

Denver Car Share Program 2016 Program Summary

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1. Introduction

In May of 2013, the City and County of Denver (the City) adopted rules and regulations pertaining to private operators providing car sharing to Denver residents, employees, and visitors. Under the arrangement, car share operators provide a fleet of vehicles that individuals may use for personal or business trips, provided they are registered members with the car share provider. The Denver Car Share Program allows qualified car share operators to purchase permits to either dedicate a parking space in the ROW for the operator's use or purchase an area permit that allows the vehicle to park at meters without payment, park in exemption of two hour or greater time limits, and park in Residential Parking Permit areas. Permit fees cover the cost of lost meter revenue and the value of on-street space as well as program administration costs. Such an arrangement adds to the attractiveness of the service because it increases the number of on-street parking options available to car share members.

The City outlined a series of goals for the program in the rules and regulations, including reducing parking demand, reducing vehicle miles traveled, and enhancing mobility options for car share members. The rules and regulations required that each service provider conduct an annual survey of their membership to gauge the program's effectiveness in meeting these goals. Each car share provider distributed their own survey language to their respective car share members. Participating car share providers at the time of this report included eGo Car Share, car2go, Zipcar, and Enterprise CarShare. This report summarizes the results of the program's third year of operation (2015-2016), and provides a comparison to the program's first two years of operation (2013-2015) where applicable.

2. Program Overview

The membership survey included questions about travel habits, modes, and types of trips made using a car share. This section provides an overview of members and their travel habits.

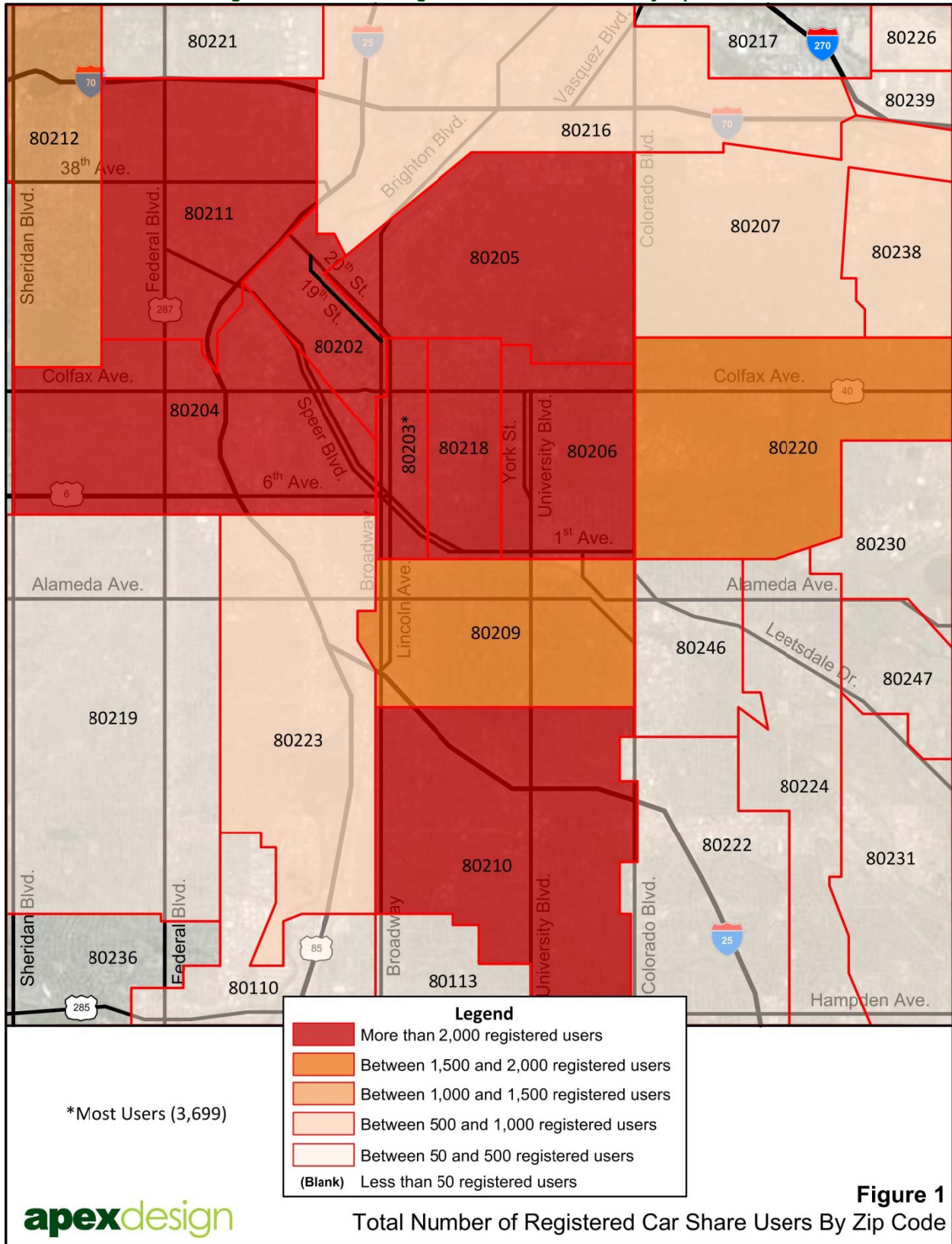
2.1. Membership

The typical car share member lives downtown, in one of the neighborhoods adjacent to downtown or in one of the neighborhoods adjacent to University of Denver, has a commute of less than five miles, does not typically drive to work, and uses car share for personal use.

Figure 1 shows the number of members living in each zip code in and around the downtown Denver area. As in 2015, the highest number of car share members resides in the Capitol Hill neighborhood, with all of the neighborhoods surrounding downtown showing high membership numbers. Figure 2 shows the percentage of the total number of registered car share members in each zip code. While these neighborhoods continue to have the highest percentage of car share members, the percentages displayed on this graphic are lower than those that were shown in 2015. This appears to be due to car share members using the service but living outside of the Denver city limits. It should be noted that some car share providers submitted zip codes only for Denver residents that use the Denver Car Share Program while others submitted zip codes for all individuals that use the Denver Car Share Program, so the results provided in Figure 2 may actually be skewed towards higher percentages in Denver than reality. Figure 3 shows the percentage of the total population that are registered car share users by zip code. The zip code with the highest percent of its population being car share members is downtown, where more than one in four residents is registered with a car share provider; the high

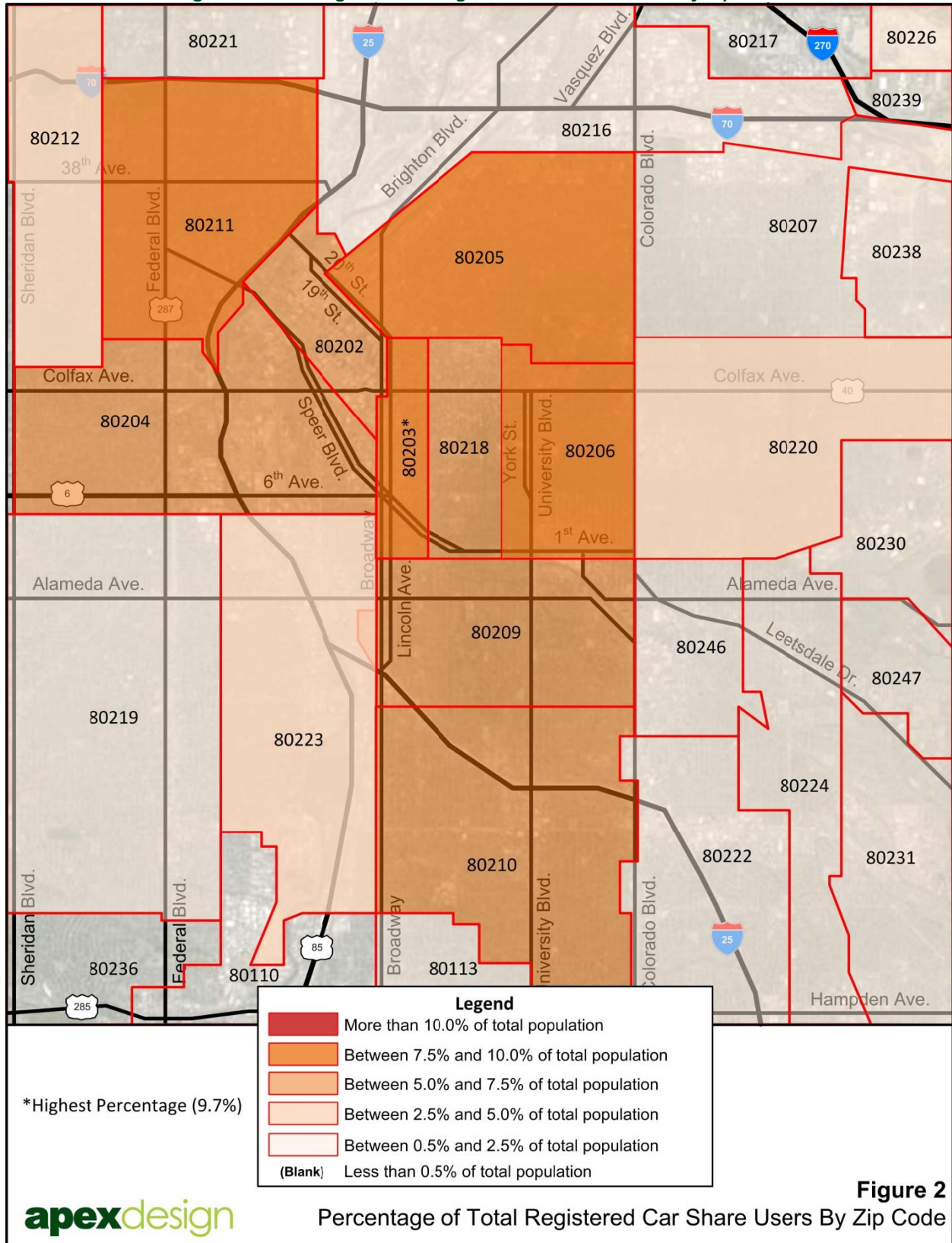
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Figure 1: Number of Registered Car Share Users by Zip Code



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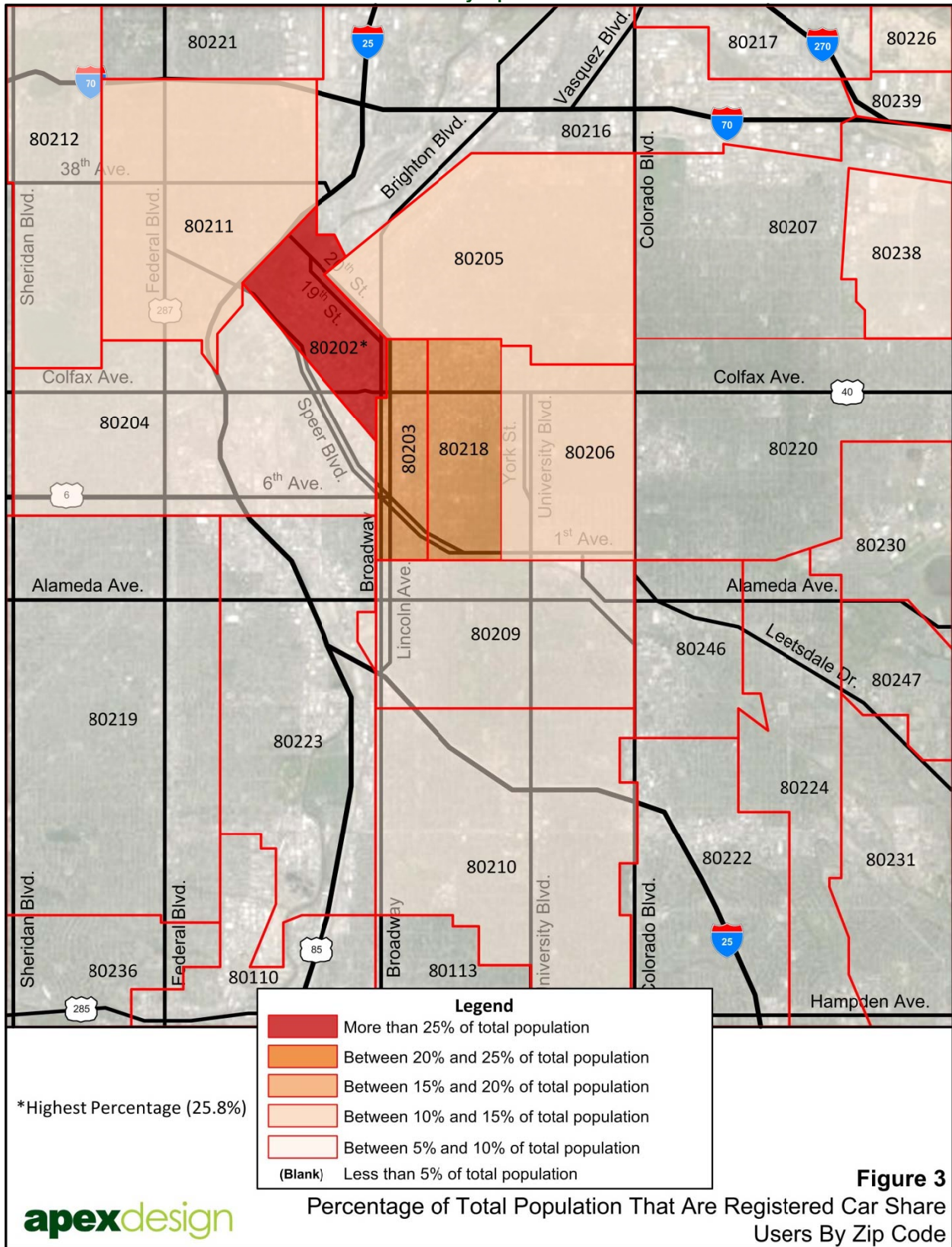
Figure 2: Percentage of Total Registered Car Share Users by Zip Code



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Figure 3: Percentage of Total Population That Are Registered Car Share Users by Zip Code



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membership in the Capitol Hill area translates to one in six residents being registered in the program.

Car share membership also appeared to be high in the University of Denver area. This can be attributed to the high population of college students, faculty, and staff in the area. Surveys conducted by the University of Denver Center for Sustainability showed that roughly 10% of the 12,000 student population were registered members of a car share service provider. These students indicated that car share services were primarily used for running errands and recreational trips on the weekends. Additionally, most parents of students indicated that they preferred alternate modes of transportation to personal vehicle use.

As Table 1 indicates, membership in the Denver Car Share Program has grown steadily in the past three years and there are now approximately 32,750 members in 2016. This number is based on the active members that the car share providers reported (it should be noted that there are additional members that have not actively used their membership within the twelve months prior to the survey). These 32,750 car share members took approximately 380,300 car share trips in 2016, a 36% reduction from 2015 when members took 591,556 trips. Changes in service provided by car share operators over the past year may have contributed to the observed decline in the number of trips.

Table 1: Annual Denver Car Share Program Membership

Year	Car Share Members
2014	17,500
2015	28,500
2016	32,750
Average Annual Percent Growth	36.8%

2.2. Personal Mobility

The typical car share member owned one or two vehicles and drove less than 10,000 miles per year prior to joining a car share. The vast majority of car share members walk to a car share location when using their membership, are not Denver B-cycle members, and do not have an RTD Eco Pass. Once they arrive at the car share location, they generally drive between 2-5 miles to their destination. Over 25 percent of car share members surveyed have given up a vehicle and another 15 percent have considered giving up a vehicle as a result of becoming a car share member. Prior to becoming a member, 40 percent of those surveyed never commuted by car, while 31 percent commuted by car five days a week. After becoming members, the number of people who never commute by car stayed fairly consistent, but those commuting by car five days a week dropped by five percent. As shown in Table 2, these findings are similar to the 2014 and 2015 survey results. One possible explanation for the shift away from five-day-a-week commuting by car is that the people who used to drive every day because they needed their vehicle during the day now have access to a vehicle even when they do not commute by car, allowing them to shift to transit or some other alternate mode for their commute trip.

Table 2: Commuting Habits Before & After Membership

Commuting Habits	2014		2015		2016	
	Before	After	Before	After	Before	After
Never Commute by Car	39%	36%	41%	40%	40%	38%
Commute by Car 5 days a week	31%	26%	31%	26%	31%	25%

Additionally, car share membership has been shown to result in changes to members’ personal mobility choices. After joining a car share, members walked, took public transit, and rode their bikes more often than prior to becoming members. On the other hand, members drove alone, carpooled, used B-Cycle, and used motorcycles or scooters less than prior to becoming members. Membership did not significantly impact working from home. These mobility choices are further discussed in Section 3.3 Enhanced Mobility and summarized in Table 8.

2.4. Trip Purpose

As shown in Table 3, members use car share most frequently for personal errands, with over 66 percent of members indicating they have used it for personal errands at least a few times a year, and 27 percent indicating they have used it for personal errands at least once a month. Entertainment was the second most frequent trip purpose, with 64 percent of members indicating they have used it for those types of trips at least a few times a year. Around half of all members also used carshare services for commuting (51 percent), visiting friends (48 percent), recreation (46 percent), and work-related trips (43 percent) at least a few times a year. Other frequent uses include: grocery shopping (40 percent), retail shopping (38 percent), healthcare (32 percent), sporting events (30 percent), and giving someone a ride (26 percent). Members very rarely use car share for moving/hauling (13 percent), trips to the airport (11 percent) and education (9 percent). These 2016 findings are all relatively similar to the results of the 2015 survey. It should be noted that a change in phrasing of the questions between the 2014 and 2015 surveys may have resulted in overall higher percentages reported in 2014 (in 2015 the “rarely” category was changed to “a few times a year”).

Table 3: Trip Purpose

Trip Purpose	2014 Percent of Car Share Members ¹	2015 Percent of Car Share Members ²	2016 Percent of Car Share Members ²
Personal Errands	73%	60%	66%
Entertainment (theater, concert, etc.)	76%	62%	64%
Commuting	59%	45%	51%
Visiting Friends	60%	44%	48%
Recreation	57%	43%	46%
Work Related Trips	47%	38%	43%
Grocery Shopping	45%	35%	40%
Retail Shopping	42%	33%	38%
Healthcare	37%	24%	32%
Sporting Events	N/A ³	32%	30%
Giving Someone a Ride	36%	26%	26%
Moving/Hauling	14%	9%	13%
Trips to the Airport	11%	8%	11%
Education	12%	9%	9%

1. The percent of car share members shown from 2014 are those that used car share for the type of trip listed anywhere from rarely to more than five times a month.

2. The percent of car share members shown from 2015 and 2016 are those that used car share for the type of trip listed anywhere from a few times a year to more than twice a week.

3. This option was not included as a possible response in the 2014 survey.

2.5. Reasons for Using Car Share

Almost three in four members surveyed cited convenience/increased mobility options as one of the reasons why they joined a car share (72 percent). Parking flexibility was also a very common reason members joined a car share service (56 percent). Other common reasons include alternative modes of transportation (44 percent), cost savings (32 percent), lack of a

personal vehicle (33 percent), and environmental awareness (25 percent). These findings are discussed further in Section 3.3 and summarized in Table 7.

2.6. Parking

The vast majority (90 percent) of car share members surveyed have not changed their personal parking habits since becoming members. Two-thirds of car share members surveyed that do own a personal vehicle predominately park off-street, with the remaining one-third predominately parking on-street.

2.7. Car Share and Additional Vehicle Ownership

The survey included a question about whether members would consider giving up a car because of becoming a car share member. One in four members surveyed cited that they either gave up a car before becoming a member or gave up a car after becoming a member, while 15 percent cited that they have considered giving up a car but have not yet done so. Similarly, the majority of members surveyed cited that they would not purchase a new vehicle if car sharing disappeared (60 percent). One in four members surveyed are unsure if they would purchase an additional vehicle if car share disappeared, and another 15 percent would purchase an additional vehicle. As shown in Table 4, these results are similar to those from the 2014 and 2015 surveys, but it should be noted that more members now are actually giving up a car as opposed to just considering giving up a car.

Table 4: Car Share and Additional Vehicle Ownership

Vehicle Ownership	2014 Percent of Respondents	2015 Percent of Respondents	2016 Percent of Respondents
Either gave up a car before becoming a member or gave up a car after becoming a member	23%	22%	27%
Have considered giving up a car	22%	19%	15%
Would not purchase a new vehicle if car sharing disappeared	58%	55%	60%
Unsure if they would purchase an additional vehicle if car share disappeared	27%	20%	25%
Would purchase an additional vehicle	15%	17%	15%

3. Program Assessment

Per the City’s Rules and Regulations, the intent of the Denver Car Share Program is to provide the opportunity to reduce parking demand, reduce vehicle miles traveled, and enhance mobility options for members. This section assesses how well the program is meeting these three metrics after the third year of operation.

3.1. Reduce Parking Demand

Members were asked how many days a week they drove to work or school prior to joining a car share and how many days a week they drove to work or school after joining the program; this information was used to estimate the parking demand generated by car share members before and after joining the program. As Table 5 indicates, prior to joining, the 32,743 current car share members generated a combined parking demand of 78,367 vehicles per week. After joining the program, those same members generated a parking demand of 72,272 vehicles per week, thereby reducing demand by almost eight percent. This is a slight improvement on the seven percent parking reduction reported in the 2015 survey. These results continue to suggest that the program is having a positive effect on reducing parking demand in the areas that it serves.

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Table 5: Weekly Parking Demand Created by Car Share Members before and after Joining the Denver Car Share Program

Days/Week Driving to Work/School	Before Joining Car Share		After Joining Car Share	
	Number of Members	Parked Vehicles/Week	Number of Members	Parked Vehicles/Week
0	13,010	0	12,591	0
1	2,138	2,138	3,509	3,509
2	2,319	4,637	2,787	5,573
3	2,190	6,569	2,451	7,354
4	2,061	8,244	2,400	9,598
5	10,021	50,106	8,283	41,413
6	361	2,164	232	1,393
7	644	4,508	490	3,432
Total	32,743	78,367	32,743	72,272
Percent Reduced, 2016				7.8%
Percent Reduced, 2015				7.0%
Percent Reduced, 2014				4.0%

3.2. Reduction in Vehicle Miles Traveled

Members were asked approximately how many miles they drove per month prior to joining a car share and how many miles they now drive per month after joining the program. As Table 6 indicates, prior to joining a car share, members drove an average of approximately 7,100 miles per year, and after joining they drove approximately 6,150 miles per year, a 13 percent reduction. This corresponds to approximately 31.1 million fewer vehicle miles traveled by car share members in the past year. In 2016 car share members drove 4.5 million fewer vehicle miles than members did in 2015, suggesting that as membership in the program increases, it is having a more positive effect on reducing vehicle miles traveled in the region.

Table 6: Annual Vehicle Miles Traveled by Car Share Members Before and After Joining the Denver Car Share Program

Average Annual Mileage Before Joining Car Share	Average Annual Mileage After Joining Car Share	Net Average Reduction in Mileage
7,100	6,150	950
Total Car Share Members		32,743
Approximate Total Mileage Reduction		31,105,850
2015 Total Mileage Reduction		26,635,600

3.3. Enhanced Mobility

Members were asked to identify the reasons they use car share. As Table 7 indicates, 72 percent of the respondents in 2016 identified Convenience and Increased Mobility Options as one of the reasons for joining the program. This level of response would indicate that the members believe that the program meets the stated intent of enhancing mobility options. It should also be noted that the Convenience and Increased Mobility Options response did drop rather significantly between 2014 and 2016, from 91 percent to 72 percent. In fact, the percent of respondents that selected each reason for using car share dropped from 2014 to 2016 with the exception of the Alternative Modes of Transportation Do Not Meet All Mobility Needs response, which in 2014 was listed as Lack of Alternative Transportation. The drop in responses across the board may be due to changes in the survey after 2014 (i.e., more options being provided and respondents only choosing a limited number of options), because the percentages for each reason remained fairly consistent in both the 2015 and 2016 surveys.

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Table 7: Reasons Members Use the Denver Car Share Program

Reason	2014 Percent of Respondents ¹	2015 Percent of Respondents ¹	2016 Percent of Respondents ¹
Convenience and Increased Mobility Options	91%	66%	72%
Parking Flexibility	76%	61%	56%
Alternative Modes of Transportation (Transit, Biking, etc.) Do Not Meet All Mobility Needs	29% ²	42%	44%
Lack of a Personal Vehicle	N/A ³	29%	33%
Cost Savings	45%	32%	32%
Environmental Awareness	35%	22%	25%
Variety of Vehicle Choices	36%	11%	13%
Other	N/A ³	18%	12% ⁴

1. Members were asked to select all of the options that applied to them, so the percentages shown add up to greater than 100.

2. This response was listed as "Lack of Alternative Transportation" in the 2014 survey.

3. This option was not included as a possible response in the 2014 survey.

4. "Other" option was only included in the survey by one car share service in 2016

A second way of assessing the program's effect on enhancing mobility is to examine how members' travel modes changed after they joined the program. Table 8 summarizes the responses to the various travel mode questions posed in the member survey. As indicated, members drove alone significantly less after joining a car share, and were also less likely to carpool, use a motorcycle or scooter, and use B-cycle. On the other hand, members increased their frequency of walking, taking public transit, and biking. Based on these results, it would appear that the program continues to be moderately effective in getting members to use other transportation options for their trips, instead of just switching their personal vehicle with a car share vehicle. Overall, the 2016 results are similar to those from 2015, with the notable exceptions of an increase in car share members walking and using public transportation, as well as fewer car share members driving alone in 2016 than were reported in 2014 and 2015.

Table 8: Travel Mode Use after Joining the Denver Car Share Program

Travel Mode	2016			2015	2014
	Less	Same	More	Net Change	Net Change
Walk	5%	61%	34%	+29%	+15%
Public Transit	14%	59%	27%	+13%	-5%
Bicycle	10%	70%	19%	+9%	+7%
Work at Home	7%	82%	11%	+4%	+0%
B-Cycle	13%	80%	6%	-7%	-2%
Motorcycle/Scooter	14%	82%	4%	-10%	-6%
Carpool	17%	79%	4%	-13%	-11%
Drive Alone	34%	58%	7%	-27%	-37%

4. Downtown Denver Partnership Survey

Each fall, the Downtown Denver Partnership (DDP) surveys employees working in downtown Denver to examine the trends and habits of downtown commuters. The Downtown Denver Commuter Survey measures a sample of the downtown employee population to analyze commuting patterns, explore the attractiveness of transportation benefits and determine how commuters currently travel to their downtown work destinations. This survey differs from the Denver Car Share Program survey because it represents a cross-section of all employees in the downtown area, rather than just car share members.

Since 2012, the DDP survey has included several questions about car share membership, whether it is employer-provided or something the employee has elected to do on their own. This section summarizes the responses to car share-related questions from the DDP survey.

4.1. Downtown Employee Car Share Membership

In the 2016 survey, 13 percent of downtown employees indicated that they were members of a car share. While the car share membership percentage increased steadily between 2012 (when car share usage was first surveyed) and 2014 (one year after the City adopted regulations that allowed car share providers to purchase parking permits and provide “free” on-street parking to members), membership has generally remained at the same percentage for the past three years.

Table 9: Downtown Employee Car Share Membership

Year	Car Share Membership (as Percent of Total Downtown Employees)
2012	1.50%
2013	7%
2014	12%
2015	14%
2016	13%

4.2. Car Share as an Employer-Provided Benefit

Although employee membership has generally increased each year, very few employers have embraced it as an employer-provided benefit, and even fewer employees have elected to participate in it through their company. In 2016, only six percent of employees indicated it was a service offered by their employer, and only one percent of the employees indicated that they elected to receive it as a benefit, which is consistent with the results of the 2014 and 2015 surveys, as shown in Table 10. Instead, most employees elect to receive benefits such as transit passes and subsidized parking (50 percent use transit and 31 percent use a personal vehicle).

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Table 10: Employer-Provided Transportation Benefits

Transportation Benefits Offered by Downtown Employers	Percent of Downtown Employees Offered Benefit ¹			Percent of Downtown Employees Using Benefit		
	2014	2015	2016	2014	2015	2016
Car Share Membership and/or Usage Fees	8%	7%	6%	1%	1%	1%
Parking Space	62%	61%	58%	30%	31%	31%
Transit Pass	85%	81%	77%	56%	54%	50%
B-Cycle Membership and/or Usage Fees	17%	14%	13%	3%	2%	2%
Secure Bicycle Parking	57%	53%	54%	12%	11%	11%

1. This includes employers that offer the benefits regardless of how much of the cost is covered.

5. Summary and Recommendations

The 2016 survey results suggest that the Denver Car Share Program continues to be successful in achieving the three-pronged intent of reducing parking demand (car share members reduced their weekly parking impact by seven percent after joining the program), reducing vehicle miles traveled (car share members reduced their annual vehicle miles traveled by 13 percent after joining the program), and enhancing the mobility options for its users (72 percent of the members identified increased mobility as one of the reasons they joined the program). Overall membership in the program continues to grow steadily each year, and the Downtown Denver Partnership's annual survey continues to indicate that just under 15 percent of all downtown employees participate in car share.

Given the positive results and the continued growth in membership, it is recommended that the City continue to support the Denver Car Share Program through the provision of parking permits. However, to better measure the program's effectiveness, it is recommended that the car share providers all be encouraged to provide resident zip codes for anyone that utilizes the Denver Car Share Program. As discussed in Section 2.1, some car share providers submitted zip codes only for Denver residents that use the Denver Car Share Program while others submitted zip codes for all individuals that use the Denver Car Share Program. Consistency in how each provider submits data will help to generate a better understanding of Denver residents using the program versus residents of Denver's surrounding Metro Area using the program.