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August 2012

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Walking and Biking in California

Analysis of the CA-NHTS

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August, 2012

NOTICE

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1. INTRODUCTION

The California Strategic Highway Safety Plan (SHSP)[1] aims to make "walking and street crossing safer" and to "improve bicycling safety." To estimate the safety risk for pedestrians and bicyclists requires reliable counts of the number of pedestrian and bicycle crashes and collisions and the amount of walking and biking. To create estimates of the amount of walking and biking in the state that can be used to estimate the exposure of bicycles and pedestrians to crashes, the State of California purchased an add-on to the 2009 National Household Travel Survey (called the CA-NHTS in this report).

The CA-NHTS provides a significant opportunity for California decision-makers to better understand walking and biking, filling an important gap in the existing knowledge base. The data from this survey can be used to calculate risk -- the probability of collision/injury/fatality per unit of exposure -- and help decision makers target resources effectively. In addition , reliable information on the amount, type, and characteristics of non-motorized travel as provided by the CA-NHTS can inform funding, policy, and planning initiatives and provide benchmark performance measures, as well as critical information for strategic planning and public education campaigns.

This report calculates exposure rates for pedestrians and bicyclists in the State, each Caltrans District, and for each of the Metropolitan Planning Organizations (MPO). In addition, a few relevant areas of analysis are used to detail important aspects of walking and biking behavior in the state. It is important to note that while the CA-NHTS is a rich resource for analyzing non-motorized activity, it will not give reliable estimates of walking and biking for local and neighborhood planning or facility design. Planning at the local level requires geographically specific information on the amount and location of walking and biking, for example, counts at the link and intersection level. The CA-NHTS does not provide this level of specificity.

The remainder of this report is divided into seven chapters. Chapter 2 presents an overall summary of the weighted and unweighted estimates of non-motorized travel for the State, each Caltrans District, and for the Metropolitan Planning Organizations. Chapter 3 investigates the difference in the estimates from the two methods CA-NHTS uses to obtain information on the amount of walking and biking: asking people to recall the number of times they walked and biked on the one hand, and on the other getting reports of walking and biking segments on the diary day as part of total daily travel. Chapter 4 presents some of the characteristics of walk and bike trips reported as part of daily travel, including the mode share for trips of one mile or less, the time of day and day of week profiles, purpose and the walk and bike trips to and from transit. Chapter 5 details the characteristics of the people who walk and bike, including age, sex, race, and immigrant status, including some analysis of people with transportation disabilities. Chapter 6 highlights some of barriers that people report to walking and biking more in California, analyzing the specific questions added by the State to help elicit information related to attitudes about, and barriers to, walking and biking. These added questions to the NHTS core interview are shown in Attachment A.

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[1] Available at http://www.dot.ca.gov/hq/traffops/survey/SHSP/SHSP-Booklet-version2_%20PRINT.pdf

This report presents an overview of the data collected on walking and biking, and provides control totals, margins of error, and other statistics useful for researchers and analysts interested in using the CA-NHTS. It is not meant to be an exhaustive presentation of the data available in the CA-NHTS. As a data resource, the CA-NHTS is available for further analysis by researchers, policy-makers, and others interested in the amount and type of travel by non-motorized means. In addition to the information on walking and biking, the CA-NHTS has detailed travel information of trips taken by members of each sampled household for all purposes and by all means of transport. The full 2009 NHTS (including the core data for California and all 50 states) can be accessed at http://ornl.nhts.gov.

This report presents the results of the first task of a larger project, the objective of which is to improve understanding of non-motorized travel in California and the factors that influence that travel. The project involves five tasks:

1.   Descriptive analysis of NHTS-CA results

2.   Comparison to 2002 Department of Public Health Pedestrian Survey data

3.   Development of spatial data on land use, transportation, and socio-demographic characteristics by geographic area

4.   Modeling of walking and bicycling activity as a function of spatial data

5.   Preparation of an executive summary

1.1 PROFILE OF CA-NHTS

Coverage: The CA-NHTS collected travel data from a representative sample of the civilian, non-institutionalized population in California. Household members included people aged 5 and older who regularly reside in the sampled household as their primary place of residence. It did not include group quarters, such as prisons, hospitals, and nursing homes. Telephones in dorm rooms and fraternity/sorority houses were eligible for sampling provided that the residence had less than 10 household members sharing the same phone line. Therefore, students who normally reside at school but were living at home for the summer were not considered household members at their parents' home, but were eligible to be sampled where they resided while attending school.

Sample Size: The sample for CA-NHTS was a population-proportioned sample with an over-sample in San Diego County. Table 1 shows the number of sampled households in the State and in each Caltrans District. A final total of 21,225 households were completed. Overall, 74.3 percent of households contacted

completed the survey (a 74.3 cooperation rate) and 28.2 percent of all eligible households that were originally sampled were complete (a 28.2 percent response rate)[2].

Table 1 Sample Size by Caltrans District

Geography	Total Sample (Households)
California	21,225
District 1 Eureka	255
District 2 Redding	326
District 3 Marysville	1,609
District 4 Oakland	3,808
District 5 San Luis Obispo	735
District 6 Fresno	990
District 7 Los Angeles	3,767
District 8 San Bernardino	1,566
District 9 Bishop	22
District 10 Stockton	815
District 11 San Diego*	6,050
District 12 Irvine	1,282

*District 11 (San Diego) had a supplement of 4,600 households

Weighting: The CA-NHTS sample data were weighted to the 2008 American Community Survey (for households) and the Census Population estimates (for persons). Eight household characteristics were used in weighting the sampled households, and three person characteristics, as shown in Table 2. Two geographic areas were weighted separately: San Diego (which had an additional sample supplement) and the remainder of the State. Separate weights were generated for the random child aged 5-15 selected for the Safe Routes to School module.

In the Version 2 release (CA-NHTS 2009 V2) the weights were trimmed to remove extreme outliers that were thought to be affecting the precision of the estimates. Person weights that were 2.5 times larger (or smaller) than the median weight were candidates for trimming. The full weighting report is available on the NHTS website at: http://nhts.ornl.gov/2009/pub/WeightingReport.pdf.

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[2] Using CASRO method RR3 at:
https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/1013/NWAF%20AAPOR%20Outcome%20Rate%20Documentation.pdf?sequence=1

Table 2 Household and Person Characteristics Used for Weighting (CA-NHTS)

Household Characteristics Used in Weighting (2008 American Community Survey)
Home-owner vs. renter status
CBSA with more than 1 mil. population vs. CBSA with less than 1 mil. population vs. Other—micro-CBSA or non-CBSA (rural)
Quarter and travel day weekday/weekend
Travel day of week
Month
Households with no child vs. households with at least one child
Households with at least one person aged 65+ vs. households with no one aged 65+
Households with one or two persons vs. households with three or more persons
Person Characteristics Used in Weighting (Census Population Estimates, July 2008)
Sex by 5 age groups: 5-17[3], 18-24, 25-44, 45-64, 65 and older
Black vs. non-Black status
Hispanic vs. non-Hispanic status

Collection Period: The CA-NHTS was conducted over a 13-month period from April 2008 through April 2009. Travel days were assigned for all seven days, including holidays. The first assigned travel day was on March 28, 2008 and the last assigned travel day was on April 30, 2009. The household was sent a diary packet and an incentive in advance of the assigned travel day, and data for each household member was collected within 7 days of the assigned travel day. Children aged 5-15 were selected randomly—one child per household—to participate in the Safe Routes to School module.

Trip Definition: The definition of a "trip" in the CA-NHTS is any movement by any means from one address to another. However, not all walking and biking trips are so purposeful—some begin and end at the same place, such as just going for a bike ride or walking the dog around the neighborhood. In order to assign locational information identifying where the trip took place the respondent was asked to identify the farthest point, generally as an intersection. The walk or bike trip was then coded as an outbound portion to the farthest point (where a location was geocoded) and an inbound portion from the farthest point back to the origin.

Figure 1 shows an example of how trips would be collected on the CA-NHTS travel diary: Trip #1 would be coded as a trip to work with transit (subway) as the means of travel, including the access coded as car and the egress coded as walk. Trip #2 would be coded as a trip to "get a meal" with walk as the means of travel, and Trip #3 would be coded as a "return to work" with walk as the means of travel. Trip #4 would be coded as a trip to "shop" (the grocery store) by transit, including the codes for access (walk) and egress (car). Trip

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[3] Note that travel information is not collected for 0-4 year olds

5 would be coded as a trip to "pick someone up" at the daycare center made in a private vehicle. Trip #6 would be coded as a trip "to home" by private vehicle, and Trips #7 and #8 would be coded as a trip from home to 'walk the dog' and a trip from 'walk the dog' to home.

Figure 1 Example of Trips on the Travel Day
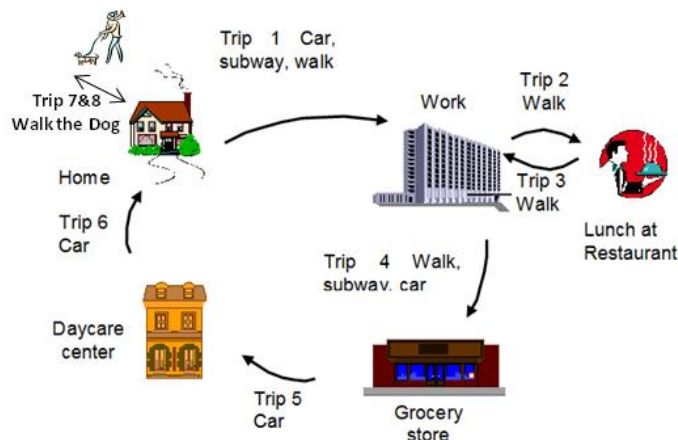
Contents: The CA-NHTS is a complete inventory of daily personal travel in the State. It includes, but is not limited to:

- Household data on the relationship of household members, education level, income, housing characteristics, and other demographic information;
- Data on persons in sampled households including age, worker status, driver status, number of times and minutes spent walking and biking 'last week' and barriers to walking and biking more;
- Detail on people with disabilities, impacts on their mobility, and the kinds of mobility aids they use.
- Detail about workers, including whether they have flexible arrival times, can telecommute and how often they do, and self-employed/work at home;
- Data about one-way trips taken during a designated 24-hour period (the household's designated travel day), including the time the trip began and ended, length of trip, composition of the travel party, mode of transportation, purpose of the trip, and the specific vehicle used (if a household vehicle);
- Information on each household vehicle, including type of vehicle and model year, odometer reading (mileage accrual) and estimates of annual miles, length of vehicle ownership, and fuel type and costs; and
- Information on typical travel to school for children aged 5-15 including attitudes of parents about walking and biking

1.2 RELIABILITY OF THE ESTIMATES

One of the major concerns with sample surveys such as CA-NHTS is that the results may not fully represent the real population because the sample doesn't reflect all households in the universe (coverage error) or because the people in the sample don't all respond to the survey (non-response error).

Coverage error in the CA-NHTS results from housing units and people who are not included in the sample but are part of the reference population (e.g. residents of California). From extensive research done on the national survey, it is known that the primary source of under-coverage in the 2009 CA-NHTS is because of the exclusion of cell-phone only households from the sample frame. At the time of the NHTS fielding, about 18 percent of all households nationwide were thought to be cell-phone only, but no reliable estimate was available for each of the states. Unfortunately, the households likely to be cell-phone only are also likely to be in one or more of the populations that traditionally have low response to surveys, such as renters, lower income, and people of African-American or Hispanic origin.

A separate cell-phone only survey was conducted in conjunction with the 2009 NHTS to provide nationwide statistics on the characteristics and travel of people in the cell-phone only households. The sample size (1,175 households) was not sufficient for separate state-wide estimates. The results of analysis of the cell-phone only sample at the national level were used to inform the weighting categories that could capture differences in travel between households with land-line telephones and those without, such as household size, renter/owner, Hispanic origin, presence of children, and householder age.

In addition to coverage concerns, non-response is an issue--not all sampled households and people will complete the survey. Hard-to-reach populations include renters, low and very high income groups, people in large households, and Blacks and Hispanics. These groups are traditionally under-represented in the NHTS, and in recent years the problem of non-response has been exacerbated by the growth of cell-phone only households in the same population groups.

The weighting process can compensate for some of these errors to a degree by adjusting the respondents to the total population in specific socio-demographic categories—those likely to have under-coverage in the sample frame and those likely to be low responders. However, the potential for bias exists if the responders in these groups do not have the same travel characteristics as the non-responders.

Therefore the estimated range of error provided in this document is an approximation of the true errors in the sample estimates. To a certain degree the margin of error reflects the non-coverage and non-response error through larger person weights for the under-represented populations, but it does not account for any systematic bias in the data.

The variability measured by the standard error of the estimate is presented in this document as the confidence interval (CI) or margin of error (MOE)—all are 95 percent confidence estimates unless noted. Calculating and understanding the margin of error in the estimates helps us think of the data (percents, means, and numeric values) as really an estimated range rather than a single, fixed number.

2. TRAVEL SUMMARY

The CA-NHTS has been weighted to represent households, people, and their annual travel by all modes and for all purposes by people living in households in California that are aged 5 and older. Table 3 presents major demographic and travel estimates obtained in the survey.

As shown in Table 3, 12 million households and nearly 34 million people are represented in the CA-NHTS. In the survey year they accounted for 46.4 billion person trips and 25.6 billion vehicle trips and traveled over 400 trillion person miles of travel (PMT) and almost 233 trillion vehicle miles of travel (VMT).

Table 3 Demographic and Travel Estimates (Unweighted and Weighted)

	Unweighted	Weighted
Households	21,225	12,176,760
Persons aged 5 and older	44,957	34,052,007
Number of Workers	20,418	16,552,957
Number of Drivers	35,390	24,281,562
Adults aged 18 and older	37,932	27,004,467
Total Person Trips	171,661	46,402,698,774
Total Vehicle Trips	105,050	25,621,981,255
Total PMT	1,653,925	404,200,525,592
Total VMT	949,652	232,936,363,911
Total Walk Trips (Travel Day)	20,077	6,273,190,216
Total Bike Trips (Travel Day)	1,941	659,946,940

Table 4 shows the rates of travel for the surveyed population. According to the CA-NHTS, an average California resident takes 3.8 trips and travels almost 33 miles each day, including weekends and holidays. The hypothetical average person—including all people aged 5 and older, those who walk and bike and those who don't-- takes a walk every other day (184.2 walks per year per capita, or about 0.5 per day) and a bike trip about once every ten days (19.4 bike trips per capita or about .05 per day).

Table 4 Annual and Daily Trip Rates and Miles

	Annual	Daily (Annual/365)
Person Trips per Person	1,375	3.8
Person Trips per Household	3,803	10.4
Person Miles per Person	11,980	32.8
Vehicle Miles per Person	6,904	18.9
PMT per Household	33,129	90.8
VMT per Household	19,092	52.3
Walk Trips per Household	515.2	1.41
Bike Trips per Household	54.2	0.15
Walk Trips per Person (5+)	184.2	0.50
Bike Trips per Person (5+)	19.4	0.05

Table 5 shows summary data for the State and by each Caltrans District, including the unweighted sample of households, the weighted estimate of households in 2008, the unweighted sample and weighted estimate of people aged 5 and older residing in households, the estimate of walk and bike origins, and the estimate of walk and bike origins per capita.

For example, there were about 515 walk trips generated for each household in the State including households that reported walk trips and those that did not. The highest per household number of walks (walk origins) on the travel day were reported in District 7, which includes Los Angeles. Not every District had sufficient samples to make sound estimates. Bishop (District 9) contributed only 22 households to the state sample, and estimates of walking and biking in District 9 have a wide margin of error—the estimates are not robust at the 95 percent confidence interval and should be used with caution. Because of the low sample size and resulting variability of the estimates, District 9 will not be included in the remainder of the analysis.

Table 6 shows the same set of estimates for each of the MPOs in the state. Similar to the distribution of samples across Districts, two MPOs contributed very few households to the state sample—Kings and Madera. Estimates calculated from small samples have wide margins of error and should be used with great caution.

Table 5 Summary Data and Trip Rates by Caltrans District

Caltrans District:	Unweighted Households	Weighted Households	Unweighted Persons, age 5+	Weighted Persons, age 5+	Weighted Walk Trips	Weighted Bike Trips	Walk Trips per Household	Walk Trips per Person	Bike Trips per Household	Bike Trips per Person
California	21,225	12,176,760	44,957	34,052,007	6,273,190,216	659,946,940	515.2	184.2	54.2	19.4
Bishop	22	12,851	39	25,361	4,108,435	3,980,168	319.7	162.0	309.7*	156.9
Eureka	255	124,389	504	295,039	59,003,412	4,623,162	474.3	200.0	37.2	15.7
Fresno	990	694,877	2,222	2,157,029	309,680,000	33,454,176	445.7	143.6	48.1	15.5
Irvine	1,282	877,032	2,832	2,596,422	401,860,000	38,323,032	458.2	154.8	43.7	14.8
Los Angeles	3,767	3,385,598	8,048	9,804,277	2,154,700,000	183,840,000	636.4	219.8	54.3	18.8
Marysville	1,609	1,000,164	3,317	2,538,322	385,950,000	67,145,565	385.9	152.0	67.1	26.5
Oakland	3,808	2,673,865	7,811	6,730,595	1,335,600,000	174,430,000	499.5	198.4	65.2	25.9
Redding	326	150,092	661	386,379	37,448,636	5,497,637	249.5	96.9	36.6	14.2
San Bernardino	1,566	1,156,819	3,555	3,735,529	446,130,000	42,230,233	385.7	119.4	36.5	11.3
San Diego	6,050	1,080,527	12,726	2,906,918	484,240,000	43,096,783	448.2	166.6	39.9	14.8
San Luis Obispo	735	480,911	1,483	1,247,703	226,560,000	38,049,973	471.1	181.6	79.1	30.5
Stockton	815	539,635	1,759	1,628,433	252,080,000	12,367,023	467.1	154.8	22.9	7.6

*Not all estimates are statistically significant

Note: Trips are counted for the district from which they originate.

Table 6 Summary Data and Trip Rates by MPO Area

MPO Area	Unweighted Households	Weighted Households	Unweighted Persons, age 5+	Weighted Persons, age 5+	Weighted Walk Trips	Weighted Bike Trips	Walk Trips per Household	Walk Trips per Person age 5+	Bike Trips per Household	Bike Trips per Person age 5+
California	21,225	12,176,760	44,957	34,052,007	6,273,190,216	659,946,940	515.18	184.22	54.20	19.38
AMBAG	361	261,390	762	727,820	117,958,751	15,663,404	451.28	162.07	59.92	21.52
BCAG	185	88,629	363	215,466	30,536,361	1,917,147	344.54	141.72	21.63	8.90
FresnoCOG	381	278,519	835	847,548	118,077,383	17,216,353	423.95	139.32	61.81	20.31
KernCOG	309	204,612	702	625,970	82,305,170	8,680,421	402.25	131.48	42.42	13.87
KingsCAG	63	59,883	155	213,853	50,608,744	1,572,727	845.13	236.65	26.26	7.35
Madera	64	36,449	140	109,285	9,467,331	326,758	259.74	86.63	8.96	2.99
MCAG	90	73,616	199	254,300	54,455,906	1,074,550	739.72	214.14	14.60	4.23
MTC	3,808	2,673,865	7,811	6,730,595	1,335,622,717	174,432,717	499.51	198.44	65.24	25.92
SACOG	1,311	853,798	2,744	2,191,068	339,016,531	63,692,738	397.07	154.73	74.60	29.07
SANDAG	6,002	1,037,955	12,625	2,774,615	474,296,062	42,778,152	456.95	170.94	41.21	15.42
SBCAG	201	131,747	382	319,847	78,707,742	8,444,849	597.42	246.08	64.10	26.40
SCAG	6,663	5,462,021	14,536	16,268,531	3,012,671,440	264,711,689	551.57	185.18	48.46	16.27
SCRTPA	176	87,534	370	232,702	23,206,562	2,978,335	265.11	99.73	34.02	12.80
SJCOG	306	219,568	666	639,946	77,453,578	8,996,277	352.75	121.03	40.97	14.06
SLOCOG	173	87,774	339	200,035	29,888,572	13,941,720	340.52	149.42	158.84	69.70
STANCOG	261	175,876	576	552,292	83,476,152	2,065,872	474.63	151.15	11.75	3.74
TulareCOG	173	115,415	390	360,372	49,220,560	5,657,916	426.47	136.58	49.02	15.70
Not in an MPO	698	328,109	1,362	787,761	306,220,652	25,795,314	933.29	388.72	78.62	32.75

Note: Trips are counted for the MPO area in which they originate.

One of the major purposes for obtaining data on walking and biking is to help the State, counties, and local areas understand the risk of pedestrian and bicycle fatalities. At the time of the start of the CA-NHTS in 2008, the National Highway Traffic Safety Administration Pedestrian Crash Report[4] identified California, Florida, and Texas as having more pedestrian deaths than any other state, and Los Angeles as one of the deadliest cities for pedestrian fatalities as a proportion of crashes.

The *number* of crashes and fatalities is only one side of the equation--to understand how much risk bicyclists and pedestrians encounter it is critical to balance the number of crashes with the amount of pedestrian or bicyclist activity. The amount of time or miles spent on the public roadways where crashes occur is generally referred to as exposure, and one common measure is walk miles of travel (WMT), although there has been recent interest in also measuring exposure in minutes.

In the CA-NHTS the amount of time and the distance traveled is recorded for each trip on the travel-day diary. However, research conducted in San Francisco and Portland, OR to assess the accuracy of self-reports for walk trips showed that less than half of the respondents could report accurate distance: less than half (43 percent) reported the distance within a tenth of a mile, and the average reported distance was off by two tenths of a mile. In addition, the range of misreports was wide: 25 percent of the reported distances were off by 50 percent and 10 percent were off by 90 percent.[5]

Reporting of trip duration suffers from problems associated with rounding: comparison of GPS time stamps and times reported by survey respondents showed that sizable error can be introduced when people round the time estimate to the nearest 5, 10 or 30 minute increment. This can have a disproportionate effect on the estimation of duration for short trips.[6]

Given those cautions, Table 7 presents the estimated mean miles walked per traveler (for those who reported walks on the travel day) and total miles of walking in each Caltrans District (Bishop is not included because of small sample size). Table 8 presents the same statistics for the MPOs in the file. These estimates are made from the travel diary data in the CA-NHTS trip file.

An example of the use of these data for safety benchmarking and analysis follows: The pedestrian fatality rate per walk miles of travel (WMT) per year is estimated by the number of annual pedestrian fatalities divided by total annual WMT. The pedestrian crashes per WMT per year equal the number of annual police-reported pedestrian crashes divided by annual WMT. In estimating the fatalities per walk miles of travel (WMT) for the State, for example, one would take the number of pedestrian fatalities (NHTSA reported 620 pedestrian fatalities in the State of California in 2008) and divide by the total estimate of walk miles for the state (4,398,968,424 as shown in Tables 7 and 8). The result is an estimate of 14.1 walk fatalities per hundred million walk miles of travel.

When looking for MPO estimates, note that King and Madera MPOs have high margins of error (noted with an asterisk in Table 8) as a result of the very small number of samples in those areas.

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[4] http://www-nrd.nhtsa.dot.gov/Pubs/810968.pdf
[5] "How Far, by Which Route, and Why?", TRB 2007, Weinstein, Bekkouche, Irvin, Schlossberg
[6] Lexington Household Travel Survey, 1995, FHWA Office of Planning, Elaine Murakami

Table 7 Average Walk Trip Length for Walkers and Sum of Walk Miles by District

Caltrans District	Statistics on the Miles of Walking					
	Mean Walk Trip Length	Std Error of Mean	Low Estimate	High Estimate	Sum of Walk Miles	Std Dev
California	0.72	0.02	0.70	0.74	4,398,968,424	223,082,868
Eureka	0.74	0.24	0.50	0.98	42,969,097	14,638,585
Fresno	0.71	0.07	0.64	0.78	215,822,621	41,599,901
Irvine	0.79	0.19	0.60	0.98	300,186,897	45,383,573
Los Angeles	0.70	0.05	0.65	0.75	1,474,596,775	132,259,764
Marysville	0.79	0.10	0.69	0.89	299,164,915	48,931,981
Oakland	0.71	0.07	0.65	0.78	931,153,512	96,976,623
Redding	0.74	0.52	0.22	1.26	25,441,778	6,373,113
San Bernardino	0.72	0.15	0.57	0.87	307,663,810	42,041,634
San Diego	0.71	0.04	0.66	0.75	333,909,729	20,265,836
San Luis Obispo	0.82	0.22	0.61	1.04	179,032,539	27,814,089
Stockton	0.59	0.25	0.34	0.84	143,773,141	24,347,416

Table 8 Average Walk Trip Length for Walkers and Sum of Walk Miles by MPO

MPO	Statistics on the Miles of Walking					
	Mean Walk Trip Length	Std Error of Mean	High Estimate	Low Estimate	Sum of Walk Miles	Std Dev
California	0.72	0.02	0.70	0.74	4,398,968,424	223,082,868
AMBAG	0.77	0.08	0.70	0.85	85,589,770	16,488,151
BCAG	0.62	0.10	0.52	0.73	17,484,837	4,449,167
FresnoCOG	0.56	0.07	0.49	0.62	63,716,437	39,935,378
KernCOG	0.70	0.08	0.62	0.78	57,087,907	13,236,863
KingsCAG *	1.09	0.59	0.50	1.69	51,942,394	38,651,292
MCAG	0.45	0.09	0.36	0.53	24,109,676	11,459,445
MTC	0.71	0.02	0.69	0.74	926,331,985	66,468,529
Madera *	1.37	0.26	1.11	1.63	12,953,254	21,843,364
SACOG	0.80	0.09	0.71	0.89	266,244,993	41,458,627
SANDAG	0.71	0.03	0.68	0.74	325,998,885	22,696,109
SBCAG	0.87	0.15	0.72	1.02	66,911,969	21,445,645
SCAG	0.71	0.03	0.68	0.74	2,080,080,346	118,953,925
SCRTPA	0.77	0.09	0.68	0.86	15,926,026	2,446,375
SJCOG	0.58	0.10	0.48	0.69	44,389,592	12,003,374
SLOCOG	0.87	0.11	0.76	0.97	25,602,326	4,081,410
STANCOG	0.72	0.11	0.61	0.84	55,053,944	17,593,915
TulareCOG	0.60	0.10	0.50	0.70	29,306,983	19,271,047
Not in an MPO	0.80	0.04	0.75	0.84	231,450,965	62,491,761

3. COMPARISON OF RECALLED AND REPORTED TRIPS

The diary day of the CA-NHTS records all trips by all modes of travel for a single assigned day. In addition to the single day diary, respondents were asked to recall the number of walks "last week."[7]   The CA-NHTS collected data from more than 50 households per day for more than a year, making the definition of "last week" representative of all seasons, including weekends and holidays. However, asking respondents to recall their walks for the previous week may lead to under-reporting for short trips that are commonly forgotten or over-reporting for trips that are frequent but not every day, such as walking the dog or exercising.

Prior research comparing travel reports collected by recall versus diary indicates that people in diary surveys under-report short or incidental trips.[8] One justification for adding the one-week recall of walks was to broadly include the types of trips that are often under-reported on the travel day diary and to get a better understanding of behavior that may not be captured in a single day. Recent research shows that including a general question on walking at the beginning of the subject interview can result in more reported walks during the collection of actual travel for the assigned day.[9]

The comparison of the number and type of walks recalled for "last week" to the walk trips reported on the one-day diary is complicated by the time frame difference. Any single day assigned as the diary day may be unusual for some reason, or may not capture even frequent activity—a person may walk for exercise every other day but the diary day assigned was not one of those days, or may walk to work every weekday but the diary day assigned was a weekend.

With those differences in mind, it is instructive to compare the number of walks reported by recalling "last week" to the number and type of specific walk trips reported on the diary day. To make the comparison the walk trips reported on the diary day have been multiplied by seven. Figure 1 compares some of the larger states that purchased additional samples of the NHTS 2009, including California. The State of California also added questions on the purpose of walks 'last week' and about the barriers to walking more to the state sample—the interviews in other states did not include these questions.

Of all the large add-on states, New York had the closest estimation between recalled and reported walk activity on the diary day—the estimates are statistically the same (see Figure 1). The two estimates for California are close but the recalled walks "last week" are still significantly higher than the reported walks on the diary day. The estimates for the other states are well outside the margin of error, with the diary day estimates much lower than the number of walks recalled for "last week."[10]

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[7] The question in the interview was: "In the past week, how many times did you take a walk outside including walking the dog and walks for exercise?" It was asked of all interviewed people and obtained by proxy (parent or adult) for children aged 5-15.
[8] See: http://nhts.ornl.gov/2001/pub/stt.pdf Appendix 3.
[9] Research on the question placement for the overall NHTS 2009 found that moving the general question (walks "last week") before the specific travel day reports significantly increased the travel day reports of walking from .51 in 2001 to .62 in 2009 (significant at the .05 level) for travelers aged 16 and older. In 2001 NHTS, the general question was after the travel day report.
[10] All significance tests reported here use a 95% confidence interval to establish margin of error.

As shown in Figure 2, people in California recalled 3.8 walks "last week" but on the diary day reported 0.5 walk trips per capita, the equivalent of 3.5 walk trips per week. People in Florida recalled 4.5 walks "last week" but on the diary day reported 0.34 walk trips per capita, or 2.8 walk trips per week.

Based on the recall of walks "last week" Californians have one of the lowest estimates of walking—lower than the national average and second lowest of all the large add-on states (only Texas is lower). In contrast, based on the diary-day trip reports Californians have a significantly higher rate of per capita walking compared to the national average and significantly higher than every large add-on state except New York.

Figure 2 Comparison of the Estimate of Walks per Week from Recall and Diary Reports
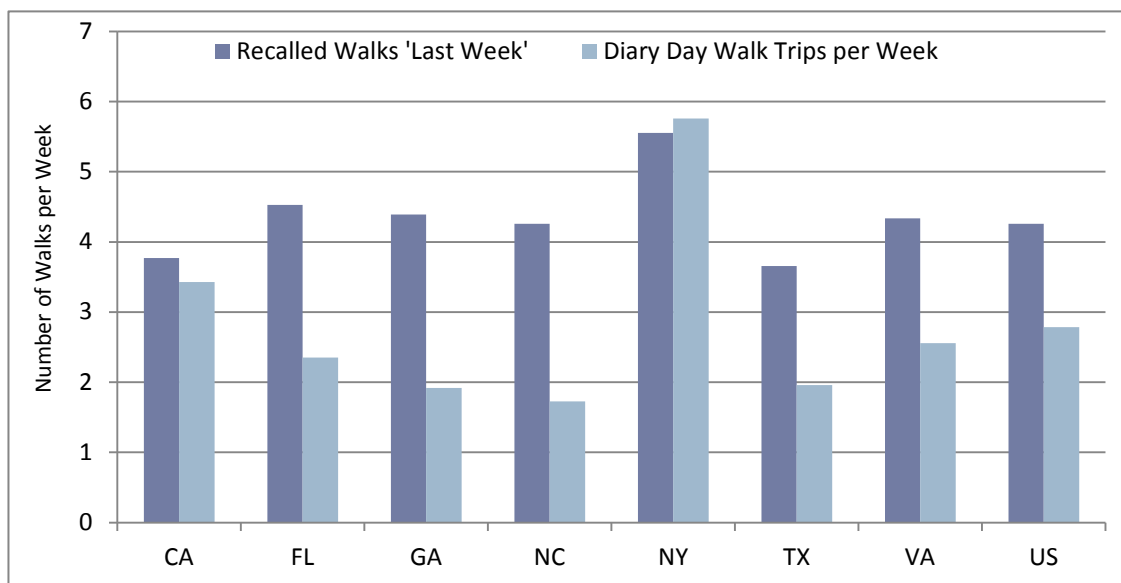
The relation of recalled walks "last week" and the number of reported walk trips varies by the age of the respondent. For example, Figure 3 shows that children aged 5-15 had the same number of walks recalled for "last week" and reported on the travel day (all interviews with children in this age group are by proxy with an adult, usually the parent). People 16-24 and over 35 recalled more walks than the travel day estimates suggest. People aged 25-34 reported more walking activity on the travel day than the recall of walks "last week" would suggest.

The direct comparison of the number of walks recalled "last week" and the number of walk trips reported on the diary day is shown for people aged 16 and older in Exhibit 3. This comparison uses the actual diary day reports—either zero or one or more walks.

Overall 34 percent recalled taking zero walks "last week" and overall 83.8 percent of people reported no walk trips on the diary day. The comparison shows that 96.8 percent of people who recalled zero walks "last week" also reported no walks on the diary day.

Over 43 percent of people recalled one to six walks "last week," and 17.1 percent of them reported at least one walk trip on the diary day. More than one out of five (22.8 percent) of people recalled seven or more walks "last week," and over one third of them reported at least one walk trip on the diary day (32.7 percent reported between one and six trips, and 1.2 percent reported seven or more trips).

Importantly for methods research and for walk activity estimation, two-thirds (66.1 percent) of people aged 16 and older who recalled taking seven or more walks "last week" reported zero walk trips on the assigned diary day.

Figure 3 Comparison of Recalled and Reported
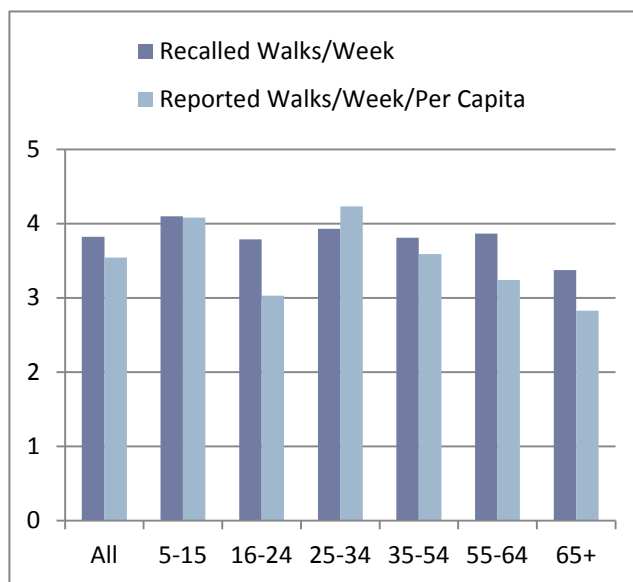
Table 9 Percent of People by the Number of Walks Recalled 'Last Week' and the Number of Walks Reported on the Travel Day

Number of Walks Recalled 'Last Week':	Number of Walks Reported on Travel Day:		
	Zero	One or more	All
Zero	96.8	3.2	34.0
One to Six	82.9	17.1	43.3
Seven or More	66.1	33.9	22.8
All	83.8	16.2	100.0

Figure 4 compares the kinds of walks people recalled "last week" with the purpose of walking trips reported on the travel day for people aged 16 and older. In recalling the purpose of their walks "last week" people in the survey could choose more than one response, so the total adds up to more than 100 percent. The responses have been proportionately distributed to compare with the walk trips reported on the travel day.

A large proportion of walks in both cases were walks for exercise. However, people more often recalled walking for exercise than they reported walk trips for exercise on the diary day. In contrast, people did not recall walking for shopping and errands as often as they reported walk trips on the diary day—which may relate to the research mentioned previously relating to the under-reporting of short and incidental trips. People recalled walking the dog more often than they reported their trips to walk the dog on the diary day. This could be because people did not think of walking the dog as a "real" trip that merited being written down on the diary and reported in the interview.

Figure 4 Purpose of Walks 'Last Week' and On Dairy Day, People 16 and older
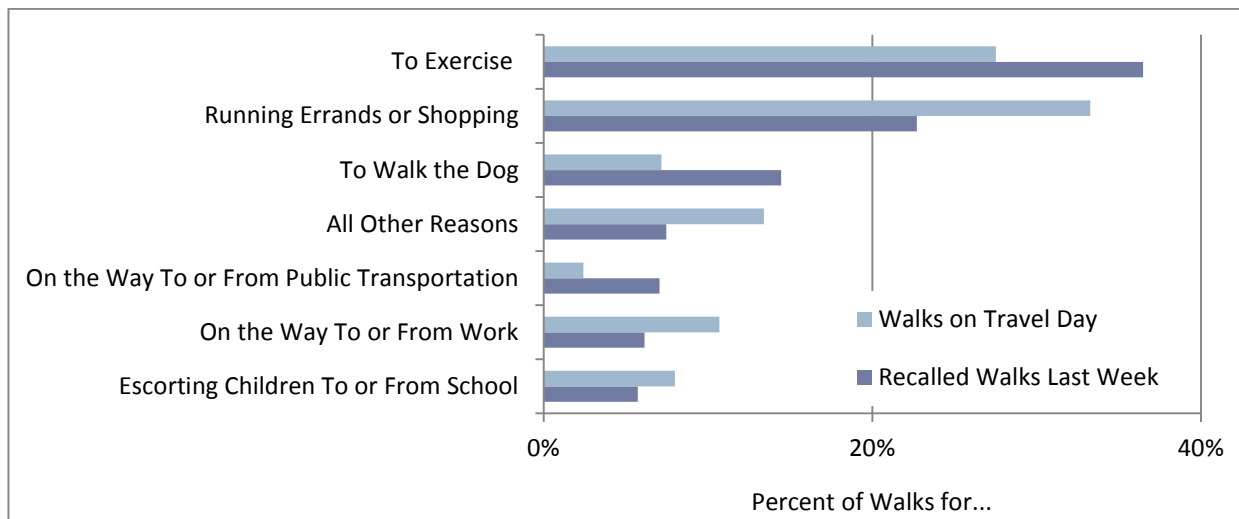
Similar to walking, the most common reported purposes of bike riding—both "last week" and on travel day--were exercise and errands/shopping (Figure 5). Riding a bike for exercise was selected over three-quarters of the time (78 percent) as one reason for riding a bike "last week."   Another common reason was shopping and errands, and commuting to and from work.

Figure 5 Purpose of Bike Rides 'Last Week' and On Diary Day, People 16 and older

Therefore the CA-NHTS presents two different estimates of walking activity—one estimate obtained by the recall of the number of walks "last week" and one estimate obtained by measuring the number of walk trips recorded as part of a single day of travel.

Each of these estimates leads to different conclusions: Based on the recall of walks "last week" Californians have one of the lowest estimates of walking—lower than the national average and second lowest of all the

large add-on states (only Texas is lower, as previously shown in Figure 2). In contrast, based on the diary-day trip reports Californians have a significantly higher rate of per capita walking compared to the national average and significantly higher than every large add-on state except New York.

One interpretation of these data is that asking for general activity, including the number of walks "last week," the kinds of walking, and barriers to walking early on in the interview led Californians to report more walking trips when they reported their travel on the diary day. This hypothesis is in line with recent findings and would lead to the conclusion that the diary day reports of walk trips are more accurate in California than in other areas that did not have these general questions added before the detailed travel interview.

4. CHARACTERISTICS OF BICYCLE AND WALKING TRIPS

This section uses the diary day reports of walks and bike rides within the context of daily travel to look at important characteristics of walking and bicycling activity, including the proportion of short trips that are by walk and bike, the time of day and day of week, and purpose, including access and egress to and from transit in major transit markets.

4.1 SHORT TRIPS

Table 10 shows the means of travel for trips of less than one mile in length. In this table, Kings, Madera and Saint Louis Obispo MPOs have been omitted because of their small sample. Not all short vehicle trips are candidates for mode shifts, since sometimes trips are chained together and the vehicle is used for each short segment. However, for the state as a whole nearly 60 percent of all trips of one mile or less in length are vehicle trips, a third are walk trips, and just fewer than 2 out of 100 are bicycle trips. The MTC MPO (San Francisco) has the highest walk percent for these short trips, with 38.4 percent walk, 2.3 percent bike, and 54.8 percent vehicle.

The data in the CA-NHTS are coded into segments with an origin and destination attached to each trip so researchers who are interested in identifying candidate trips for mode shifts could examine short trips that originate at home and return home, for example, as trips that might be shifted to non-motorized travel.

Table 10 Percent of Trips of One Mile or Less by Means of Travel

Percent of Trips of 1 mile or Less by Means of Travel				
Trip Origin:	**Means of Travel**			
	Private Vehicle	**Bike**	**Walk**	**All Other**
California	59.7	1.9	33.9	4.5
AMBAG	62.6	2.3	32.7	2.4
BCAG	73.7	0.1	22.1	4.0
FresnoCOG	67.8	2.9	26.1	3.2
KernCOG	69.8	0.6	24.8	4.8
KingsCAG	72.7	0.3	27.1	0.0
Madera	88.9	0.0	11.1	0.0
MCAG	66.0	0.0	33.2	0.8
MTC	54.8	2.3	38.4	4.5
SACOG	62.9	2.4	33.6	1.1
SANDAG	60.2	1.1	35.2	3.6
SBCAG	61.0	2.4	34.5	2.1
SCAG	58.2	1.8	34.2	5.8
SCRTPA	75.6	2.9	21.1	0.4
SJCOG	72.9	1.3	24.5	1.2
SLOCOG	60.8	11.1	27.6	0.4
STANCOG	76.5	0.1	22.9	0.5
TulareCOG	68.3	2.0	27.8	1.9
Not in an MPO	60.1	1.1	32.8	6.0

4.2 TIME OF DAY AND DAY OF WEEK

Walking and biking are primarily daytime activities. Children are more likely to walk during the day than people aged 16 and older (Table 11). Over 85 percent of walk trips reported for children were between 6 am and 6 pm, only 14.5 percent were after 6 pm or before 6 am. In contrast, nearly a quarter of people aged 16 and older (23.4 percent) who reported walking on the travel day indicated that the trip was after 6 pm or before 6 am.

Children are also much more likley to walk on a weekday compared to people aged 16 and older, 85.9 percent of walk trips reported for children were on weekdays, with 8.2 percent on Saturday and 5.9 percent on Sunday.   In contrast, 77 percent of walk trips reported by people 16 and older were on weekdays, with 11.7 percent on Saturday and 11.3 percent on Sunday.

There were not large differences in the time of day of reported bike rides by children and people aged 16 and older. However, a larger share of bike rides reported by people aged 16 and older were on Saturday, while a larger share of bike rides reported for children were on Sunday.

Table 11 Percent of Walk and Bike by Time and Day of Week

	Walking			Biking		
	Children 5-15	People 16 and Older	All Walks	Children 5-15	People 16 and Older	All Bike Rides
Day (6 am to 6 pm)	85.5%	76.6%	78.3%	81.8%	80.3%	80.5%
Night(6 pm to 6 am)	14.5%	23.4%	21.7%	18.2%	19.7%	19.5%
Weekday	85.9%	77.0%	78.7%	71.6%	78.7%	72.7%
Saturday	8.2%	11.7%	11.0%	11.0%	14.7%	12.8%
Sunday	5.9%	11.3%	10.3%	17.5%	6.6%	14.5%

Land use affects the amount of walking people do, as shown in Table 12. Overall people in urban areas walk 233 times a year (these per capita rates are for the whole population, including people who walk a lot and those who don't walk at all). As shown, land use has a bigger effect on children's walking than on those aged 16 and older—children in suburban areas walk about 35 percent less than children in urban areas. On the other hand, children aged 5 to 15 are more likely to bike in suburban and other non-urban areas than in urban settings. The data show that children in urban areas average 19.5 bike trips per capita per year while children in suburban areas average 29.

Table 12 Annual per Capita Walk and Bike Trips by Land-Use Type*

	Urban		Suburban		Other		All	
	Walk	Bike	Walk	Bike	Walk	Bike	Walk	Bike
Age 5-15	276.2	19.5	178.7	29.0	135.6	23.7	212.3	24.5
Age 16 and Older	225.0	23.8	155.0	14.9	118.5	14.0	178.7	18.4
All	233.3	23.1	158.9	17.2	121.3	15.6	184.2	19.4

*the land-use type is defined by Claritas, see http://nhts.ornl.gov/2009/pub/UsersGuideClaritas.pdf

4.3 PURPOSE OF WALK AND BIKE RIDES

The purpose of walking and biking differs by the age of the traveler; children walk and bike to school, for instance while adults walk and bike to work. Figure 6 shows the purpose of walks and bike rides for children aged 5-15 and for people aged 16 and older who reported a walk or bike ride on the travel day.

As shown in Figure 6, 34.5 percent of the walks and 17.2 percent of the bike rides reported for children on the travel day were to go to school as a student, and 20.2 percent of the walks and 33.7 percent of bike rides were reported for social and recreational purposes, which includes visiting friends, going to the park or library, and going to an entertainment or sporting event. Another 16.1 percent of walks and 7.2 percent of bike rides were reported as exercise, and 12.1 and 8.3 respectively were for shopping and errands (not including meals/coffee).

In contrast, for travelers aged 16 and older, 10.7 percent of walks and 22.9 percent of bike rides reported were for commuting, and 19.4 percent of walks and 22 percent of bike rides were for shopping and errands. A nearly equal percent of walk and bike rides were reported as exercise (23.8 percent of walks and 24 percent of bike rides), and 7.2 percent of walks were to walk the dog. Finally, 12.2 percent of walks and 14.1 percent of bike rides were reported as for other social and recreational purposes.

Figure 6 Percent of Walks and Bike Rides on the Travel Day by Purpose for Children aged 5-15 and for People Aged 16 and older
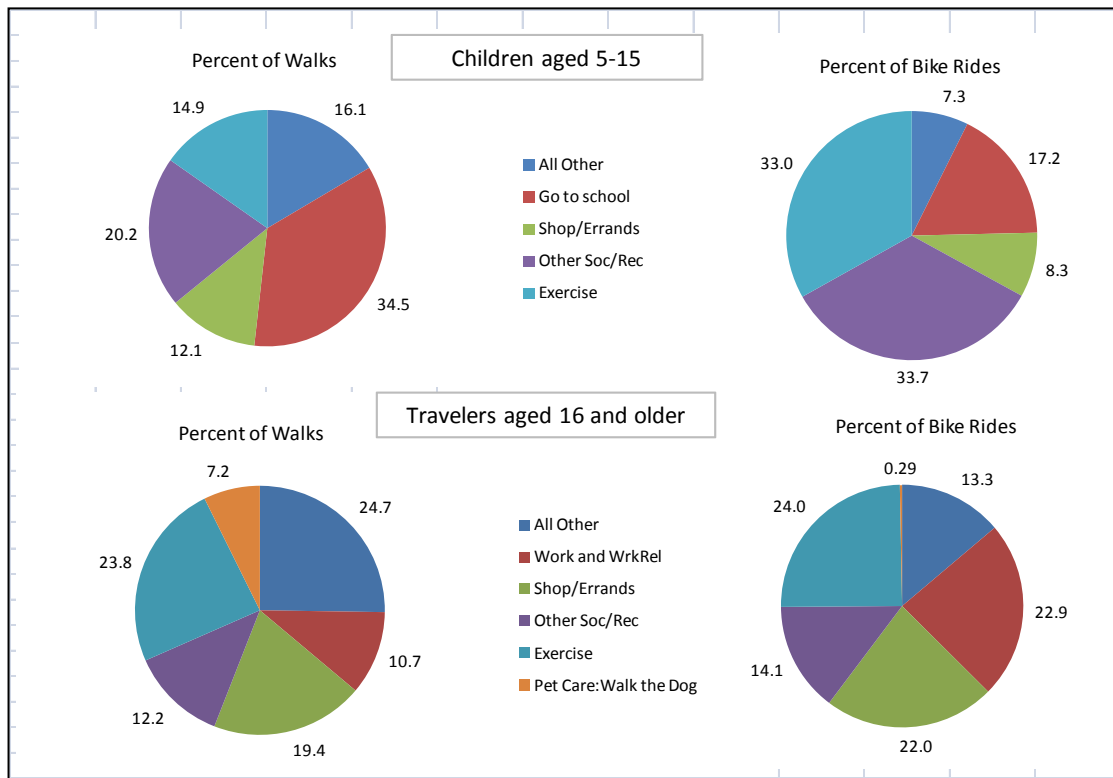
4.4 Access and Egress to Transit

Walking is the predominate mode of access to transit. Figure 7 shows the proportion of trips to access transit by mode for the largest transit markets in California. As shown, the proportions range from 83.6 percent walk to transit in the Los Angeles region (SCAG MPO), followed by 82.6 percent in San Diego (SANDAG MPO), 78.6 percent in the San Francisco region (MTC MPO), and 72.8 percent in Sacramento (SACOG MPO).

Interestingly, the regions with the highest walk to transit shares had the lowest bike to transit percents. The bike-access trips to transit in the Los Angeles region (SCAG MPO) were 1.8 percent of all trips to access transit, and 2.8 percent in San Diego (SANDAG MPO), 3.3 percent in the San Francisco region (MTC MPO), with the highest estimate of 6.4 percent in Sacramento (SACOG MPO).

Figure 7 Percent of Trips to Access Transit by Mode of Travel

Percent of Trips to Access Transit	SACOG	MTC	SANDAG	SCAG	All
Other	3.2	3.5	2.4	1.5	2.3
Transfer	2.0	5.7	7.8	8.2	7.1
POV	15.6	8.8	4.4	5.1	6.7
Bike	6.4	3.3	2.8	1.8	2.5
Walk	72.8	78.6	82.6	83.6	81.5
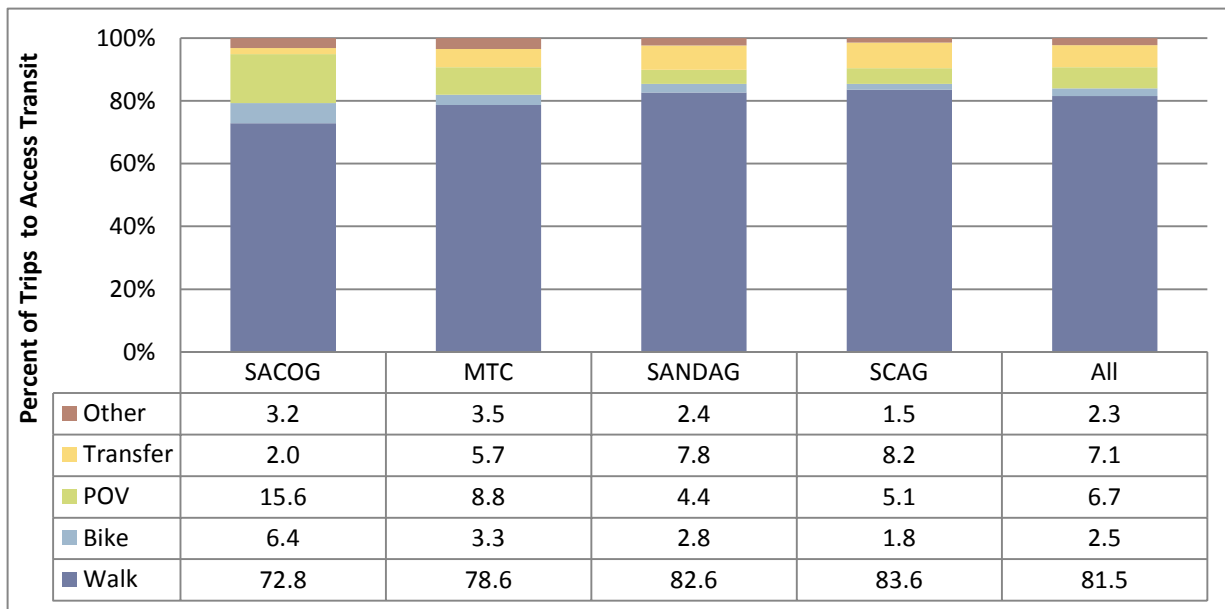
As noted in the data description, access and egress to transit is not considered a "trip" in the CA-NHTS. Trips are defined as the movement from one address to another, so travel to access and egress transit is linked into the total transit trip from one address to another.

Walking is by far the most common method to access transit and adds significantly to the count of total walks in a region with a large transit market. Figure 8 illustrates the amount of walks added by including walks to and from transit with the total count of walk trips in each of the large transit markets in California.

For example, in the Los Angeles Region (SCAG), there was an estimated 2,377 million (2.377 billion) walk trips as defined in the CA-NHTS. Adding 536 million walks to access transit and 540 million walks from transit to the traveler's destination adds a total of 1,760 million (1.76 billion) walks or 31 percent more walks than estimated by counting separate trips. In the San Francisco region (MTC), there were an estimated 1,158 million (1.158 billion) walk trips, with 292 million walks to access transit and 289 million walks from transit to the final destination—a total of 581 million added walks or 33 percent more. In San Diego (SANDAG), an estimated 388 million walk trips are supplemented by 66 million walks to transit and 64 million walks from transit to the destination—these walks to and from transit add 33.5 percent to the total. In Sacramento (SACOG), walks to access and egress transit add an estimated 22.7 percent to the total.

Although the walks to access and egress transit may add substantially to the total walking activity in a region, not very many miles of exposure are added since these walks are generally short. And while the CA-NHTS includes the mode of the access and egress to transit, the distance is not obtained for each segment of the transit trip.

Figure 8 Annual Walk 'Trips' including Walks to Access and Egress Transit

	SACOG	SANDAG	MTC	SCAG
Walk Trips	286	388	1,158	2,377
Walk Access	33	66	292	536
Walk Egress	32	64	289	540

Annual walk 'Trips' in millions, including walks to access and egress transit
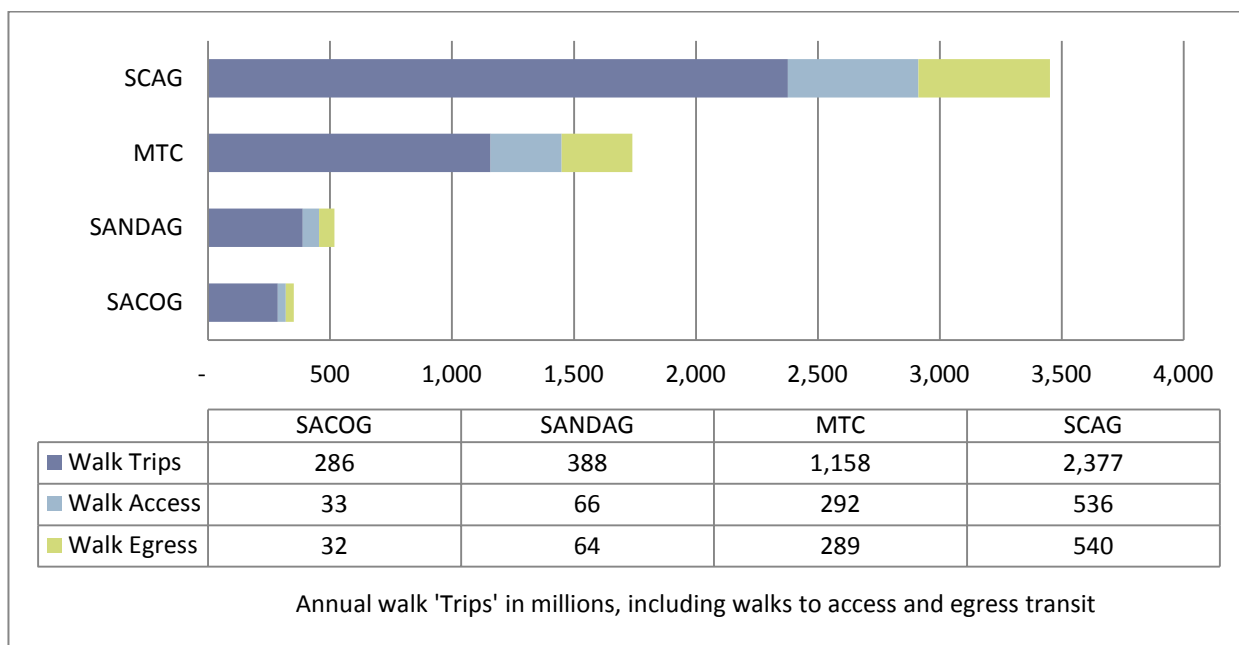
5. CHARACTERISTICS OF PEOPLE WHO WALK AND BIKE

5.1 COMPARISON BY FREQUENCY OF WALKING AND BIKING

People who say that they walk a lot (seven or more times last week) are on average a bit younger and have more household income than people who say they don't walk at all (as shown in Table 12). People who walk a lot are more likely to have higher education than non-walkers but less likely to be employed. African-American, Whites, and people of other races are more likely to report walking a lot when compared to Asians and Hispanics of any race. Since walking is an activity nearly everyone engages in, the differences between groups reporting a lot of walking and those reporting less are slight and directional.

On the other hand, people who say they bike a lot (seven or more times last week) are very different on some key characteristics compared to those who report no bike rides last week. Frequent bikers are much younger (36.4 years compared to 44.7 for non-bikers) and much more likely to be workers (72.6 percent compared to 61.1 percent of non-bikers). Frequent bikers are not more likely to have higher education. African-Americans are much more likely to report biking seven or more times a week compared to people of other races.

New immigrants, defined here as people who came to the US within the last year or two (2007 or later for the survey that was conducted in 2008 and 2009), are a small part of the overall Californian sample but have the greatest propensity to walk and bike. New immigrants are the most likely of all the groups analyzed to report walking—three quarters report at least one walk last week—and have the highest proportion reporting seven or more walks last week. New immigrants are also more likely to report at least one bike ride last week and have the highest proportion reporting seven or more bike rides last week (6.4 percent).

Table 13 Characteristics of People Who Walk and Bike, ages 16 and older

Person Characteristic:	Walks Last Week			Bike Rides Last Week			Full Sample
	None (zero last week)	Some (1-6 last week)	Frequent (7+ last week)	None (zero last week)	Some (1-6 last week)	Frequent (7+ last week)	Characteristic for All 16+
Mean Age	45.5	43.1	44.5	44.7	39.1	36.4	44.2
Mean Income	$ 59,483	$ 63,912	$ 62,657	$ 61,548	$ 69,165	$ 62,201	$ 62,174
Percent Worker	61.6	63.9	60.3	61.1	75.3	72.6	62.4
Percent by Education:							
HS or less	47.9	39.8	38.4	42.7	37.9	39.0	42.3
Some college or BA	43.6	46.5	45.7	45.2	46.7	49.1	45.4
Grad Degree and Higher	8.5	13.7	16.0	12.1	15.4	12.0	12.4
Percent by Race:							
African-American	32.7	46.3	21.0	92.7	5.3	2.1	6.0
Asian	37.6	46.6	15.9	93.3	6.0	0.8	8.4
Hispanic (of any Race)	37.2	46.7	16.1	91.4	7.6	1.0	32.9
Other	30.3	45.8	23.9	91.9	7.6	0.5	4.6
White	31.7	45.4	22.9	89.5	9.1	1.5	48.0
New Immigrants (2 years or less):	24.2	39.1	36.8	83.9	9.8	6.4	0.9
Percent for Full Sample 16+	34.0	46.0	20.0	90.7	8.0	1.2	--

5.2 COMMUTERS WHO USUALLY WALK AND BIKE TO WORK

People report their usual mode to work in the CA-NHTS in a set of questions similar to those used by the American Community Survey, which is the basis of the CTPP journey to work tables used by planners to understand work travel in their region. These questions in the CA-NHTS and the ACS ask workers about their usual means of travel to work "last week." Since the survey collects data for each day and in all seasons, "last week" is representative of the entire year.

In addition to the usual means of travel, the CA-NHTS also has the reported actual mode of travel to work on the assigned diary day (for workers who went to work on that day). It is interesting to look at how often the usual means of work travel differs from the actual mode used to commute on the assigned diary day.

As shown in Table 13, people who usually walk and bike are very loyal to their commute mode. For people who usually walked to work, on the travel day 9.6 percent drove alone, 4.3 percent commuted in a car with others (carpool), 5.3 percent commuted on transit, 80.1 percent walked to work as they usually do, 0.6 percent took a bike to work, and 2.4 percent used some other way to get to work.

People who say they usually bike to work reported driving alone to work on the travel day 9.2 percent of the time, 2.9 percent carpooled, 4.3 percent took transit, 4.0 percent walked to work, 78.2 percent rode their bikes as usual, and 1.4 percent used another commute mode.

Table 14 Percent of Commuters by Usual Means of Travel versus Actual Commute Mode

Usual Means of Travel to Work:	Actual Commute Mode on Diary Day:						Usual Commute (Row Pct)
	Drive alone	Carpool	Transit	Walk	Bike	Other	All
Drive alone	**92.5**	6.3	0.2	0.5	0.0	0.5	100.0
Carpool	39.9	**56.5**	1.0	1.6	0.2	0.8	100.0
Transit	14.6	8.4	**68.4**	6.1	0.7	1.8	100.0
Walk	9.6	4.3	5.3	**80.1**	0.6	0.1	100.0
Bike	9.2	2.9	4.3	4.0	**78.2**	1.4	100.0
Other	57.3	24.5	6.2	5.6	0.7	5.8	100.0

People who normally walk to work have lower mean incomes than other workers, as shown in Table 14. Men are much more likely to bike to work than women, and younger and older workers are more likely to bike to work than middle-aged commuters. People in sales and service jobs are the most likely to walk and bike to work.

Table 15 Characteristics of Workers by Commute Mode

	Usual Means of Travel to Work:						
	Drive Alone	Carpool	Transit	Bike	Walk	All Other Means	All Workers
Mean Income	$ 73,840	$ 63,692	$ 55,592	$ 66,090	$ 51,745	$ 64,564	$ 69,075
All Workers:	58.9%	14.7%	5.8%	1.5%	2.7%	16.5%	100.0%
Men	60.6%	12.2%	5.4%	2.1%	2.5%	17.3%	56.0%
Women	56.8%	17.9%	6.3%	0.7%	2.9%	15.4%	44.0%
16-29	56.1%	18.3%	7.3%	2.6%	4.2%	11.5%	22.0%
30-44	58.0%	16.9%	5.5%	1.4%	2.4%	15.9%	37.4%
45-64	61.9%	11.3%	5.3%	0.9%	1.9%	18.7%	35.8%
65+	57.1%	6.8%	4.1%	0.8%	4.3%	26.9%	4.8%
Sale & Service	55.9%	14.5%	6.8%	1.8%	3.7%	17.4%	30.6%
Clerical/Admin	62.9%	18.8%	6.6%	0.9%	2.7%	8.2%	11.0%
Manufact./Constr.	52.8%	15.9%	5.4%	1.4%	2.3%	22.2%	19.5%
Prof/Mgr/Technical	63.8%	12.9%	4.9%	1.4%	2.1%	14.9%	37.6%

Note: 'Transit' includes all public and private: Local bus (including ADA dial-a-ride), commuter bus, charter bus, city-to-city bus, private shuttle, Amtrak and commuter train, subway, streetcar/trolley, and ferry

5.3 PEOPLE REPORTING TRANSPORTATION DISABILITIES

People with travel disabilities are some of the most vulnerable in the public sphere. In California, nearly 10 percent of the population aged 16 and older indicated that they had a condition or handicap that made it difficult for them to travel outside of the home.[11] The incidence of a transportation disability is correlated with both age and sex—women are more likely than men to report having difficulty traveling, and older people are more likely than younger people to report such a condition.

Table 15 shows the percent of people reporting a condition that makes it difficult to travel by age group, the percent or incidence in the population, the proportion by sex within each age group, and the percent by age group who indicate that they used a mobility aid when they walked.

Of all the people reporting a medical condition that makes travel difficult, overall nearly half reported using a mobility aid when they walked. Mobility aids are also highly correlated with age—less than one out of six people aged 16-30 who had difficulty traveling indicated they use a mobility aid while over three-quarters of the people aged 85 who had difficulty traveling used a mobility aid to help them walk.

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[11] The question is worded:"Do you have a temporary or permanent condition or handicap that makes it difficult to travel outside the home?" This question was asked of people aged 16 and older.

Table 16 Percent of the Population Reporting a Transportation Disability by Age and Sex

Age:	Percent by Sex		Percent of the Population	Percent who Need Help Walking
	Men	Women		
16-30	45.8	54.3	3.4	16.8
31-45	49.5	50.5	5.0	35.2
46-65	41.4	58.6	11.3	45.4
65-84	36.0	64.1	25.3	60.5
85 and older	31.4	68.6	46.2	76.5
ALL	40.6	59.4	9.7	48.2

Figure 9 shows the kinds of accommodations people with travel disabilities reported. The vast majority-- 82.3 percent of those reporting a travel handicap--said they reduced their day-to-day travel because of their condition, 41 percent said they limited their driving to daytime and another 38 percent had given up driving altogether. Just over 15 percent has used special transit services, such as dial-a-ride.

Figure 9 Accommodations of People with Reported Travel Disability

Percent of People with a Travel Disability Who:

Reduced Day-to-Day Travel	82.3
Used any Mobility Aid to Walk	48.2
Limited Driving to Daytime	41.0
Gave up Driving Altogether	38.0
Used Spec Transport, like Dial-a-Ride	15.1
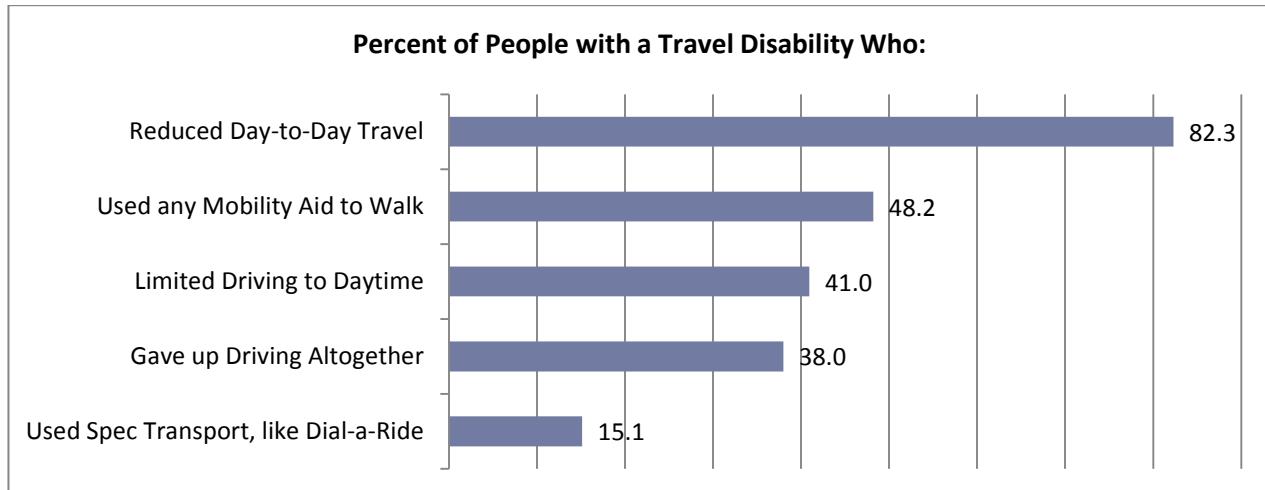
Table 17 shows the percent of the population aged 16 and older who reported a travel disability in each MPO, the percent of those with a travel disability who said they needed help walking, and the percent of those who need help walking who use a wheelchair, scooter, or motorchair.

In the state of California as a whole, 2.7 million people reported a travel disability (9.5 percent of the population 16 and older), and of those 1.3 million reported needing help walking (48 percent of those with a travel disability) and of those less than half a million people (489.500 or 37.4 percent) used a

wheelchair, scooter, or motorchair. For any one MPO, these percents of percents can end up representing a small but important segment of the traveling public.

Table 17 Percent of Population aged 16 and older with Travel Disability

MPO:	Percent Aged 16+ Who Report a Travel Disability	Percent with Travel Disability that Need Help Walking	Percent of Those Who Need Help Walking Who Use a Wheelchair, scooter or motorchair
Califronia	9.5	48.2	37.4
AMBAG	7.4	71.5	41.1
BCAG	13.1	46.7	20.8
FresnoCOG	9.7	49.3	31.4
KernCOG	12.8	57.0	47.3
KingsCAG	9.0	52.8	31.4
Madera	13.2	38.0	17.8
MCAG	10.4	52.0	24.2
MTC	8.5	46.9	34.6
SACOG	9.9	46.8	36.2
SANDAG	9.4	44.9	31.7
SBCAG	6.6	47.7	48.8
SCAG	9.7	48.5	38.9
SCRTPA	12.4	43.0	31.9
SJCOG	10.5	51.0	49.1
SLOCOG	5.4	47.4	50.5
STANCOG	12.6	38.5	44.8
TulareCOG	10.3	56.9	40.1
Not in an MPO	11.1	45.5	36.3

One consequence of having a travel disability is limited mobility—wanting to get out more but not being able to. Limited mobility can interfere with basic human needs, such as getting to the grocery store, drug store, or doctor's office, or even just being able to get out and socialize.

Of the people who indicated that they had a travel disability more than a third reported not leaving the house on the travel day (compared to 10 percent of people with no limitations on their travel) and of those, one out of six said that they would like to get out more often.

6. BARRIERS TO WALKING AND BIKING MORE

California added questions to the core NHTS data collection instrument to specifically obtain information on what kinds of things kept people from walking and biking more often. Figure 10 shows the ranked order of the reasons people in California do not walk more.[12]

By far the most common reason is that people feel they are too busy—56 percent of those responding said they were too busy , a third thought there wasn't enough light at night, and over a quarter had too much to carry or no interesting place to go.

Figure 10 Barriers to Walking More

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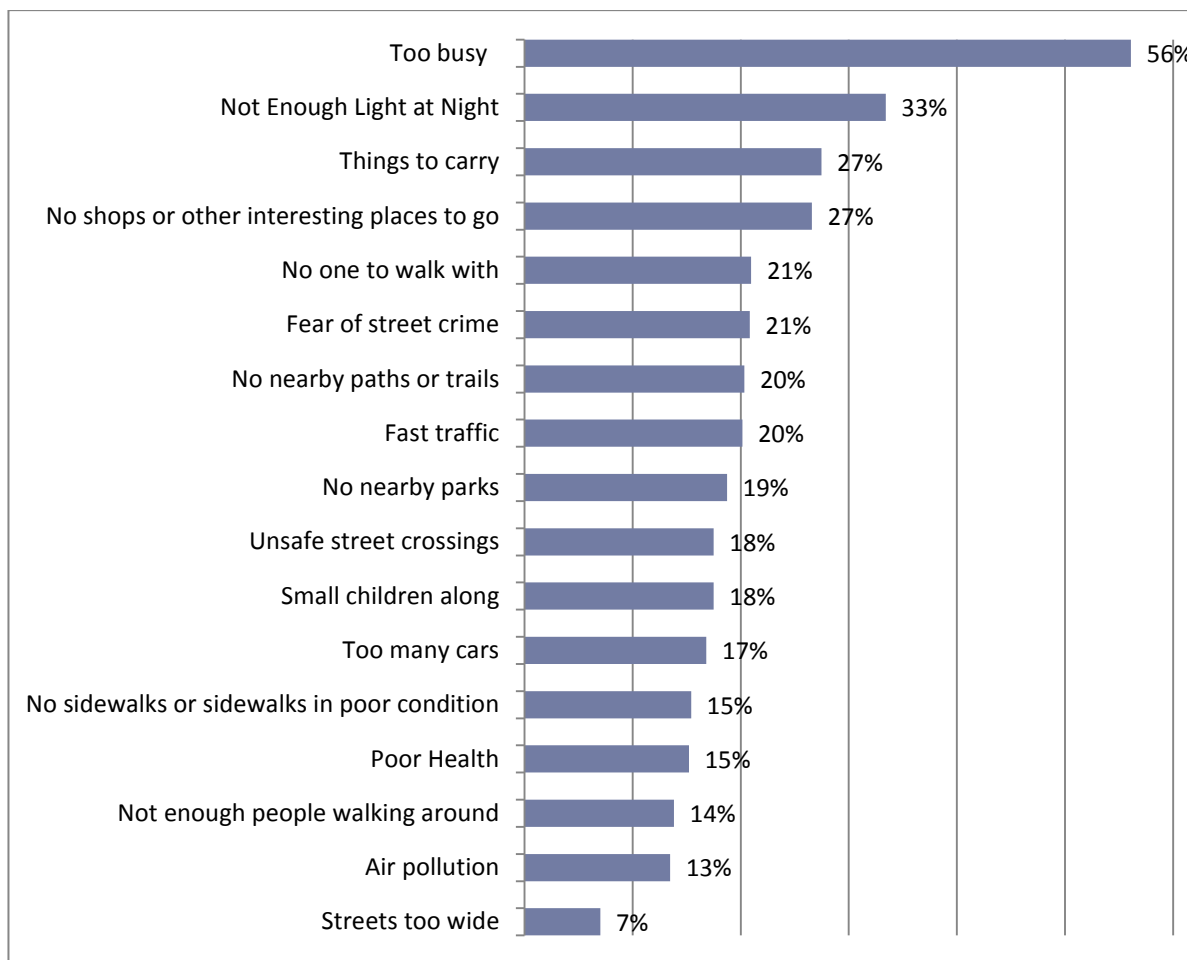
[12]The question in the interview was asked of people who reported walking at all last week:: "I'm now going to ask you about things that may keep you from doing more walking. Please tell me if any of the following keep YOU from doing more walking." The randomized response-list was read with each reason asked as a yes or no question. Each respondent was read up to four reasons.

Figure 11 Barriers to Biking More[13]
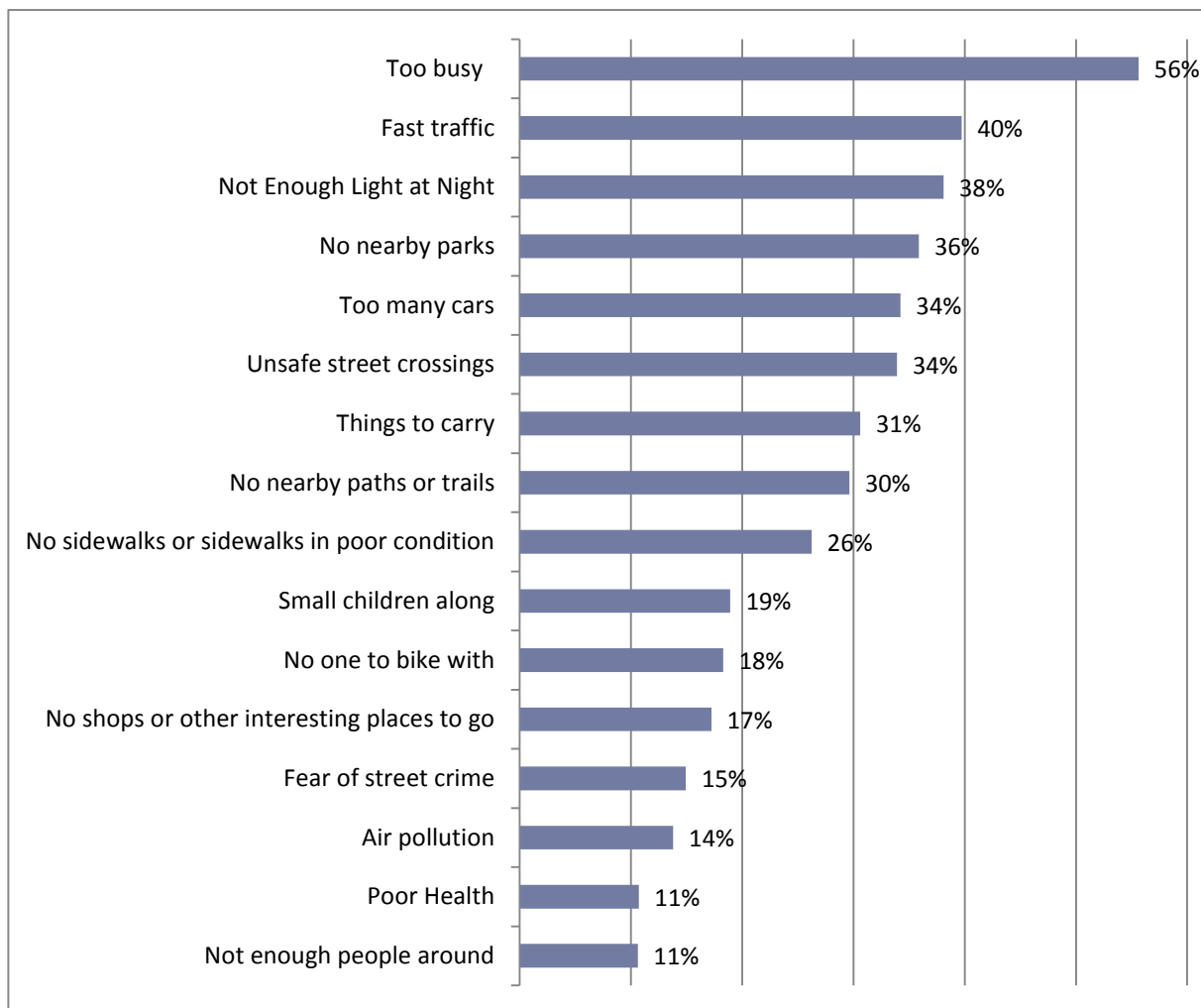
Over half of respondents said that they were too busy to walk or bike more (56 percent for each group), and "not enough light at night" appeared high on the reasons for each group—second for walkers and third for bikers.

Many of the options are related to the physical environment, such as sidewalks in poor condition, fast traffic, or unsafe street crossings. It is interesting to look at which Caltrans Districts had the highest percentage of people indicating that environmental factor was a barrier to walking more (Table 16). The District containing Los Angeles, which was noted as one of top metro areas for pedestrian fatalities in NHTSA's 2008 report (cited in the Introduction of this report) is the Caltrans District with the highest percent of people mentioning these factors as barriers to walking, with Fresno a very close second.

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[13] The question in the interview was asked of people who reported biking at all last week: "I'm now going to ask you about things that may keep you from doing more biking. Please tell me if any of the following keep YOU from doing more biking." The randomized response-list was read with each reason asked as a yes or no question. Each respondent was read up to four reasons.

Table 18 Transportation Factors Related to Barriers to Walking

Barriers to Walking More	District with Highest Percentage	District with Second Highest
Streets too wide	Los Angeles	Eureka
No sidewalks or sidewalks in poor condition	Redding	Fresno
Too many cars	Los Angles	Fresno
Unsafe street crossings	Los Angeles	Fresno
Fast traffic	Los Angeles	Fresno
No nearby paths or trails	Eureka	Fresno
Not enough light at night	San Bernardino	Redding

ATTACHMENT A – QUESTION SEQUENCE FOR WALK AND BIKE TRIPS IN THE CA-NHTS ADD-ON

L3.   In **the past week**, how many times did {you/SUBJECT} take a walk or a jog outside including walk the dog and walks for exercise? (This includes walks from home, work, or some other place)

(NWALKTRP) [DO <u>NOT</u> INCLUDE WALKS ON A TREADMILL.]

WALKS OUTSIDE IN PAST WEEK .... |___|___|

REFUSED .... -7
DON'T KNOW .... -8

NOTE: ASK LCA1 IF L3 GT 0

LCA1. And in the past week, how much total time did you spend walking?

[DO <u>NOT</u> INCLUDE WALKS ON A TREADMILL.]

WALK TIME .... |___|___|

REFUSED .... -7
DON'T KNOW .... -8

L4.   In **the past week**, how many times did {you/SUBJECT} ride a bicycle outside including bicycling for exercise?

(BIKETRIP) [DO <u>NOT</u> INCLUDE BICYCLING ON A STATIONARY BIKE.]

BIKE RIDES .... |___|___|

REFUSED .... -7
DON'T KNOW .... -8

NOTE: ASK LCA2 IF L4 GT 0

LCA2. And in the past week, how much total time did you spend biking?

[DO <u>NOT</u> INCLUDE BICYCLING ON A STATIONARY BIKE.]

BIKE TIME .... |___|___|

REFUSED .... -7
DON'T KNOW .... -8

Note: If Respondent reports a bike trip (LCA2>0), he/she gets the bike section. We want to capture ALL the bikers, so if a R reports bike and walk, they get bike section. If LCA1>0 and LCA2=0, -7, -8 the Respondent gets the walk section. Randomized response pattern: each respondent gets 4-5 possible response categories.

Bike Section (Added Questions for People Reporting Bike Rides):

LCA3.   Were these rides:

A.	On the way to or from work	1	2	7	9	(LCA3_A)
B.	On the way to or from public transportation	1	2	7	9	(LCA3_B)
C.	Escorting children to or from school	1	2	7	9	(LCA3_C)
D.	Running errands or shopping	1	2	7	9	(LCA3_D)
E.	For Exercising	1	2	7	9	(LCA3_E)
F.	To exercise the dog	1	2	7	9	(LCA3_F)

G. OTHER SPECIFY_____ .... (LCA3_OTH)

LCA4. I'm now going to ask you about things that may keep you from doing more BIKING or BIKE activities. Please tell me if any of the following keep YOU from doing more BIKING.

		Yes	No	DK/NS	Ref	
A.	You're too busy. Would you say yes or no?	1	2	7	9	BIKE_A
B.	You have poor health. Would you say yes or no?	1	2	7	9	BIKE_B
C.	No one to bike with	1	2	7	9	BIKE_C
D.	Dogs	1	2	7	9	BIKE_D
E.	No nearby paths or trails	1	2	7	9	BIKE_E
F.	Not enough bike lanes or wide curb lanes	1	2	7	9	BIKE_F
G.	No sidewalks or sidewalks in poor condition	1	2	7	9	BIKE_G
H.	Unsafe street crossings	1	2	7	9	BIKE_H
I.	No shops or other interesting places to go	1	2	7	9	BIKE_I
J.	Not enough people around	1	2	7	9	BIKE_J
K.	Fear of street crime	1	2	7	9	BIKE_K
L.	Too many cars	1	2	7	9	BIKE_L
M.	Fast traffic	1	2	7	9	BIKE_M
N.	Air pollution	1	2	7	9	BIKE_N
O.	Too many things to carry	1	2	7	9	BIKE_O
P.	Small children along	1	2	7	9	BIKE_P
R.	Not Enough Light at Night	1	2	7	9	BIKE_R
S.	OTHER SPECIFY_____	(BIKE_OTH)				

Walk Section (Added Questions for People Reporting Walks):

LCA5.   Were these walks, jogs, or runs:

A.	To walk/exercise the dog	1	2	7	9	(LCA5_A)
B.	On the way to or from work	1	2	7	9	(LCA5_B)
C.	On the way to or from public transportation	1	2	7	9	(LCA5_C)
D.	Escorting children to or from school	1	2	7	9	(LCA5_D)
E.	Running errands or shopping	1	2	7	9	(LCA5_E)
F.	For Exercising	1	2	7	9	(LCA5_F)

G. Other SPECIFY_____(LCA5_OTH)

LCA6. I'm now going to ask you about things that may keep you from doing more walking. Please tell me if any of the following keep YOU from doing more walking.

		Yes	No	DK/NS	Ref	
A.	You're too busy. Would you say yes or no?	1	2	7	9	WALK_A
B.	You have poor health. Would you say yes or no?	1	2	73	9	WALK_B
C.	No one to walk with	1	2	7	9	WALK_C
D.	Dogs	1	2	7	9	WALK_D
E.	No nearby paths or trails	1	2	7	9	WALK_E
F.	No nearby parks	1	2	7	9	WALK_F
G.	No sidewalks or sidewalks in poor condition	1	2	7	9	WALK_G
H.	Unsafe street crossings	1	2	7	9	WALK_H
I.	No shops or other interesting places to go	1	2	7	9	WALK_I
J.	Not enough people walking around	1	2	7	9	WALK_J
K.	Fear of street crime	1	2	7	9	WALK_K
L.	Too many cars	1	2	7	9	WALK_L
M.	Fast traffic	1	2	7	9	WALK_M
N.	Air pollution	1	2	7	9	WALK_N
O.	Streets too wide	1	2	7	9	WALK_O
P.	Things to carry	1	2	7	9	WALK_P
Q.	Small children along	1	2	7	9	WALK_Q
R.	Not Enough Light at Night	1	2	7	9	WALK_R

S. Other Specify_____   (WALK_OTH)

Transportation Disability Section

M4. {Do you/Does SUBJECT} have a temporary or permanent condition or handicap that makes it difficult to travel outside of the home?

(MEDCOND)

YES.. 1
NO 2   GO TO M7 (K5)
REFUSED.. -7   GO TO M7 (K5)
DON'T KNOW .... -8   GO TO M7 (K5)

M5.   How long {have you/has SUBJECT} had this condition?

(MEDCOND6)

[CODE 6 ONLY IF RESPONDENT OFFERS.]

0 - 5 MONTHS.. 1
6 – 11 MONTHS 2
1 – 4 YEARS... 3
5 – 9 YEARS... 4
10 YEARS OR MORE................................... 5
ALL HIS/HER LIFE 6
REFUSED.. -7
DON'T KNOW .... -8

NOTE: ASK MCA5 IF M4=1

MCA7. Do you use anything to help you walk or get around, such as a cane, seeing-eye dog, or wheelchair?

WALKHELP

1.   Yes
2.   No

NOTE: ASK MCA8 IF MCA7=1

MCA8. **Do you use a**: (Read list and mark all that apply)

		Yes	No	DK/NS	Ref	
a.	Cane	1	2	7	9	(W_CANE)
b.	Walker 1		2	7	9	(W_WLKR)
c.	White cane	1	2	7	9	(W_WHCANE)
d.	Seeing eye/K-9 assistance	1	2	7	9	(W_DOG)
e.	Crutches	1	2	7	9	(W_CRUTCH)
f.	Motorized Scooter	1	2	7	9	(W_SCOOTR)
g.	Manual Wheelchair	1	2	7	9	(W_CHAIR)
h.	Motorized Wheelchair	1	2	7	9	(W_MTRCHR)
	i. Other SPECIFY_____					(W_OTHER)