.1. The average trip distance was about 6 miles for SOV trips and about 8 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 24: Summary Trip Characteristics, SOV Trips

Summary Travel Characteristics	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of SOV trips per day per person	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	53.6%	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	3.36	3.57	3.52	3.76	3.83	4.00	3.77	3.90	3.85
Average estimated trip length in miles	6.1	5.2	5.7	5.0	5.1	5.1	5.2	5.2	4.6
Average estimated trip time in minutes	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	21.1	20.3	21.0	19.7	20.0	19.4	20.5	20.2	19.3

Figure 25: Summary Trip Characteristics, MOV Trips

Summary Travel Characteristics	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of MOV trips per day per person	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	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	2.95	3.23	3.10	3.20	3.30	3.23	3.16	3.26	3.19
Average estimated trip length in miles	7.5	6.2	8.6	6.4	6.1	7.5	6.8	6.6	5.8
Average estimated trip time in minutes	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	21.0	20.9	21.4	20.1	19.9	19.9	20.3	19.2	18.5

Vehicle Occupancy

The average number of people in an automobile has not changed significantly from 1990 to 2009 (see Figure 26). The average vehicle occupancy for all automobile trips was about 1.6 persons; for MOV trips the average vehicle occupancy was about 2.5 persons. Just over 60% of all automobile trips were made with only one person in the vehicle.

Figure 26: Vehicle Occupancy

Number of Occupants	Percent of Total Auto Trips								
	2009	2006	2003	2000	1998	1996	1994	1992	1990
1	60.6%	58.9%	61.3%	62.8%	60.9%	60.9%	60.8%	61.3%	61.5%
2	26.8%	29.3%	28.4%	26.5%	27.3%	27.9%	28.0%	27.2%	26.6%
3	7.5%	6.8%	6.7%	6.5%	6.7%	7.0%	7.3%	6.5%	7.7%
4	4.1%	3.6%	2.2%	3.1%	3.8%	3.5%	2.9%	3.6%	2.9%
5 or more	1.0%	1.3%	1.4%	1.1%	1.3%	0.7%	1.0%	1.4%	1.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Average Vehicle Occupancy for all Automobiles	1.58	1.60	1.55	1.55	1.58	1.56	1.56	1.57	1.56
Average Vehicle Occupancy for Autos with at Least Two Passengers	2.48	2.46	2.41	2.47	2.47	2.42	2.43	2.47	2.46
Number of Trips	3,573	4,212	4,722	4,589	4,067	4,375	4,524	4,564	5,310

Vehicle Ownership and Availability

Households can be classified according to their ratio of number of vehicles to eligible drivers. If the ratio is 1:1 or greater, this household can be considered to have “high vehicle availability”.⁸ Persons in households with high vehicle availability tend to drive alone more often.

Vehicle availability and ownership for all study years are shown in Figure 27. The average number of bicycles per household is also displayed in the table. Vehicle availability has declined slightly since 1990, when the average was 1.0 vehicles for every household member age 16 and over to 0.9 vehicles per household member aged 16 and older. The average number of motorized vehicles per household has also declined somewhat, from 1.83 vehicles per household in 1990 to 1.66 vehicles per household in 2009. Bicycles per household has increased somewhat over the study period, from 1.98 bicycles per household in 1992 (the 1990 household survey did not ask about bicycles) to 2.26 bicycles per household in 2009.

Figure 27: Vehicle Availability, Vehicles per Household and Bicycles per Household

Vehicle and Bicycle Availability	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average vehicle availability (per person in household 16 or older)	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	1.66	1.60	1.69	1.79	1.73	1.63	1.78	1.83	1.83
Average number of bicycles per household	2.26	2.19	2.21	2.09	2.04	2.00	2.00	1.98	<i>not asked</i>

⁸ Puget Sound Council of Governments: “Household Travel Surveys, 1985-1988 Puget Sound Region”; June 1990.

Transit Trip Characteristics

The characteristics of trips made on the assigned travel day via transit are shown in Figure 28. The proportion of people who made at least one trip on the bus increased from about 5% in 1990 to about 13% in 2009. The average bus trip was about 8 miles, a decrease since 1990, although a slight increase compared to 2006. This may be due to the increasing number of Community Transit Network routes (such as the SKIP, HOP and JUMP), which tend to serve shorter trips within town.

Figure 28: Summary Trip Characteristics, Transit Trips

Summary Travel Characteristics	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of bus trips per day per person	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1
Percent of people making at least one bus trip	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 one bus trip	2.1	2.3	2.1	2.2	2.4	2.0	2.2	2.1	1.9
Average estimated trip length in miles	7.9	6.2	6.3	6.6	7.2	9.7	10.1	13.2	10.4
Average estimated trip time in minutes	23.8	21.1	20.9	16.6	18.1	18.4	28.3	29.7	29.7
Average miles per hour of transit trips	17.0	15.6	15.3	14.9	17.1	17.9	18.1	24.5	18.9

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. In 2009, participants were first asked if they were eligible to have an Eco-Pass. Over half (53%, see Figure 29) said they were eligible for an Eco-Pass. However, 16% of those eligible for a pass had not picked up their pass (see Figure 30).

Figure 29: Eco-Pass Eligibility

Are you eligible to have an Eco-Pass, an annual pass that allows you unlimited bus rides? (Please check all that apply.)*	2009
yes, through my employer	17.6%
yes, through my neighborhood	12.0%
yes, a CU Boulder student Buff One pass	18.0%
yes, CU Boulder faculty/staff Buff One pass	7.1%
yes, other pass	1.7%
no, I am not eligible for an Eco-Pass	47.6%
Number of Respondents	1,157

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

Figure 30: Eco-Pass Pick-up Status

Did you pick up a pass (or passes)?**	2009
Yes	84.4%
No	15.6%
Total	100.0%
Number of Respondents	577

** Only asked of those eligible for an Eco-Pass.

To compare Eco-Pass holdership 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 31, about 45% of study participants in 2009 held some kind of an Eco-Pass: 12% through their employer, 8% through their neighborhood, about 7% had a CU Boulder faculty/staff BuffOne pass, and 15% had a CU Boulder student BuffOne pass. Eco-Pass holdership has remained fairly steady since 1998 (when the question was first asked), fluctuating between 38% and 46% of respondents.

Figure 31: Eco-Pass Status

Do you have an Eco-Pass?	2009 [†]	2006	2003	2000	1998
no	55.9%	61.9%	53.9%	60.7%	61.0%
yes, through employer	12.4%	12.3%	12.6%	11.2%	10.2%
yes, through neighborhood	8.4%	4.7%	2.6%	3.9%	3.5%
yes, a CU Boulder student BuffOne Pass	15.3%	15.9%	23.2%	20.4%	21.2%
yes, a CU Boulder faculty/staff BuffOne pass	6.5%	3.7%	4.6%	2.9%	4.2%
yes, other pass	1.4%	1.4%	3.1%	0.9%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Number of Respondents	1,157	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 are not directly comparable.

In 2009, survey participants with an Eco-Pass were asked how often, on average, they used their Eco-Pass. Over half said they use their Eco-Pass once a week or more.

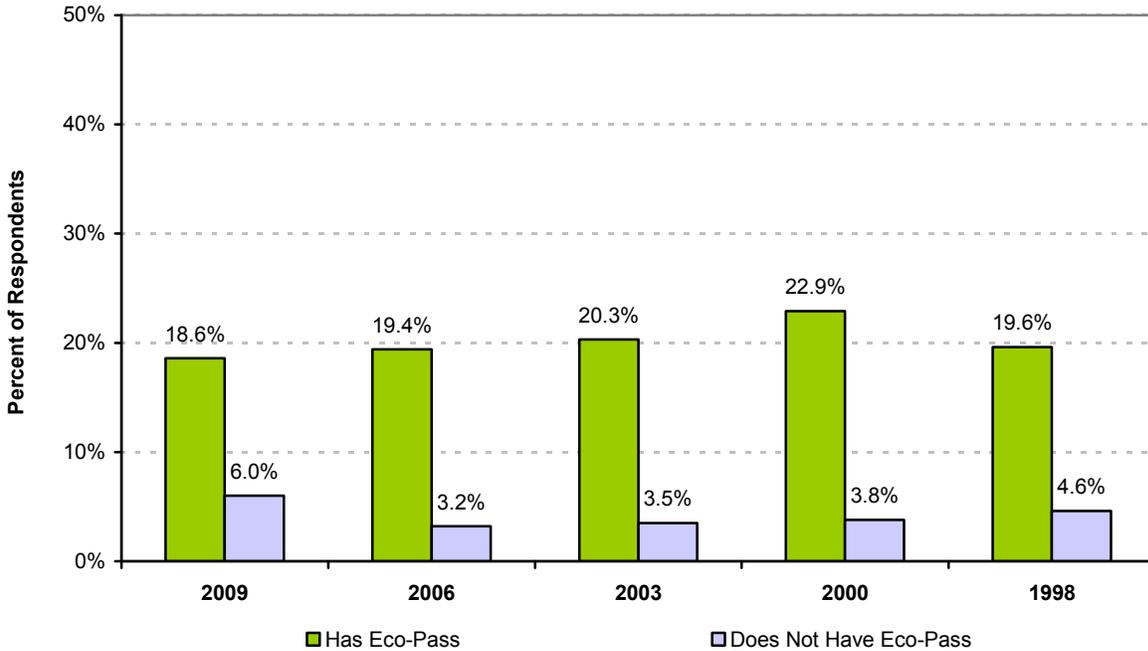
Figure 32: Use of the Eco-Pass

About how often, on average, do you use your Eco-Pass? ^{**}	2009
More than once a week	41.3%
About once a week	15.5%
About once every two weeks	10.4%
About once a month	10.8%
Less often than once a month	21.9%
Total	100.0%
Number of Respondents	485

^{**} Only asked of who have an Eco-Pass.

Bus ridership has been positively associated with having an Eco-Pass. In 2009, respondents with an Eco-Pass were three times as likely to have made at least one trip on the bus compared to non-Eco-Pass holders. About one-fifth of Eco-Pass holders in the study made a trip on their assigned travel day, while only about 6% of non-Eco-Pass holders made a bus trip on their assigned travel day (Figure 33).

Figure 33: Bus Ridership by Eco-Pass Status: Percent of Respondents Who Made at Least One Trip on the Bus



School Bus Trips

Very few study participants (less than 1%) made trips on school buses. In 2009, the few trips made were rather lengthy, about 24 miles in distance, and about 49 minutes in duration (see Figure 34). Likely this was due to one or more student athlete trips made on a school bus to a game. Given the decline in the use of school buses since the study was implemented in 1990, this type of trip will not be examined on its own in future travel diary studies, but merged with other transit trips.

Figure 34: Summary Trip Characteristics, School Bus Trips

Summary Travel Characteristics	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of school bus trips per day per person	0.01	0.01	0.02	0.04	0.04	0.03	0.03	0.04	0.03
Percent of people making at least one school bus trip	0.6%	0.6%	0.8%	1.1%	1.1%	1.5%	0.8%	1.1%	1.3%
Average number of school bus trips per day per person who made at least one school bus trip	1.19	1.93	1.97	3.50	3.46	1.99	3.13	3.27	2.55
Average estimated school bus trip length in miles	23.5	4.2	3.6	2.8	3.5	1.5	2.1	3.3	1.7
Average estimated school bus trip time in minutes	48.63	19.4	16.6	13.5	9.5	12.4	9.8	11.3	11.3
Average miles per hour of school bus trips	23.7	12.3	13.5	12.7	22.1	7.9	14.8	17.8	11.3

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 35). Walking trips have tended to be quite short in distance; the average trip length was about a mile. The proportion of respondents making one or more trips by bicycle on their assigned travel day increased from 15% in 1990 to 24% in 2009 (see Figure 36). In 2009, the average distance of a bike trip was 2.5 miles and took about 18 minutes to complete.

Figure 35: Summary Trip Characteristics, Pedestrian Trips

Summary Travel Characteristics	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of pedestrian trips per day per person	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	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	2.62	2.85	2.81	3.11	3.09	3.04	3.00	2.78	3.16
Average estimated pedestrian trip length in miles	0.7	0.9	0.9	0.7	0.8	0.7	0.7	0.7	0.7
Average estimated pedestrian trip time in minutes	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	3.2	3.6	3.9	2.8	3.5	3.3	3.6	3.4	3.3

Figure 36: Summary Trip Characteristics, Bicycle Trips

Summary Travel Characteristics	2009	2006	2003	2000	1998	1996	1994	1992	1990
Average number of bicycle trips per day per person	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	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	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	2.5	2.2	2.8	2.0	2.4	2.2	2.3	2.0	2.1
Average estimated bicycle trip time in minutes	18.3	16.3	16.9	15.4	13.6	14.3	9.5	14.1	15.1
Average miles per hour	8.1	8.1	8.8	8.2	8.7	8.4	8.4	7.7	8.2

Biking for Work, Errands and Recreation

Beginning in 2000, respondents have been asked about their bicycle use for work and for recreation. People surveyed were asked how many times each week, if at all, they biked to work. Additionally, they were asked the number of times per week they used a bike for recreational trips. In 2009, the question was changed to ask about three types of trips: commuting, shopping/meals/errands and fun or exercise. In 2009, over 40% of respondents said they had ridden a bicycle for fun or exercise at least once in the previous week, while 39% had ridden a bicycle at least once to shop, get a meal or run an errand, and 36% had ridden a bicycle at least once for the work commute.

Looking across all three categories, 58.2% of respondents had used a bike at least once for one of the three purposes. (Conversely, 41.8% had not used a bike at all for any of the three purposes.)

Figure 37: Use of Bicycle in Previous Week for Shopping/Errands, Fun/Exercise and Commuting, 2009

In the last week, about how frequently have you ridden a bicycle:	to shop, get a meal or run errands	for commuting	for fun or exercise
5 or more times	8.3%	17.3%	4.3%
3 to 4 times	9.5%	9.7%	13.3%
Once or twice	21.0%	9.3%	23.6%
Not at all	61.2%	63.7%	58.8%
Total	100.0%	100.0%	100.0%
<i>Number of Respondents</i>	1,120	1,120	1,120

Figure 38: Bicycle Trips for Work and Recreation, 2000-2009

Number of Times a Bicycle was used	Bicycle trips for work (commuting)				Bicycle trips for recreation /fun or exercise/shop/meals/errands			
	2009	2006	2003	2000	2009	2006	2003	2000
5 or more times per week	17.3%	16.0%	18.5%	14.1%	10.0%	6.9%	6.1%	6.7%
4 times per week or less	19.0%	24.7%	22.1%	21.0%	43.3%	53.6%	48.5%	50.4%
Not at all	63.7%	59.3%	59.4%	64.9%	46.7%	39.5%	45.5%	42.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Number of Respondents</i>	1,121	1,154	1,269	1,180	1,121	1,154	1,269	1,180

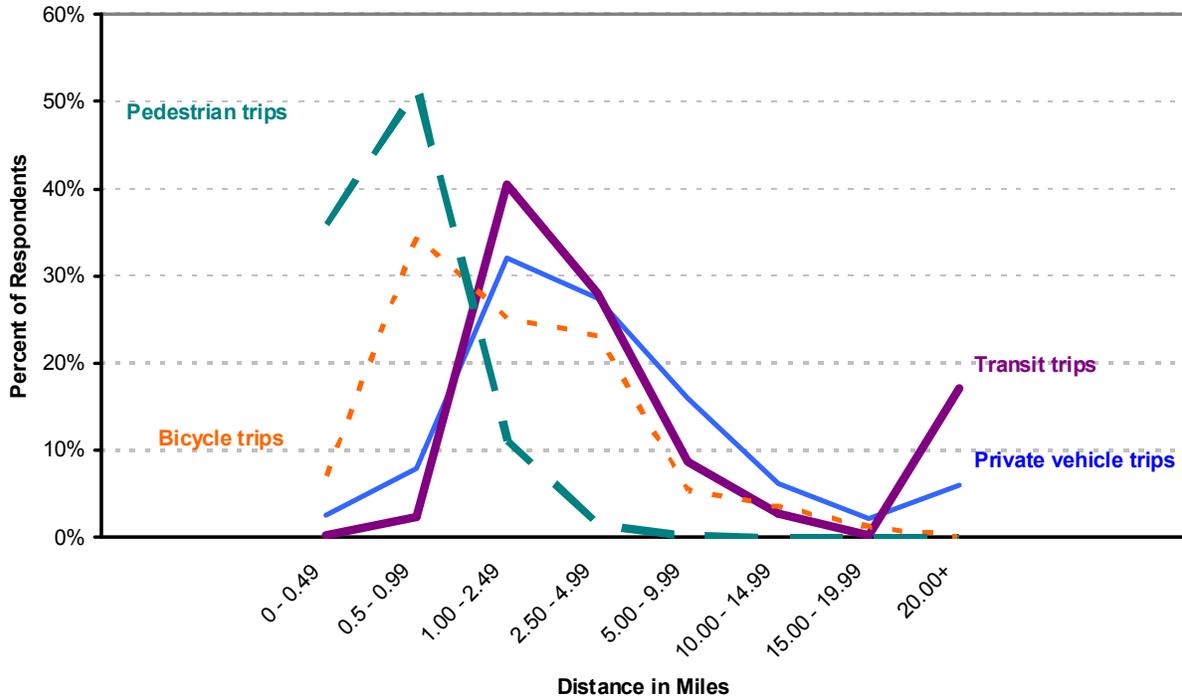
Figure 39: Bicycle Trips in Previous Week or Month, 2000-2009

Ever use a bike to shop/run errands, fun/exercise, or commuting in the last week (2009) or month (2000-2006)?	2009	2006	2003	2000
Yes	58.2%	65.0%	61.7%	61.9%
No	41.8%	35.0%	38.3%	38.1%
Total	100.0%	100.0%	100.0%	100.0%
<i>Number of Respondents</i>	1,121	1,154	1,269	1,180

Trip Distance

In Figure 40, trip distances are exhibited by mode of travel. For motorized vehicle trips, private and transit, distances tend to be either of 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 walk trips, on the other hand, tend to be much shorter, especially for walking trips.

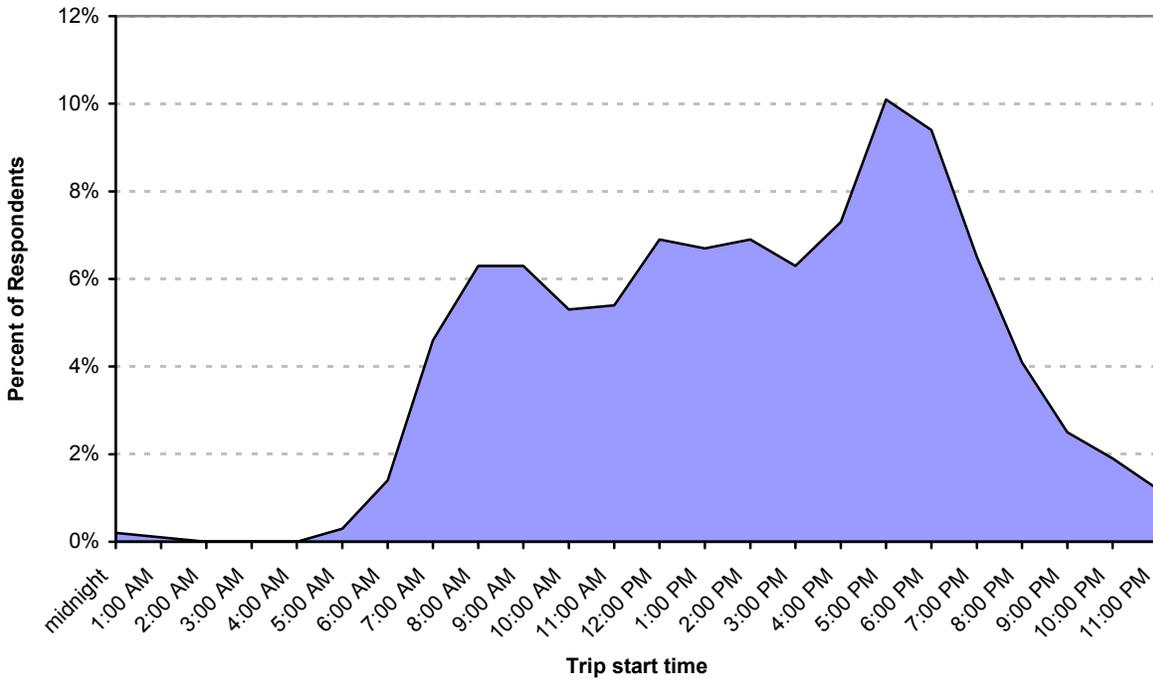
Figure 40: Trip Distance by Mode of Travel



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 41 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 41: Time When Trip Began



Deliveries to the Home or Office

In 1998, for the first time, 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 11 for information on telecommuting).

About 8% of respondents in 1998 had received at least one delivery on their assigned travel day, and about 5% received a delivery in 2009 (see Figure 42). Just under half of the respondents receiving a delivery felt that the delivery took the place of a drive alone a trip (Figure 43).

Figure 42: Deliveries Received by Respondents

Percent of Respondents Who Received Any Deliveries On Their Assigned Travel Day	2009	2006	2003	2000	1998
No, did not receive deliveries	94.9%	93.6%	93.8%	94.6%	92.1%
Yes, received deliveries	5.1%	6.4%	6.2%	5.4%	7.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Number of respondents</i>	1,107	1,130	1,262	1,150	1,008

Figure 43: Did Deliveries Replace Any Drive Alone Trips

Did the delivery substitute for a travel trip you might have made to seek the good or service?*	2009	2006	2003	2000
Yes	46.3%	41.8%	43.7%	44.2%
No	53.7%	58.2%	56.3%	55.8%
Total	100.0%	100.0%	100.0%	100.0%
<i>Number of respondents</i>	54	72	81	97

***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 44 (below) and Figure 45 (on the next page) 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), recreational trips account for one of the largest proportion of trip purposes; 16% of trips and 21% of miles in 2009. Trips for work comprise the next largest proportion of trips (14%) and miles (16%).

Figure 44: Purpose of Trips

Trip Purpose		2009	2006	2003	2000	1998	1996	1994	1992	1990
Go Home		33.7%	33.1%	33.3%	33.7%	32.0%	31.6%	32.8%	32.3%	33.6%
Work	Work Commute	8.6%	8.5%	9.2%	9.0%	8.8%	15.5%	14.4%	14.1%	15.1%
	Other Work/Business	5.3%	5.4%	4.0%	4.1%	4.3%				
		13.9%	13.9%	13.2%	13.1%	13.1%				
Social/Recreation		16.2%	14.8%	16.2%	12.9%	14.4%	13.9%	13.5%	12.6%	12.3%
Shopping		10.3%	11.5%	10.8%	11.0%	10.2%	11.3%	10.6%	11.7%	11.0%
Personal Business		6.5%	8.6%	8.1%	8.7%	9.5%	10.1%	9.4%	11.1%	11.9%
School		4.6%	3.8%	5.5%	5.5%	6.0%	4.6%	5.4%	6.5%	5.6%
Eat a Meal		6.3%	5.4%	5.0%	5.3%	5.9%	6.1%	3.5%	5.4%	4.6%
Drive a Passenger		3.9%	4.7%	4.5%	5.0%	4.7%	4.3%	4.4%	3.8%	4.0%
Change Travel Mode		4.2%	3.5%	3.1%	4.8%	4.2%	2.7%	5.4%	2.0%	1.7%
Other		0.4%	0.7%	0.2%	0.0%	0.1%	0.0%	0.5%	0.6%	0.1%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number of trips		5,496	6,076	6,373	6,773	5,981	6,446	6,711	6,672	7,350

Figure 45: Purpose of Trips Miles

Trip Purpose		2009	2006	2003	2000	1998	1996	1994	1992	1990
Go Home		34.3%	35.5%	30.3%	32.5%	31.7%	32.1%	32.7%	33.8%	34.3%
Work	Work Commute	10.7%	11.1%	11.0%	11.8%	10.5%	16.6%	19.2%	18.1%	18.1%
	Other Work/ Business	4.9%	4.5%	3.8%	7.3%	7.6%	18.1%	16.6%	19.2%	18.1%
		15.6%	15.6%	15.6%	18.3%	18.1%	16.6%	19.2%	18.1%	18.1%
Social/Recreation		21.4%	15.2%	25.8%	16.4%	18.3%	18.6%	17.9%	18.1%	16.8%
Shopping		6.9%	8.5%	7.0%	8.7%	6.6%	7.0%	5.7%	7.3%	7.8%
Personal Business		6.3%	7.6%	7.5%	6.9%	7.5%	10.2%	7.9%	8.4%	11.1%
School		1.6%	2.6%	2.8%	1.8%	2.8%	1.6%	2.4%	3.1%	2.5%
Eat a Meal		3.1%	4.2%	2.8%	3.4%	3.3%	3.6%	5.9%	3.4%	2.7%
Drive a Passenger		5.4%	5.5%	4.7%	5.6%	5.8%	6.2%	4.8%	3.8%	3.8%
Change Travel Mode		5.0%	4.2%	3.4%	6.4%	5.9%	4.2%	3.1%	3.4%	3.0%
Other		0.4%	1.1%	0.1%	0.0%	0.1%	0.0%	0.4%	0.5%	0.1%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Number of trips		26,983	25,742	31,195	28,657	25,538	30,033	30,282	29,710	29,587

Trip purpose by travel mode is exhibited in Figure 46, while Figure 47, which is similar to Figure 46, displays the modal split of trips by the trip purpose. The types of trips most likely to have been made by driving alone in 2009 were “personal business” trips, work commute and other work-related trips and “go home” trips. The trips most likely to be made by transit were “change travel mode,” school and work, which is expected as most transit trips are linked to other modes.

Figure 46: Purpose of 2009 Trips by Travel Mode

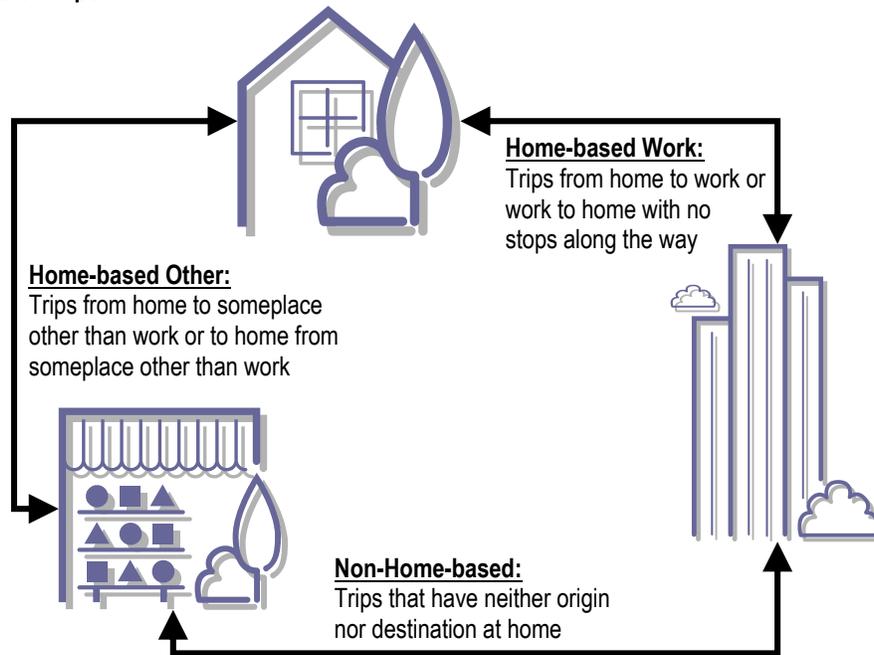
Trip Purpose	Percent of Trips by Travel Mode				
	Single-Occupancy Vehicle	Multiple-Occupancy Vehicle	Transit	Bicycle	Foot
go home	35.8%	31.9%	24.2%	37.7%	31.4%
personal business	9.5%	5.7%	5.0%	4.1%	4.0%
shopping	14.4%	11.7%	5.0%	7.7%	3.9%
school	1.7%	1.5%	10.7%	9.3%	8.5%
work or work commute	11.4%	2.1%	14.4%	13.8%	4.9%
other work/business	7.0%	4.5%	24.2%	37.7%	31.4%
social/recreation	11.5%	19.8%	6.4%	16.9%	23.1%
change travel mode	1.6%	0.5%	28.9%	1.8%	9.1%
drive a passenger	2.7%	11.8%	2.7%	0.8%	10.1%
eat a meal	3.9%	10.2%	0.3%	3.1%	0.8%
other	0.2%	0.4%	2.3%	4.8%	4.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Number of trips	2040	1299	298	871	982

Figure 47: Modal Split of All Trips in 2009 by Trip Purpose

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	39.4%	54.2%	51.9%	13.9%	49.5%	48.6%	26.4%	14.2%	25.9%	23.2%
MOV with adults	14.6%	16.8%	17.5%	7.6%	3.4%	17.3%	20.8%	2.6%	33.8%	31.9%
MOV with children	7.7%	3.9%	9.4%	0.4%	2.3%	2.7%	8.1%	0.0%	37.0%	6.1%
Transit	3.9%	4.2%	2.7%	12.7%	9.1%	2.4%	2.1%	37.1%	0.0%	2.3%
Bicycle	17.7%	10.1%	11.8%	32.3%	25.5%	14.3%	16.5%	6.9%	3.2%	7.8%
Foot	16.6%	10.9%	6.7%	33.1%	10.2%	14.6%	25.5%	38.4%	0.0%	28.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	1,853	358	566	251	471	294	889	232	216	345

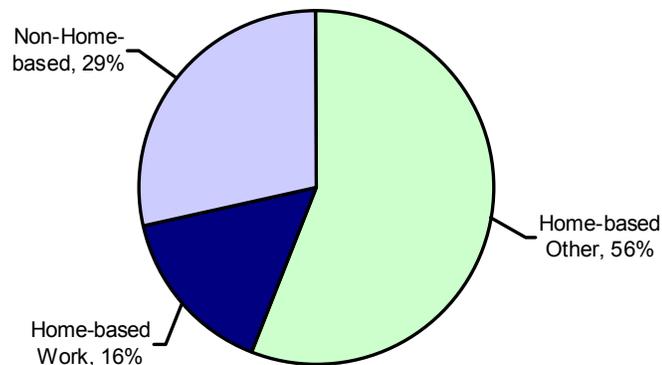
Traditional transportation planning has often focused on origins and destinations of trips, particularly those based at home or work, to study trends regarding trip purpose. Thus trips have often been classified in more aggregated categories of purpose depicting “home-based work” trips, “home-based other” trips and “non-home” trips. The following figure with definitions describes the classification scheme.⁹

Figure 48: 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. A majority of trips were made between respondents’ homes and a destination other than work. Approximately 3 in 10 trips neither began nor ended at home. About 16% of trips were direct travel between work and home.

Figure 49: Types of Trips Made, 2009



⁹ 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 50, while Figure 51 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 (probably due to the use of another mode to get to or from the bus). Home-work trips were the type most likely to have been made via SOV, while alternate mode use was a bit higher for home-other and non-home trips.

Figure 50: 2009 Type of Trips by Mode of Trip

Trip Type	Percent of Trips by Travel Mode				
	Single-Occupancy Vehicle	Multiple-Occupancy Vehicle	Transit	Bicycle	Foot
Home-based Other	53.4%	62.6%	37.6%	56.8%	62.2%
Home-based Work	18.5%	3.2%	9.7%	22.5%	7.0%
Non-home Based	28.0%	34.2%	52.7%	20.7%	30.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Number of trips</i>	2025	1295	298	873	981

Figure 51: 2009 Modal Split of All Trips by Type of Trip

Modal Split of All Trips	Percent of Trips by Type of Trip		
	Home-based Other	Home-based Work	Non-home Based
SOV	34.8%	52.8%	34.3%
MOV with adults	16.9%	4.0%	20.4%
MOV with children	9.1%	1.7%	6.3%
Transit	3.6%	4.1%	9.5%
Bicycle	15.9%	27.7%	10.9%
Foot	19.6%	9.7%	18.2%
Total	100.0%	100.0%	100.0%
<i>Number of trips</i>	3,113	708	1,655

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 2009 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. While the study is complete, and some preliminary data are available, no reports have yet been published that contain the comparison data of interest. Thus, the tables below still have blank cells for where the 2009 data will be entered when available.

The NHTS was conducted previously in 2001, and the NPTS in 1995, 1990, 1983, 1977 and 1969. However, users of the 1995 NPTS data are warned not to make comparisons between the 1995 results and results from earlier studies, due to changes in study methodology. This is unfortunate, as it is the comparison of the changes over time that is of most interest, to examine whether or not trends seen within the Boulder Valley are similar or convergent from trends seen nationwide. However, comparisons are made in this report between the 1990, 1995 and 2001 NHTS or NPTS, so that the observed change (which may not be an accurate one) can be compared to the change observed in Boulder's travel diary data. In addition, the point-in-time comparisons may also be helpful in understanding how Boulder's travel patterns may differ from those seen nationally.

Over the period of 1990 to 2009, the proportion of trips made by Boulder Valley residents in a private vehicle have decreased from 70.5% to 60.8%, an average annual decrease of 0.51%. In the U.S. as a whole, the decline was from 87.6% in 1990 to 87.0% in 2001, an average annual decrease of 0.05%.

Figure 52: Modal Split of All Trips, Boulder Compared to the U.S.

Travel Mode	Boulder				U.S.						
	Boulder 2009		Boulder 1990		NHTS 2009*		NHTS 2001*		NPTS 1995		NPTS 1990
SOV	37.1%	60.8%	44.2%	70.5%			37.8%	87.0%	43.5%	89.9%	87.6%
MOV	23.7%		26.3%		49.2%	46.3%					
Public Transportation/Transit	5.4%		1.6%				1.7%		1.8%		2.0%
Walk	17.9%		18.2%				8.8%		5.6%		7.2%
School Bus	0.1%		0.6%				1.7%		1.8%		2.5%
Bike	15.9%		9.1%				0.8%		0.9%		0.7%
Total	100.0%		100.0%		100.0%		100.0%		100.0%		100.0%

*In 2001, the NHTS included all persons, including those age 15 and younger. In 1990 and 1995, the NPTS included all persons aged 5 and older. The Boulder data always include persons aged 16 and older.

Over the same time periods, the percent of miles traveled by personal vehicle by Boulder Valley residents decreased from 87.7% in 1990 to 82.0% in 2009, an average annual decrease of 0.3%. On the other hand, nationally the trend was actually a small *increase* in the number of miles traveled by personal vehicle, from 95.3% of miles traveled in 1990 to 96.5% of miles traveled in 2001.

Figure 53: Modal Split of All Miles, Boulder Compared to the U.S.

Travel Mode	Boulder				U.S.						
	Boulder 2009		Boulder 1990		NHTS 2009*		NHTS 2001*		NPTS 1995		NPTS 1990
SOV	46.1%	82.0%	50.0%	87.7%			96.5%		42.1%	95.9%	95.3%
MOV	35.9%		37.7%		53.9%						
Public Transportation/Transit	6.9%		4.1%				1.4%		2.3%		2.5%
Walk	2.5%		3.0%				0.7%		0.3%		0.5%
School Bus	0.5%		0.2%				1.2%		1.3%		1.5%
Bike	8.1%		4.9%				0.2%		0.1%		0.1%
Total	100.0%		100.0%		100.0%		100.0%		100.0%		100.0%

*In 2001, the NHTS included all persons, including those age 15 and younger. In 1990 and 1995, the NPTS included all persons aged 5 and older. The Boulder data always include persons aged 16 and older.

In examining the proportion of work commute trips made by personal vehicle, a decrease from 76.5% in 1990 to 55.9% in 2009 was observed among Boulder Valley residents, representing an average annual decrease of 1.08%. However, in the U.S., from 1990 to 2001, a small increase in the proportion of work commute trips made by personal vehicle was observed.

Figure 54: Modal Split of Work Commute Trips, Boulder Compared to the U.S.

Travel Mode	Boulder				U.S.				
	Boulder 2009		Boulder 1990		NHTS 2009*	NHTS 2001*	NPTS 1995		NPTS 1990
SOV	47.4%	55.9%	66.6%	76.5%		92.7%	77.1%	93.6%	91.6%
MOV	8.5%		9.9%				16.5%		
Public Transportation/Transit	9.7%		4.0%			3.7%	3.3%		3.9%
Walk	11.1%		8.9%			3.1%	2.4%		4.0%
School Bus	0.0%		0.0%			0.1%	0.3%		0.1%
Bike	23.3%		10.6%			0.4%	0.4%		0.3%
Total	100.0%		100.0%		100.0%	100.0%	100.0%		100.0%

Likewise, in examining the number of miles traveled for the work commute, an average annual decrease of 0.74% was observed among Boulder Valley residents, while the proportion of miles traveled for the work commute by personal vehicle remained steady from 1990 to 2001 among the U.S. as a whole.

Figure 55: Modal Split of Work Commute Miles, Boulder Compared to the U.S.

Travel Mode	Boulder				U.S.				
	Boulder 2009		Boulder 1990		NHTS 2009*	NHTS 2001*	NPTS 1995	NPTS 1990	
SOV	59.7%	68.8%	71.9%	82.8%		95.7%	96.2%	95.6%	
MOV	9.1%		10.9%						
Public Transportation/Transit	19.5%		11.2%			3.7%	3.2%		4.0%
Walk	1.1%		1.3%			0.1%	0.1%		0.3%
School Bus	0.0%		0.0%			0.3%	0.3%		0.1%
Bike	10.6%		4.7%			0.1%	0.1%		0.0%
Total	100.0%		100.0%		100.0%	100.0%	100.0%		100.0%

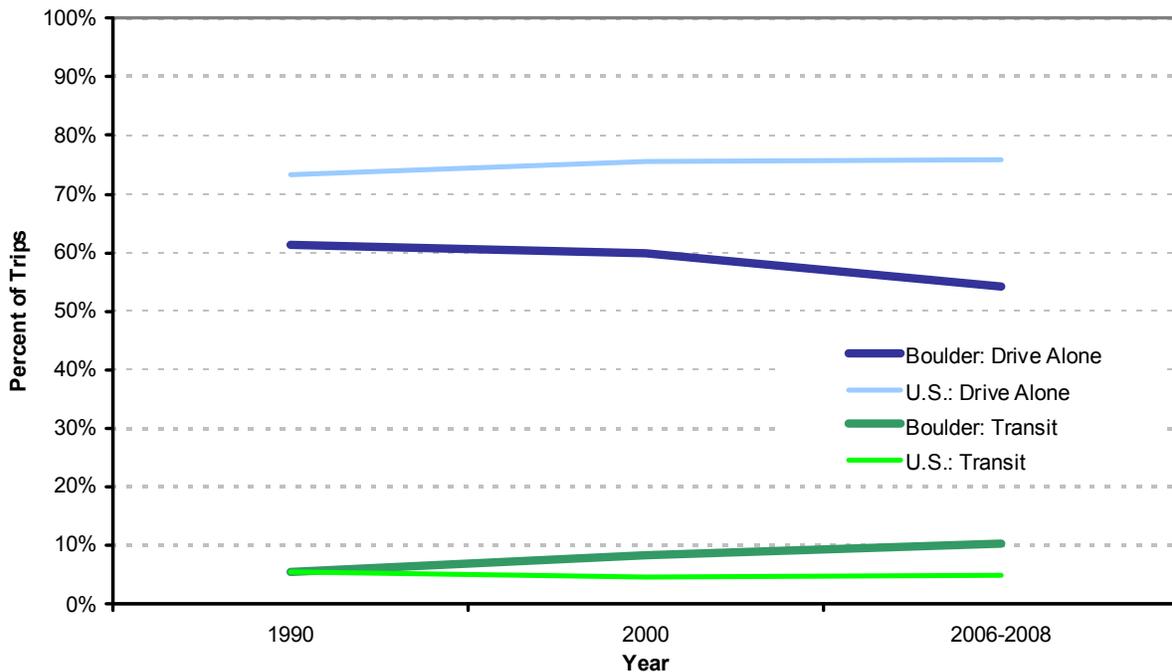
The 1990 and 2000 Census long form include data on modal split estimates for the “Journey to Work,” and the Census’ American Community Survey asks about “Means of Transportation to Work.” The data are derived by asking residents about their usual mode of travel to work. As one might expect, Boulder residents used SOVs less and alternate modes more frequently for the work commute when compared to the rest of the nation.

Figure 56: Census Journey to Work Data, Boulder Compared to the U.S.

Travel Mode	Percent of People Using Mode						Difference Between Boulder and U.S. 2006-2008
	Boulder			U.S.			
	2006-2008	2000	1990	2006-2008	2000	1990	
Drive alone	54.2%	59.8%	61.3%	75.8%	75.7%	73.2%	+21.6%
Walked	9.7%	15.5%	15.8%	2.8%	6.2%	6.9%	-6.9%
Worked at home	8.7%			4.0%			
Carpool	6.4%	8.7%	9.5%	10.6%	12.2%	13.4%	+4.2%
Bike	9.2%	7.6%	7.8%	0.5%	1.2%	1.3%	-8.7%
Other means (bicycle, motorcycle, etc.)	1.4%			1.1%			
Public transportation (bus, trolley, subway, etc.)	10.3%	8.3%	5.6%	4.9%	4.7%	5.3%	-5.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

In addition, the trend from 1990 to 2008 has been one of decreasing SOV use among Boulder residents (61.3% to 54.2%) and slight increases in SOV use nationwide (73.2% to 75.8%). Nationwide, transit use has remained stable (5.3% to 4.9%), but has increased among Boulder residents (5.6% to 10.3%).

Figure 57: Census Journey to Work: Boulder Compared to the U.S., 1990 to 2006-2008



In general, Boulder Valley residents made somewhat more trips per day compared to the U.S. population. The average trip distance of Boulder Valley residents was about half of that observed among residents in the nation as a whole, while the average trip duration was similar among Boulder Valley residents as among the U.S. population.

Figure 58: Household and Travel Characteristics, Boulder Compared to the U.S.

Characteristic	Boulder				U.S.			
	2009	2000	1996	1990	NHTS 2009	NHTS 2001*	NPTS 1995	NPTS 1990
Average number of trips	5.1	6.1	6.2	5.9		4.1	NA†	NA†
Average trip distance, all trips	5.0	4.3	4.7	4.0		9.9	9.1	9.5
Average work-related trip distance	6.1	5.7	5.3	5.2		14.6	13.4	11.8
Average trip duration, all trips	17.0	13.5	13.3	14.4		18.7	16.6	NA†
Average work-related trip duration	17.1	16.3	13.7	15.1		24.8	21.9	NA†
Personal vehicles per household	1.66	1.79	1.63	1.83		1.90	NA†	NA†
Bicycles per household**	2.26	2.09	2.00	NA†		0.86	NA†	NA†

* The NHTS data are for all persons, including those 15 and under. The Boulder data are only for those aged 16 and older.

**The NHTS specified “adult-sized” bicycles.

† Data are not available, or the question was not asked.

Figure 59: 7. Purpose of Travel, Boulder Compared to the U.S.

Trip Purpose		Percent of Trips		Percent of Miles	
NPTS	Boulder	NHTS 2001	Boulder 2006*	NHTS 2001	Boulder 2006*
Work, work-relate, return to work	Work commute, other work business	11.2%	14.6%	17.7%	16.7%
Shopping	Shopping	12.9%	12.4%	8.8%	8.9%
Church and School	School				
Other Family & Personal Business/Doctor or Dentist/ Visiting/ Other Social & Recreation	Personal Business/ Eat a Meal/ Social or Recreation/ Drive a Passenger	40.9%	39.8%	38.8%	39.6%
Return home	Go home	33.8%	32.4%	31.2%	33.7%
Other	Other	1.3%	0.7%	3.5%	1.1%
Total	Total	100.0%	100.0%	100.0%	100.0%

*Boulder’s trip purposes do not include “change travel mode”, in order to make them more comparable to the national data.

Appendix B. Modal Split by Trip and Respondent 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 percent of respondents making at least one trip by each mode on the assigned travel day by respondent characteristics. Figure 60 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 highlighted in grey.

Figure 60: Respondent Characteristics

Survey Respondent Characteristic		Percent of Respondents
Sex of Respondent	male	51%
	female	49%
Age of Respondent	16-34	51%
	35-54	30%
	55+	19%
CU Student?	NOT a student	80%
	CU student	20%
Tenure Status	Owner-Occupied	50%
	Renter-Occupied	50%
Type of Housing Unit	Attached (Multi-Family Housing)	0%
	Detached (Single-Family)	63%
Annual Household Income	Under \$50,000	37%
	\$50,000 +	84%
Have Children?	No children	16%
	Have children	27%
Ratio of Autos to Drivers	Less than 1 vehicle per driver	73%
	1 or more vehicles per driver	99%
HH own any bikes?	Yes	1%
	No	46%
Have an Eco-Pass?	No, don't have	54%
	Yes, have Eco-Pass	28%
Day of the Week	weekend	72%
	weekday	51%

Note: Grey shading indicates differences between subgroups are “statistically significant” (that is, there is a less than 5% probability that differences observed are due to chance alone).

Figure 61: Modal Split of All Trips by Respondent Characteristics, part 1

Modal Split of All Trips	Sex of Respondent		Age of Respondent			CU Student?	
	male	female	16-34	35-54	55+	NOT a student	CU student
Single-Occupancy Vehicle	31.3%	41.4%	28.8%	42.1%	51.1%	40.1%	22.9%
Multiple-Occupancy Vehicle with Adults Only	16.8%	15.0%	17.5%	12.0%	18.7%	16.0%	15.0%
Multiple-Occupancy Vehicle with Children	5.9%	9.3%	4.5%	14.2%	3.8%	9.3%	1.3%
Bus (Transit), including School Bus	5.5%	6.1%	7.4%	3.6%	4.6%	4.6%	10.2%
Bicycle	23.1%	9.3%	20.3%	14.1%	6.5%	14.5%	22.9%
Foot	17.5%	18.9%	21.5%	13.9%	15.4%	15.5%	27.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=2654	N=2500	N=2777	N=1637	N=745	N=4029	N=1141

Figure 62: Modal Split of All Trips by Respondent Characteristics, part 2

Modal Split of All Trips	Have Children?		Tenure Status		Tenure Status	
	No children	Have children	Owner-Occupied	Renter-Occupied	Attached (Multi-Family Housing)	Detached (Single-Family)
Single-Occupancy Vehicle	38.7%	30.5%	41.9%	32.8%	32.9%	45.4%
Multiple-Occupancy Vehicle with Adults Only	18.2%	5.6%	13.9%	18.5%	17.1%	14.7%
Multiple-Occupancy Vehicle with Children	2.2%	33.9%	11.7%	3.8%	5.3%	11.8%
Bus (Transit), including School Bus	5.8%	3.9%	4.2%	6.5%	6.5%	3.2%
Bicycle	17.0%	12.1%	14.2%	18.2%	18.3%	12.6%
Foot	18.1%	14.0%	14.0%	20.3%	19.9%	12.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=4128	N=878	N=2470	N=2464	N=3104	N=1849

Note: Grey shading indicates differences between subgroups are “statistically significant” (that is, there is a less than 5% probability that differences observed are due to chance alone).

Figure 63: Modal Split of All Trips by Respondent Characteristics, part 3

Modal Split of All Trips	Ratio of Autos to Drivers		HH own any bikes?	
	Less than 1 vehicle per driver	1 or more vehicles per driver	Yes	No
Single-Occupancy Vehicle	25.8%	45.1%	35.8%	29.4%
Multiple-Occupancy Vehicle with Adults Only	19.5%	15.0%	15.2%	2.6%
Multiple-Occupancy Vehicle with Children	7.2%	8.3%	8.3%	2.2%
Bus (Transit), including School Bus	5.9%	4.1%	5.1%	6.3%
Bicycle	20.4%	12.7%	18.8%	.0%
Foot	21.3%	14.7%	16.7%	59.5%
Total	100.0%	100.0%	100.0%	100.0%
	N=1356	N=3293	N=4474	N=26

Figure 64: Modal Split of All Trips by Respondent Characteristics, part 4

Modal Split of All Trips	Have an Eco-Pass?		Day of the Week	
	No, don't have	Yes, have Eco-Pass	weekend	weekday
Single-Occupancy Vehicle	45.9%	29.0%	36.3%	37.1%
Multiple-Occupancy Vehicle with Adults Only	17.9%	14.5%	16.8%	16.8%
Multiple-Occupancy Vehicle with Children	8.1%	7.0%	9.5%	6.5%
Bus (Transit), including School Bus	2.8%	8.1%	5.2%	5.7%
Bicycle	12.5%	19.1%	14.4%	16.2%
Foot	12.9%	22.2%	17.8%	17.7%
Total	100.0%	100.0%	100.0%	100.0%
	N=2294	N=2922	N=1424	N=3673

Note: Grey shading indicates differences between subgroups are “statistically significant” (that is, there is a less than 5% probability that differences observed are due to chance alone).

Figure 65: 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?	
	male	female	16-34	35-54	55+	NOT a student	CU student
Single-Occupancy Vehicle	36.1%	60.7%	38.5%	58.3%	58.2%	46.7%	47.5%
Multiple-Occupancy Vehicle with Adults Only	5.9%	4.4%	6.6%	3.1%	4.5%	5.8%	.0%
Multiple-Occupancy Vehicle with Children	3.2%	4.0%	2.7%	5.5%	1.9%	3.8%	.6%
Bus (Transit), including School Bus	10.3%	9.9%	10.2%	10.2%	9.2%	10.3%	8.2%
Bicycle	33.1%	10.5%	28.0%	17.7%	14.4%	22.8%	28.2%
Foot	11.4%	10.6%	14.1%	5.2%	11.8%	10.5%	15.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=559	N=417	N=573	N=322	N=81	N=880	N=99

Figure 66: 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	Have children	Owner-Occupied	Renter-Occupied	Attached (Multi-Family Housing)	Detached (Single-Family)
Single-Occupancy Vehicle	48.3%	40.1%	52.5%	40.4%	43.3%	54.8%
Multiple-Occupancy Vehicle with Adults Only	6.2%	1.3%	2.6%	8.2%	7.0%	1.9%
Multiple-Occupancy Vehicle with Children	1.3%	14.2%	5.0%	2.2%	4.1%	2.5%
Bus (Transit), including School Bus	9.2%	13.9%	10.5%	9.3%	9.2%	11.0%
Bicycle	24.3%	19.0%	21.2%	26.7%	24.4%	22.3%
Foot	10.7%	11.5%	8.1%	13.2%	12.0%	7.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	N=794	N=172	N=473	N=477	N=641	N=325

Note: Grey shading indicates differences between subgroups are “statistically significant” (that is, there is a less than 5% probability that differences observed are due to chance alone).

Figure 67: 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?	
	Less than 1 vehicle per driver	1 or more vehicles per driver	Yes	No
Single-Occupancy Vehicle	38.2%	53.2%	46.1%	24.1%
Multiple-Occupancy Vehicle with Adults Only	3.9%	6.3%	5.6%	.0%
Multiple-Occupancy Vehicle with Children	.4%	4.7%	3.1%	.0%
Bus (Transit), including School Bus	10.4%	8.8%	9.5%	12.3%
Bicycle	31.6%	18.4%	26.3%	.0%
Foot	15.5%	8.6%	9.5%	63.6%
Total	100.0%	100.0%	100.0%	100.0%
	N=258	N=658	N=872	N=7

Figure 68: 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	
	No, don't have	Yes, have Eco-Pass	weekend	weekday
Single-Occupancy Vehicle	56.8%	39.6%	42.8%	47.4%
Multiple-Occupancy Vehicle with Adults Only	9.4%	2.1%	1.7%	6.5%
Multiple-Occupancy Vehicle with Children	5.0%	2.4%	4.2%	3.1%
Bus (Transit), including School Bus	3.2%	15.1%	14.2%	8.5%
Bicycle	21.2%	24.9%	20.0%	24.4%
Foot	4.4%	15.8%	17.0%	10.1%
Total	100.0%	100.0%	100.0%	100.0%
	N=415	N=567	N=217	N=717

Note: Grey shading indicates differences between subgroups are “statistically significant” (that is, there is a less than 5% probability that differences observed are due to chance alone).

Figure 69: 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?	
	male	female	16-34	35-54	55+	NOT a student	CU student
Single-Occupancy Vehicle	48.3%	58.0%	48.6%	62.5%	50.7%	56.9%	39.1%
Multiple-Occupancy Vehicle with Adults Only	30.5%	33.3%	34.2%	30.8%	27.5%	32.7%	28.0%
Multiple-Occupancy Vehicle with Children	10.5%	13.0%	7.4%	22.4%	5.8%	14.1%	2.2%
Bus (Transit), including School Bus	12.8%	14.3%	18.5%	8.9%	8.0%	10.9%	24.2%
Bicycle	33.2%	16.1%	32.0%	22.6%	8.1%	21.7%	36.2%
Foot	33.8%	33.7%	41.3%	28.2%	22.2%	29.6%	49.9%
<i>Number</i>	<i>N=577</i>	<i>N=560</i>	<i>N=580</i>	<i>N=341</i>	<i>N=216</i>	<i>N=908</i>	<i>N=232</i>

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

Figure 70: 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	Have children	Population in Owner-Occupied Home	Population in Renter-Occupied Home	Attached (Multi-Family Housing)	Detached (Single-Family)
Single-Occupancy Vehicle	54.4%	53.1%	60.3%	48.8%	50.0%	62.8%
Multiple-Occupancy Vehicle with Adults Only	31.9%	31.9%	31.6%	32.8%	32.1%	32.7%
Multiple-Occupancy Vehicle with Children	3.8%	55.8%	18.3%	5.8%	7.8%	19.1%
Bus (Transit), including School Bus	13.1%	12.0%	9.7%	15.5%	15.0%	8.2%
Bicycle	24.9%	23.2%	21.9%	27.4%	27.2%	20.4%
Foot	34.1%	27.4%	27.4%	38.0%	37.6%	24.3%
<i>Number</i>	<i>N=932</i>	<i>N=175</i>	<i>N=547</i>	<i>N=545</i>	<i>N=688</i>	<i>N=409</i>

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

Note: Grey shading indicates differences between subgroups are “statistically significant” (that is, there is a less than 5% probability that differences observed are due to chance alone.

Figure 71: 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?	
	Less than 1 vehicle per driver	1 or more vehicles per driver	Yes	No
Single-Occupancy Vehicle	43.9%	63.3%	55.1%	14.7%
Multiple-Occupancy Vehicle with Adults Only	34.5%	32.4%	32.2%	5.1%
Multiple-Occupancy Vehicle with Children	12.3%	12.7%	13.2%	2.4%
Bus (Transit), including School Bus	14.2%	9.7%	12.6%	3.4%
Bicycle	33.8%	20.6%	29.3%	.0%
Foot	39.9%	29.5%	33.6%	29.0%
<i>Number</i>	<i>N=279</i>	<i>N=738</i>	<i>N=953</i>	<i>N=12</i>

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

Figure 72: 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	
	No, don't have	Yes, have Eco-Pass	weekend	weekday
Single-Occupancy Vehicle	59.4%	47.9%	55.4%	54.6%
Multiple-Occupancy Vehicle with Adults Only	34.2%	29.8%	32.3%	33.9%
Multiple-Occupancy Vehicle with Children	13.9%	9.7%	13.8%	10.7%
Bus (Transit), including School Bus	7.0%	18.9%	11.5%	14.1%
Bicycle	18.6%	29.4%	23.2%	24.7%
Foot	24.7%	41.0%	31.6%	34.9%
<i>Number</i>	<i>N=529</i>	<i>N=622</i>	<i>N=312</i>	<i>N=788</i>

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

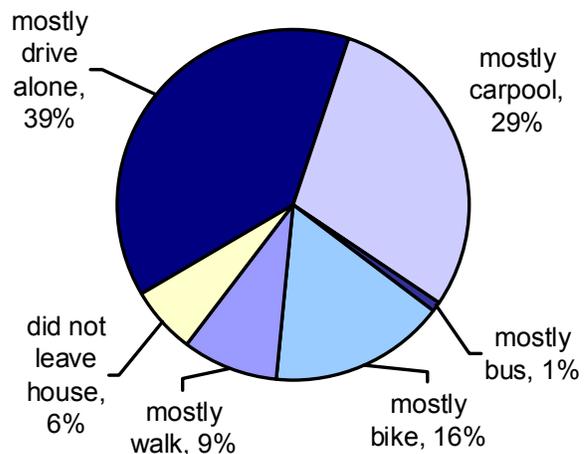
Note: Grey shading indicates differences between subgroups are “statistically significant” (that is, there is a less than 5% probability that differences observed are due to chance alone.

Appendix C. Transportation Market Segmentation

In order to better understand the types of “markets” in respect to Boulder residents’ transportation mode choices, the dataset was analyzed using an analysis technique referred to as cluster analysis or market segmentation. This analysis sorts respondents into the “clusters,” that is, groups in which respondents’ responses are 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 day 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. (The exception is the group labeled “mostly walk” – several groups had similar proportions of trips made by walking.). A sixth group was formed of those study participants who had not left the house on their assigned travel day. These six groups were:

- ◆ The “*mostly drive alone*” group, which represented the largest proportion of the population with 39% of respondents. This group made 79% of their trips on the assigned travel day by driving alone. This group had the highest proportion of households with one or more vehicles per driver, the highest proportion of female members, and the highest proportion of households with annual incomes of \$100,000 or more.
- ◆ The “*mostly carpool*” segment, representing 29% of the population. In this group, 55% of the trips made on the assigned travel day were made by carpooling. A significant proportion of trips were also made by walking in this group, 29%. This group had the highest proportion of households that included children.
- ◆ The “*mostly bus*” group, which was quite small, representing only 1% of the population. Nearly 7 in 10 trips made by this group on the assigned travel day were made via a bus or transit. Nearly all the members of this group had an Eco-Pass, and all of those with Eco-Passes used them more than once a week. This group had the highest proportion of CU students, and the lowest median annual household income.
- ◆ The “*mostly bike*” sector, comprising 16% of the population. This group made the large majority of their trips (81%) by bike. This group was also the most likely to have ridden a bicycle in the previous week to commute, to shop or run errands, or for fun or exercise. This group had the highest proportion of male members, and the lowest proportion of members age 55 or more.
- ◆ The “*mostly walk*” group, which actually made a larger proportion of trips, on average, by bus (44%) than by walking (25%). This may indicate that many of the walking trips are linked to transit. Eco-Pass holders in the group were very likely to say they use their Eco-Pass more than once a week.
- ◆ Six percent of respondents “*did not leave the house*” on their assigned travel day. This group was the least likely to be employed. Among those who were employed, a significantly larger proportion said they telecommuted to work every day compared to the other group, and 23% had telecommuted on their assigned travel day. This group was the most likely to have received any goods or services by delivery on the day of the survey. This group had the highest proportion of female members, and the highest proportion of members age 55 or more.

Figure 73: 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 table below. Detailed tables showing selected survey results by transportation segment are presented on the pages following.

Figure 74: Key Characteristics of the Transportation Segments

Transportation Segment	Percent of Population	Average Percent of Trips Made Via Each Mode	Other Characteristics
mostly drive alone	39%	SOV, 79% MOV, 10% Bus, 0% Bike, 3% Foot, 8%	<ul style="list-style-type: none"> This group had the highest proportion of households with one or more vehicles per driver (83%). This group had among the highest proportion of female members (57%). This group had the highest proportion of persons living in owner-occupied housing. This group had the highest proportion of households with annual incomes of \$100,000 or more (27%).
mostly carpool	29%	SOV, 10% MOV, 55% Bus, 2% Bike, 4% Foot, 29%	<ul style="list-style-type: none"> In addition to a large proportion of trips made by carpooling (55%), a significant proportion of trips were made by walking (29%). This group had a higher proportion of persons living in owner-occupied housing (47%). This group had the highest proportion of households that included children (24%). This group had a fairly high proportion of households with annual incomes of \$100,000 or more (21%).
mostly bus	1%	SOV, 2% MOV, 2% Bus, 69% Bike, 3% Foot, 25%	<ul style="list-style-type: none"> This group was second least likely to be employed (50% were not employed). This group had the lowest proportion of employed members who worked in Boulder (57%). This group was the most likely to have used their Eco-Pass in the last week (100%). This group had among the highest proportion of female members (57%). This group had the highest proportion of CU students (64%). This group had the lowest median annual household income (\$20,000 to \$29,999). This group had the highest proportion of members with an Eco-Pass(86%).
mostly bike	16%	SOV, 4% MOV, 4% Bus, 1% Bike, 81% Foot, 10%	<ul style="list-style-type: none"> This group was the most likely to have ridden a bicycle in the last week for commuting (91%), for shopping/errands (84%), or for exercise (71%). This group had the highest proportion of employed members who worked in Boulder (82%). This group had the highest proportion of households that owned a bicycle (97%). This group had the highest proportion of male members (79%). This group had the lowest proportion of members aged 55+ (6%).
mostly walk	9%	SOV, 15% MOV, 8% Bus, 44% Bike, 8% Foot, 25%	<ul style="list-style-type: none"> While this group is labeled “mostly walk,” an even larger proportion of trips made by this group were made by bus (44%). Eco-Pass holders in this group are very likely to be frequent user of their Eco-Pass (88% use it more than once a week). This group had among the lowest median annual household income (\$30,000 to \$39,999). This group had among the highest proportion of members with an Eco-Pass(76%).
did not leave house	6%	No trips made	<ul style="list-style-type: none"> This group was the least likely to be employed (52% were not employed). Among those who were employed, 16% said they telecommuted every day for work, and 23% had telecommuted on their assigned travel day. This group was the most likely to have received any goods or services by delivery on the day of the survey (11%), and among those who had received a delivery, much more likely to have reported that the delivery substituted for travel (83%). This group had the highest proportion of female members (62%). This group had the highest proportion of members aged 55+ (56%). This group had a higher proportion of persons living in owner-occupied housing (47%).

Figure 75: 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	79%	10%	2%	4%	15%	0%	36%
MOV	10%	55%	2%	4%	8%	0%	21%
Bus	0%	2%	69%	1%	44%	0%	6%
Bike	3%	4%	3%	81%	8%	0%	16%
Foot	8%	29%	25%	10%	25%	0%	16%

Figure 76: Frequency of Bike Use for Shopping, Meals and Errands by Transportation Segment

How frequently in last week ridden a bicycle to shop, get a meal or run errands?	mostly drive alone	mostly carpool	mostly bus	mostly bike	Mostly walk	did not leave house	OVERALL
5 or more times	3%	7%	0%	30%	2%	2%	9%
3 to 4 times	5%	9%	8%	21%	14%	0%	10%
Once or twice	19%	19%	39%	33%	21%	9%	21%
Not at all	73%	66%	54%	16%	63%	89%	61%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 77: Frequency of Bike Use for Commuting by Transportation Segment

How frequently in last week ridden a bicycle for commuting?	mostly drive alone	mostly carpool	mostly bus	mostly bike	mostly walk	did not leave house	OVERALL
5 or more times	8%	11%	21%	58%	12%	9%	18%
3 to 4 times	5%	11%	29%	20%	8%	5%	10%
Once or twice	8%	9%	0%	13%	13%	0%	9%
Not at all	78%	70%	50%	9%	67%	86%	63%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 78: Frequency of Bike Use for Fun or Exercise by Transportation Segment

How frequently in last week ridden a bicycle for fun or exercise?	mostly drive alone	mostly carpool	mostly bus	mostly bike	mostly walk	did not leave house	OVERALL
5 or more times	3%	2%	0%	13%	5%	4%	5%
3 to 4 times	12%	12%	14%	23%	9%	5%	13%
Once or twice	19%	27%	29%	34%	16%	16%	24%
Not at all	66%	59%	57%	29%	70%	75%	59%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 79: 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	21%	34%	50%	16%	25%	52%	26%
Yes, part-time	24%	22%	21%	20%	24%	22%	23%
Yes, full-time	55%	44%	29%	64%	51%	26%	51%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 80: 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	67%	75%	57%	82%	65%	63%	72%
Other	33%	25%	43%	19%	35%	38%	29%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 81: Frequency of Telecommuting by Transportation Segment

How often, if ever, do you telecommute for work?	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)	7%	12%	0%	8%	1%	16%	8%
3 to 4 times per week	3%	6%	0%	4%	0%	9%	4%
2 to 3 times per week	7%	5%	0%	6%	7%	0%	6%
Once or twice a month	9%	10%	0%	10%	12%	22%	10%
Occasionally	15%	17%	29%	21%	18%	19%	17%
Never	60%	51%	71%	51%	62%	34%	55%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 82: Telecommuting Status on Assigned Travel Day by Transportation Segment

Telecommuted on the day of the survey?	mostly drive alone	mostly carpool	mostly bus	mostly bike	mostly walk	did not leave house	OVERALL
No	92%	91%	100%	94%	97%	77%	92%
Yes	8%	9%	0%	6%	3%	23%	8%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 83: 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	95%	95%	100%	96%	92%	89%	95%
Yes	5%	5%	0%	4%	8%	11%	5%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 84: 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%	40%	0%	71%	80%	17%	47%
Yes	55%	60%	0%	29%	20%	83%	53%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 85: 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
No, don't have an Eco-Pass	58%	44%	14%	28%	24%	57%	45%
Yes, have an Eco-Pass	42%	56%	86%	72%	76%	44%	55%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 86: 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	27%	33%	100%	31%	88%	58%	42%
about once a week	14%	21%	0%	20%	7%	0%	15%
about once every two weeks	9%	13%	0%	14%	3%	8%	10%
about once a month	17%	11%	0%	13%	0%	0%	11%
less than once a month	33%	22%	0%	22%	3%	33%	22%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 87: 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	18%	35%	43%	40%	29%	27%	28%
1 or more vehicles per driver	83%	65%	57%	60%	71%	73%	72%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 88: 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	78%	79%	79%	97%	75%	47%	79%
No	22%	21%	21%	3%	25%	53%	21%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 89: 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	43%	49%	43%	79%	48%	38%	51%
Female	57%	51%	57%	21%	52%	62%	49%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 90: 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
16-34	41%	55%	77%	70%	69%	25%	52%
35-54	38%	29%	15%	24%	19%	19%	30%
55+	21%	16%	8%	6%	12%	56%	18%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 91: CU Student Status by Transportation Segment

CU Student Status	mostly drive alone	mostly carpool	mostly bus	mostly bike	mostly walk	did not leave house	OVERALL
NOT a student	88%	79%	36%	65%	70%	91%	79%
CU student	12%	21%	64%	35%	30%	9%	21%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 92: Housing Tenure by Transportation Segment

Tenure	mostly drive alone	mostly carpool	mostly bus	mostly bike	mostly walk	did not leave house	OVERALL
Rent	43%	53%	80%	62%	57%	53%	51%
Own	57%	47%	20%	39%	43%	47%	49%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 93: 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)	56%	65%	89%	72%	73%	59%	63%
Detached (Single-Family)	44%	35%	11%	28%	27%	41%	37%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 94: 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	5%	19%	39%	15%	23%	6%	13%
\$10,000 to \$19,999	9%	7%	8%	8%	12%	17%	9%
\$20,000 to \$29,999	9%	5%	15%	7%	10%	17%	8%
\$30,000 to \$39,999	12%	11%	0%	11%	10%	8%	11%
\$40,000 to \$49,999	10%	7%	0%	16%	7%	6%	10%
\$50,000 to \$74,999	16%	18%	31%	15%	9%	15%	16%
\$75,000 to \$99,999	13%	12%	0%	9%	12%	13%	12%
\$100,00 to \$149,999	12%	9%	0%	11%	8%	8%	10%
\$150,000 or more	15%	13%	8%	9%	9%	10%	12%
Total	100%	100%	100%	100%	100%	100%	100%

Figure 95: Presence of Children in Household by Transportation Segment

Presence of Children in Household?	mostly drive alone	mostly carpool	mostly bus	mostly bike	mostly walk	did not leave house	OVERALL
No children	87%	76%	100%	86%	86%	93%	84%
Have children	13%	24%	0%	14%	14%	7%	16%
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	29%	31%	14%	24%	28%	29%	29%
Weekday	71%	69%	86%	76%	72%	71%	72%
Total	100%	100%	100%	100%	100%	100%	100%

Appendix D. References

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Appendix E. Study Methodology

The 2009 Travel Diary Study is the ninth implementation of the survey since the baseline study was first conducted in 1990. The 2009 study used similar materials to that used in the previous implementations of the study (1990, 1992, 1994, 1996, 1998, 2000, 2003 and 2006).

This long trend line is useful in measuring the City's progress towards one of the original Transportation Master Plan's (TMP) major objectives: 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. A 15% shift would result in a goal of only 29% of all trips being made by driving alone in 2010, or an annual shift of 0.75%.

The TMP was adopted in 1989 and updates to the TMP were adopted in 1996, 2003 and 2008. In the 1996 TMP, the objective was modified somewhat as a target to reduce the SOV modal share to only 25% of all trips by the year 2020. This translates to an average annual shift of 0.63%, with an overall shift in drive alone trips of 19%. In the 2003 and 2008 updates, this objective was modified to a target year of 2025. This target is now the standard against which these study results are measured. Achieving an SOV modal share of 25% by the year 2025 would mean a 19% shift in the proportion of SOV trips made from 1990 to 2025, or a 0.54% shift per year.

Study Design

The Study Materials

The diary materials (see *Appendix F. Data Collection Materials*) were mailed to potential participants a week in advance, describing the study, explaining the materials and assigning a travel day. The subjects were instructed to call the research staff if they had any questions or problems.¹⁰

Selecting Survey Recipients

Approximately 7,000 households within the Boulder Valley were invited to participate in the travel study. 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 get 1,200 residents to return travel diaries.

An address listing service was contracted to prepare the sample using a database containing all postal customers in the Boulder Valley. Addresses in the database were stratified as needed, and then a systematic sample¹¹ of households to contact for participation was produced.¹²

¹⁰ In 2000, a small change was made to the study design. The travel diaries were mailed a week in advance, but most arrived the next day to participants' homes. In the past, since these materials are mailed "bulk rate", materials arrived a few days before the study; Audit and Evaluation staff were worried in 2000 that since materials arrived rather far in advance of the actual date respondents were to keep the diary that some would forget. Thus, participants were given reminder calls the night before their assigned travel day. If the respondent was not at home, a message was left on an answering machine or voice mail, if such existed.

¹¹ Systematic sampling is a procedure where a complete list of all possible items is sorted through, selecting every Nth one until the appropriate amount of items is selected.

¹² In 1990, 1992 and 1994, attached units were over sampled at a rate of 5:3 compared to detached units. This was because attached units typically under respond to surveys. However, on the citizen surveys conducted by the Center, it was noticed that response rates were becoming more similar for the unit types, and so this over sampling was dropped beginning in 1996.

An additional 700 students were selected from student group quarters, that is, the University of Colorado Dorms and the Greek Houses. This section of the population accounts for about 7,500 residents of Boulder Valley.

Recruitment

In implementations prior to 2003, selected households were mailed a letter from Boulder's Mayor inviting the member of the household who most recently had a birthday¹³ to participate in a travel study by keeping track of his or her travel for one day during a week in September. Two weeks later a second letter was sent from the Mayor prompting those who had not responded yet to please do so. Enclosed in both letters was a postcard for the appropriate person to return agreeing to participate and listing his or her name and phone number. The postcards of those agreeing to participate were entered in a database to prepare for the mailing of the diary materials. Each participant was randomly assigned a day of the week to travel. The number of participants assigned to each day was roughly equal.

Beginning in 2003, no invitation was mailed. Instead, residents were mailed a pre-notification postcard informing them they had been randomly selected to participate in the Travel Diary Study. One week after residents received the pre-notification postcard, the full travel study packets were sent to all households selected for the study.

In prior travel diary study implementations, the dorm students were contacted by phone because they were not in town when diary invitations were mailed to the other residents. However, beginning in 2006, the telephone directory of dormitory students was no longer publicly available. The housing director was contacted in the summer of 2006 and agreed to provide the mailing addresses of dormitory students. However, despite repeated contacts and assurances that such a list would be forthcoming, it was not delivered. Thus, the prior dormitory mailing list was used. Many of these addresses, however, were returned as undeliverable. In 2009, a mailing list was provided to research staff.

Also prior to 2003, students in fraternities and sororities were contacted through their house leader, and travel diaries were dropped off and picked up from these students. However, starting in 2003, the Greeks were mailed travel diary packets. Each packet consisted of seven diaries (one for each day of the week), and were mailed to the President of each of the fraternities and sororities. The President was asked to distribute the diaries to randomly selected members of their organization. In 2006, many of these packets were returned as undeliverable, as most of the fraternities are currently not operating on the CU campus. In 2009, the packets were delivered, but very few completed diaries were returned.

In 2009, an add-on sample was undertaken of residents of in affordable housing units managed by Boulder Housing Partners. Some of these addresses were already in the randomly selected list of Boulder Valley residences; an additional 600 addresses not on that list were mailed travel diary packets.

Response Rates

Figure 97 on the next page displays the response rates for the 2009 study. If the undeliverable addresses are eliminated from the sample, about 7,892 households or students in group quarters

¹³ Asking the person who most recently had a birthday to participate is a method used to randomly select a person within a household. In this manner, people from varying age groups and household roles participate and provide a more representative sample of an area's population

were contacted to participate in the study. Of these, 1,220 returned a usable survey, representing 15% of everyone contacted. Figure 98 displays the response rates obtained in each of the study years.

Figure 97: Response Rate for the 2009 Travel Diary Study

Housing Type	Sampled	Returned with Undeliverable Address	Eligible to Participate	Returned a Usable Travel Diary	Response Rate
Households	7,000	411	6,589	1,144	17.4%
BHP affordable housing	600	38	603	26	4.3%
Group quarters (dormitories, fraternities and sororities)	700	0	700	21	3.0%
Total	8,300	449	7,892	1,215	15.4%

Figure 98: Comparison of Response Rates Across Study Years

Response Rates	Year								
	2009	2006	2003	2000	1998	1996	1994	1992	1990*
Percent agreeing to participate (returning the postcard)	N/A**	N/A**	N/A**	30%	27%	29%	30%	32%	36%
Percent of those who agreed to participate who completed a travel diary	N/A**	N/A**	N/A**	64%	72%	67%	64%	64%	70%
Percent of entire sample who completed a travel diary	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.*

***Not applicable starting in 2003.*

Analysis of Results

Cleaning and Coding of Data

Once received, the diaries were prepared for the 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. Thus, to reduce the number of this type of error, the categories for “travel method” on the recording form were changed as follows:

1990-1994	1996-2009
1 car (driver)	1 car or light truck (driver)
2 car (passenger)	2 car or light truck (passenger)
3 bus (transit)	3 bus (transit)
4 school bus	4 school bus
5 motorcycle	6 motorcycle
6 taxi (passenger)	7 taxi (passenger)
7 truck (driver)	5 large truck
8 truck (passenger)	
9 bicycle	8 bicycle
10 walk only	9 walk only
11 other _____	10 other _____

As in years’ past, the instructions explained that the truck category was to be used for large commercial trucks, although more even more explanation was added in 1996 (see *Appendix F. Data Collection Materials* for a copy of all the travel diary materials).

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.¹⁴ On the diary document the participants were asked to estimate how many miles each trip had taken them. At

¹⁴ When coding origins and destinations into Census tracts or transportation zones, there is an ambiguous amount of error associated with the amount of area a zone encompasses. For example, if one Census tract is 5 square miles, and a bordering tract is 3 square miles, a trip from one zone to the other may range from less than 1 mile to 8 miles. A database would produce the same estimate of miles for both circumstances

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.¹⁵

The geocoded miles were then correlated with the miles estimated by the participants. The estimates were found to be extremely accurate;¹⁶ 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.¹⁷ 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-based program “MapQuest” (www.mapquest.com/directions) was used to estimate trip distances.

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 socioeconomic groups, the participants’ responses were statistically weighted. Using the data from the 2000 Census, the results were adjusted to give more weight to the travel of those who were under represented in the sample.

¹⁵ Chuck Green, DRCOG

¹⁶ Simple Correlation of 0.9, $p < .001$.

¹⁷ 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

Figure 99 on the next page displays the sociodemographic profile of the 2009 study participants using unweighted and weighted data compared to the 2000 Census data for comparison. Rows which are shaded indicate the variables used for the weighting.

Figure 99: Comparison of 2009 Weighted and Unweighted Data to 2000 Census Population Estimates

Characteristic	Population Estimates*	Unweighted Data	Weighted Data
Population in Owner-Occupied Home	48%	65%	49%
Population in Renter-Occupied Home or GQ	52%	35%	51%
Non-CU Student	78%	89%	79%
CU Student (in Boulder)	22%	11%	21%
Female (18+ years old)	48%	57%	49%
Male (18+ years old)	52%	43%	51%
18-34 years of age	53%	25%	53%
35-54 years of age	31%	32%	30%
55+ years of age	16%	43%	17%
Females: 18-34	24%	15%	24%
Females: 35-54	15%	20%	15%
Females: 55+	9%	23%	9%
Males: 18-34	29%	10%	29%
Males: 35-54	15%	12%	15%
Males: 55+	7%	20%	7%

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 Trip and Respondent 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.

For this dataset, the SPSS procedure “K-Means Cluster Analysis” was used. 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 2009 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 can be frustrating at times. I am inviting a member of your household to be part of a small group of residents who will keep a simple travel log for a single day during the week of September 14, 2009. Basically, the log will show how you get where you're going and how long it takes you to get there. This will help the city better understand existing travel patterns and work to improve your travel experience.

Your household was chosen at random and your participation will be completely confidential. We are only mailing travel logs to a small number of Boulder Valley residents, so your participation is extremely important. The results will be used in transportation planning to improve our community.

Your travel log will arrive the week of September 14th at which time you'll receive your assigned log day. Many thanks in advance for your help.

Sincerely,



Matthew Appelbaum
Mayor

Dear Boulder Valley Resident,

Travel is something we all do and can be frustrating at times. I am inviting a member of your household to be part of a small group of residents who will keep a simple travel log for a single day during the week of September 14, 2009. Basically, the log will show how you get where you're going and how long it takes you to get there. This will help the city better understand existing travel patterns and work to improve your travel experience.

Your household was chosen at random and your participation will be completely confidential. We are only mailing travel logs to a small number of Boulder Valley residents, so your participation is extremely important. The results will be used in transportation planning to improve our community.

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Sincerely,



Matthew Appelbaum
Mayor

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Sincerely,



Matthew Appelbaum
Mayor

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Your household was chosen at random and your participation will be completely confidential. We are only mailing travel logs to a small number of Boulder Valley residents, so your participation is extremely important. The results will be used in transportation planning to improve our community.

Your travel log will arrive the week of September 14th at which time you'll receive your assigned log day. Many thanks in advance for your help.

Sincerely,



Matthew Appelbaum
Mayor



CITY OF BOULDER, COLORADO
c/o National Research Center, Inc.
3005 30th Street
Boulder, CO 80301

Presorted
First Class Mail
US Postage
PAID
Boulder, CO
Permit NO. 94



CITY OF BOULDER, COLORADO
c/o National Research Center, Inc.
3005 30th Street
Boulder, CO 80301

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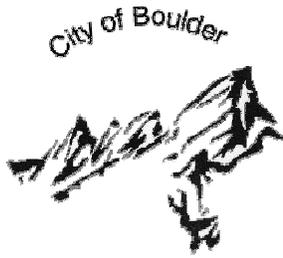
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Matthew Appelbaum, Mayor
Crystal Gray, Deputy Mayor

Suzy Ageton, Councilmember
Macon Cowles, Councilmember
Angelique Espinoza, Councilmember
Shaun McGrath, Councilmember
Lisa Morzel, Councilmember
Susan Osborne, Councilmember
Ken Wilson, Councilmember

CITY COUNCIL OFFICE

Dear Boulder Valley Resident,

We all travel and transportation has been an important concern in the Boulder Valley for many years. The City works to accommodate your travel desires by conducting studies, preparing plans, and making transportation improvements. To meet your travel needs, we've built and repaired roads, bicycle and pedestrian paths, and added bus routes in Boulder. Periodically we also turn to our residents to get information on their travel so that we can understand existing travel patterns and work to improve your travel experience. This survey is the primary data source for understanding the travel patterns of Boulder Valley residents.

Now you can help! I am inviting a member of your household to be a part of a small group of Boulder Valley residents who will keep a simple travel log for a single day during the week of September 14, 2009. It's similar to one of the Nielson diaries for logging television viewing but it has a different purpose. Basically, the log will show how you get where you're going and how long it takes you to get there. Your household was chosen at random and your participation will be completely confidential.

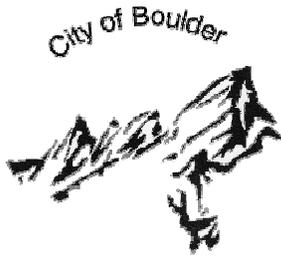
Because we want to know what the travel circumstances are for all of Boulder Valley, we need a representative sample of residents in our community. **That's why it's so important that the person in your household who completes the travel diary be a household member who is in town on that day age 16 or older and who most recently had a birthday. Year of birth is not to be considered.**

If that person (the one who's at least 16 and most recently had a birthday) is willing to help with this simple but very important project, he or she should complete the enclosed household survey, read the enclosed instructions and complete the travel diary on **Monday September 14**. The survey and travel diary should be mailed to National Research Center, Inc. (the company conducting the study) using the enclosed postage-paid envelope. If you have questions, call Rachel or Erin at 303-444-7863 and they'll be happy to talk with you.

Thank you very much! The log is easy to complete and will be helpful to our community.

Sincerely,

Matthew Appelbaum
Mayor



Matthew Appelbaum, Mayor
Crystal Gray, Deputy Mayor

Suzy Ageton, Councilmember
Macon Cowles, Councilmember
Angelique Espinoza, Councilmember
Shaun McGrath, Councilmember
Lisa Morzel, Councilmember
Susan Osborne, Councilmember
Ken Wilson, Councilmember

CITY COUNCIL OFFICE

Dear University of Colorado Student,

We all travel and transportation is an important concern in the Boulder Valley. The city works to accommodate your travel desires by conducting studies, preparing plans, and making transportation improvements. To meet your travel needs, we've built and repaired roads, bicycle and pedestrian paths, and added bus routes in Boulder. Periodically we also turn to our residents to get information on their travel so that we can understand existing travel patterns and work to improve your travel experience. This survey is the primary data source for understanding the travel patterns of Boulder Valley residents.

Now you can help! I am inviting you to be a part of a small group of Boulder Valley residents who will keep a simple travel log for a single day during the week of September 14, 2009. Basically, the log will show how you get where you're going and how long it takes you to get there.

Students at the University are a large part of Boulder's population, and it is essential that the city get information about student's transportation behavior in order to plan for this important segment of our community.

Your assigned travel day is **Monday, September 14**. The survey and travel diary should be mailed to National Research Center, Inc. (the company conducting the study) using the enclosed postage-paid envelope. If you have questions, call Rachel or Erin at 303-444-7863 and they'll be happy to talk with you.

Thank you very much! The log is easy to complete and will be helpful to our community.

Sincerely,

Matthew Appelbaum
Mayor

2009 Travel Diary Study

TRAVEL SURVEY INSTRUCTIONS

THE MATERIALS

This packet contains:

- a) a cover letter and these instructions
- b) a Travel Diary
- c) an overflow sheet, if needed to record more trips than fit on the Travel Diary
- d) a Household Travel Survey
- e) a postage paid return envelope.

Please review the materials briefly before continuing to read the instructions. If any materials are missing, please call Rachel or Erin of National Research Center, Inc. at 303-444-7863, and materials will be mailed to you.

YOUR TRAVEL DIARY DAY

The day selected for you to record your travel on the enclosed Travel Diary is **MONDAY, SEPTEMBER 14, 2009**. You should keep your travel diary on this day regardless of weather or number and type of activities you have planned.

IMPORTANT: You should not change your travel behavior just because you are keeping this diary. If you were going to take the car, take the car. If you were planning to go by bus, go by bus. Don't let the fact that you are recording your travel influence how or whether you go places.

Honest responses of your travel behavior for a single day whether your travel is typical or unusual are needed for this study to be reliable. Please record all trips whether you are a passenger, driver or pedestrian. If you will be out of town or have a problem with the day you have been assigned, you may complete the diary on the same day of the next week (on Monday, September 21).

COMPLETING THE TRAVEL DIARY

The travel diary is the 8½" x 11" card included in this packet. You should take this card with you on **Monday**, your assigned travel diary day. On it you will report every trip you make, beginning at 12:01 am (that is, right after midnight of the previous day) until 12:00 midnight on your assigned travel diary day.

WHAT IS A "TRIP"?

A trip is a one-way journey that takes you further than one city block (about 200 yards) from your original location. Examples of trips include:

- 1) You take your car to work 6 miles away
- 2) You walk 2 blocks to the grocery store
- 3) You carpool with another person 12 blocks to the Park-n-Ride (bus pick-up)
- 4) You ride your bike 2 miles along the Boulder Creek for enjoyment
- 5) You jog along the Mesa Trail for exercise
- 6) You take the bus to Denver for a concert.

Examples of what does **NOT** count as a "trip" include:

- 1) You walk across the hall to use the photocopier;
- 2) You drive to the next building (less than 200 yards away) for a business meeting;
- 3) You skateboard across the street to the neighbor's house.

A round trip counts as two trips. For example:

- 1) You drive to the grocery store and back. Record two trips on your diary.
- 2) You go for a half-hour jog or bike ride. (This is counted as two trips because you leave home on the first leg of the trip and return home on the second leg. Your "destination" is your halfway point.)

(continued on reverse side)

What if you don't make any trips during the day assigned to you? There is a box on the Travel Diary form you can check if you make no trips on your assigned travel day. Please check this box, and complete 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 make more than 9 trips during the day assigned to you? The Travel Diary allows you to record up to 9 trips. If you take more than this number on your assigned day, please use the overflow sheet. If you make more trips than can be recorded on the Travel Diary and overflow sheet, call the National Research Center, and they will either record your trips over the phone or send you more overflow sheets, or simply 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. Paula or Erin will give you special instructions for completing your Travel Diary.

What about trips with multiple stops? Record each leg of the trip. An example:

You walk with your 8-year old to school, then catch the bus to downtown Boulder to shop, then return home, stopping to pick up a prescription at the drugstore. This would be counted as four trips. Leaving from your home the destination is the school. The next destination is downtown. Returning back to your home, record first the stop at the drugstore, and then your home.

What about walking to a bus stop (or other trips with changes of travel mode)? Please record every leg of a trip, even when it is just to change travel modes. For example, if you drive to the Park-n-Ride (1 mile), then take the bus to Denver (25 miles) and then walk 5 blocks to work, all three of those trips should be recorded on the Travel Diary form. The purpose of the first two trips would be to “change travel mode”, while the third would be “work commute”.

What about bus transfers? Stops only to transfer from one bus to another do not count as separate trips.

EXAMPLE OF A COMPLETED TRAVEL DIARY

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). After work, Jane 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.

The Travel Diary example on the next page 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.
4. 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”.
5. 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.
6. 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.

The **INSTRUCTIONS FOR COMPLETING THE TRAVEL DIARY** on the reverse side of the example diary give more detailed information about completing your diary form. Please contact Rachel or Erin at National Research Center, Inc. at 303-444-7863 if you have any other questions. Thank you very much for your participation in this study.

EXAMPLE OF A COMPLETED TRAVEL DIARY
 (See previous page for descriptions of Jane's travel on her assigned day.)
 2009 Travel Diary

Please record all of your trips, whether you are a passenger, driver, 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 trip.

Name: <u>Jane Smith</u> Address: <u>3523 N. 16th Street</u> City/State/Zip: <u>Boulder, CO 80302</u> DIARY DATE: <u>9/21/09</u>	STARTING POINT ADDRESS Street Address: <u>SAME</u> City/State/Zip: _____ Nearest Cross Streets: <u>16th</u> & <u>Kalmia</u>	I did not leave the house today: <input type="checkbox"/> If using motor vehicle, list odometer reading: at beginning of day: <u>79645</u> at end of day: <u>79661</u>
--	---	---

trip #	DESTINATION (address, building or nearest cross streets)	trip start time		trip end time		trip purpose	travel method	est. trip miles	number of people in vehicle (inc. yourself)		
		hour:min	am/pm	hour:min	am/pm				children	adults	
1	<u>Uni. Hills School</u> <u>Broadway</u> & <u>16th Street</u>	<u>7:30</u>	AM	<u>7:50</u>	AM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	4	1	1
2	<u>CU - Old Main</u> _____ & _____	<u>7:55</u>	AM	<u>8:05</u>	AM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	1	0	1
3	<u>The Hill (Abo's)</u> <u>College</u> & <u>13th Street</u>	<u>12:00</u>	Noon	<u>12:10</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	5 blocks		
4	<u>CU - Old Main</u> _____ & _____	<u>12:55</u>	PM	<u>1:05</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	5 blocks		

trip #	DESTINATION (address, building or nearest cross streets)	trip start time		trip end time		trip purpose	travel method	est. trip miles	number of people in vehicle (inc. yourself)		
		hour:min	am/pm	hour:min	am/pm				children	adults	
5	<u>Uni. Hills School</u> <u>Broadway</u> & <u>16th Street</u>	<u>5:05</u>	PM	<u>5:15</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	1	0	1
6	<u>Home</u> _____ & _____	<u>5:20</u>	PM	<u>5:35</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	4	1	1
7	<u>Orchard</u> & <u>19th Street</u>	<u>5:50</u>	PM	<u>6:05</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	1		
8	<u>Home</u> _____ & _____	<u>6:05</u>	PM	<u>6:20</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	1		
9	<u>Willow Springs</u> <u>Shopping Center</u> <u>Iris</u> & <u>28th</u>	<u>7:15</u>	PM	<u>7:40</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	10 blocks		
10	<u>Home</u> _____ & _____	<u>8:05</u>	PM	<u>8:30</u>	PM	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger	2. personal business 4. school 6. other work/business 8. eat a meal 10. change travel mode	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk	10 blocks		

Instructions for Completing the Travel Diary

2009 Travel Diary

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 trip.

Please record all of your trips, whether you are a passenger, driver, or pedestrian.

I did not leave the house today:

If using motor vehicle, list odometer reading: _____

at beginning of day: 79645

at end of day: 79661

Name: Jane Smith

Street Address: SAME

City/State/Zip: Boulder, CO 80302

Nearest Cross Streets: 16th & Kalmia

DIARY DATE: 9/21/09

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

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 list the address, building or nearest intersection to the location you are going. You do not need to determine the precise address of every location if you can name an intersection, or a building/store, which is common enough to be recognized (e.g., "McGuckin Hardware").

Please try to keep good estimates of the start and end times. These are the start and end times of the TRIP, not of the reason you are making the trip. For example, if you go to the store, please record the time you left for the store (trip start time), and then the time you arrived at the store (trip end time). When you leave the store, please record the time you left the store (trip start time), and then the time you arrived at your next destination (trip end time). The time you leave the store is not the trip end time of the first trip; we are only interested in the duration of the actual trip to the store, not how much time was spent at the store.

trip #	DESTINATION (address, building or nearest cross streets)	trip start time (hour:min am/pm)	trip end time (hour:min am/pm)	trip purpose	travel method	est. trip miles	number of people in vehicle (inc. yourself)
				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. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s)) 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk 10. other:		children adults
1	Uni. Hills School & Broadway 16th Street	7:30 AM	7:50 AM	6. other work/business	1. car or light truck (passenger)	4	1 1

Please include yourself as one of the adults if you are in a vehicle. "Children" refer to those under age 18 who would not be able to drive themselves. (Include 16 and 17 year old children as adults if they have a driver's license.)

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. If you are in a vehicle with an odometer, please check it at the beginning and end of each trip you make.

Be careful if you select "car or light truck", because there are two answers for this category -- passenger or driver. If you use one of these categories, please also fill in the number of adults and children in the vehicle (including yourself as one of the adults). "Large commercial truck" refers to large trucks used by businesses for commercial purposes.

Go Home: A trip from some other location to your usual place of residence.

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 by a teacher or other employee to the school where employed should be classified as a work commute trip. If you are driving a student to school, the trip should be classified as "drive a passenger."

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.)

Social/Recreation: Trips made 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: Any trip you make which 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.

2009 Travel Diary

Please record all of your trips, whether you are a passenger, driver, 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 trip.

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 #

DESTINATION
 (address, building or
 nearest cross streets)

trip start time
 hour:min am/pm

trip end time
 hour:min am/pm

trip purpose

travel method

est. trip miles

number of people in vehicle (inc. yourself)
 children adults

example

Foothill Elementary
Broadway & Grape

7:13 AM

7:22 AM

1. go home
 3. shopping
 5. work commute
 7. social/recreation
 9. drive passenger
 11. other: →

1. car or light truck (driver)
 2. car or light truck (passenger)
 3. bus/transit (route(s))
 4. school bus
 5. large commercial truck
 6. motorcycle
 7. taxi (passenger)
 8. bicycle
 9. walk
 10. other: →

3 miles

1 1

1

_____ & _____

_____ : _____

_____ : _____

1. go home
 3. shopping
 5. work commute
 7. social/recreation
 9. drive passenger
 11. other: →

1. car or light truck (driver)
 2. car or light truck (passenger)
 3. bus/transit (route(s))
 4. school bus
 5. large commercial truck
 6. motorcycle
 7. taxi (passenger)
 8. bicycle
 9. walk
 10. other: →

2

_____ & _____

_____ : _____

_____ : _____

1. go home
 3. shopping
 5. work commute
 7. social/recreation
 9. drive passenger
 11. other: →

1. car or light truck (driver)
 2. car or light truck (passenger)
 3. bus/transit (route(s))
 4. school bus
 5. large commercial truck
 6. motorcycle
 7. taxi (passenger)
 8. bicycle
 9. walk
 10. other: →

3

_____ & _____

_____ : _____

_____ : _____

1. go home
 3. shopping
 5. work commute
 7. social/recreation
 9. drive passenger
 11. other: →

1. car or light truck (driver)
 2. car or light truck (passenger)
 3. bus/transit (route(s))
 4. school bus
 5. large commercial truck
 6. motorcycle
 7. taxi (passenger)
 8. bicycle
 9. walk
 10. other: →

trip #	DESTINATION (address, building or nearest cross streets)	trip start time		trip end time		trip purpose	travel method	est. trip miles	number of people in vehicle (inc. yourself)	
		hour:min	am/pm	hour:min	am/pm				children	adults
4	_____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: _____	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk 10. other: _____			
5	_____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: _____	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk 10. other: _____			
6	_____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: _____	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk 10. other: _____			
7	_____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: _____	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk 10. other: _____			
8	_____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: _____	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk 10. other: _____			
9	_____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: _____	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 9. walk 10. other: _____			

Overflow Sheet

trip #	DESTINATION (address, building or nearest cross streets)	trip start time		trip end time		trip purpose	travel method	est. trip miles	number of people in vehicle (inc. yourself)	
		hour:min	am/pm	hour:min	am/pm				children	adults
10	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
11	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
12	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
13	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
14	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
15	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			

trip #	DESTINATION (address, building or nearest cross streets)	trip start time		trip end time		trip purpose	travel method	est. trip miles	number of people in vehicle (inc. yourself)	
		hour:min	am/pm	hour:min	am/pm				children	adults
16	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
17	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
18	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
19	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
20	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			
21	_____ _____ _____ & _____ _____	_____ : _____	_____	_____ : _____	_____	1. go home 3. shopping 5. work commute 7. social/recreation 9. drive passenger 11. other: →	1. car or light truck (driver) 2. car or light truck (passenger) 3. bus/transit (route(s): _____ 4. school bus 5. large commercial truck 6. motorcycle 7. taxi (passenger) 8. bicycle 10. other: →			

2009 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 to 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 kept in strict confidence and only used in the aggregate. 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, such as a meal (pizza, etc.), groceries, haircuts or other goods and services? (Please include deliveries for items you ordered by phone, through a mail order catalogue, or by Internet.)

- no → Go to question #3
 yes → From how many different sources did you receive 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. In the last week, about how frequently have you ridden a bicycle:

To Shop, Get a Meal

or Run Errands

For Commuting

For Fun or Exercise

- | | | |
|--|--|--|
| <input type="checkbox"/> 5 or more times | <input type="checkbox"/> 5 or more times | <input type="checkbox"/> 5 or more times |
| <input type="checkbox"/> 3 to 4 times | <input type="checkbox"/> 3 to 4 times | <input type="checkbox"/> 3 to 4 times |
| <input type="checkbox"/> Once or twice | <input type="checkbox"/> Once or twice | <input type="checkbox"/> Once or twice |
| <input type="checkbox"/> Not at all | <input type="checkbox"/> Not at all | <input type="checkbox"/> Not at all |

4. Are you eligible to have an Eco-Pass, an annual pass that allows you unlimited bus rides? (Please check all that apply.)

- yes, through my employer
 yes, through my neighborhood
 yes, a CU Boulder student Buff One pass
 yes, CU Boulder faculty/staff Buff One pass
 yes, other pass: _____
 no, I am not eligible for an Eco-Pass → go to #7

5. Did you pick up a pass (or passes)?

- yes
 no → go to question #7

6. About how often, on average, do you use your Eco-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

7. Are you employed?

- no → Go to question #13
 yes, part-time
 yes, full-time

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

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

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

Building or address: _____

Nearest cross streets: _____

& _____

10. Employees telecommute when they fulfill their job responsibilities at home by substituting telecommunications (computer, Internet/Web and/or phone) for work-related travel. How often, if ever, do you telecommute for work? (Note: do not include times you take work home to do in the evenings, only times you work from home instead of traveling to a workplace.)

- Every work day (I always work from my home)
 3 to 4 times per week
 2 to 3 times per week
 Once or twice a month
 Occasionally
 Never

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

- no → Go to question #13
 yes → About how many

12. Did working at home reduce the number of single-occupancy vehicle (drive alone) trips you made on the day you completed the travel diary compared to days you do not telecommute?

- No, I made the same number of drive alone trips
 Yes, reduced about 2 drive-alone trips
 Yes, reduced more than 2 drive-alone trips

HOUSEHOLD INFORMATION

13. How many passenger cars, vans and light trucks does your household own or normally have use of?

vehicles

14. How many usable bicycles does your household have?

bicycles

15. About how much was the TOTAL 2008 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

16. 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, fraternity or sorority, nursing home) → go to question #20
- other: _____

17. Do you rent or own your residence?

- rent own

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

<u>Age category</u>	<u>Number in Household</u>
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	_____

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

- no
 yes → How many are full-time?

students

How many are part-time?

students

INDIVIDUAL INFORMATION

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

years

21. Are you a student at the University of Colorado, Boulder campus?

- no
 yes

22. What is your gender?

- male
 female

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

24. How much education have you completed?

- 0 to 11 years of school
- high school
- some college or associate's degree
- bachelor's degree
- graduate/professional degree

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.