



**SPARE THE AIR**  
SUMMARY REPORT FOR 2023 SURVEY

PREPARED FOR  
**SAC METRO AIR DISTRICT**



NOVEMBER 2023



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## INTRODUCTION

The Sacramento Metropolitan Air Quality Management District (Sac Metro Air District) was created under Health and Safety Code Sections 40960 et. seq. to monitor, promote, and improve air quality in the County of Sacramento, as well as neighboring jurisdictions within the Sacramento Federal Ozone Nonattainment Area<sup>1</sup> for ozone standards. One of 35 regional air quality districts in California, the Sac Metro Air District is responsible for monitoring air pollution within the basin and for developing and administering programs to reduce air pollution levels below the health-based standards established by the state and federal governments.

To this end, the Spare The Air Program was established in 1995 to educate residents about air pollution and to encourage them to modify their behavior to reduce and prevent it. During the summer ozone season (May to October), the Spare The Air Program conducts an episodic public education campaign designed to encourage the public to reduce their driving on days that are expected to violate ozone air quality standards. In recent years, these outreach efforts have included radio, television, newspaper, digital and outdoor billboard advertising featuring various air quality tips, a website ([www.SpareTheAir.com](http://www.SpareTheAir.com)) including “Scooter’s World” for children, daily social media posts (Facebook, Twitter, Instagram, and Pinterest), the Sacramento Region Air Quality app, community events, and the distribution of newsletter articles and other materials to over 4,000 business and community partners.

**PURPOSE & METHODOLOGY OF STUDY** The motivation for the current study was to design and employ a streamlined methodology to accurately assess the effectiveness of the Spare The Air program. In other words, did the Spare The Air Program have any effects on residents? If yes, what types of residents were being influenced by the campaign, in what ways did they respond to the campaign, and how large were the effects? Although the research objectives for the 2023 study are similar those of studies conducted periodically for the District since 1995, the methodology was updated in 2023 to include a broader array of recruiting methods (email, text, and telephone) and focus on measuring changes that can be attributed to the Spare The Air campaign without a need for control days. The 2023 methodology is based on the original CARB-EPA method<sup>2</sup> as updated by Dr. McLarney in 2005. A more detailed description of the methodology is included later in this report (see *Methodology* on page 18). In brief, the survey was administered to a random sample of 333 driving age adults who reside within the Sacramento Federal Ozone Nonattainment Area for ozone standards. The survey followed a mixed-method design that employed multiple recruiting methods (email, text, and phone) and multiple data collection methods (phone and online), with all interviewing occurring the day following one of seven Spare The Air days in June and July, 2023.

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1. For study purposes, the Sacramento Nonattainment Area was defined as all of Sacramento and Yolo Counties, the eastern portion of Solano County, and the western slopes of El Dorado and Placer Counties up to the Sierra crest.
  2. The CARB-EPA Method is summarized in the Transportation Research Board’s (TRB) journal—*Transportation Research Record*—for 2004 in an article entitled *Development of a Quantification Method for Measuring the Travel and Emissions Impacts of Episodic Ozone Alert Programs* (pages 153 to 159). It is described in detail in the following air resources guidance report: CARB, “Quantification Method Reference Manual: A Method to Measure Travel and Emissions Impacts of Ozone Action Public Education Programs,” April 2003. In addition to Eric Schreffler, Dr. Timothy McLarney and Richard Sarles, the TRB paper and guidance report were co-authored by Joann Lu and Jeff Weir of CARB, and Thomas Higgins and Dr. Will Johnson of K.T. Analytics.

**ORGANIZATION OF REPORT** This report is designed to meet the needs of readers who prefer a summary of the findings as well as those who are interested in the details of the results. For those who seek an overview of the findings, the section titled *Key Findings* is for you. It provides a short summary of the most important factual findings of the survey in a Question & Answer format. For the interested reader, this section is followed by a more detailed question-by-question discussion of the results from the survey by topic area (see *Table of Contents*), as well as a description of the methodology employed for collecting and analyzing the data. And, for the truly ambitious reader, the questionnaire used for the interviews is contained at the back of this report (see *Questionnaire & Toplines* on page 21).

**ACKNOWLEDGEMENTS** True North thanks the Sac Metro Air District for the opportunity to conduct the study and for contributing valuable input during the design stage of this study. The collective experience, insight, and local knowledge provided by District staff improved the overall quality of the research presented here.

**DISCLAIMER** The statements and conclusions in this report are those of the authors (Dr. Timothy McLarney and Richard Sarles) at True North and not necessarily those of the District. Any errors and omissions are the responsibility of the authors.

**ABOUT TRUE NORTH** True North is a full-service survey research firm that is dedicated to providing public agencies with a clear understanding of the values, perceptions, opinions, and behaviors of their residents and customers. Through designing and implementing scientific surveys, focus groups, and one-on-one interviews, as well as expert interpretation of the findings, True North helps its clients to move with confidence when making strategic decisions in a variety of areas, such as planning, policy evaluation, performance management, and developing effective public information campaigns.

During their careers, Dr. McLarney (President) and Mr. Sarles (Principal Researcher) have designed and conducted over 1,200 survey research studies for public agencies, including dozens of studies related to air quality and Spare The Air public education programs.



## KEY FINDINGS

As noted in the *Introduction*, this study was designed to measure the effectiveness of Sac Metro Air District’s 2023 Spare The Air public education campaign. Whereas subsequent sections of this report are devoted to conveying the detailed results of the study, in this section we attempt to ‘see the forest through the trees’ and note how the collective results answer some of the key questions that motivated the research.

*How many drivers in the Sacramento Nonattainment Area were aware of Spare The Air advertisements and the specific request not to drive on Spare The Air days?*

During the 2023 summer season, 33% of driving age adults in the Sacramento Nonattainment Area had heard, read, or seen commercials, news broadcasts, or information online about Spare The Air, poor air quality, or requests to drive less in the two days prior to the interview. When compared to their respective counterparts, recalled exposure to Spare The Air messaging was highest among seniors, those with a child in the household, individuals not working full-time, Asian Americans, residents of Placer County, those whose primary media source is radio, and those who tend to watch broadcast television.

Approximately one-quarter of respondents (24%) indicated they were aware that the day prior to the interview was a Spare The Air day, whereas 72% indicated they were not aware and 4% were unsure. Awareness that it was a Spare The Air day varied considerably across subgroups, with seniors, part-time employees, Asian Americans, residents of Placer County, those whose primary media source is radio, and those who tend to watch broadcast television exhibiting the highest levels of awareness. For more details, see *Recall and Awareness of Spare The Air Messaging* on page 10.

*What percentage of drivers’ responded to Spare The Air messaging by reducing their driving?*

Overall, 2.1% of drivers interviewed indicated they reduced at least one trip because of the Spare The Air campaign. The remaining 98% reported that either they did not decrease their driving or they did so but for reasons unrelated to the campaign. With a random sample of 333 driving age residents in the study area and seven (2.1%) qualifying as a Spare The Air reducer, one can be 95% confident that the actual percentage of Spare The Air reducers in the study area in 2023 is between 0.57% and 3.67%.

The most common *methods* of trip reduction were trip linking and carpooling as a passenger, collectively accounting for 80% of trips reduced because of the campaign. The most common *types* of trip reduced in 2023 were going to/from work (28%), shopping (26%), and going to/from school (19%). For more details, see *Driving on Spare The Air Days* on page 5.

*Where do driving-age residents in the study area spend most of their media time?*

When asked what type of media they consume most often, the dominant channels were social media (40%) and television (35%), followed by online newspapers or magazines (9%), subscription streaming services



(5%), and Broadcast radio (5%). Regardless of age, county of residence, and awareness of the day prior being a Spare the Air day, respondents reported that they spend most of their time on social media or television.

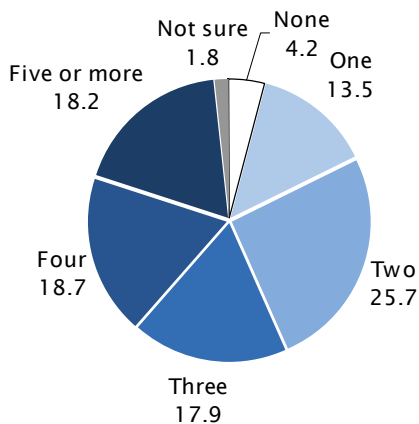
With respect to television, approximately two-thirds of respondents (68%) reported that they typically watch programming on subscription streaming services, whereas 20% watch cable TV and 11% tend to watch broadcast TV. When compared to their counterparts, those who were aware the day prior was a Spare The Air day were more than three-times as likely to watch broadcast TV (see *Media* on page 15).

## DRIVING ON SPARE THE AIR DAYS

The primary goal of this study was to estimate the percentage of drivers who reduced their driving because of Spare The Air messaging. Using the established CARB-EPA methodology<sup>3</sup> as a framework for addressing this issue, True North developed an improved question series to limit measurement error and thereby improve the reliability of trip reduction estimates. This improved method was first employed by True North in 2005 for the Bay Area Air Quality Management District's Spare The Air evaluation.

The first question in this series presented respondents with a definition of a driving trip and asked them how many trips they had made in the course of the day (which was a Spare The Air day). A trip was defined for respondents as: *as traveling from one place to another and then stopping. For example, if you left your house and went to the store, that is one trip. Leaving the store and going to work or coming back home is another trip. Another example would be if you left your house and went to the bus or train station, which is one trip. Taking the bus or train to your work would be a second trip.*

**FIGURE 1 TRIPS TAKEN ON A SPARE THE AIR DAY**



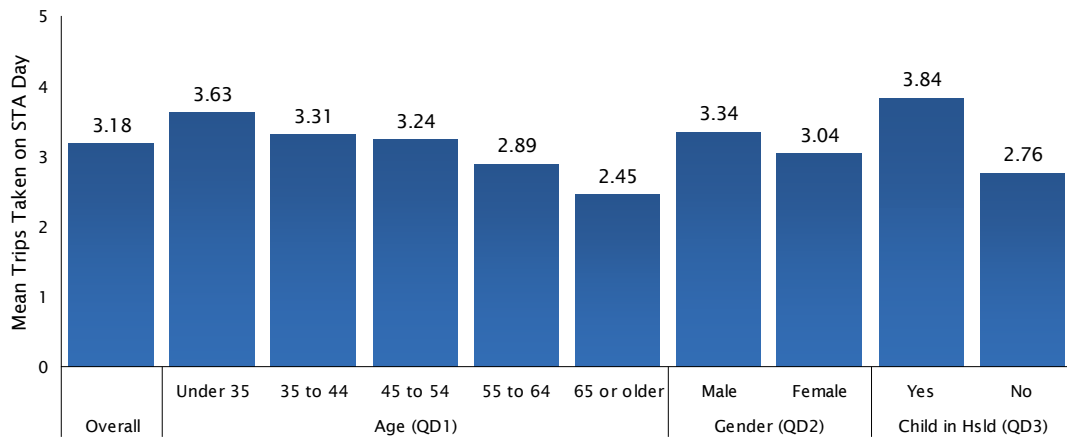
As shown in Figure 1, more than half of respondents reported taking three (18%), two (26%), one (14%), or zero (4%) driving trips on a Spare The Air day, while 19% reported taking four trips, 18% five or more trips, and 2% were unsure. The overall average number of driving trips taken on a Spare The Air day during the 2023 season was 3.18 trips.

Figures 2-4 on the next page show how the average number of driving trips taken on a Spare The Air day varied by age, gender, presence of a child in the household, employment status, ethnicity, county of residence, whether the individual reduced their driving

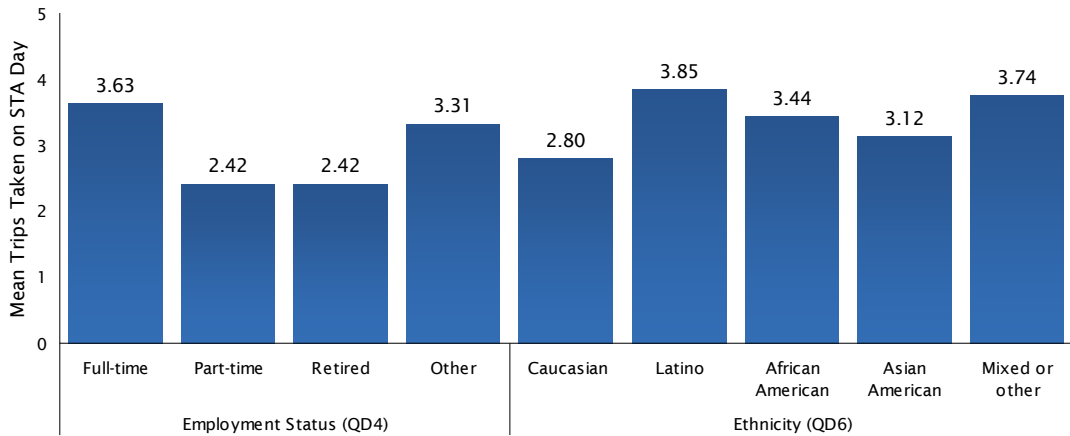
trips in response to the Spare The Air campaign, their exposure to Spare The Air messaging in the two days prior to the interview, and whether they were aware that the day of the interview was a Spare The Air day. Consistent with past research performed by True North when evaluating Spare The Air campaign impacts, individuals who respond to the Spare The Air campaign by reducing one or more driving trips also tend to be individuals who take more driving trips in general (see Figure 4).

3. The CARB-EPA Method is summarized in the Transportation Research Board's (TRB) journal—*Transportation Research Record*—for 2004 in an article entitled *Development of a Quantification Method for Measuring the Travel and Emissions Impacts of Episodic Ozone Alert Programs* (pages 153 to 159). It is described in detail in the following air resources guidance report: CARB, "Quantification Method Reference Manual: A Method to Measure Travel and Emissions Impacts of Ozone Action Public Education Programs," April 2003. In addition to Eric Schreffler, Dr. Timothy McLarney and Richard Sarles, the TRB paper and guidance report were co-authored by Joann Lu and Jeff Weir of CARB, and Thomas Higgins and Dr. Will Johnson of K.T. Analytics.

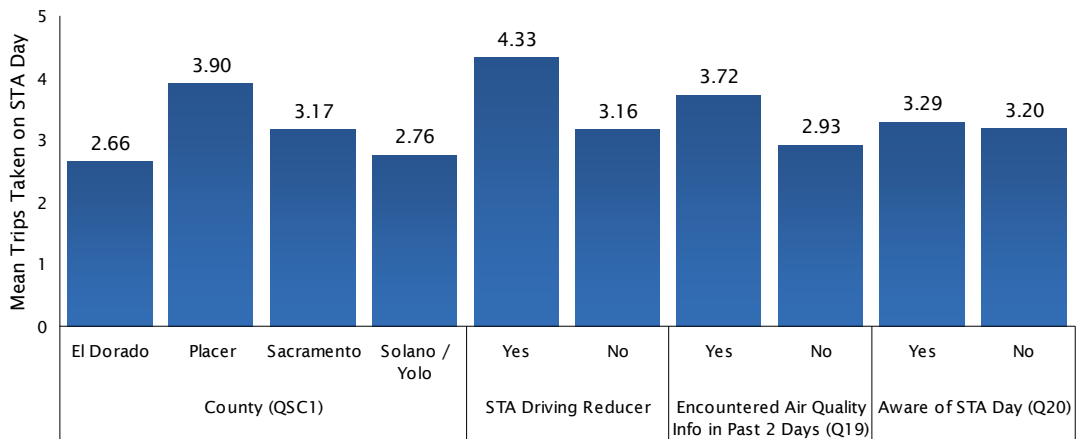
**FIGURE 2 MEAN TRIPS TAKEN ON A SPARE THE AIR DAY BY AGE, GENDER & CHILD IN HSLD**



**FIGURE 3 MEAN TRIPS TAKEN ON A SPARE THE AIR DAY BY EMPLOYMENT STATUS & ETHNICITY**



**FIGURE 4 MEAN TRIPS TAKEN ON A SPARE THE AIR DAY BY COUNTY, STA DRIVING REDUCER, ENCOUNTERED AIR QUALITY INFO IN PAST 2 DAYS & AWARE OF SPARE THE AIR DAY**



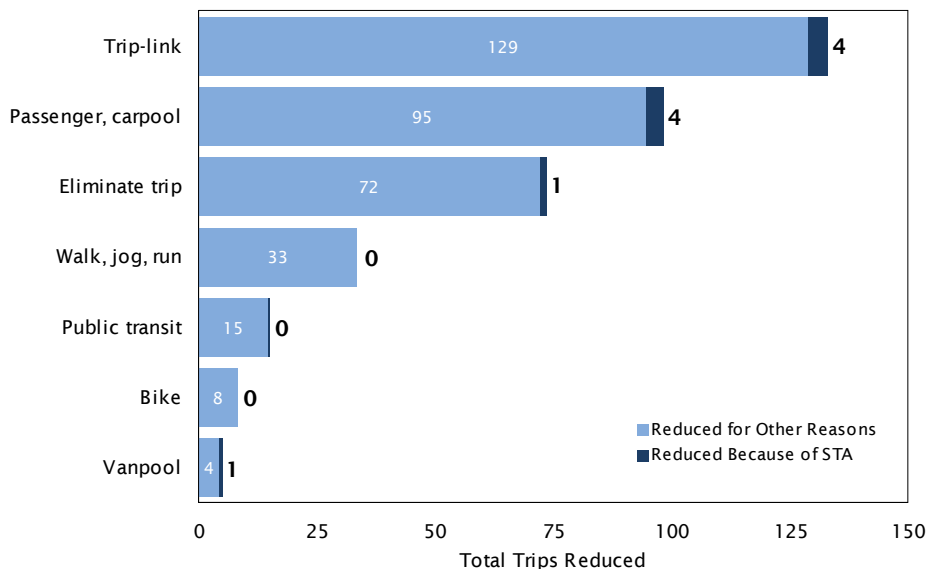
**MEASURING TRIP REDUCTION** Measuring the number of trips a respondent reduced due to the Spare The Air campaign is a delicate task—one that, if not done properly, can easily lead to an overestimate or underestimate of trip reduction behavior. For example, directly asking respondents if they drove less because of the Spare The Air campaign is likely to prompt the *socially desirable* response that they had driven less even if they had not.

To overcome this potential problem, the CARB-EPA Method employs an indirect approach to measuring trip reduction behavior. To avoid alerting the respondent to the ultimate purpose of the study, respondents are first asked if they purposely *increased* their driving trips by deciding to drive anywhere that day in a car when they would have normally walked, bicycled, or taken a bus. Following this question, the survey asks if the respondent had purposely decreased the amount of driving they did that day.

The CARB-EPA Method as refined by True North limits a potential source of measurement error and obtains a reliable estimate of trip reduction by providing respondents with each possible way they can reduce their driving behavior and then asking them, for each way, whether they decreased their driving in this manner. Because there are dozens of reasons why an individual can choose to reduce their driving that have nothing to do with the Spare The Air campaign—such as car problems, schedule changes, or agreeable weather—a follow-up question was also asked to determine the reason why a respondent reduced each trip.

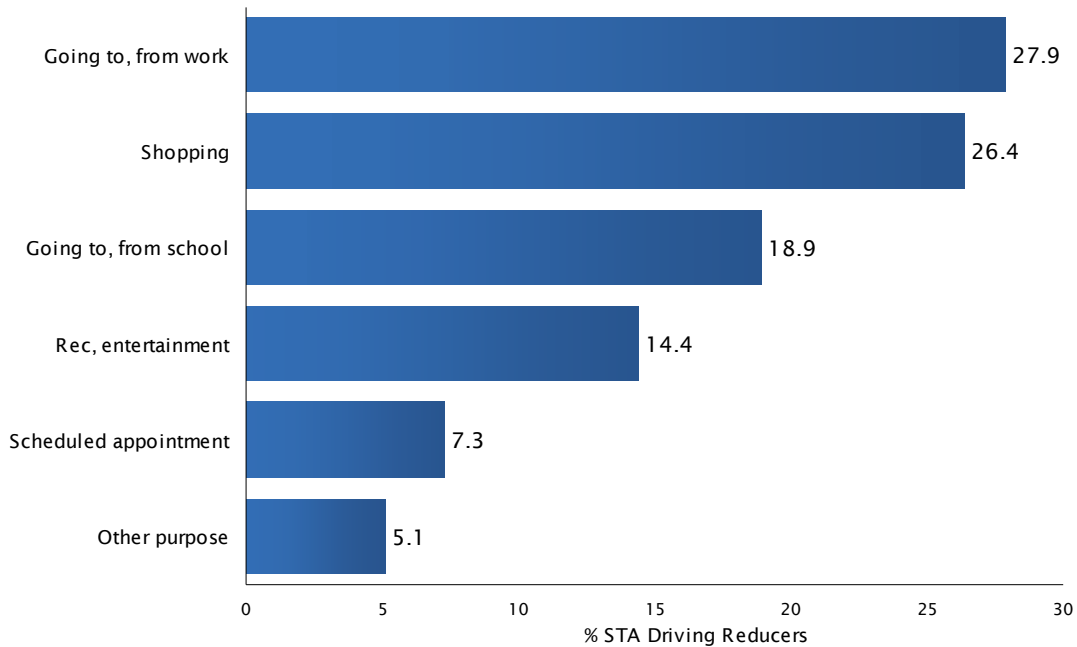
The results for the 2023 season are presented in Figure 5, which shows the number of trips reduced for each method of reduction and highlights trips reduced because of Spare The Air messaging in dark blue. In sum, the 333 drivers who answered this question reduced a total of 10 trips because of Spare The Air messaging. The most common method of trip reduction was ‘linking several driving trips together that you normally would make separately’ and carpooling as a passenger, collectively accounting for 80% of trips (8 of 10) reduced because of the campaign.

**FIGURE 5 TOTAL TRIPS REDUCED**

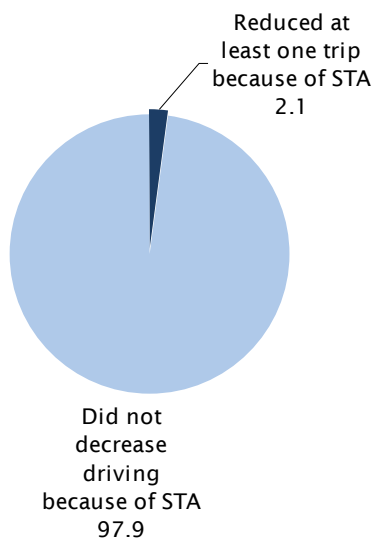


Respondents who reduced their driving due to the Spare The Air campaign were also asked to indicate the purpose of the trips that they reduced. Figure 6 illustrates the distribution of trips reduced by Spare The Air driving reducers according to trip purpose. The most common types of trip reduced in 2023 were going to/from work (28%), shopping (26%), and going to/from school (19%).

**FIGURE 6 ORIGINAL PURPOSE OF TRIP REDUCED BECAUSE OF SPARE THE AIR**



**FIGURE 7 SPARE THE AIR DRIVING REDUCERS**



In terms of individual drivers, Figure 7 shows how they are distributed among the two mutually exclusive categories of interest to this study. Overall, 2.1% of drivers interviewed indicated they reduced at least one trip because of the Spare The Air campaign. The remaining 98% reported that either they did not decrease their driving or they did so but for reasons unrelated to the campaign.

Table 1 on the next page provides the information needed to estimate the confidence interval surrounding the estimated percentage of drivers who responded to the Spare The Air campaign by reducing at least one driving trip. With a random sample of 333 driving age residents in the study area and seven (2.1%) qualifying as a Spare The Air reducer, one can be 95% confident that the actual percentage of Spare The Air reducers in the study area is between 0.57% and 3.67%.

Spare The Air reducer, one can be 95% confident that the actual percentage of Spare The Air reducers in the study area is between 0.57% and 3.67%.

**TABLE 1 STA DRIVING REDUCERS, MARGIN OF ERROR**

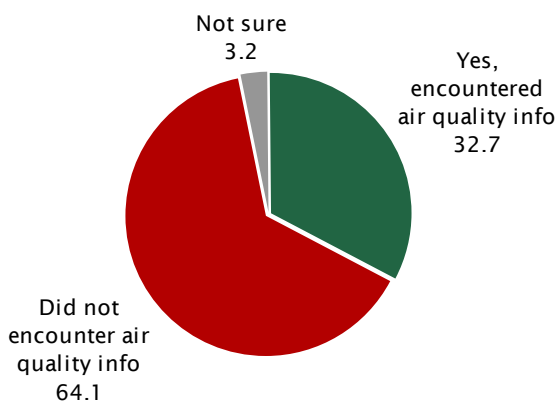
Spare The Air Driving Reducers	
Universe Estimate (residents 16+ yrs old in District)	1,975,386
Sample Size	333
STA Reducers	7
Non-STA Reducers	326
Proportion of Driving Reducers	2.12%
Proportion of Non-STA Reducers	97.88%
Maximum Margin of Error (95% confidence)	1.55%
Confidence Interval for Proportion of Driving Reducers	Upper Bound
	Lower Bound
	0.57%
	3.67%

# RECALL AND AWARENESS OF SPARE THE AIR MESSAGING

Although the ultimate goal of the Spare The Air campaign is to persuade individuals to reduce their driving, there are a series of related objectives which must be met in order for this to occur. For example, regardless of how compelling the message may be, if the message does not reach the target audience then the campaign can not succeed in its primary goal. Thus, an important secondary objective of the campaign is to simply increase awareness of the Spare The Air program and Spare The Air events.

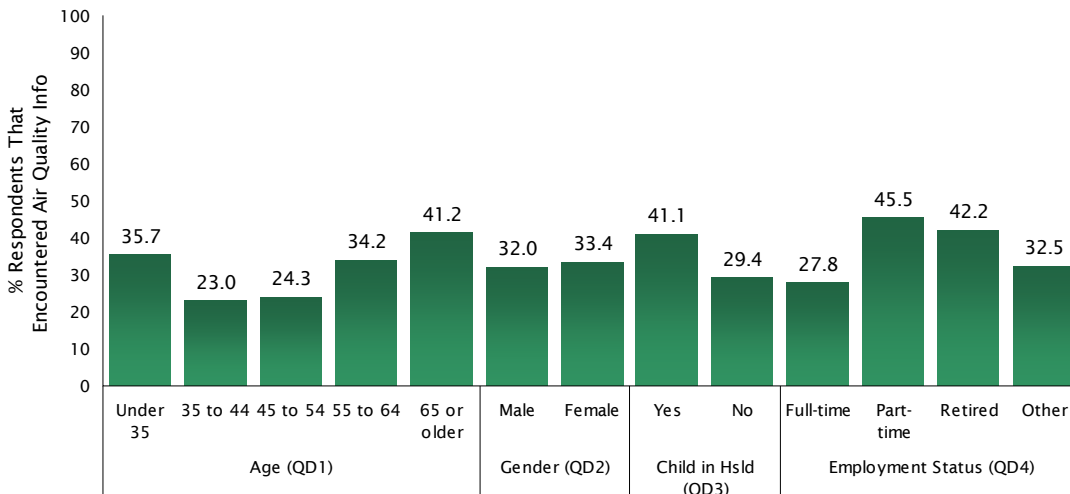
**RECALL EXPOSURE TO SPARE THE AIR MESSAGING** Accordingly, a series of questions was asked of respondents about their recall of Spare The Air messaging—including the medium and content of the information—as well as whether they were aware that the day prior to the interview was a Spare The Air day. The first of these questions asked: *In the past two days, have you heard, read, or seen any new stories or public service announcements about Spare The Air, poor air quality, or requests to drive less in this area?*

**FIGURE 8 ENCOUNTERED AIR QUALITY INFO IN PAST 2 DAYS**

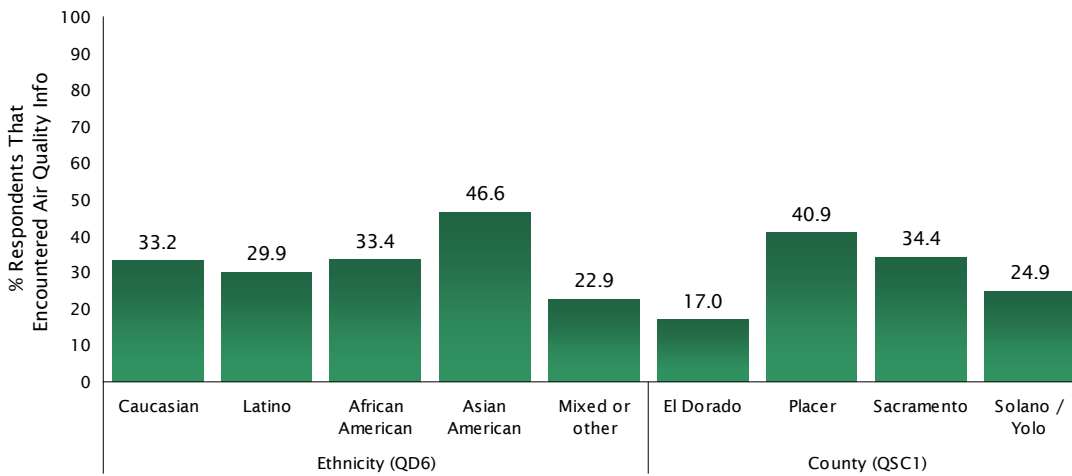


Approximately one-third (33%) of respondents recalled being exposed to Spare The Air messaging during the two days preceding the interview, whereas 64% did not recall hearing, reading, or seeing Spare The Air-related messaging and 3% were unsure (Figure 8). When compared to their respective counterparts, recalled exposure to Spare The Air messaging was highest among seniors, those with a child in the household, individuals not working full-time, Asian Americans, residents of Placer County, those whose primary media source is radio, and those who tend to watch broadcast television (Figures 9-11).

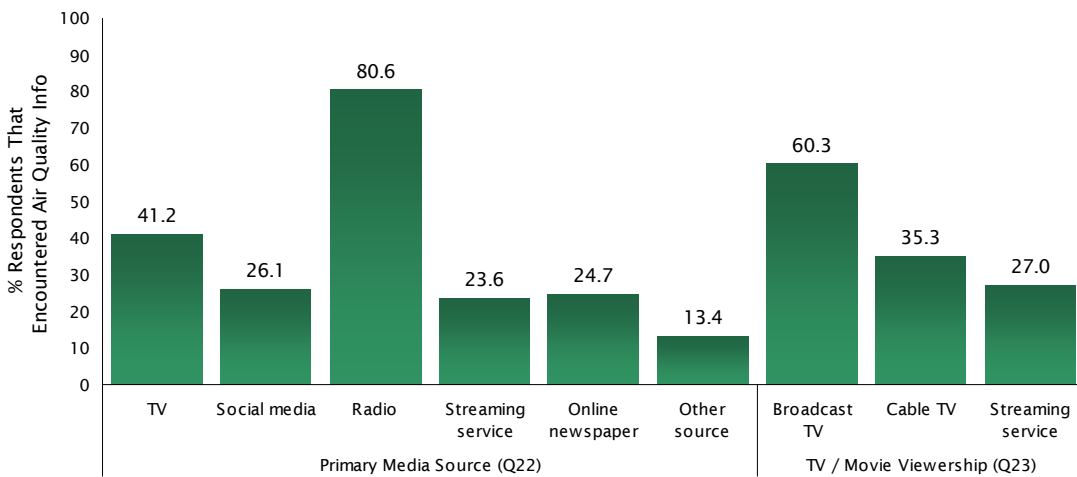
**FIGURE 9 ENCOUNTERED AIR QUALITY INFO IN PAST 2 DAYS BY AGE, GENDER, CHILD IN HSLD & EMPLOYMENT STATUS**



**FIGURE 10 ENCOUNTERED AIR QUALITY INFO IN PAST 2 DAYS BY ETHNICITY & COUNTY**



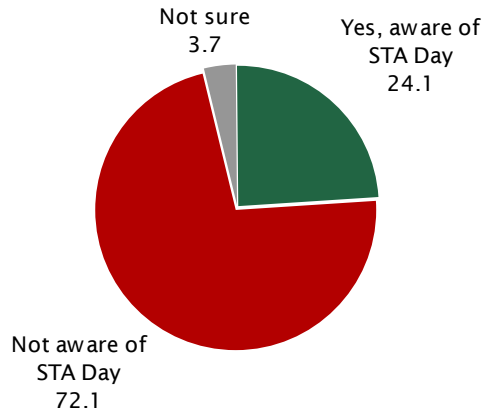
**FIGURE 11 ENCOUNTERED AIR QUALITY INFO IN PAST 2 DAYS BY PRIMARY MEDIA SOURCE & TV/MOVIE VIEWERSHIP**



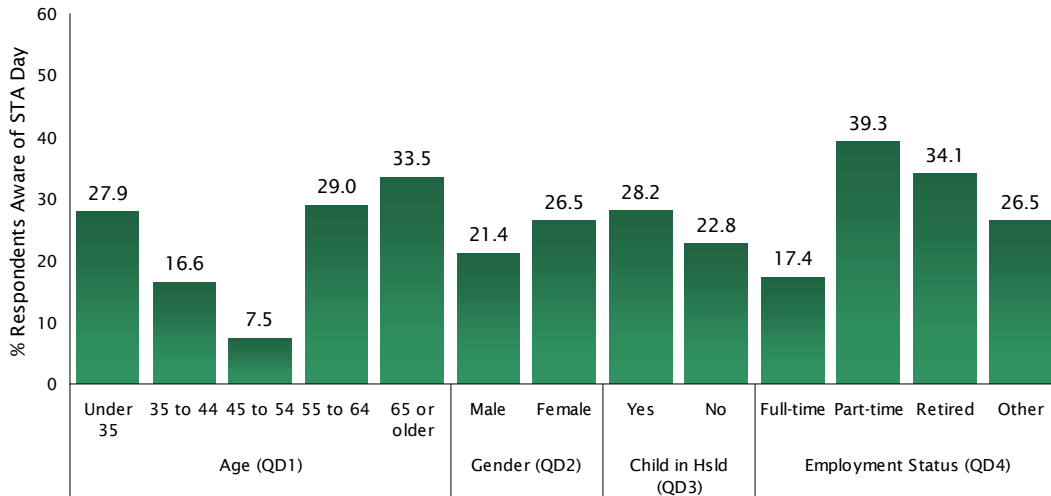
**AWARE OF SPARE THE AIR DAY** The survey next asked all respondents if, prior to taking the survey, they were aware that a Spare The Air day had been called the day prior. As shown below in Figure 12 on the next page, approximately one-quarter of respondents (24%) indicated they were aware that yesterday was a Spare The Air day, whereas 72% indicated they were not aware and 4% were unsure. Awareness that it was a Spare The Air day varied considerably across subgroups, with seniors, part-time employees, Asian Americans, residents of Placer County, those whose primary media source is radio, and those who tend to watch broadcast television exhibiting the highest levels of awareness (see figures 13-15).



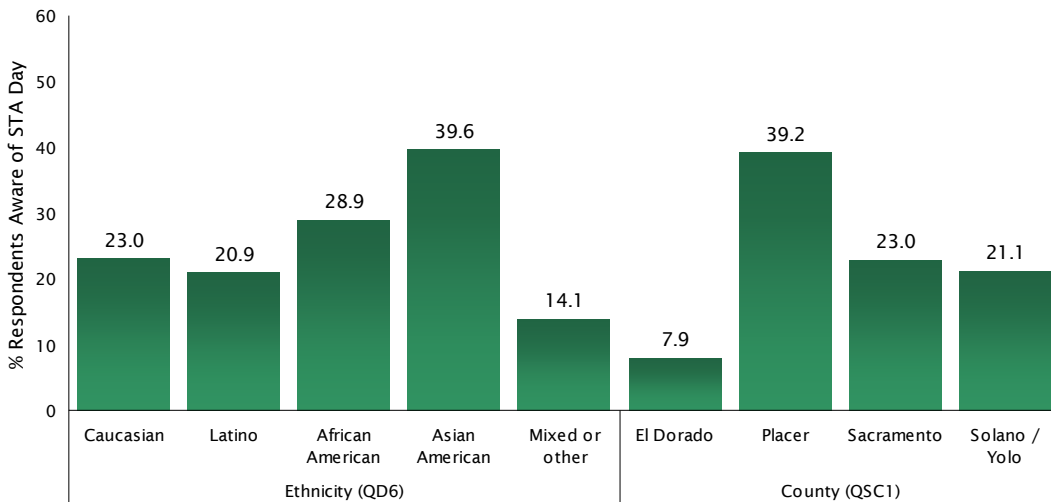
**FIGURE 12 AWARENESS OF SPARE THE AIR DAY**



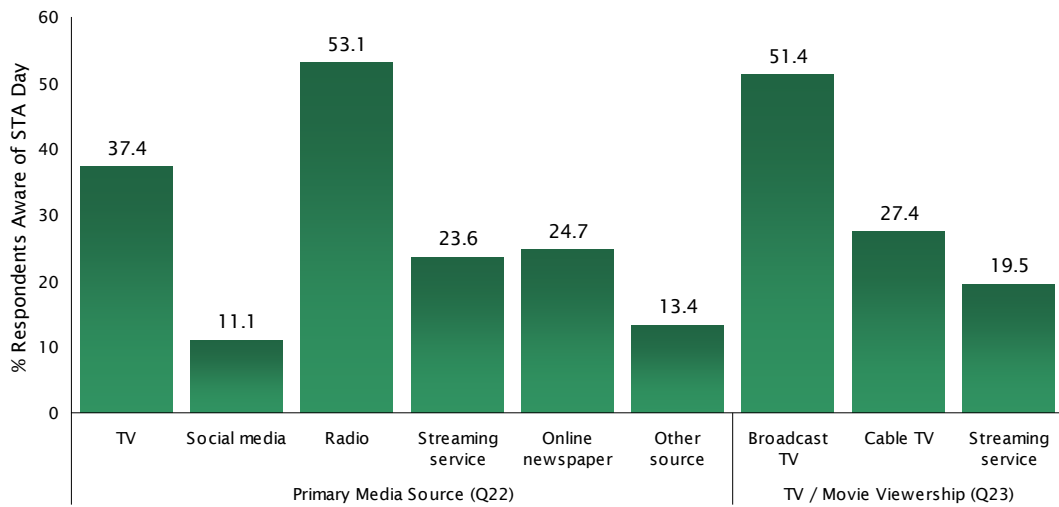
**FIGURE 13 AWARENESS OF SPARE THE AIR DAY BY AGE, GENDER, CHILD IN HSLD & EMPLOYMENT STATUS**



**FIGURE 14 AWARENESS OF SPARE THE AIR DAY BY ETHNICITY & COUNTY**

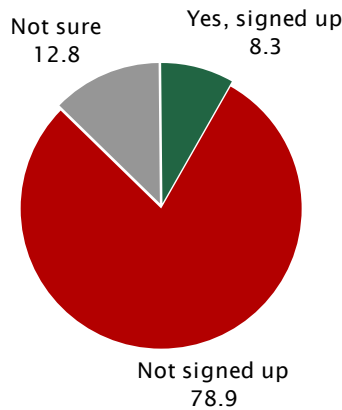


**FIGURE 15 AWARENESS OF SPARE THE AIR DAY BY PRIMARY MEDIA SOURCE & TV/MOVIE VIEWERSHIP**

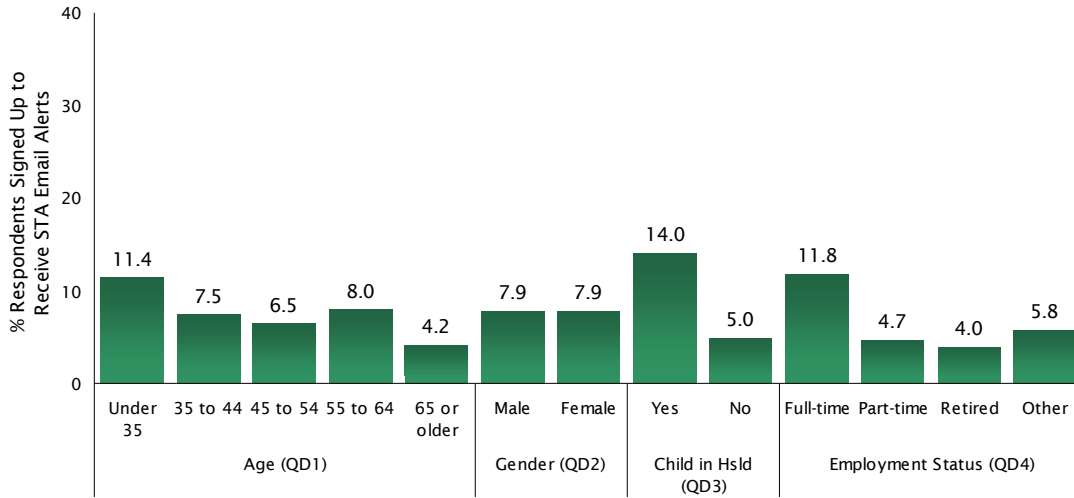


**SIGNED UP FOR SPARE THE AIR ALERTS?** The final question in this series simply asked respondents whether they were signed up to receive Spare The Air alerts via email. Overall, 8% of respondents answered in the affirmative, whereas 79% reported they were not signed up for Spare the Air email alerts and 13% were unsure (Figure 16). For the interested reader, figures 17-19 show how the percentage of respondents indicating they were signed up for Spare The Air alerts varied by subgroup.

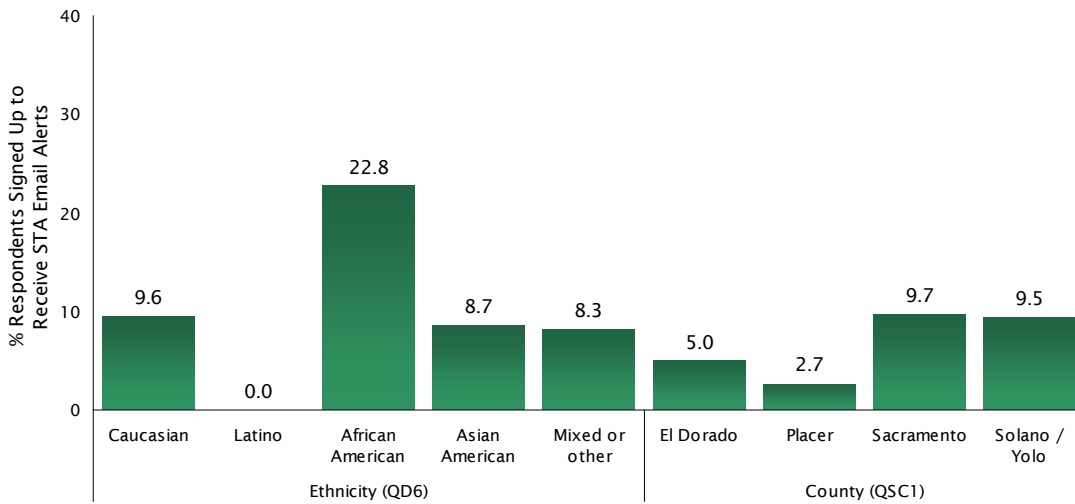
**FIGURE 16 SIGNED UP TO RECEIVE STA EMAIL ALERTS**



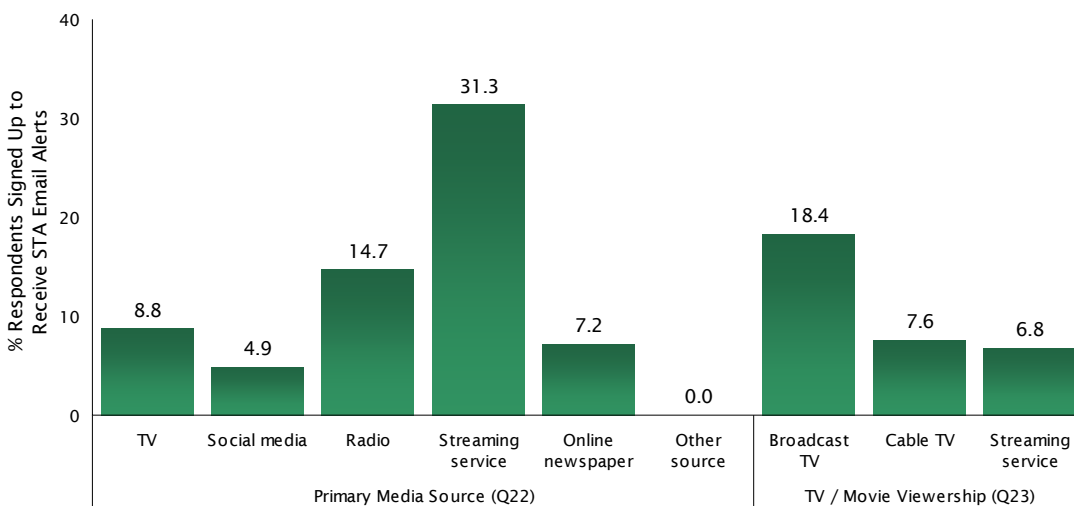
**FIGURE 17 SIGNED UP TO RECEIVE STA EMAIL ALERTS BY AGE, GENDER, CHILD IN HSLD & EMPLOYMENT STATUS**



**FIGURE 18 SIGNED UP TO RECEIVE STA EMAIL ALERTS BY ETHNICITY & COUNTY**



**FIGURE 19 SIGNED UP TO RECEIVE STA EMAIL ALERTS BY PRIMARY MEDIA SOURCE & TV/MOVIE VIEWERSHIP**

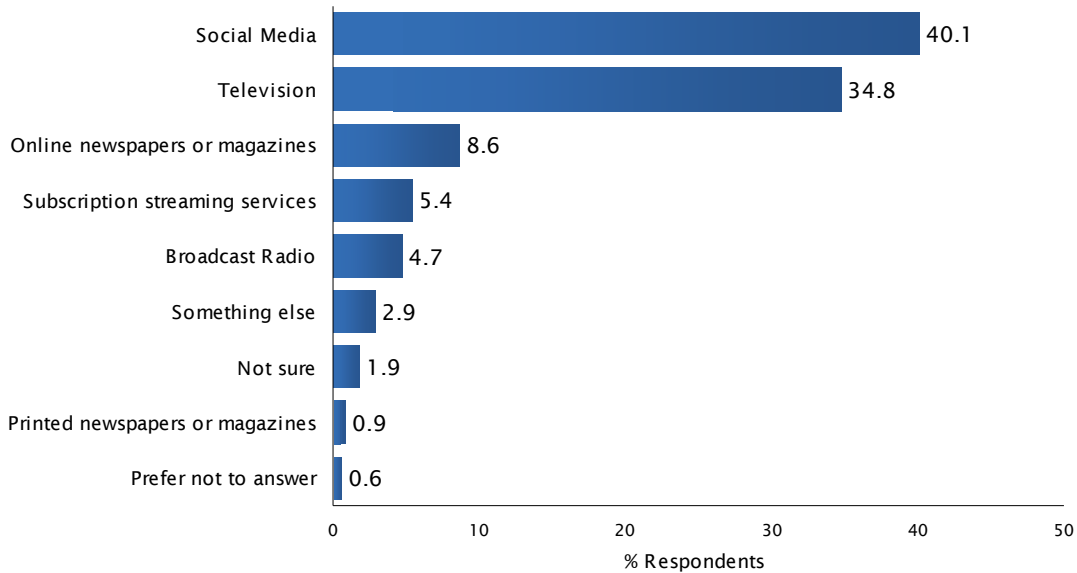


# MEDIA

The final substantive section of the survey explored respondents' media habits. Specifically, in what media channel do they spend the most time, and what type of television service do they view most often?

**WHERE DO YOU SPEND MOST OF YOUR TIME?** When asked what type of media they consume most often, the dominant channels were social media (40%) and television (35%), followed by online newspapers or magazines (9%), subscription streaming services (5%), and Broadcast radio (5%). Regardless of age, county of residence, and awareness of it being a Spare the Air day, respondents reported that they spend most of their time on social media or television (see Table 2).

**FIGURE 20 MOST-USED MEDIA TYPE**

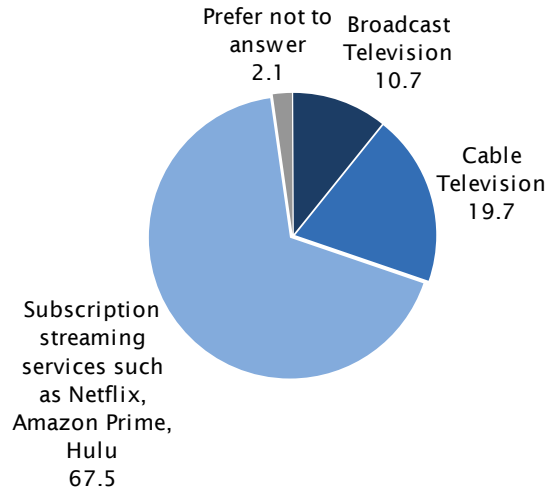


**TABLE 2 MOST-USED MEDIA TYPE BY AGE, COUNTY & AWARE OF STA DAY**

	Age (QD1)					County (QSC1)				Aware of STA Day (Q20)	
	Under 35	35 to 44	45 to 54	55 to 64	65 or older	El Dorado	Placer	Sacramento	Solano / Yolo	Yes	No
Social media	50.6	57.2	55.1	18.7	14.0	23.0	25.7	46.6	36.6	18.5	48.6
TV	26.7	17.8	27.8	44.7	61.5	46.8	56.9	27.8	37.8	53.9	27.0
Online newspaper	3.1	13.8	2.6	12.3	16.9	10.6	7.4	8.2	11.3	8.9	8.6
Other source	7.1	4.0	3.8	10.6	2.8	9.8	7.4	5.5	3.2	3.2	6.9
Streaming service	9.1	1.9	5.6	4.0	3.0	5.0	1.7	7.3	1.8	5.3	5.8
Radio	3.4	5.2	5.2	9.7	1.8	4.7	0.8	4.6	9.4	10.3	3.1

**TYPE OF TV VIEWERSHIP** All respondents were also asked whether they tend to watch broadcast TV, cable TV, or subscription streaming services such as Netflix, Amazon Prime, and Hulu? Approximately two-thirds of respondents (68%) reported that they typically watch programming on subscription streaming services, whereas 20% watch cable TV and 11% tend to watch broadcast TV. When compared to their counterparts, those who were aware it was a Spare The Air day were more than three-times as likely to watch broadcast TV (see Table 3).

**FIGURE 21 TYPE OF TV VIEWERSHIP**



**TABLE 3 TYPE OF TV VIEWERSHIP BY AGE, COUNTY & AWARE OF STA DAY**

	Age (QD1)					County (QSC1)				Aware of STA Day (Q20)	
	Under 35	35 to 44	45 to 54	55 to 64	65 or older	El Dorado	Placer	Sacramento	Solano / Yolo	Yes	No
Streaming service	92.7	77.9	67.5	43.8	41.3	53.0	69.9	68.5	77.7	54.8	74.9
Cable TV	4.9	16.2	28.0	30.9	33.9	37.1	15.8	20.2	16.1	22.4	18.4
Broadcast TV	2.4	5.9	4.5	25.3	24.8	9.9	14.3	11.3	6.2	22.8	6.7



## DEMOGRAPHIC & BACKGROUND INFO

**TABLE 4 DEMOGRAPHICS OF SAMPLE**

<b>Total Respondents</b>	<b>333</b>
<b>Age (QD1)</b>	
16 to 24	18.0
25 to 34	18.0
35 to 44	14.8
45 to 54	15.5
55 to 64	14.2
65 or older	16.9
Prefer not to answer	2.7
<b>Gender (QD2)</b>	
Male	48.6
Female	49.9
Non-binary	0.4
Prefer not to answer	1.2
<b>Child in Hsld (QD3)</b>	
Yes	35.7
No	61.6
Prefer not to answer	2.7
<b>Employment Status (QD4)</b>	
Full-time	51.8
Part-time	8.9
Student	6.2
Homemaker or caregiver	4.6
Retired	21.0
In-between jobs	5.1
Prefer not to answer	2.4
<b>Ethnicity (QD6)</b>	
Caucasian / White	47.9
Latino / Hispanic	21.6
African American	6.6
Native American	1.4
Asian American	13.3
Pacific Islander	0.8
Mixed	3.4
Other	0.9
Prefer not to answer	4.2
<b>County (QSC1)</b>	
El Dorado	6.9
Placer	15.2
Sacramento	63.1
Solano / Yolo	14.9

Table 4 presents the key demographic and background information that was collected during the survey. Because of the probability-based sampling methodology used in this study, the results shown in the table are representative of driving age adults in Sac Metro's jurisdiction and conform to Census ACS estimates on key demographics. In addition to ensuring a balanced sample, collecting the background and demographic information was also useful for generating insights into how effective the Spare The Air program is among demographic subgroups.

## M E T H O D O L O G Y

The following sections outline the methodology used in the study, as well as the motivation for using certain techniques.

**QUESTIONNAIRE DEVELOPMENT** Dr. McLarney of True North Research worked closely with the Sac Metro Air District to develop a questionnaire that covered the topics of interest and avoided many possible sources of systematic measurement error, including position-order effects, wording effects, response-category effects, scaling effects, and priming. Several questions included multiple individual items. Because asking items in a set order can lead to a systematic position bias in responses, the items were asked in a random order for each respondent.

Some questions asked in this study were presented only to a subset of respondents. For example, only respondents who indicated they had purposely decreased the amount of driving they did on the day prior to the interview (Question 3) were subsequently asked to describe the number of trips they decreased by method (Question 4) and their reasons for doing so (Question 5). The questionnaire included with this report (see *Questionnaire & Toplines* on page 21) identifies the skip patterns used during the interview to ensure that each respondent received the appropriate questions.

**PROGRAMMING & PRE-TEST** Prior to fielding the survey, the questionnaire was CATI (Computer Assisted Telephone Interviewing) programmed to assist interviewers when conducting the telephone interviews. The CATI program automatically navigates the skip patterns, randomizes the appropriate question items, and alerts interviewers to certain types of keypunching mistakes should they happen during the interview. The survey was also programmed into a passcode-protected online survey application to allow residents who preferred to complete the survey online the opportunity to do so. The integrity of the questionnaire was pre-tested internally by True North and by dialing into random homes in the study area prior to formally beginning the survey.

**DATA COLLECTION** Respondents were recruited via email, text and telephone and interviews were conducted online and by telephone the day following a Spare The Air Day. A total of 333 randomly selected residents of driving age within the District's boundaries participated during one of seven Spare The Air events between June 30 and July 22, 2023. Although the plan was to collect additional interviews through the latter part of the season to reach 600 completed interviews, these late season episodes never materialized.

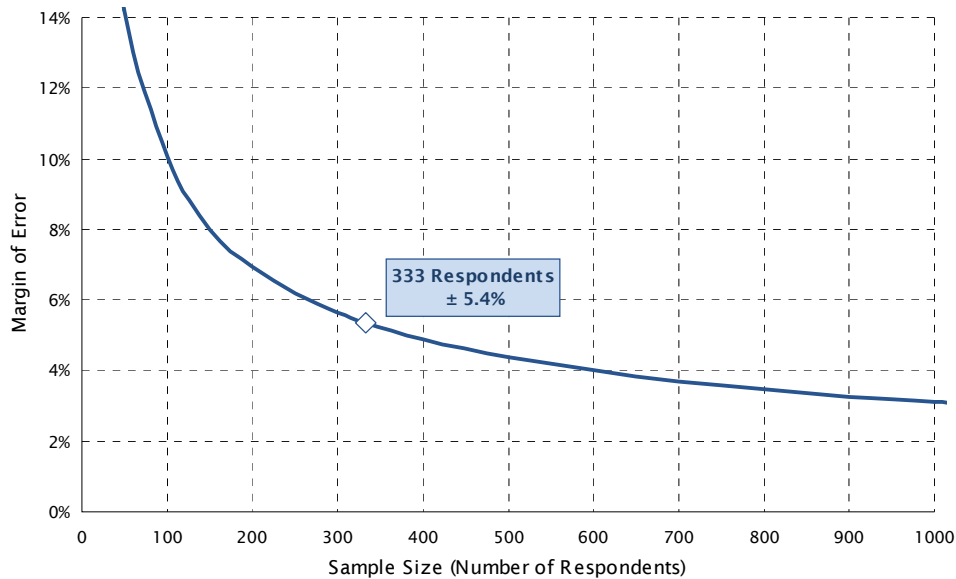
**TABLE 5 2023 STA DAYS & COMPLETED SURVEYS**

STA Day	Surveys Completed the Following Day
June 30	43
July 1	91
July 13	19
July 14	40
July 15	40
July 21	50
July 22	50

**MARGIN OF ERROR DUE TO SAMPLING** The results of the survey can be used to estimate the opinions of all adult drivers in the Sacramento Nonattainment Area (study area). Because not every adult driver in the region participated in the survey, however, the results have what is known as a statistical margin of error due to sampling. The margin of error refers to the difference between what was found in the survey of 333 drivers for a particular question and what would have been found if all of the estimated 1,975,386 drivers had been interviewed.<sup>4</sup>

Figure 22 provides a plot of the *maximum* margin of error in this study. The maximum margin of error for a dichotomous percentage result occurs when the answers are evenly split such that 50% provide one response and 50% provide the alternative response. For this survey, the maximum margin of error is  $\pm 5.4\%$  for questions answered by all 333 respondents.

**FIGURE 22 MAXIMUM MARGIN OF ERROR**



Within this report, figures and tables show how responses to certain questions varied by demographic characteristics such as length of residence, age of the respondent, and other dimensions. Figure 22 is thus useful for understanding how the maximum margin of error for a percentage estimate will grow as the number of individuals asked a question (or in a particular subgroup) shrinks. Because the margin of error grows exponentially as the sample size decreases, the reader should use caution when generalizing and interpreting the results for small subgroups as the margin of error for small subgroups can be  $\pm 10\%$  or more.

Several of the key findings of this study—most notably the percentage of driving reducers—involve greatly skewed response distributions that result in a much tighter confidence interval than the maximum depicted in Figure 22. As an example, Table 6 on the next page presents the margin of error and corresponding confidence interval for the percentage of driving reducers, which identifies the range within which one may be 95% confident the ‘true’ value of the driver population lies.

4. Source: 2021 Census ACS estimate.



**TABLE 6 MARGIN OF ERROR: SPARE THE AIR DRIVING REDUCERS**

Spare The Air Driving Reducers	
Universe Estimate (residents 16+ yrs old in District)	1,975,386
Sample Size	333
STA Reducers	7
Non-STA Reducers	326
Proportion of Driving Reducers	2.12%
Proportion of Non-STA Reducers	97.88%
Maximum Margin of Error (95% confidence)	1.55%
Confidence Interval for Proportion of	Upper Bound
Driving Reducers	Lower Bound
	0.57%
	3.67%

**DATA PROCESSING & WEIGHTING** Data processing consisted of checking the data for errors or inconsistencies, coding and recoding responses, categorizing verbatim responses, and preparing frequency analyses and cross-tabulations. The final data were weighted to balance the sample by key demographics according to 2021 Census ACS estimates.

**ROUNDING** Numbers that end in 0.5 or higher are rounded up to the nearest whole number, whereas numbers that end in 0.4 or lower are rounded down to the nearest whole number. These same rounding rules are also applied, when needed, to arrive at numbers that include a decimal place in constructing figures and tables. Occasionally, these rounding rules lead to small discrepancies in the first decimal place when comparing tables and charts for a given question. Due to rounding, some figures and narrative include numbers that add to more than or less than 100%.

# QUESTIONNAIRE & TOPLINES



Sac Metro AQMD  
Spare The Air Evaluation Survey  
Final Toplines (n=333)  
October 2023

## Section 1: Introduction to Study

Hi, my name is \_\_\_\_\_ and I'm calling from TNR, an independent public opinion research firm. We're conducting a **short** survey about transportation issues and would like to get your input. It will take about 5 minutes.

*If needed:* This is a survey for research purposes only. I'm NOT trying to sell anything and I won't ask for a donation.

*If needed:* The survey is anonymous and your responses will be confidential.

*If needed:* If now is not a convenient time, can you let me know a better time so I can call back?

*If asked to know which agency sponsored the survey, explain:* For statistical purposes and to avoid biasing the study, I can't reveal the agency's name at the outset of the interview. However, I will glad to tell you at the end of the survey.

## Section 2: Screening Criteria

SC1	To begin, what county do you live in?			
	1	El Dorado	7%	Continue
	2	Placer	15%	Continue
	3	Sacramento	63%	Continue
	4	Solano	7%	Continue
	5	Yolo	8%	Continue
	6	Any other county	0%	Terminate
	7	Prefer not to answer	0%	Terminate
SC2	Are you a licensed driver?			
	1	Yes	100%	Continue
	2	No	0%	Terminate
SC3	Do you regularly drive a vehicle four or more days per week?			
	1	Yes	100%	Continue
	2	No	0%	Terminate

**Section 3: Driving on Spare The Air Days**

We're interested in the travel behavior of people – specifically the number and types of trips that they make in a day. A 'trip' is defined as traveling from one place to another and then stopping. For example, if you left your house and went to the store, that is one trip. Leaving the store and going to work or coming back home is another trip. Another example would be if you left your house and went to the bus or train station, which is one trip. Taking the bus or train to your work would be a second trip.

*Make sure respondent understands what a 'trip' is.*

Q1	Please take a moment to think about the places you visited <b>yesterday</b> . Excluding any trips that were made 'on-the-job', such as driving a delivery truck, as well as any trips made on an airplane, how many trips did you make yesterday? <i>If respondent says not sure, ask them to estimate to the best of their ability. If still unsure, record below.</i>		
	Mean number of trips = 3.18 (4.33 for STA Driving Reducers)		
	0		4%
	1		13%
	2		26%
	3		18%
	4		19%
	5 or more		18%
	Not sure		2%
	Prefer not to answer		0%

*If Q1=98 then skip to Q3. If Q1=0 then skip to Q3G.*

Q2	Sometimes people will purposely <u>increase</u> the amount of driving they do in a day. An example of purposely <u>increasing</u> driving would be if a person decided to drive to the store when they normally would have walked, bicycled, or taken a bus. Did you purposely <u>increase</u> the amount of your driving yesterday?  <i>If respondent asks to clarify what purposely increasing driving is, say: It means deciding to drive somewhere in a car that you would normally go without driving.</i>		
	1	Yes	13%
	2	No	84%
	98	Not sure	3%

Q3	Sometimes people will purposely <u>decrease</u> the amount of driving they do in a day. There are several ways that people can <u>decrease</u> their driving, so let me ask you about each. Yesterday, did you: _____?			
		Yes	No	Not Sure
	<i>Read in Order</i>			
A	Ride as a passenger in someone else's car or as a passenger in a carpool for a trip that you <u>normally</u> would make by driving yourself	22%	76%	2%
B	Ride in a vanpool for a trip that you <u>normally</u> would make by driving yourself	5%	94%	0%

C	Ride public transit for a trip that you <u>normally</u> would make by driving yourself	5%	95%	0%
D	Ride a bike for a trip that you would <u>normally</u> make by driving yourself	4%	96%	0%
E	Walk, jog or run for a trip that you <u>normally</u> would make by driving yourself	11%	88%	1%
F	For the purpose of reducing your driving trips, decide to link several driving trips together that you <u>normally</u> would make separately	30%	69%	1%
G	For the purpose of reducing your driving trips, decide <u>not</u> to take a trip that you <u>normally</u> would have taken	20%	79%	1%

*Ask Q4 for each item where Q3=1. If no items in Q3=1, skip to Q19.*

Q4	Yesterday, how <b>many</b> driving trips did you reduce by: _____?		
<i>Read in Order</i>		Total # Trips Reduced	# Trips Reduced b/c of STA
A	Riding as a passenger in someone else's car or as a passenger in a carpool for a trip that you <u>normally</u> would make by driving yourself	98	4
B	Riding in a vanpool for a trip that you <u>normally</u> would make by driving yourself	5	1
C	Riding public transit for a trip that you <u>normally</u> would make by driving yourself	15	0
D	Riding a bike for a trip that you would <u>normally</u> make by driving yourself	8	0
E	Walking, jogging or running for a trip that you <u>normally</u> would make by driving yourself	33	0
F	Linking several driving trips together that you <u>normally</u> would make separately	133	4
G	<u>Not</u> taking a trip that you <u>normally</u> would have taken	73	1

Section 4: Reduced Trip Details										
<i>Question Loop, if Q4&gt;0: Ask both questions for each trip decreased in Q4.</i>										
Q5 thru Q18: Ok, I'd like you to think about the (first/second/third...) trip yesterday in which you _____ (insert item from Q4, change verb tense as needed).										
Total # Trips Reduced Among all Respondents Shown Below.										
Why did you decrease this driving trip? Do <u>not</u> prompt for specific answer.										
			Overall	Carpool (Q5)	Vanpool (Q7)	Public Transit (Q9)	Bike (Q11)	Walk, Jog, Run (Q13)	Trip-Link (Q15)	Eliminate (Q17)
1	Spare The Air Alert/Notification asking people to drive less 7 of 333 (2.1% of) respondents indicated they reduced at least one trip because of Spare The Air Alerts.		11	4	1	0	0	0	4	1
2	Air quality reason/Public health		13	0	0	0	0	0	6	6
3	Other reason		284	87	3	13	8	33	106	33
99	Not sure / Prefer not to answer		60	7	1	1	0	0	17	33
What was the purpose of this trip?										
			Overall	Carpool (Q6)	Vanpool (Q8)	Public Transit (Q10)	Bike (Q12)	Walk, Jog, Run (Q14)	Trip-Link (Q16)	Eliminate (Q18)
1	Going to or from work		56	17	1	4	1	11	14	8
2	Going to or from school		33	10	2	4	0	1	16	0
3	Shopping (mall, groceries)		107	26	1	4	2	2	47	25
4	Recreation and entertainment (out for dinner, movies, beach, gym)		78	27	1	2	4	10	22	12
5	Scheduled appointments, lessons, or practices (doctor's, music, little league, soccer)		34	8	0	0	0	4	20	1
98	Other		45	10	0	1	2	5	13	13
99	Not sure		14	0	0	0	0	0	1	13

Section 5: Recall of Spare The Air		
Q19	In the past two days, have you heard, read, or seen any new stories or public service announcements about Spare The Air, poor air quality, or requests to drive less in this area?	
	1 Yes	33%
	2 No	64%
	98 Not sure	3%
Q20	Before taking this survey, were you aware that yesterday was a Spare The Air day?	
	1 Yes	24%
	2 No	72%
	98 Not sure	4%
Q21	Are you signed up to receive Spare The Air alerts by email?	
	1 Yes	8%
	2 No	79%
	98 Not sure	13%

Section 6: Media		
Q22	Thinking of your media use, with which of the following do you spend the <i>most</i> time?	
	1 <b>Television</b>	35%
	2 <b>Social Media</b> such as Facebook, Instagram, Twitter, and YouTube	40%
	3 <b>Broadcast Radio</b>	5%
	4 <b>Satellite</b> radio or other subscription streaming service such as Spotify, Google Music, Apple Music, or Pandora	5%
	5 <b>Printed</b> newspapers or magazines	1%
	6 <b>Online</b> newspapers or magazines	9%
	7 Other source	3%
	98 Not sure	2%
	99 Prefer not to answer	1%

Q23	Do you tend to watch <b>Broadcast TV</b> , <b>Cable TV</b> , or <b>Subscription Streaming</b> services such as Netflix, Amazon Prime, and Hulu?	
	1	<b>Broadcast Television</b> 11%
	2	<b>Cable Television</b> 20%
	3	<b>Subscription streaming services</b> such as Netflix, Amazon Prime, or Hulu 68%
	4	Prefer not to answer 2%

### Section 7: Background & Demographics

Thank you so much for your participation. I have just a few background questions for statistical purposes.

D1	In what year were you born? Year recoded into age categories shown below.	
	1	16 to 24 18%
	2	25 to 34 18%
	3	35 to 44 15%
	4	45 to 54 15%
	5	55 to 64 14%
	6	65 or older 17%
	99	Prefer not to answer 3%
D2	What is your gender?	
	1	Male 49%
	2	Female 50%
	3	Non-binary 0%
	99	Prefer not to answer 1%
D3	Do you have one or more children under the age of 18 living in your household?	
	1	Yes 36%
	2	No 62%
	99	Prefer not to answer 3%

D4	Which of the following best describes your employment status? Would you say you are employed full-time, part-time, a student, a homemaker, retired, or are you in-between jobs right now?		
	1	Employed full-time	52%
	2	Employed part-time	9%
	3	Student	6%
	4	Homemaker or caregiver	5%
	5	Retired	21%
	6	In-between jobs	5%
	98	Not sure	0%
	99	Prefer not to answer	2%
D5	Are you currently working from home, commuting to a workplace outside of your home, or a mixture of both?		
	1	Working from home	14%
	2	Commuting to a workplace outside home	58%
	3	Mixture of both	27%
	99	Prefer not to answer	0%
D6	What ethnic group do you consider yourself a part of or feel closest to? <i>Read list if respondent hesitates.</i>		
	1	Caucasian/White	48%
	2	Latino/Hispanic	22%
	3	African-American/Black	7%
	4	Native American Indian or Alaskan Native	1%
	5	Asian -- Korean, Japanese, Chinese, Vietnamese, Filipino or other Asian	13%
	6	Pacific Islander	1%
	7	Mixed Heritage	3%
	8	Other	1%
	99	Prefer not to answer	4%
Those are all of the questions that I have for you! Thanks so much for participating in this important survey! This survey was conducted for Sac Metro Air Quality Management District.			