Regional Air Quality Survey Analysis Report

Prepared by the Capital Area Council of Governments

February 16, 2017

Executive Summary

CAPCOG's Air Quality Program conducted a regional phone survey of 710 residents of Bastrop, Caldwell, Hays, Travis, and Williamson Counties from October 22, 2016 – November 26, 2016, the third such survey conducted since 2014. This report provides selected analyses of the responses, including:

- Comparisons of the general demographic, household, employment, and commuting data in CAPCOG's 2014-2016 surveys compared to the U.S. Census Bureau's 2011-2015 American Community Survey Data; and

- Statistical analysis of the direction, magnitude, and statistical significance of the impacts of various demographic factors on some key responses for air quality planning purposes.

This is the first analysis that CAPCOG has performed on its survey that has included regression analysis, which enables a more subtle understanding of the factors that influence key issues such as level of air quality awareness, willingness and ability to take action to reduce exposure and emissions, and support for vehicle emissions inspections and maintenance programs. This report is not a comprehensive analysis of every question asked, just some key ones where there were sufficient data to perform such regression analyses. The data itself is being submitted to TCEQ along with this report and will be posted on CAPCOG's website to allow others to use the data for research purposes.

Some key findings from this report include:

- CAPCOG's 2014-2016 surveys have all been geographically representative (by county)

- CAPCOG's 2016 survey does the best job of any of the three in ensuring adequate inclusion of survey respondents who spoke Spanish

- CAPCOG's 2016 survey and other surveys have tended to skew older

- CAPCOG's surveys have tended to under-represent Hispanics/Latinos and Asians

- CAPCOG's surveys have tended to over-represent higher income and higher-education individuals

- CAPCOG's surveys have tended to under-represent households with children in them

- CAPCOG's surveys have tended to over-represent individuals who are not working

- CAPCOG's surveys have tended to over-represent single-occupancy vehicle commuters, particularly in 2016

- Educational attainment has one of the strongest and most consistent signals across most of the questions analyzed – the more educated you are, the more likely you are to be aware of air quality generally and the more willing you are to take action

- Age shows up as another factor that has a statistically significantly positive impact on levels of awareness and willing to take action

- There are some residents, including women and non-whites, who appear to be less aware of air quality issues generally, but more willing to take action to reduce exposure and emissions

- There are some factors, such as identifying as politically conservative and being a resident of Williamson County that appear to make people less likely to be aware of ozone action days

- Having allergies, kids, or a family member with asthma show up as having statistically significant impacts on some of the results, but actually having asthma did not appear to have a statistically significant impact on level of awareness of air quality issues or willingness to take action

- Being politically progressive is statistically significantly related to support for the vehicle emissions inspection and maintenance program and willingness to take actions other than commuting reductions to reduce ozone on Ozone Action Days

This report documents these analyses.

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1 Comparisons of General Demographic and Household Data

CAPCOG asked a number of general demographic questions to enable comparisons of our survey results to demographic data tracked in the American Community Survey (ACS), including telephone access, language, population by county, age, race and ethnicity, income, and educational attainment. This section provides comparisons of ACS data to CAPCOG's survey responses for these demographic characteristics.

1.1 Telephone Access

The ACS asks respondents if their household has "telephone service from which you can make and receive calls? *Include cell phones*." The ACS table B25043 provides data on the number of households reporting that they have phone survey by tenure and age. Overall, the percentage of households with phone service in the Austin-Round Rock MSA ranges from 96.60% to 98.86%, depending on the demographic for the 2011-2015 ACS averages.[1] These data provide an indication of the likelihood that a specific housing types and age groups may have been included or excluded from the survey by virtue of having access to a phone.

Table 1. Phone Service by Housing Type and Age of Householder

Household Type	Age of Householder	Total Number	% with Phone Service
Owner-Occupied	Total 15-34	49,406	97.14%
Owner-Occupied	Total 35-64	270,803	98.38%
Owner-Occupied	Total 65+	79,274	98.86%
Owner-Occupied	TOTAL	399,483	98.32%
Renter-Occupied	Total 15-34	138,393	96.69%
Renter-Occupied	Total 35-64	130,125	96.41%
Renter-Occupied	Total 65+	21,277	97.17%
Renter-Occupied	TOTAL	289,795	96.60%
TOTAL	**TOTAL**	**689,278**	**97.60%**

The percentage of householders in this range with no access to a phone ranges from 1.14% to 3.59%. While there appear to be statistically significant differences in the likelihood that someone would not have access to a phone based on age and housing type, the low overall percentage relative to the margin of error for this survey suggests that this would not be a meaningful factor that would be likely to influence the overall results of this survey.

1.2 Language

The figure below shows a comparison of ACS data on language to CAPCOG's 2014, 2015, and 2016 surveys by language. The ACS percentages reflect the percentage of ACS respondents who could

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[1] United States Census Bureau. American FactFinder. "B25043: Tenure by Telephone Service Available by Age of Householder"*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. December 29, 2016. Available online at http://factfinder2.census.gov.

communicate in English "very well," who primarily speak Spanish but who don't speak English "very well," and who primarily speak another language but who don't speak English "very well."[2]

Figure 1. Comparison of 2011-2015 ACS Ability to Communicate by Language to CAPCOG Surveys
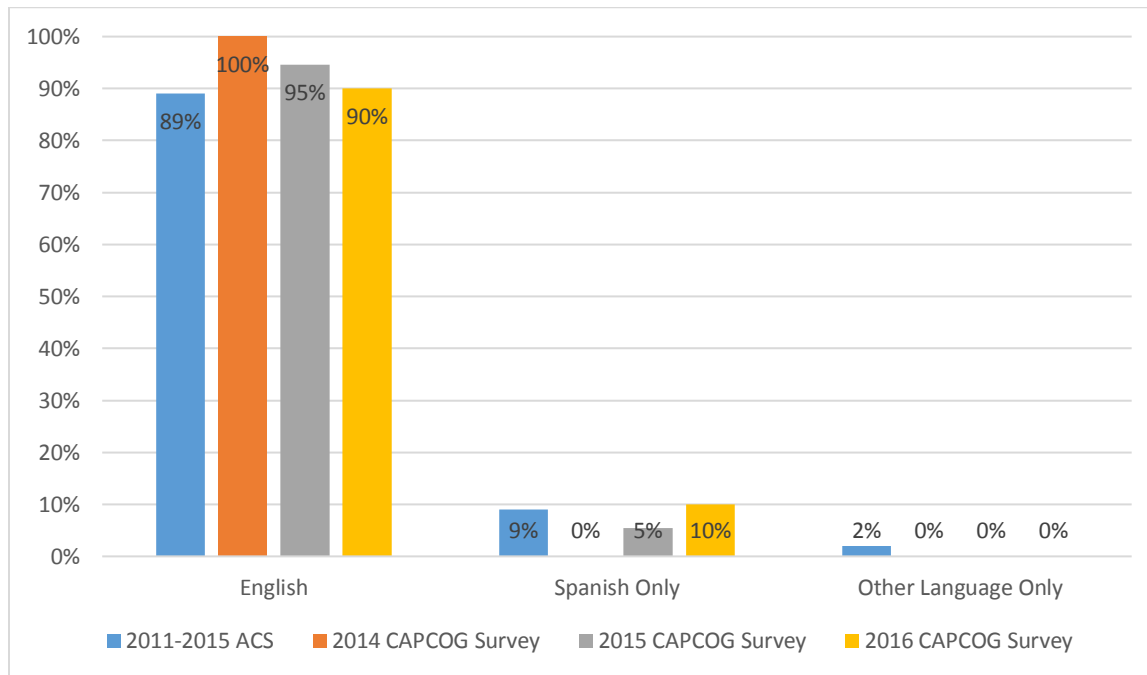
As the figure shows, 10% of the population primarily speaks Spanish but cannot speak English "very well," which is what prompted CAPCOG to begin to require that a minimum percentage of surveys be conducted in Spanish starting with the 2015 survey. Overall, only 72% of the population of the Austin-Round Rock MSA reports only speaking English at home, while 22% of the population primarily speak Spanish, and 6% of the population primarily another language at home. For the purpose of evaluating the opportunity for a randomly selected individual to participate in this survey, CAPCOG believes that the 2016 survey adequately ensured the opportunity to participate for people who primarily speak Spanish by ensuring that at least 9% of the surveys were conducted in Spanish.

Of the 33,258 individuals estimated to speak primarily speak another language while not being able to speak English well, 27,591 (83%) of them primarily speak an Asian language (includes Gujarati, Hindi, Urdu, "Other Indic Languages," Chinese, Japanese, Korean, Mon-Khmer/Cambodian, Hmong, Thai, Laotian, Vietnamese, and "Other Asian Languages). The three largest sub-groups that fall into this category are people who primarily speak Vietnamese (7,583 people or 0.4% of the population), Chinese (5,797 people or 0.3% of the population), and Korean (2,391 people or 0.1% of the population).

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[2] United States Census Bureau. American FactFinder. "B16001: Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over."*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. December 29, 2016. Available online at http://factfinder2.census.gov.

Altogether, people who primarily speak one of these Asian languages who report not speaking English "very well" constitute 1.6% of the population of the Austin-Round Rock MSA.

1.3 Population by County

The following table shows a comparison of the 2011-2015 ACS adult population (18 years old and higher) by county to the distribution of survey responses in each county for CAPCOG's 2014, 2015, and 2016 surveys.[3] The overall distribution for each of the three CAPCOG surveys is quite close to the distribution in the ACS, although there is a noticeably larger share of responses from Hays County and noticeably smaller share of responses from Williamson County in 2016 than would be expected.

Figure 2. Comparison of 2011-2015 ACS Total Adult Population by County to CAPCOG Survey Data
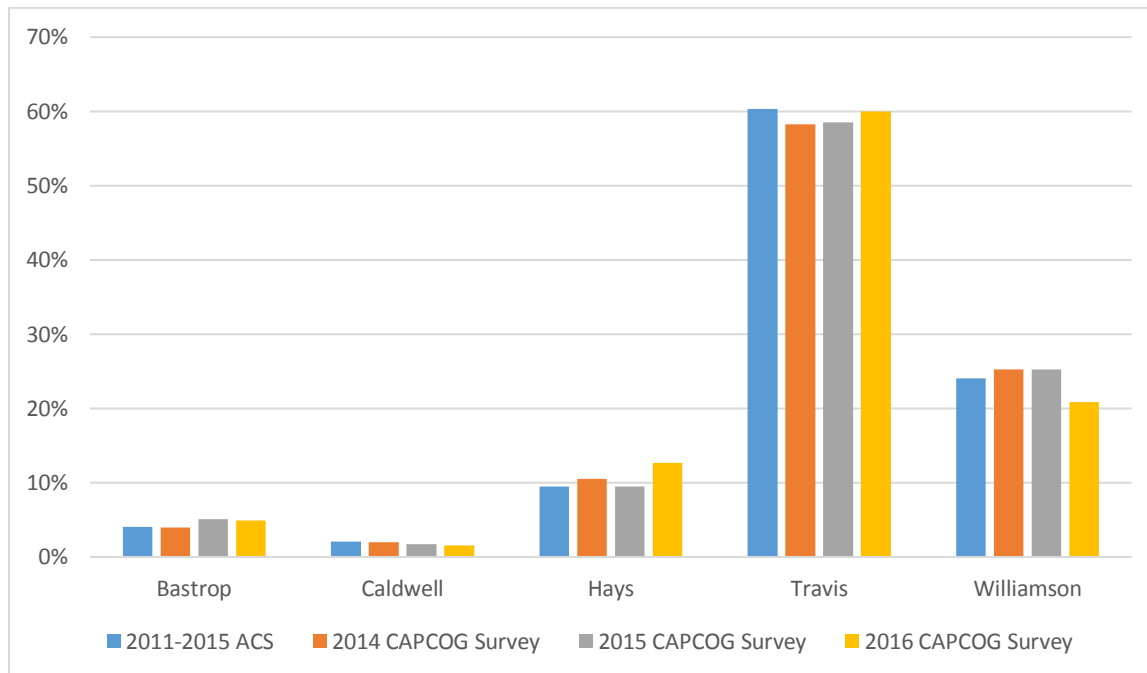
1.4 Age

The following figure shows a comparison of the 2011-2015 ACS age distribution to the age distribution of the responses to CAPCOG's 2014, 2015, and 2016 surveys.[4] As the figure shows, despite CAPCOG's efforts to ensure that there was adequate balance between the under-45 age group and the 45+ age group, there was still a skew towards older residents *within* these groups.

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[3] United States Census Bureau. American FactFinder. "B01001: Sex by Age."*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. December 29, 2016. Available online at http://factfinder2.census.gov.

[4] United States Census Bureau. American FactFinder. "B01001: Sex by Age."*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. December 29, 2016. Available online at http://factfinder2.census.gov.

Figure 3. Comparison of 2011-2015 ACS Age Distribution to CAPCOG Surveys
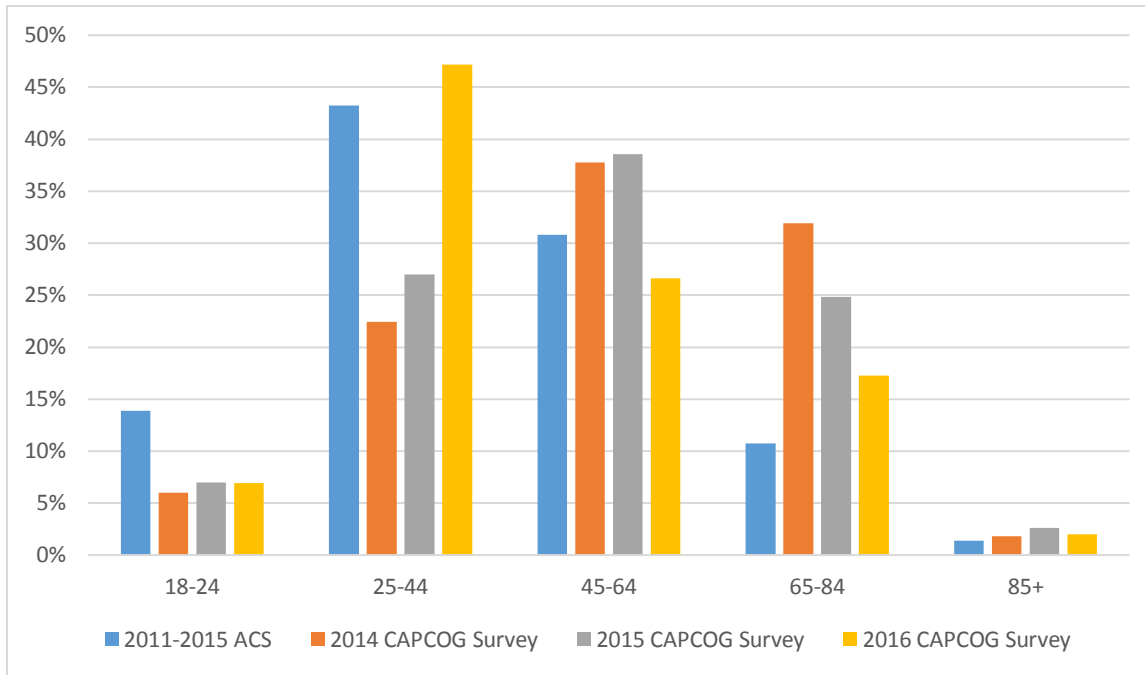
1.5 Race and Ethnicity

CAPCOG compared the racial and ethnic identification of respondents to its 2014, 2015, and 2016 surveys relative to the 2011-2015 ACS.[5] In the ACS, race and Hispanic/Latino origin are treated as two separate ethnic identifications. Using the ACS's "Hispanic or Latino Origin by Race" table, CAPCOG calculated that 53.61% of the population of the Austin-Round Rock MSA "White alone", with 24.88% White-Hispanic/Latino, 7.02% "Black or African-American alone," 5.36% Some other race-Hispanic/Latino, 5.08% "Asian alone," and all other racial/ethnic identities making up 4.05% of the population.

Question 39 in CAPCOG's 2016 survey asked respondents about race and Hispanic/Latino origin in a single question using the following wording: "Which of the following categories describe you – select all that apply," similar to the American Community Survey's proposed new methodology. The table below shows the results.

Table 2. CAPCOG 2016 Survey Responses by Racial and Ethnic Identity

Description	Count	Percentage
White	523	73.66%
Hispanic, Latino, or Spanish Origin	109	15.35%
Black or African-American	49	6.90%

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[5] United States Census Bureau. American FactFinder. "B03002: Hispanic or Latino Origin by Race."*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. December 29, 2016. Available online at http://factfinder2.census.gov.

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Asian	16	2.25%
American Indian or Alaska Native	8	1.13%
Middle Eastern or North African	5	0.70%
Native Hawaiian or Other Pacific Islander	5	0.70%
Some other race, ethnicity, or origin	5	0.70%
Don't know/Won't say	31	4.37%
TOTAL	**710**	**100.00%**

In order to provide a direct comparison, CAPCOG used a series of ACS tables that included estimates of the total number of people reporting a specific identification: [6]

- White alone or in combination with other races (Table B02008), 1,531,390 (81.06%), 1,889,094
- Black or African-American alone or in combination with one or more races (Table B02009); 159,387 people (8.44%)
- American Indian and Alaska Native alone or in combination with one or more races (Table B02008), 22,532 people (1.19%);
- Asian alone or in combination with one or more other races (Table B02011), 117,298 people (6.21%);
- Native Hawaiian and other Pacific Islander alone or in combination with one or more other races (Table B02012), 3,700 people (0.20%);
- Some other race alone or in combination with one or more other races (Table B02013), 115,702 (6.12%)
- Hispanic or Latino origin by race (Table B03002), 602,079 people (31.87%)

The following figure shows a comparison of the distribution of responses by race/ethnicity for the ACS and CAPCOG's three surveys. In CAPCOG's 2014 and 2015 surveys, CAPCOG asked the question regarding race and Hispanic/Latino identity separately like the 2011-2015 ACS did. In analyzing those results. CAPCOG found that a large majority of the people who responded "other" to race in fact had listed some variant of a Hispanic/Latino identity, which strongly suggests that the wording of this question in 2016 compared to the ACS and CAPCOG's 2014 and 2015 surveys had an impact on the respondent would reply as "other." Percentages in the figure below are not mutually exclusive, so that someone could respond as both white and Hispanic/Latino, for example.

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[6] All tables cited as follows: United States Census Bureau. American FactFinder. "[TABLE NUMBER:TABLE NAME]"*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. January 31, 2017. Available online at http://factfinder2.census.gov.

Figure 4. Comparison of 2011-2015 ACS Race and Ethnicity to CAPCOG Survey Data
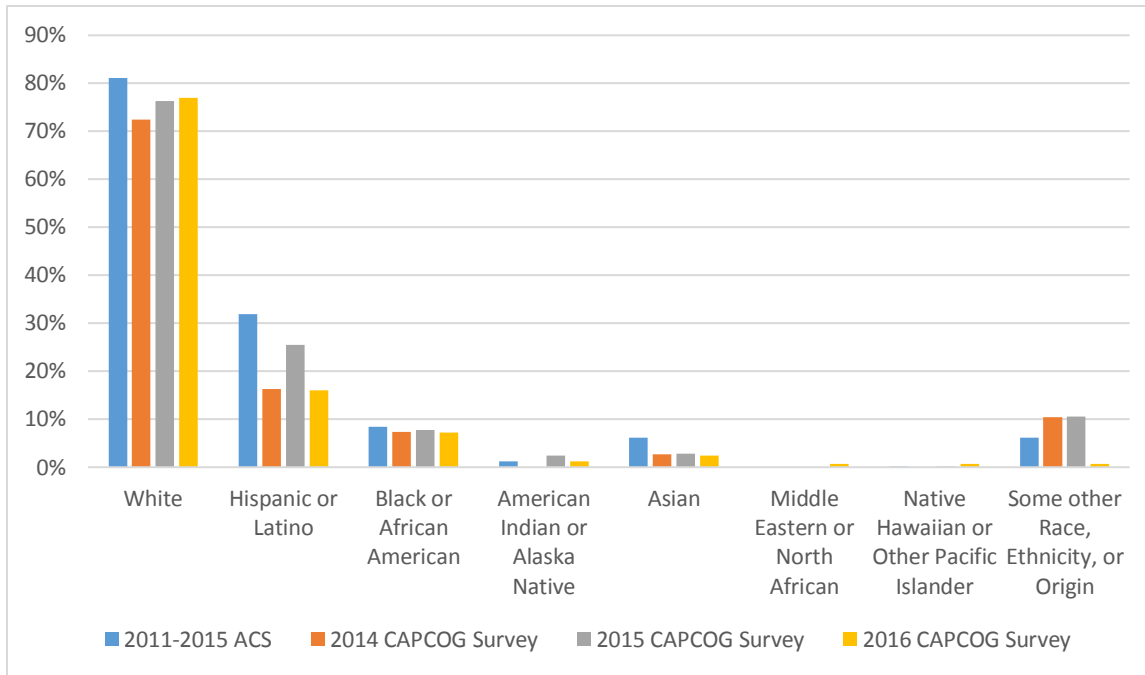
These data seem to show that CAPCOG's surveys have generally significantly under-represented the region's Hispanic/Latino population, and that despite ensuring that at least 9% of the surveys in 2016 were conducted in Spanish, compared to none in 2014, the 2016 survey actually had a slightly lower percentage of respondents who identified as Hispanic or Latino.

While it is a much smaller racial/ethnic group than Hispanic/Latino, Asians made up a noticeably smaller share of CAPCOG's survey in all three years compared to the overall population. Asians make up 6.21% of the population according to the ACS, while only 2.36% - 2.86% of CAPCOG's survey respondents have identified as Asian. Considering what is known about the share of the population that primarily speaks an Asian language at home that reports not speaking English "very well" (1.6% of the population), there still appears to be a consistently lower share of Asians that do speak English "very well" in CAPCOG's phone surveys compared to their overall share of the population (4.7% of the population primarily speaks an Asian language at home).

1.6 Income

The following figure shows a comparison of the ACS data to CAPCOG's data by household income range.[7]

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[7] United States Census Bureau. American FactFinder. "B19001: Household Income in the Past 12 Months (in 2015 Inflation-Adjusted Dollars)" *2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. December 29, 2016. Available online at http://factfinder2.census.gov.

Figure 5. Comparison of 2011-2015 ACS Household Income to CAPCOG Survey Data Household Income
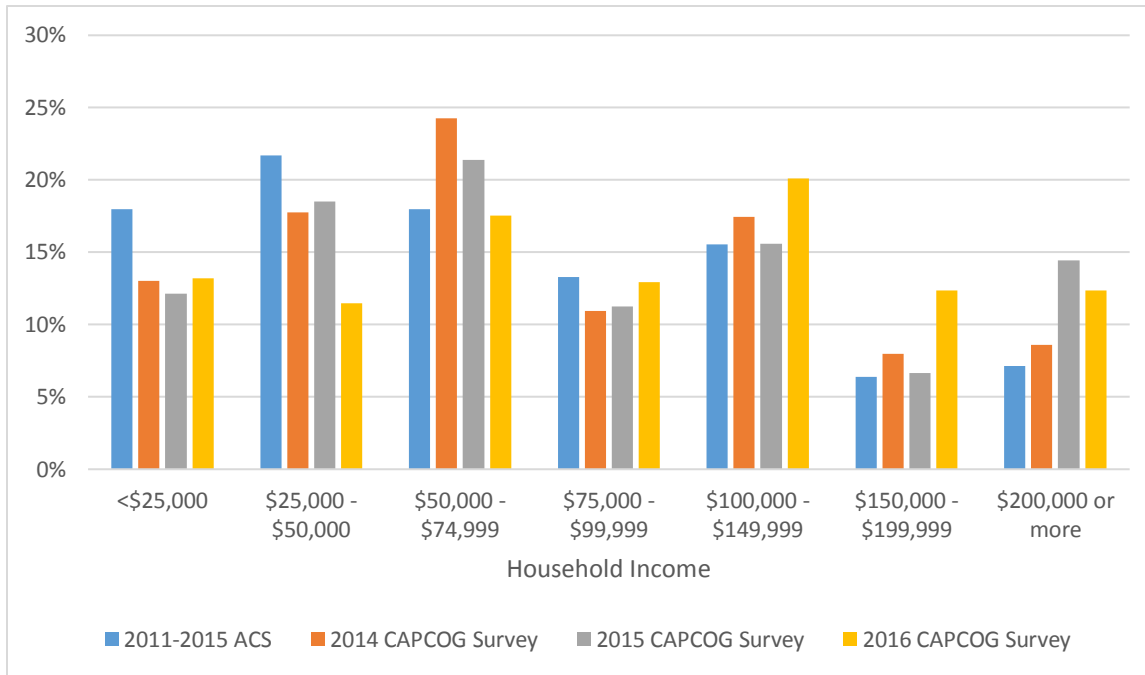
While all three of the surveys had noticeably lower percentages of respondents in the <$25,000/year and $25,000 - $50,000 household income level than the ACS shows would be representative of the region's population as a whole, the 2014 and 2015 surveys had median and mean household incomes very close to the ACS numbers, while the 2016 survey data appeared to be skewed particularly high on the income range.

Median and mean household income data are shown below:

- 2011-2015 ACS Data: $63,437 = median[8], $86,672 = mean[9]
- 2014 Survey: $65,000 = median, $89,337 = mean
- 2015 Survey: $65,000 = median, $82,705 = mean
- 2016 Survey: $89,000 = median, $114,396 = mean

These data show that, while average and median incomes in CAPCOG's 2014-2015 surveys were well in line with 2011-2015 ACS data, the 2016 survey respondents reported substantially higher median and average incomes than the 2011-2015 ACS. .

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[8] Table B19013: Median Household Income in the Past 12 Months (in 2015 Inflation-Adjusted Dollars)
[9] Using Table B19001: Household Income in the Past 12 Months (in 2015 Inflation-Adjusted Dollars) (689,278 households) and table B19025: Aggregate Household Income in the Past 12 Months (in 2015 Inflation-Adjusted Dollars) $59,740,995,000

1.7 Educational Attainment

Educational attainment is one of the factors that CAPCOG has previously identified as highly correlated with certain types of survey responses, including level of awareness of air quality and willingness to take action to reduce exposure and emissions. The figure below shows a comparison of the distribution of survey responses compared to the percentage of the population by educational attainment reported in the ACS.[10]

Figure 6. Comparison of 2011-2015 ACS Educational Attainment to CAPCOG Survey Data
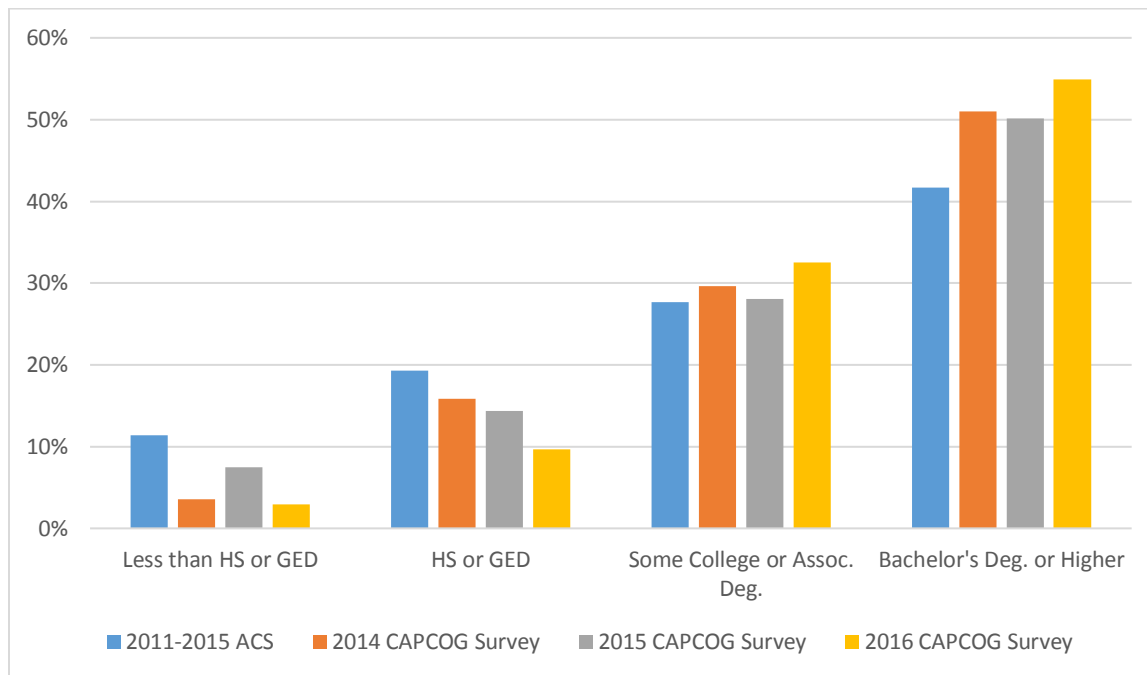
As the figure above shows, CAPCOG's surveys have tended to over-sample people on the higher end of the educational attainment spectrum – particularly people with Bachelor's degrees or higher, and under-sample people with only a High School degree or GED or lower.

1.8 Presence of Children in the Household

One of the pieces of information CAPCOG has tracked is whether a survey respondent has children under the age of 18. The 2016 survey asks the question as follows: "How many children do you have under the age of 18 and what are their ages?" The question was worded differently in 2014 and 2015: "Do you have children under the age of 18?" The following figure shows a comparison of CAPCOG's

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[10] United States Census Bureau. American FactFinder. "B16010: Educational Attainment and Employment Status by Language Spoken at Home for the Population 25 Years and Over"*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. December 29, 2016. Available online at http://factfinder2.census.gov.

survey results to the ACS data on the percentage of households with a child under the age of 18 in the home.

Figure 7. Comparison of ACS Presence of Children in Household to Survey Data on Having Children
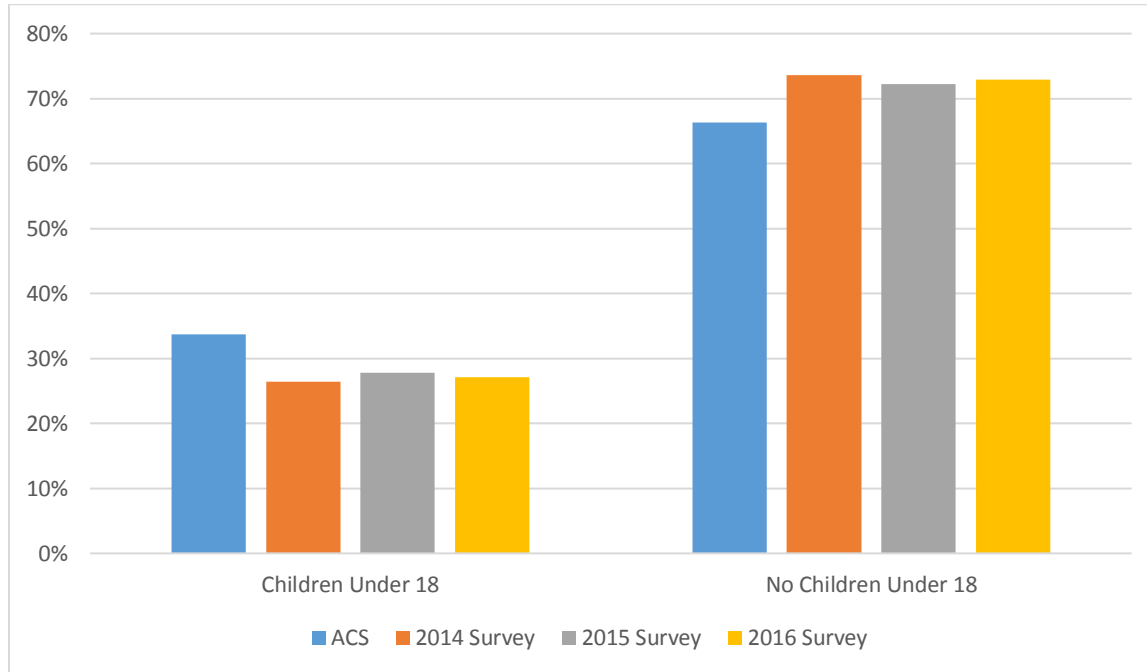
Strictly speaking, the difference between CAPCOG's survey question and the derivation of the ACS data makes these data somewhat different.[11] For example, in CAPCOG's survey, there are people who could have responded that they had children under the age of 18, but the child did not live in the respondent's household. Similarly, there are households in which grandparents or other care-givers are taking care of children that the wording of CAPCOG's survey may not capture. However, there appears to be relatively good agreement across all three of CAPCOG's surveys, and these numbers are not drastically different than the percentage of households reporting having children under the age of 18.

2 Comparisons of Employment and Commuting Data

In 2015, CAPCOG began asking respondents detailed data on their commuting in questions intended to be directly comparable to the ACS survey. This section includes comparisons of the survey responses by employment status, time leaving home to go to work, number of vehicles available, and commuting mode.

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[11] United States Census Bureau. American FactFinder. "Table B11005: Households by Presence of People Under 18 Years by Household Type"*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. January 31, 2017. Available online at http://factfinder2.census.gov.

2.1 Employment Status

One of the key variables in vehicle usage is employment status. The following figure shows the percentage of survey respondents who reported being employed compared to ACS data. The wording of CAPCOG's question used for this data point in 2014 was significantly different than the wording in 2015 and 2016, which stick closer to the ACS questionnaire.[12]

Figure 8. Comparison of ACS Employment Status Data to CAPCOG Survey Data
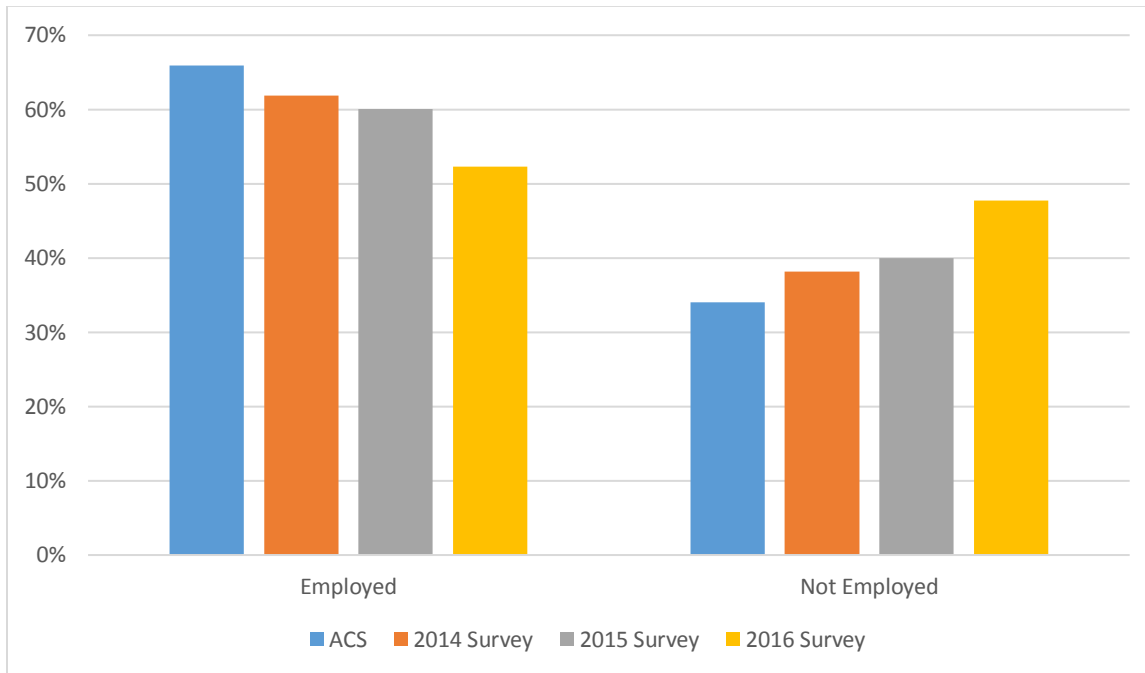
These data show that CAPCOG's survey respondents were less likely to be employed than a random member of the general public, particularly in the 2016 survey.

2.2 Time Leaving Home to Go to Work

In 2015, CAPCOG began asking survey respondents what time they leave to go to work in order to obtain data comparable to the ACS.[13] The figure below shows the distribution of responses to each survey regarding the time leaving home to go to work. In general, there is good agreement among the surveys, except that there seems to be a substantially larger share of respondents in the 2016 survey who leave

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[12] United States Census Bureau. American FactFinder. "Table B23025: Employment Status for the Population 16 Years and Over"*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. January 31, 2017. Available online at http://factfinder2.census.gov.

[13] United States Census Bureau. American FactFinder. "Table B08301: Time Leaving Home to Go to Work"*2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. January 31, 2017. Available online at http://factfinder2.census.gov.

home between 6:00 am – 6:59 am and smaller shares who leave work between 7:00 am – 7:59 am and between 4:00 pm – 11:59 pm. CAPCOG did not ask this question in the 2014 survey, so only the 2015 and 2016 data are available for comparison.

Figure 8. Comparison of ACS Commuting Time Leaving Home to Go to Work to 2015 and 2016 Survey Results
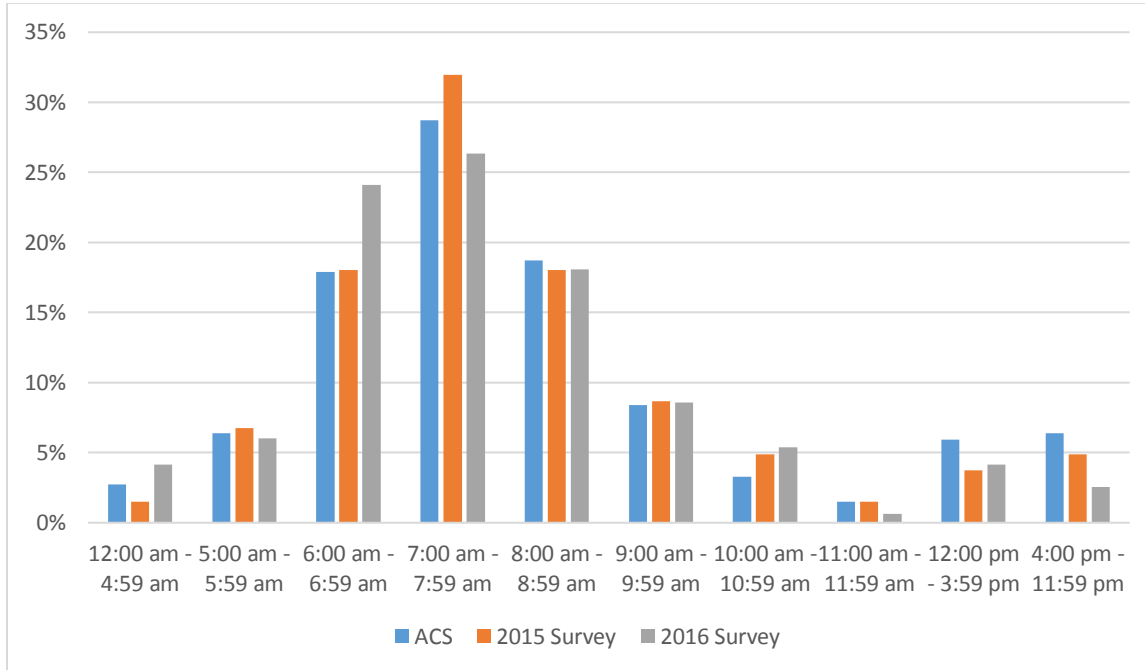
2.3 Passenger Vehicles Available

The figure below shows a comparison of the distribution of responses by the number of passenger vehicles (cars and trucks, excluding motorcycles) available in the household of the respondent. CAPCOG did not ask this question in 2014, so only 2015 and 2016 data are available for comparison.

Figure 9. Comparison of ACS Data on Personal Vehicles Available to 2015 and 2016 Survey Data
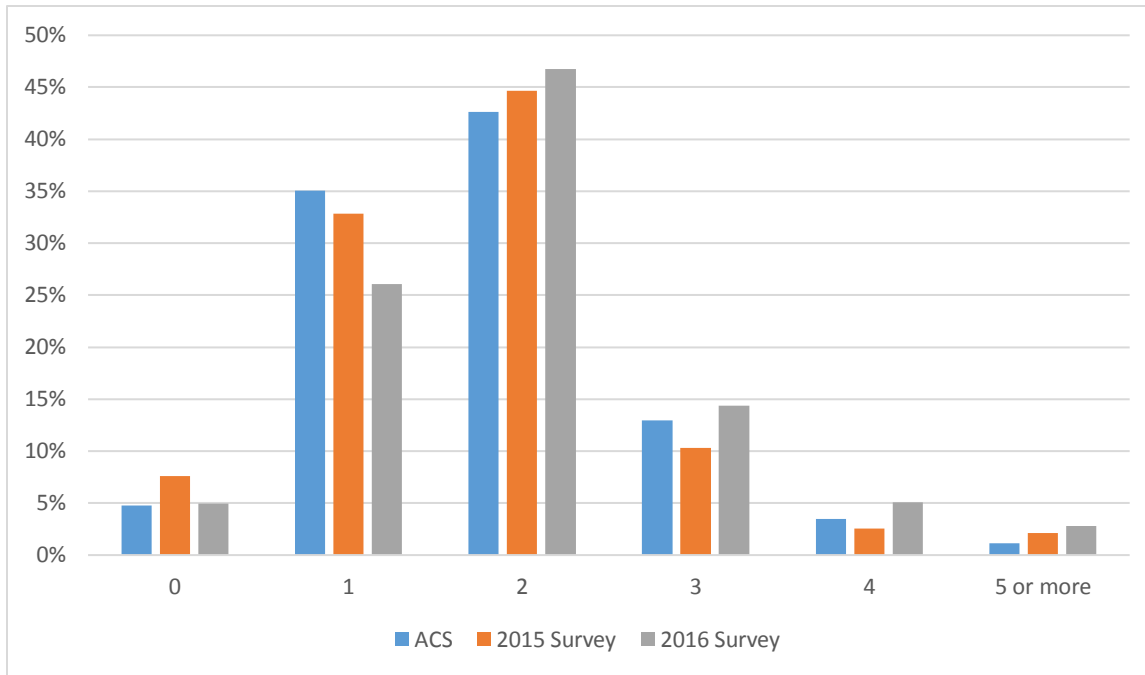
The 2011-2015 ACS accounts for 689,278 households and 1,233,706 vehicles available in the region, for an average of 1.79 vehicles per household.[14] By comparison, the average number of vehicles per household in the 2015 survey was 1.75 vehicles per household, and the average for the 2016 survey was 1.98 vehicles per household.

2.4 Commuting by Mode

The figure below shows a comparison of commuting by mode in the 2011-2015 ACS to CAPCOG's 2014-2016 surveys[15].

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[14] United States Census Bureau. American FactFinder. "B25043: Tenure by Vehicles Available" and "Aggregate Number of Vehicles by Tenure." *2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. January 31, 2017. Available online at http://factfinder2.census.gov.

[15] United States Census Bureau. American FactFinder. "Table B08301: Means of Transportation to Work" *2015 American Community Survey*. U.S. Census Bureau's American Community Survey Office, 2011. Web. January 31, 2017. Available online at http://factfinder2.census.gov.

Figure 10. Comparison of ACS Commuting by Mode to 2015 and 2016 Survey Results
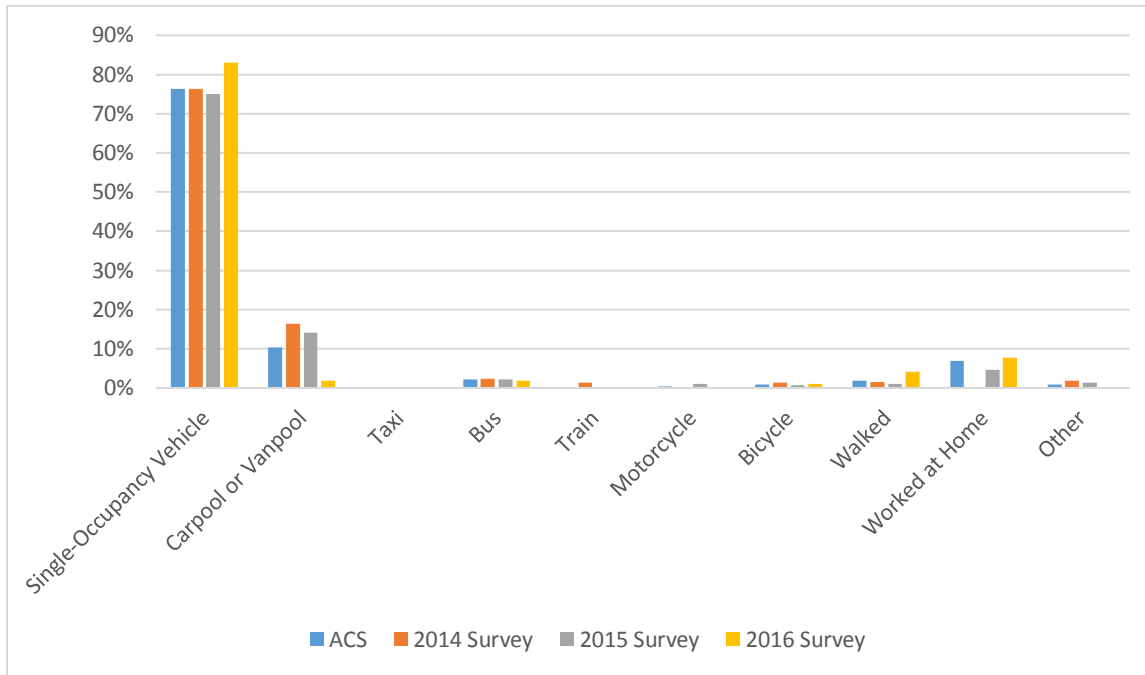
The most noteworthy aspect of these data is the substantially higher percentage of respondents in the 2016 survey who reported commuting by single-occupancy vehicle commuting than the ACS or 2015 survey, and the correspondingly much smaller percentage who reported commuting by carpool.

3   Regression Analyses

Regression analyses allow researchers to analyze the impact of multiple factors on an outcome simultaneously and determine if the impact is statistically significant. In analyzing public opinion surveys, the responses usually do not lend themselves to linear regression since the responses are usually binary or multiple choice. For these types of responses, it is necessary to use logistic models that calculate the impact of a factor on the probability of a particular survey response occurring. CAPCOG performed a series of such analyses on its 2016 survey data, and then added data from its 2014 and 2015 surveys in order to perform multi-year analyses that would be able to determine if there were statistically significant trends between the three surveys conducted.

Logistic regressions can be used to develop "odds-ratios" that describe the odds of particular outcome occurring relative to it not occurring given the value of a survey response.

A logistic model is generally set up as follows:

Where π_i represents the probability of the i-th value for a dependent variable equaling 1:

$$odds_i = \frac{\pi_i}{1 - \pi_i}$$

$$logit\,(\pi_i) = \log\frac{\pi_i}{1 - \pi_i} = x_i\beta$$

$$\frac{\pi_i}{1 - \pi_i} = e^{x_i\beta}$$

$$\pi_i = \frac{e^{x_i\beta}}{1 + e^{x_i\beta}}$$

$$\frac{d\pi_i}{dx_{ij}} = \beta_j\pi_i(1 - \pi_i)$$

For a model with two independent variables, the form looks as follows:

$$logit\,(\pi_{ij}) = n + \alpha_i + \beta_j$$

Where n is a constant.

3.1 Overview of Regression Analyses

CAPCOG performed a series of regression analyses in an iterative process, summarized below:

1. Initial analyses testing 18 explanatory variables' impacts on the responses to 14 questions from the 2016 survey;

2. Refined analyses of responses to 9 of the 14 questions tested in the initial analysis, using a reconfiguration of the explanatory variables used in the initial analysis and additional explanatory variables selected for each question; and

3. Analyses of expanded datasets consisting of results from CAPCOG's 2014, 2015, and 2016 surveys.

3.2 Dependent Variables Analyzed

CAPCOG tested each of the following questions using logistic models:

- Q3: on a scale of 1-7, with 1 being "very informed" and 7 being "very uninformed," how well-informed on regional air quality in Central Texas do you consider yourself?
- Q4: on a scale of 1-7, with 1 being the lowest and 7 being the highest, how much of a threat do you believe that air pollution in Central Texas is to you or your family?
- Q5: are you familiar with the Air Quality Index?
- Q7: are you familiar with air quality forecasts?
- Q9: are you familiar with Ozone Action Days?
- Q11: do you take action to reduce your exposure or your family's exposure to ozone on Ozone Action Days?
- Q12: do you change your commute on Ozone Action Days?
- Q14:do you take any other actions to reduce your emissions on Ozone Action Days?
- Q20: which of the following best describes your opinion of a) the vehicle emissions inspection and maintenance program in Travis and Williamson Counties or b) having a similar vehicle emissions inspection program in your county?

CAPCOG also tested questions 17, 25, 27, 32, and 33, but due to low numbers of responses, was not able to perform full-scale logistic regression analyses on these questions.

CAPCOG first set up each response based on the desired value to correspond with y = 1. For example, CAPCOG set a value of "1" for any response to question 3 that was either 5, 6, or 7 to reflect the three responses that indicated some level of "informed," with all other responses coded as "0."

3.3 Independent Variables Analyzed

CAPCOG used an iterative approach to analyzing independent variables. CAPCOG staff first developed an initial list of factors that it decided to include in an initial set of analyses for all dependent variables for the 2016 survey. The objective of this initial set of analyses was to provide a screening-level analysis of the significance of some key demographic factors and determine if any adjustments needed to be made. These included:

- Phone type;
- Language survey was conducted in;
- Gender;
- County (question 1);
- Race/ethnicity (question 39);
- Age (question 40);
- Educational attainment (question 41); and
- Political perspective (question 43).

CAPCOG did not include income (question 42) among these initial variables due to the large number of non-responses and the significant loss of explanatory power that any model that would include income would face. Out of the 710 survey respondents, a total of 362 refused to report income, compared to 31 for race/ethnicity, 4 for age, 9 for education, and 46 for political perspective.

CAPCOG configured the independent variables for the initial were configured as follows:

1. Phone call type ("1" if land line, "0" if cell phone)
2. Bastrop County ("1" if response to question 1 = "Bastrop," all other responses = "0")
3. Caldwell County ("1" if response to question 1 = "Caldwell," all other responses = "0")
4. Hays County ("1" if response to question 1 = "Hays," all other responses = "0")
5. Williamson County ("1" if response to question 1 = "Williamson," all other responses = "0")
6. Some College ("1" if response to question 41 = "Some College or an Associate's Degree," all others = "0")
7. Bachelor's Degree ("1" if response to question 41 = "Bachelor's Degree," all other responses = "0")
8. Advanced Degree ("1" if response to question 41 = "Advanced Degree," all other responses = "0")
9. Age (continuous variable)
10. Female ("1" if survey respondent was female, "0" if male)
11. Language ("1" if survey conducted in Spanish, "0" if in English)
12. Conservative ("1" if response to question 43 = 1, 2, or 3, "0" for all other responses)

13. Progressive ("1" if response to question 43 = 5, 6, or 7, "0" for all other responses)
14. Hispanic/Latino only ("1" if response to question 39 only = "Hispanic, Latino, or Spanish Origin," "0" for all other responses)
15. Black only ("1" if response to question 39 only = "Black or African-American," "0" for all other responses)
16. Asian only ("1" if response to question 39 only = "Asian," "0" for all other responses)
17. Other race only ("1" if response to question 39 is only one of the following: "American Indian or Alaska Native," "Middle Eastern or North African," "Native Hawaiian or Other Pacific Islander," or "Some Other Race, Ethnicity, or Origin;" all other responses are "0")
18. Multiple races ("1" if response to question 39 includes more than 1 race, "0" for all other responses)

Based on the results of these initial analyses, which did not show significant differences among the racial/ethnic identity explanatory variables or phone type, CAPCOG grouped all responses that were not only "white" with no second identity into a single "non-White-only" explanatory variables and removed phone type as an explanatory variable. CAPCOG also added several question-specific explanatory variables:

- For questions 3, 4, 5, 6, 7, 9, 11, and 14 CAPCOG included whether the respondent had children, whether the respondent had asthma, whether the respondent had a family member with asthma, and whether the respondent had seasonal allergies

- For question 12, CAPCOG used the same explanatory variables as questions 3-14, but consolidated the responses for Bastrop and Caldwell County due to problems with the number of responses from Caldwell County alone

- For question 20, CAPCOG: a) grouped Travis and Williamson Counties together and grouped Bastrop, Caldwell, and Hays Counties together to differentiate areas that already have an I/M program from those that don't, b) removed race as an explanatory variable, and c) added income as an explanatory variable

CAPCOG configured its explanatory variables as follows:
- o 1: Bastrop County
  - Testing effect of Bastrop County relative to Travis County
  - Bastrop County (Q1 = "Bastrop") = 1
  - Non-Bastrop County (Q1 = "Caldwell," "Hays," "Travis," or "Williamson") = 0
- o 2: Caldwell County
  - Testing effect of Caldwell County relative to Travis County
  - Caldwell County (Q1 = "Caldwell") = 1
  - Non-Caldwell County (Q1 Column F = "Bastrop," "Hays," "Travis," or "Williamson") = 0
- o 3: Hays County
  - Testing effect of Hays County relative to Travis County
  - Hays County (Q1 = "Hays") = 1
  - Non-Hays County (Q1 = "Bastrop," "Caldwell," "Travis," or "Williamson") = 0

- o 4: Williamson County
    - Testing effect of Williamson County relative to Travis County
    - Williamson County (Q1 = "Williamson") = 1
    - Non-Williamson County (Q1 = "Bastrop," "Caldwell," "Hays," or "Travis") = 0
- o 5: Some College
    - Testing effect of some college relative to HS or less as highest educational attainment
    - Filter out any "Don't Know/No Response" records
    - Some College (Q41 = "Some College or Associates Degree") = 1
    - Others (Q41 = "No Schooling Completed," "Grade School or Less (8th Grade or Lower)," "Some High School (9th-11th Grades)," "High School Graduate or Graduate Equivalent Diploma," "Bachelor's Degree," or "Advanced Degree (Master's/JD/PhD)") = 0
- o 6: Bachelor's Degree
    - Testing effect of Bachelor's Degree or Higher to HS or less as highest educational attainment
    - Filter out any "Don't Know/No Response" records
    - Bachelor's Degree (Q41 = "Bachelor's Degree") = 1
    - Others (Q41 = "No Schooling Completed," "Grade School or Less (8th Grade or Lower)," "Some High School (9th-11th Grades)," "High School Graduate or Graduate Equivalent Diploma," "Some College or Associates Degree," or "Advanced Degree (Master's/JD/PhD)") = 0
- o 7: Advanced Degree
    - Testing effect of Advanced Degree to HS or less as highest educational attainment
    - Filter out any "Don't Know/No Response" records
    - Advanced (Q41 = "Advanced Degree (Master's/JD/PhD") = 1
    - Others (Q41 Column DW = "No Schooling Completed," "Grade School or Less (8th Grade or Lower)," "Some High School (9th-11th Grades)," "High School Graduate or Graduate Equivalent Diploma," "Some College or Associates Degree," or "Bachelor's Degree") = 0
- o 8: Age
    - Testing marginal effect of age
    - Filter out any "Don't Know/No Response" records (Q40 Column DV = "999")
    - Age is a continuous variable
- o 9: Female
    - Testing effect of female relative to male
    - Female (Q45 = "Female") = 1
    - Male (Q45 = "Male") = 0
- o 10: Language
    - Testing effect of Spanish-language survey compared to English-language survey
    - Spanish (Language = "SP") = 1
    - English (Language = "EN") = 0
- o 11: Political Views "Conservative"

- Testing effect of "conservative" views compared to "moderate" views
- Remove any "Don't Know/No Response" records
- Conservative (Q43 = "1," "2," or "3,")
- Non-Conservative (Q43 = "4," "5," "6," or "7")
  - o 12: Political Views "Progressive"
    - Testing effect of "progressive" views compared to "moderate" views
    - Remove "Don't Know/No Response" records
    - Progressive (Q43 = "5," "6," or "7")
    - Non-Progressive (Q43 = "1," "2," "3," or "4")
  - o 13: Nonwhite
    - Testing effect of racial/ethnic minority groups relative to people who identify as White only
    - Screen out any records with no reported race/ethnicity only (Q39(9) = 0)
    - Hispanic/Latino (Q39(2) = "Yes"), Black or African-American (Q39(3) = "Yes"), Asian (Q39(4) = "Yes"), American Indian or Alaska Native (Q39(5) = "Yes"), Middle Eastern or North African (Q39(6) = "Yes"), Native Hawaiian or Other Pacific Islander (Q39(7) = "Yes"), and Some Other Race, Ethnicity, or Origin (Q39(other) = "Yes") = 1
    - White only (Q39(1) = "Yes") = 0
  - o 14: Kids
    - Testing effect of having children under 18 relative to not having children under 18
    - Children = 1
    - No Children =0
  - o 15: Asthma
    - Testing the effect of having or previously having asthma
    - Screen out records with a ' Don't know / Won't say' response
    - 'Currently have asthma' or 'do not currently have asthma, but have previously had asthma' = 1
    - 'I do not currently have asthma and never previously had' = 0
  - o 16: Family history of Asthma
    - Testing the effect of having a family member who has or previously had asthma
    - Screen out records with a ' Don't know / Won't say' response
    - 'An immediate family member currently has asthma' or 'No immediate family member currently has asthma, but at least one immediate family member has previously had asthma' = 1
    - 'I do not currently have asthma and never previously had' = 0
  - o 17: Allergies
    - Testing the effect of having seasonal allergies
    - Screen out records with a ' Don't know / Won't say' response
    - 'Yes' = 1
    - 'No' = 0
  - o 18: Income
    - Testing the effect of income per $1000

- Screen out records with a no response
- Divided response by 1000
  - o 19: Vehicle Miles Traveled
    - Test the effect of vehicle miles traveled
    - Screen out records with no response
  - o 20: Eastern Counties
    - Testing for the effect of living in Bastrop or Caldwell County
    - Living in Bastrop or Caldwell County = 1
    - All other counties = 0
  - o 21: 2014
    - Testing the effect of the survey year
    - Survey occurred in 2014 = 1
    - Survey occurred in 2015 or 2016 = 0
  - o 22: 2016
    - Testing the effect of the survey year
    - Survey occurred in 2016 = 1
    - Survey occurred in 2014 or 2015 = 0

3.4 Summary of Key Findings from Regression Analysis

The following list are some of the key findings from the regression analyses. The full R-model outputs are compiled on two spreadsheets being submitted along with this report.

- Question 3: informed/not informed

  - o Model is significant

  - o Education (advanced = statistically significant at alpha = 0.05, some college at alpha = 0.10) and age have a statistically significant positive impact

  - o Female has a statistically significant negative impact

  - o No statistically significant difference between 2016 and 2015

- Question 4: health threat

  - o Model is significant

  - o Statistically significant positive impacts: Age, Female, Non-White, Family Asthma, and 2014

  - o Statistically significant negative impacts: Williamson county and conservative

  - o *Note that scale for 2014 was different (1-5, rather than 1-7)

- Question 5: familiar with AQI:

  - o Model is significant

  - o Some college, Bachelor, Advanced Degree, and Spanish language were statistically significant and positive

- o Female and non-white were statistically significant and negative
- Question 7: familiar with air quality forecasts
    - o Model is significant
    - o Some college, bachelor's advanced degrees, age, and allergies were statistically significant and positive
    - o Non-white and 2016 were statistically significant and negative
- Question 9: familiar with Ozone Action Days?
    - o Model is significant
    - o Some college, bachelor's degree, advanced degree, age, and allergies were statistically significant and positive
    - o Conservative, non-white, and 2014 were statistically significant and negative
- Question 11: take action to reduce exposure on Ozone Action Days?
    - o Model is significant
    - o Age, female, having children, and having allergies had statistically significant and positive impacts on taking action
    - o Being conservative had a statistically significantly negative impact on taking action
- Question 12: do you change your commute on Ozone Action Days?
    - o Model is significant
    - o Two sensitivities for multi- year: with and without miles driven
    - o Non-white significant in both
    - o 2016 significant when miles driven without
    - o 2016 and miles significant at 0.10 level
- Question 14: do you take other action on ozone action days?
    - o Model not significant at alpha = 0.05, but is at 0.10
    - o Progressive is statistically significant and positive
    - o Non-white is statistically significant and negative
    - o Bastrop County significant at 0.10 level and positive
- Question 20: support for I/M program
    - o In multi-year analysis, I/M county was statistically significant only at alpha = 0.10
    - o Some college, bachelor's degree, advanced degree, and "progressive" had statistically significant positive impact on support
    - o Income was significant and negative in 2016-only analysis, but not in 2014/2016 analysis

o 2014 worded differently, but no statistically significant impact from year

4 Summary and Conclusions for Further Work

CAPCOG's 2016 survey, particularly combined with the data from 2014 and 2015, provides a valuable insight into the region and an important tool for guiding outreach efforts within the region to support air quality goals. Some of the key issues that CAPCOG will need to consider based on these results are:

- How much effort and what kind of messaging should be used to target people who know a lot about air quality and are very willing to take action, such as whites, educated, politically progressive residents?

- How much effort and what kind of messaging should be used to target residents who are less aware of air quality generally, but more likely to take action to reduce exposure and emissions, such as women and non-whites?

- How much effort and what kind of messaging should be used to target residents who are less likely to be aware of air quality issues and less likely to be willing to take action, such as people who identify as conservatives and people in Williamson County?

It's also important to note that even though this analysis does indicate the relative impact of various factors on a response, it doesn't directly describe the actual levels awareness and willingness to take action to support regional air quality goals. For example, while there are some factors that lead certain groups to be more or less likely to be aware of ozone action days or support inspection and maintenance programs, some 7 out of 10 respondents reported knowing about Ozone Action Days and supporting inspection and maintenance programs.

It is also important to note that this report is not comprehensive, and that there are opportunities for additional analyses on these survey results, including:

- Weighting survey responses based on the demographic factors analyzed in this report

- Performing additional policy-related analysis of some of the key commuting and air quality questions

- Additional analysis of the implications of the survey results for future air quality planning efforts

- Conduct trend analyses, particularly with any survey respondents who were included in both the 2015 and 2016 surveys

- Recommendations for specific changes to the sampling methodology or analysis for the next survey.

Based on some of the findings in this report and the additional analyses that could still be completed in this data set, CAPCOG may propose to TCEQ to add a second report to cover these analyses.

In general, some of the areas in which CAPCOG believes its future surveys could be improved:

- Using alternative response mechanisms, such as the survey that the Alamo Area Council of Governments recently completed;

- Work to obtain more representative sample, particularly in terms of income and age

- Space out the intervals between surveys to periods long enough that trends can be more readily observed

Appendix A: List of Supplemental Electronic Files Submitted

CAPCOG is submitting the following electronic files as supplements to this report:

- *Deliverable_1.3.5b-Detailed_2016_Survey_results_phone_withheld.xlsx*

    o Contains a table with individual results and topline data calculated in tabs, 1 for each question

- *Deliverable_1.3.5.c-Regression_Analyses_of_CAPCOG_Survey_Results_final_analysis.xlsx*

    o Contains the initial, refined, and multi-year regression analyses outputs from the R model, along with some notes

    o Includes data for regressions run for questions 3, 4, 5, 7, 11, 12, 14, and 20

- *Deliverable_1.3.5.d-Regression_Analyses_of_CAPCOG_Survey_Results_initial_abandoned.xlsx*

    o Contains the initial regression analyses performed on questions 17, 25, 27, 32, and 33

Appendix B: 2016 Survey Data Codebook

This appendix provides a description of the various data fields in the "individual results tab"

- Unique ID Number
- Phone Number
- Call Date (October 22, 2016 – November 26, 2016)
- Phone (WIR for wireless and LL for land line)
- Intro (Continue for all final results)
- Q1: What County do you live in? (DO NOT READ LIST)
    - Bastrop
    - Caldwell
    - Hays
    - Travis
    - Williamson
    - Other (TERMINATE CALL)
- Q2: What is your home zip code? (ENTER '99999' FOR REFUSED)
    - 1=NUMERIC
- Q3: On a scale of 1-7, with 1 being "very uninformed" and 7 being "very informed," how well-informed on regional air quality in Central Texas do you consider yourself?
    - (RECORD RESPONSES, NUMBERED 1-7; RECORD 9 IF RESPONSE IS DON'T KNOW/NO RESPONSE)
- Q4: On a scale of 1 to 7, with 1 being the lowest and 7 being the highest, how much of a threat do you believe that air pollution in Central Texas is to you or your family?
    - (RECORD RESPONSES, NUMBERED 1-7; RECORD 9 IF RESPONSE IS DON'T KNOW/NO RESPONSE)
- Q5: Are you familiar with the Air Quality Index?
    - Yes
    - No
    - DON'T KNOW/NO RESPONSE)
- Q6: What percentage of days do you think air quality in Central Texas in 2015 was considered "good," "moderate," "unhealthy for sensitive groups" (such as children, older individuals, and people with asthma), and "unhealthy" for the general public? (must add up to 100%)
    - Q6[1]: Percentage for "good" days
    - Q6[2]: Percentage for "moderate" days
    - Q6[3]: Percentage for "unhealthy for sensitive group" days
    - Q6[4]: Percentage for "unhealthy" days
- Q7: Are you familiar with air quality forecasts?
    - Yes
    - No (skip to Q9)
    - DON'T KNOW/NO RESPONSE (skip to Q9)

- Q8: How do you find out about air quality forecasts? (SELECT ALL THAT APPLY, ROTATE OPTIONS)
  - Q8[1]=Television
  - Q8[2]=Radio
  - Q8[3]=E-mail alerts
  - Q8[4]=Text message alerts
  - Q8[5]=Mobile phone apps
  - Q8[6]=Websites
  - Q8[7]=Buses
  - Q8[8]=Print
  - Q8[9]=Work
  - Q8[10]=(OTHER - SPECIFY)
  - Q8[11]=(DON'T KNOW/NO RESPONSE)
- Q9: Are you familiar with Ozone Action Days?
  - Yes
  - No (skip to Q17)
  - DON'T KNOW/NO RESPONSE (skip to Q17)
- Q10: How do you find out about Ozone Action Days? (SELECT ALL THAT APPLY, ROTATE OPTIONS)
  - Q10[1]=Television
  - Q10[2]=Radio
  - Q10[3]=E-mail alerts
  - Q10[4]=Text message alerts
  - Q10[5]=Mobile phone apps
  - Q10[6]=Websites
  - Q10[7]=Buses
  - Q10[8]=Print
  - Q10[9]=Work
  - Q10[10]=(OTHER - SPECIFY)
  - Q10[11]=(DON'T KNOW/NO RESPONSE)
- Q11: Do you take any actions to reduce your exposure or your family's exposure to ozone on Ozone Action Days?
  - Yes (Specify in Q11a)
  - No
  - DON'T KNOW/NO RESPONSE
- Q12: Do you change your commute on Ozone Action Days?
  - Yes
  - No (skip to Q14)
  - Not Applicable (does not commute) (skip to Q14).
  - DON'T KNOW/NO RESPONSE (skip to Q14)

- Q13: How do you change your commute on Ozone Action Days? (READ LIST, ROTATING OPTIONS – RECORD ALL THAT APPLY)
    - Q13[1] = Carpool
    - Q13[2] =Ride the Bus or Train
    - Q13[3] =Walk or Bike
    - Q13[4] =Work at home
    - Q13[5] =Change time you go to or return from work or school
    - Q13[6] =Other (Specify)
- Q14: Do you take any other actions to reduce your emissions on Ozone Action Days?
    - Yes
    - No (Skip to Q17)
    - DON'T KNOW/NO RESPONSE (Skip to Q17)
- Q15: Which actions do you take on Ozone Action Days? (READ LIST, ROTATING OPTIONS - RECORD ALL THAT APPLY)
    - Q15[1]=Avoid idling your vehicle
    - Q15[2]=Change number of side trips/extra trips
    - Q15[3]=Delay buying gas until 6:00 pm
    - Q15[4]=Postpone doing lawn work with gas-powered equipment
    - Q15[5]=Conserve energy
    - Q15[6]=OTHER (SPECIFY)
- Q16: Which actions to reduce your emissions might you be willing to take on Ozone Action Days? (READ LIST, ROTATING OPTIONS - RECORD ALL THAT APPLY)
    - Q16[1]=Avoid idling your vehicle
    - Q16[2] =Change number of side trips/extra trips
    - Q16[3]=Delay buying gas until 6:00 pm
    - Q16[4]=Postpone doing lawn work with gas-powered equipment
    - Q16[5]=Conserve energy
    - Q16[6]=OTHER (SPECIFY)
- Q17: Have you heard any radio ads about air quality recently?
    - Yes
    - No (skip to Q20)
    - DON'T KNOW/NO RESPONSE (skip to Q20)
- Q18: Have the ads increased your overall level of awareness about air quality?
    - Yes
    - No
    - DON'T KNOW/NO RESPONSE
- Q19: Did the ads persuade you to consider taking action to reduce your emissions?
    - Yes
    - No
    - DON'T KNOW/NO RESPONSE

- Q20: Inspection and Maintenance Question – wording varies based on reported county of residence:
    - [If residing in Travis or Williamson County] Since 2005, Travis and Williamson Counties have required that gas-powered vehicles between 2-24 years old pass an emissions test in addition to the normal safety test. The program reduces emissions from vehicles in the region by about 12%, equivalent to the emissions of a medium-sized power plant or large factory. The cost for the emissions inspection program includes an annual fee of $16 in addition to the safety inspection fee, and any repair costs required if the vehicle fails its emissions inspection, up to a maximum of $600. Financial assistance for repairs are available for moderate-income and low-income motorists to complete repairs. Knowing this information, which of the following best describes your opinion of the vehicle emissions inspection and maintenance program in Travis and Williamson Counties?
        i. strongly support
        ii. support
        iii. somewhat support
        iv. neutral
        v. somewhat opposed
        vi. opposed
        vii. strongly opposed
        viii. don't know/no response
    - [If residing in Bastrop, Caldwell, or Hays County] Since 2005, Travis and Williamson Counties have required that gas-powered vehicles between 2-24 years old pass an emissions test in addition to the normal safety test. The program reduces emissions from vehicles in the region by about 12%, equivalent to the emissions of a medium-sized power plant or large factory. The cost for the emissions inspection program includes an annual fee of $16 in addition to the safety inspection fee, and any repair costs required if the vehicle fails its emissions inspection, up to a maximum of $600. Financial assistance for repairs are available for moderate-income and low-income motorists to complete repairs. Knowing this information, which of the following best describes your opinion of having a similar vehicle emissions inspection program in [State name of county of residence]?
        i. strongly support
        ii. support
        iii. somewhat support
        iv. neutral
        v. somewhat opposed
        vi. opposed
        vii. strongly opposed
        viii. don't know/no response

- Q21: How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household? Do not include motorcycles, recreational vehicles, vehicles that are used primarily for business purposes, or vehicles that are permanently out of working order.
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6 or more
    - none (skip to Q23)
- Q22: On average, how many miles per week do drive your primary vehicle?
    - (RECORD ANSWER - ENTER '99999' FOR REFUSED) 1=NUMERIC
- Q23: Last week, did you work for pay at a job or business?
    - Yes
    - No (skip to Q35)
    - Don't know/refused (skip to Q35)
- Q24: What is the zip code of the location where you worked last week? If you worked at more than one location, use the zip code of the location where you worked most last week.
    - (RECORD ANSWER - ENTER '99999' FOR REFUSED)
- Q25: How did you usually get to work last week? If you used more than one method of transportation, list the one used for most of the distance.
    - Car, truck, or van by yourself (go to Q27)
    - Carpool or vanpool (go to Q26)
    - Bus (go to Q28)
    - Railroad (go to Q28)
    - Taxicab (go to Q28)
    - Motorcycle (go to Q28)
    - Bicycle (go to Q28)
    - Walked (go to Q28)
    - Worked at home (go to Q28)
    - Ride-hailing services (go to Q28)
    - Other Method (Specify) (go to Q28)
    - Don't Know/No Response (go to Q28)
- Q26: How many people, including yourself, usually rode to work in your carpool or vanpool?
    - (RECORD ANSWER - ENTER '99999' FOR REFUSED)
- Q27: Which of the following factors is the most important factor keeping you from using an alternative form of commuting?
    - Longer commute time
    - Transit routes do not go near home or place of work

- Need for ability to run errands
- Need for ability to pick up child from school
- No other employees live close to me
- Other (Specify)
- Q28: What time did you usually leave home to go to work last week? [ACS Question]
  - (RECORD ANSWER - ENTER '99999' FOR REFUSED)
  - Time recorded as 1:00 am = 100, 1:30 pm = 1330
- Q29: How many miles is your commute one-way?
  - (RECORD ANSWER - ENTER '99999' FOR REFUSED)
- Q30: How many minutes did it usually take you to get from home to work last week?
  - (RECORD ANSWER - ENTER '99999' FOR REFUSED)
- Q31: Which of the following best describes parking at your place of employment?
  - There is a fee for parking at your place of employment, but your employer covers the cost
  - There is a fee for parking at your place of employment and your employer does not cover the cost
  - There is no fee for parking
  - Unsure whether there is a fee for parking that your employer pays for
- Q32: Does your employer offer any of the following benefits or options? [Select all that apply]
  - Q32[1] = Part-Time Telecommuting
  - Q32[2] = Full-Time Telecommuting
  - Q32[3] = Compressed Work Week (such as working 4, 10-hour days per week)
  - Q32[4] = Flexible work hours with a 5-day work week (such as a 7 am - 4pm or 8:30 am - 5:30 pm schedule)
  - Q32[5] = Carpool or vanpool incentives for employees
  - Q32[6] = Transit incentives
  - Q32[7] = An "emergency ride home" for transit riders or carpoolers
  - Q32[8] = Preferential parking for carpools or vanpools
  - Q32[9] = Bicycle parking or storage facilities
  - Q32[10] = Shower facilities for employees
  - Q32[11] = Parking "cash-out" incentives for not having a parking spot
  - Q32[12] = No/None (skip to Q35)
- Q33: Which of these options do you take advantage of? (READ CHOICES AS NECESSARY)
  - Q33[1]: 1 = Part-Time Telecommuting
  - Q33[2] = Full-Time Telecommuting
  - Q33[3] = Compressed Work Week (such as working 4, 10-hour days per week)
  - Q33[4] = Flexible work hours with a 5-day work week (such as a 7 am - 4pm or 8:30 am - 5:30 pm schedule)
  - Q33[5] = Carpool or vanpool incentives for employees
  - Q33[6] = Transit incentives

- Q33[7] = An "emergency ride home" for transit riders or carpoolers
- Q33[8] = Preferential parking for carpools or vanpools
- Q33[9] = Bicycle parking or storage facilities
- Q33[10] = Shower facilities for employees
- Q33[11] = Parking "cash-out" incentives for not having a parking spot
- Q33[12] = None
- Q34: Which options that your employer does not offer would you take advantage of if they were offered? (READ CHOICES AS NECESSARY)
  - Q34[1] = Part-Time Telecommuting
  - Q34[2] = Full-Time Telecommuting
  - Q34[3] = Compressed Work Week (such as working 4, 10-hour days per week)
  - Q34[4] = Flexible work hours with a 5-day work week (such as a 7 am - 4pm or 8:30 am - 5:30 pm schedule)
  - Q34[5] = Carpool or vanpool incentives for employees
  - Q34[6] = Transit incentives
  - Q34[7] = An "emergency ride home" for transit riders or carpoolers
  - Q34[8] = Preferential parking for carpools or vanpools
  - Q34[9] = Bicycle parking or storage facilities
  - Q34[10] = Shower facilities for employees
  - Q34[11] = Parking "cash-out" incentives for not having a parking spot
  - Q34[12] = None
- Q35: How many children do you have under the age of 18 and what are their ages?
  - Number of children reported under Q35, with 99999 = don't know/refused
  - Q35a = reported ages, aggregated, 99999 = don't know/refused
  - Q35a1-Q35a5 reflect disaggregated ages of each child, youngest to oldest. Partial years reflected as follows: 0 < age <= 1: 1….1< age <=2: 2, etc.,
- Q36: Which of the following best describes your asthma status? (READ LIST)
  - I currently have asthma,
  - I do not currently have asthma, but have previously had asthma,
  - I do not currently have asthma and have never previously had asthma
  - DON'T KNOW/WON'T SAY
- Q37: Which of the following best describes the asthma status of your immediate family members? (READ LIST)
  - An immediate family member currently has asthma;
  - No immediate family member currently has asthma, but at least one immediate family member has previously had asthma;
  - None of my immediate family member currently has asthma, and none have ever had asthma;
  - DON'T KNOW/WON'T SAY
- Q38: Do you suffer from seasonal allergies?

- Yes
- No
- DON'T KNOW/WON'T SAY
- Q39: Which of the following categories describe you – select all that apply:
  - Q39[1] = White
  - Q39[2] = Hispanic, Latino, or Spanish Origin
  - Q39[3] = Black or African-American
  - Q39[4] = Asian
  - Q39[5] = American Indian or Alaska Native
  - Q39[6] = Middle Eastern or North African
  - Q39[7] = Native Hawaiian or Other Pacific Islander
  - Q39[8] = Some other race, ethnicity, or origin (Specify)
  - Q39[9] = Don't Know/Won't Say
  - Q39_count = Number of different reported ethnic/racial identifications
- Q40: What is your age?
  - (999 = REFUSED)
  - 1=NUMERIC
- Q41: What is the highest level of education you have completed?
  - No Schooling Completed
  - Grade school or less (8th Grade or Lower)
  - Some High School (9-11th Grades)
  - High School Graduate or Graduate Equivalent Diploma (GED)
  - Some College or an Associate's Degree
  - Bachelor's Degree
  - Advanced Degree (Master's/JD/Ph.D.)
  - DON'T KNOW/REFUSED
- Q42: What is your family income before taxes?
  - (ENTER '9999999' FOR REFUSED)
  - 1=NUMERIC
- Q43: On a scale of 1 to 7, with 1 being very conservative, 7 being very progressive, and 4 being in the middle, how would you describe your political views.
  - Record 1-7; List "9" if don't know/no answer
- Q44: Would it be okay to contact you again if we have any follow-up questions?
  - Yes
  - No
- Q45: RECORD GENDER (DO NOT ASK):
  - Male
  - Female