



**EVALUATION OF THE 2019-2020 PIMA COUNTY
CLEAN AIR PROGRAM CAMPAIGN
AND
CLEAN WATER PROGRAM CAMPAIGN SURVEY**

(May 2020)

Prepared for:

PIMA COUNTY DEPARTMENT OF
ENVIRONMENTAL QUALITY

Tucson, Arizona

Prepared by:

FMR ASSOCIATES, INC.

Tucson, Arizona

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**Introduction
and Goals**

This Campaign Effectiveness Study, conducted for the Pima County Department of Environmental Quality, was designed to evaluate the specific effectiveness of the 2019-2020 Clean Air and Clean Water Program Campaigns.

This study is a continuation of the Pima County Department of Environmental Quality's long-term effort to raise the level of public awareness regarding air quality problems in the Tucson metropolitan area and reduce air pollution by encouraging use of alternative modes of transportation and other options. The Clean Air Program Campaign is the 30th annual installment of this long-term effort which began in January 1989.

In addition, the study measured and tracked key issues related to stormwater management and hazardous waste disposal for PDEQ's Clean Water Program. The Clean Water Program Campaign is the 8th annual installment of the effort to raise awareness to keep stormwater clean.

One unique aspect of the 2020 survey is the impact of the COVID-19 outbreak. The survey was fielded in the midst of the pandemic (late May) and the various restrictions it imposed on lifestyle and other behaviors (especially employment and commute-related patterns). To yield the most complete results, the 2020 survey measured both current (during the COVID-19 restrictions) and pre-COVID-19 employment/commuting patterns.

Areas of Investigation – The tracking survey was implemented and the results analyzed so as to determine the success of the Campaign in accomplishing its objectives, including:

1. Determining current (during the COVID-19 outbreak) travel behavior (commuting/telecommuting/compressed work weeks) in Pima County.
2. Determining recent (prior to the COVID-19 outbreak) travel behavior (commuting/telecommuting/compressed work weeks) in Pima County and measuring changes from previous studies.

3. Increasing long-range awareness that motor vehicles are the primary source of air pollution and that effective long-term solutions to air quality problems will involve reducing single occupant motor vehicle trips.
4. Determining the present and potential use of alternate transportation modes, with specific emphasis on carpooling and employer encouragement of alternative modes. Estimating the number of daily commuter miles saved through alternative modes.
5. Assessing the awareness and perceptions of air quality problems in Tucson and what is known about air pollution. Learning whether children are talking about or bringing home materials from school about improving air quality. Determining the actions, if any, taken to help reduce air pollution. Assessing daily miles not driven due to COVID-19 outbreak.
6. Measuring the awareness of the Clean Air Program in Pima County and various clean air special events or activities.
7. Measuring the awareness of the Clean Water Program in Pima County.
8. Tracking the perception or awareness of stormwater destinations, level of seriousness for local stormwater pollution and land use behaviors influencing stormwater quality.
9. Tracking actions impacting stormwater quality, including disposal methods of household products, reporting dumping to a government entity and willingness to take selected actions to improve stormwater quality.
10. Assessing the demographics of people whose perceptions do not match the facts or have behaviors contributing to stormwater pollution.

Methodology Overview – To accomplish the goals of this study, a random sampling of 500 men and women, 16 years of age and older, in the Pima County area was interviewed by telephone (250) and online (250) during late May 2020. The specific procedures used to select the sample are explained in detail in the Appendix of this report.

Details of the Findings

Profile of Respondents

Survey Language – In line with past surveys, nearly all interviews (97%) were conducted in English. The remaining 3% were Spanish-language surveys. Each of these 13 Spanish-language interviews were conducted among self-identified Hispanics who live in the South, Central and Northwest geographic zones – including both Telephone (8) and Internet (5) surveys. Refer to Table 4 for complete zip code region definitions.

Table 1 Language of Interview

	05/15	05/16	05/17	04/18	05/19	05/20	Sample	
	Total	Total	Total	Total	Total	Total	Telephone	Internet
English	98%	98%	97%	98%	98%	97%	97%	98%
Spanish	2%	2%	3%	2%	2%	3%	3%	2%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: Would you feel most comfortable if this interview is conducted in Spanish, English or does it make no difference?

Survey Method – Consistent with the dual-methodology sampling plan utilized since 2015, interviews were conducted via telephone and online using the same bilingual questionnaire. There were 500 total surveys, split 50/50 between telephone and online. Telephone respondents were randomly-selected for participation, with surveys conducted by the FMR field staff. Internet surveys were conducted using a national online panel company. This panel company sent an email invitation to randomly-selected panelists. These panelists opt in to accept such invitations, and receive an incentive to participate in surveys for which they qualify.

Once again, the screening criteria for the two survey methodologies is identical (and has remained unchanged for 25+ years). Specifically, all survey participants are Pima County residents, age 16 or older, who live in specific zip codes.

The only difference in the questionnaire design methodology is how survey questions with unaided pre-coded responses are handled. For Telephone surveys, pre-coded response options for unaided questions are not read to respondents. However, Internet respondents are provided all pre-coded response options to select from. As always, both Telephone and Internet respondents are provided an “other” category to capture responses not included on the pre-coded list.

Table 2 Method of Interview

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Telephone	50%	50%	50%	52%	49%	50%
Internet	50%	50%	50%	48%	51%	50%
	N=500	N=500	N=504	N=500	N=500	N=500

Self-Identified Ethnicity – As in prior surveys, there were specific sampling quotas with respect to self-identified ethnicity (with targets set based on household distributions within Pima County). The 2020 sample is highly reflective of these sampling goals: 66% White, 26% Hispanic, 3% African-American, 2% Asian/Pacific Islander and 2% Native American. This ethnicity distribution is consistent regardless of Internet or Telephone survey methodology.

Table 3 Ethnicity of Respondents

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Sample	
							Telephone	Internet
White	72%	71%	69%	69%	68%	66%	66%	66%
Hispanic	20%	22%	25%	25%	26%	26%	28%	24%
African-American	3%	3%	3%	3%	2%	3%	3%	4%
Asian, Pacific Islander	2%	2%	2%	2%	2%	2%	1%	4%
Native American	3%	2%	1%	1%	2%	2%	2%	2%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: This survey is intended to reflect the attitudes of all segments of the population. To which of the following ethnic groups do you belong?

Area of Residence – There again were geographic sampling quotas with respect to area of residence. These quotas are based on population density by zip code in Pima County. All zip codes assigned to one of four geographic regions as defined in the table below. The respondent provided their home zip code and was assigned to a specific region. The geographic quotas were adjusted for the 2020 survey to reflect the population growth occurring in the South and Northwest regions. The geographic composition of the 2020 sample is highly representative of these adjusted quotas: 32% South, 30% Northwest, 23% Central and 14% East.

Table 4 Area of Residence

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	5/20 Total
<u>South</u> 85321 85614 85622 85629 85634 85641 85701 85706 85707 85708 85713 85714 85735 85736 85746 85756 85757 85341 85601 85633 85639 85645	27%	27%	28%	28%	28%	32%
<u>Northwest</u> 85653 85654 85658 85704 85705 85737 85739 85741 85742 85743 85745 85755	27%	27%	27%	27%	27%	30%
<u>Central</u> 85710 85711 85712 85716 85718 85719	31%	31%	30%	30%	30%	23%
<u>East</u> 85619 85715 85730 85747 85748 85749 85750	15%	15%	15%	15%	15%	14%
	N=500	N=500	N=504	N=500	N=500	N=500

	Air Quality Problem			Sample	
	Major	Moderate	Minor	Telephone	Internet
<u>South</u> 85321 85614 85622 85629 85634 85641 85701 85706 85707 85708 85713 85714 85735 85736 85746 85756 85757 85341 85601 85633 85639 85645	38%	33%	26%	27%	37%
<u>Northwest</u> 85653 85654 85658 85704 85705 85737 85739 85741 85742 85743 85745 85755	30%	29%	38%	32%	28%
<u>Central</u> 85710 85711 85712 85716 85718 85719	22%	21%	26%	27%	20%
<u>East</u> 85619 85715 85730 85747 85748 85749 85750	10%	17%	10%	14%	15%
	N=96	N=252	N=125	N=250	N=250

Sex Distribution – Once again, there were no survey sampling quotas with respect to sex or age. However, in line with recent surveys, there is a near 50/50 mix of men (49%) and women (51%) in the 2020 sample. Consistent with the methodology for the telephone interviews in past years, there was only one survey conducted per randomly-selected household, and all respondents were further randomized by speaking with “the male or female in your household who is 16 or older and most recently celebrated a birthday.” Internet surveys were again conducted among randomly-selected online panelists with a Pima County zip code who “opt in” to receive such survey invitations.

Table 5 Sex of Respondents

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Sample	
							Telephone	Internet
Men	42%	44%	46%	49%	49%	49%	52%	46%
Women	58%	56%	54%	51%	51%	51%	48%	54%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: For this survey, we need to speak with the male or female in your household who is sixteen years old or older and most recently celebrated a birthday. Are you that person?

Age Category Distribution – Consistent with recent surveys, one-half of the 2020 (48%) sample is 26 to 55. As evident in other dual Telephone-Internet studies that we conduct, the Telephone sub-sample tends to skew older. For the 2020 sample, 25% of Telephone respondents are 66 or older – compared to just 12% of the Internet sub-sample. As a result, the median age of Internet participants (41.8 years) is significantly younger than Telephone respondents (50.5 years). The median age among the combined 2020 sample is 45.9 years.

Table 6 Age of Respondents

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Sample	
							Telephone	Internet
16 to 25	16%	14%	15%	15%	16%	16%	12%	20%
26 to 35	16%	17%	17%	19%	18%	18%	16%	20%
36 to 45	15%	16%	15%	16%	16%	16%	16%	17%
46 to 55	14%	15%	15%	15%	15%	14%	15%	13%
56 to 65	18%	18%	18%	18%	17%	17%	17%	17%
66 to 75	15%	14%	14%	11%	12%	12%	16%	8%
76 or over	6%	6%	6%	7%	7%	7%	9%	4%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: Please stop me when I read the age category you belong to. Are you...

Length of Residence – Six of ten indicate that they have lived in Pima County for 11+ years. This compares to two-thirds in 2018 and 2019. Consistent with last year, these longest term residents in the 2020 study are more likely to be Telephone (66%) than Internet (54%) respondents. Another 18% are newer residents (for five years or less), up from 15% last year. Part-year residents comprise 7% of the total sample (compared to 6% last year).

Table 7 Length of Residence in Pima County

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Sample	
							Telephone	Internet
Part year	4%	4%	7%	7%	6%	7%	4%	9%
Less than 2 years	8%	7%	6%	6%	4%	4%	3%	6%
2 to 5 years	11%	9%	11%	10%	11%	14%	14%	15%
6 to 10 years	13%	14%	16%	10%	14%	15%	13%	16%
11 or more years	64%	67%	61%	68%	66%	60%	66%	54%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: Do you live in Pima County all year or are you a part-year resident?

Question: How many years have you lived in Pima County?

Household Member With a Breathing-Related Medical Condition – Overall, 36% report that someone in their household suffers from a breathing-related medical condition. This compares to 40%-43% in the last four surveys. Allowing for multiple responses, 18% report that they themselves are impacted a breathing-related medical condition (down from 24% in 2019), while one of four indicate it is their children (10%, down slightly from 11%) or some other family member (16%, down from 19%). Geographically, households in the South or Northwest regions are most likely to be affected.

Consistent with recent surveys, there is a high degree of correlation between the incidence of impacted household members and the perception of a progressively more severe air quality problem in the Tucson area.

Table 8 Household Member With Breathing-Related Medical Condition

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Sample	
							Telephone	Internet
Yes	34%	40%	42%	43%	40%	36%	36%	37%
Respondent	(18%)	(21%)	(21%)	(21%)	(24%)	(18%)	(16%)	(20%)
Children	(9%)	(11%)	(10%)	(13%)	(11%)	(10%)	(10%)	(10%)
Other family member	(13%)	(17%)	(21%)	(21%)	(19%)	(16%)	(15%)	(17%)
No	64%	58%	57%	55%	57%	61%	62%	59%
Don't know/ Not sure	2%	2%	1%	2%	3%	3%	2%	4%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: Do you, your children or any other family member suffer from a breathing-related medical condition – such as asthma, emphysema, lung disease, etc.? If yes, who?

Number of Motor Vehicles Owned or Leased – Relative to 2019, there are a few more single-vehicle households (from 34% to 38%) and slightly fewer two-vehicle households (from 39% to 36%). The share of multi-vehicle (3+) households is unchanged since last year at 18%. In line with past surveys, less than one of ten report that no one in their household lease or own any motor vehicles (8%, down just slightly from 9% last year). This is particularly true in the Central zip codes (14%). The incidence of single-vehicle households is lower only in the South (32% versus 40%-43% elsewhere). Two-vehicle households are more common in the South or East regions (40%-41%), while Northwest residents are most likely to own or lease 3+ vehicles (23%).

Table 9 Number of Motor Vehicles Owned or Leased

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Sample	
							Telephone	Internet
No working cars	8%	6%	7%	8%	9%	8%	8%	8%
One	36%	41%	35%	37%	34%	38%	41%	36%
Two	40%	37%	42%	36%	39%	36%	33%	39%
Three or more	17%	16%	16%	19%	18%	18%	18%	17%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: How many motor vehicles in working condition are owned or leased by members of your household?

Education Level – Consistent with recent studies, 73% indicate that they completed at least some college level coursework. Relative to last year, there are a few more college graduates (from 25% to 29%) and slightly fewer with some graduate work or a graduate degree (from 19% to 17%). The percentage with some college (but no degree) is basically unchanged at 27%. Similar to recent surveys, educational achievement (a college degree or better) is highest in the East and Northwest zip codes.

The remaining 27% are high school/trade school graduates (21%, down from 23%) or have less than a high school diploma (unchanged at 6%). These tend to be South or Central region residents.

Table 10 Education Level of Respondents

	05/15	05/16	05/17	04/18	05/19	05/20	Sample	
	Total	Total	Total	Total	Total	Total	Telephone	Internet
Less than high school	7%	4%	5%	4%	6%	6%	6%	6%
Completed high school/Trade school	16%	19%	19%	20%	23%	21%	20%	22%
Some college	31%	33%	27%	25%	28%	27%	27%	26%
College graduate	28%	27%	36%	31%	25%	29%	30%	29%
Some graduate work or graduate degree	17%	15%	13%	19%	19%	17%	17%	17%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: What was the last grade of school you completed?

Annual Household Income – The median household income (excluding refusals) of 2020 respondents is \$50,251. This is up from \$46,378 last year. In with prior surveys, median household incomes among Telephone respondents (\$51,232) are higher than Internet panelists (\$49,388). With respect to geography, high income households (\$80,000+) are more likely to be found in the East zips.

Among the total sample, 11% refused to disclose their household income category. This is down slightly from 13% last year.

Table 11 Household Income

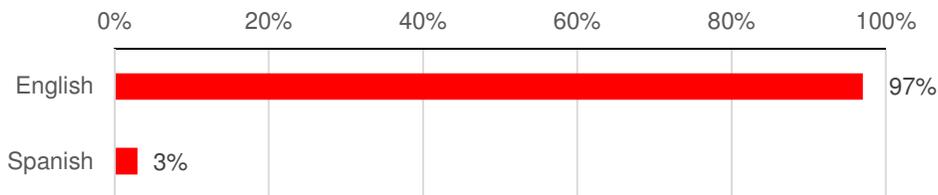
	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Sample	
							Telephone	Internet
Less than \$15,000	12%	11%	12%	11%	12%	9%	8%	11%
\$15,000 to \$24,999	14%	13%	10%	10%	11%	10%	9%	11%
\$25,000 to \$39,999	16%	17%	17%	15%	15%	16%	14%	18%
\$40,000 or more*	46%	48%	50%	56%	48%	54%	50%	58%
No answer/Refused	13%	11%	11%	7%	13%	11%	19%	2%
* \$40,000 to \$59,999	14%	16%	16%	18%	16%	18%	16%	19%
\$60,000 to \$79,999	11%	12%	10%	16%	12%	16%	13%	20%
\$80,000 or more	21%	20%	24%	22%	20%	20%	20%	19%
	N=500	N=500	N=504	N=500	N=500	N=500	N=250	N=250

Question: As I read the following categories, please tell me into which group your total annual household income falls. We are not interested in your exact income, just your household income category...from all sources before taxes.

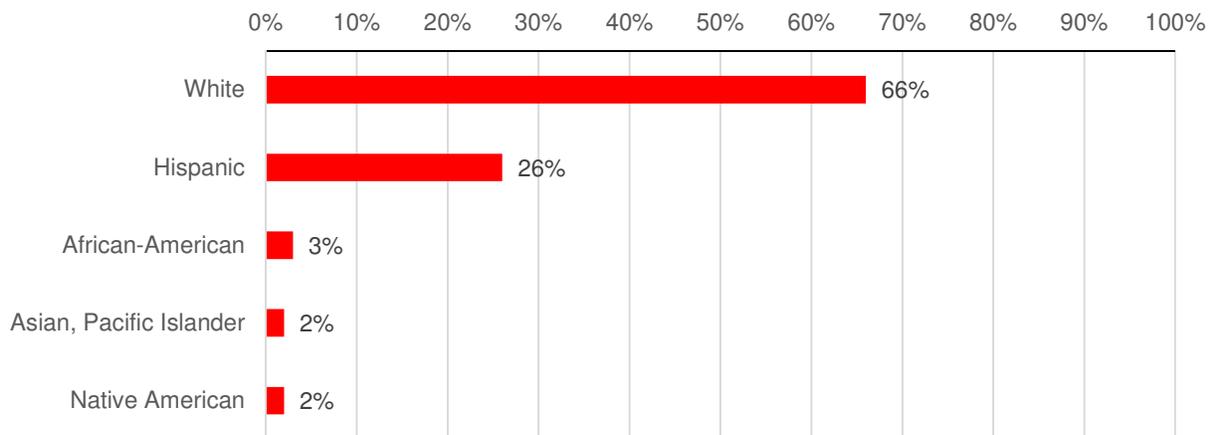
Display 1

Demographic Profile of Respondents (Among the Total Sample)

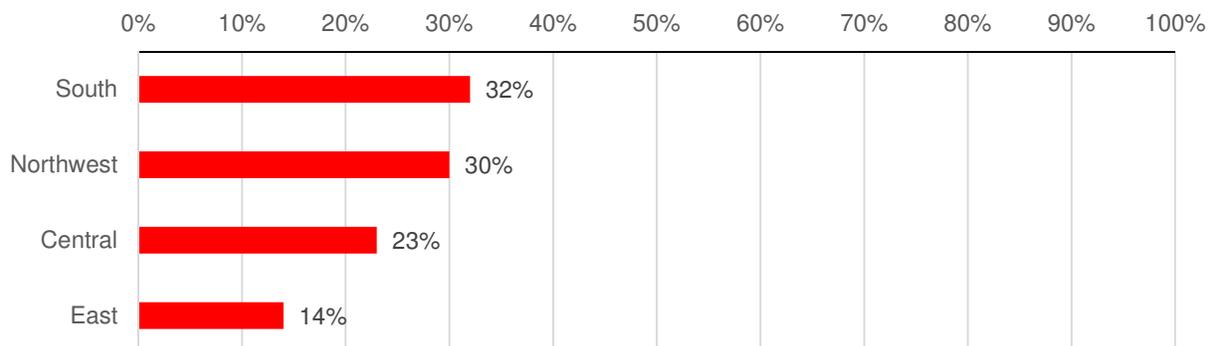
Language of Interview



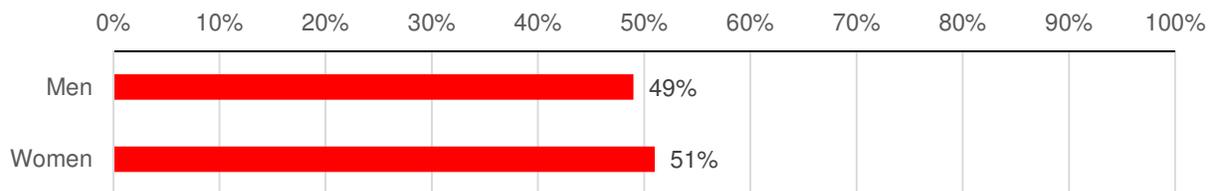
Ethnicity



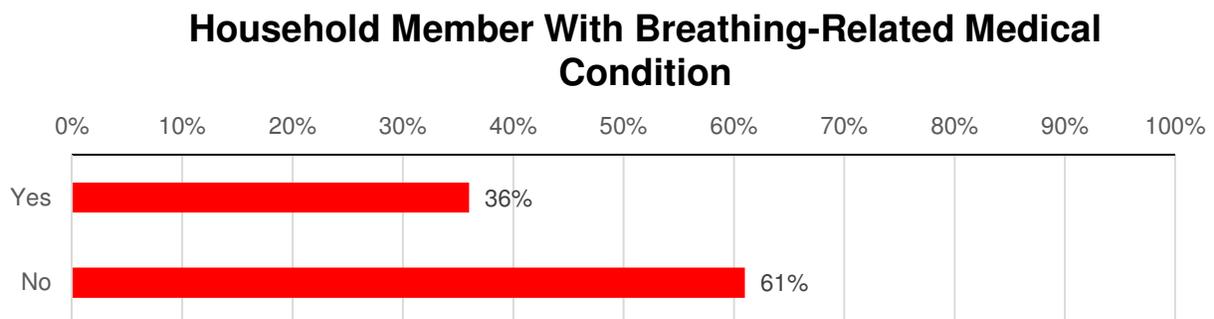
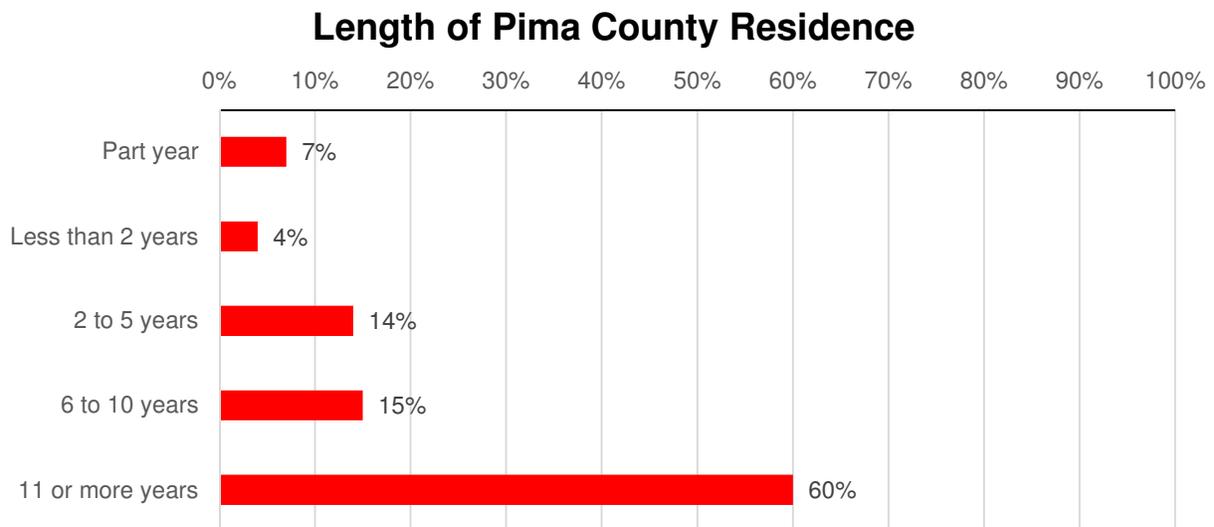
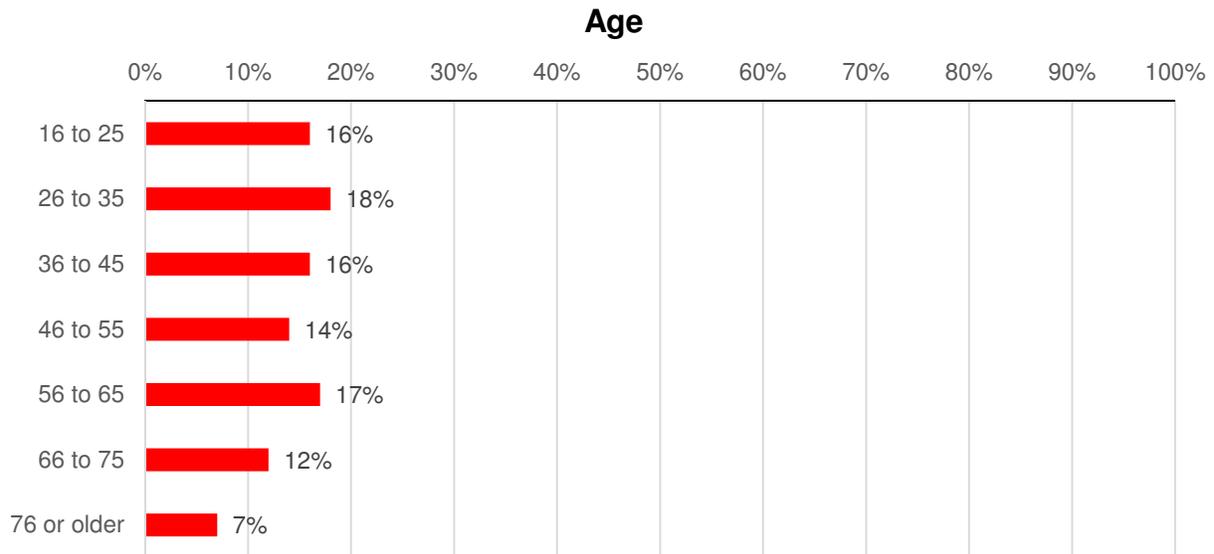
Area of Residence



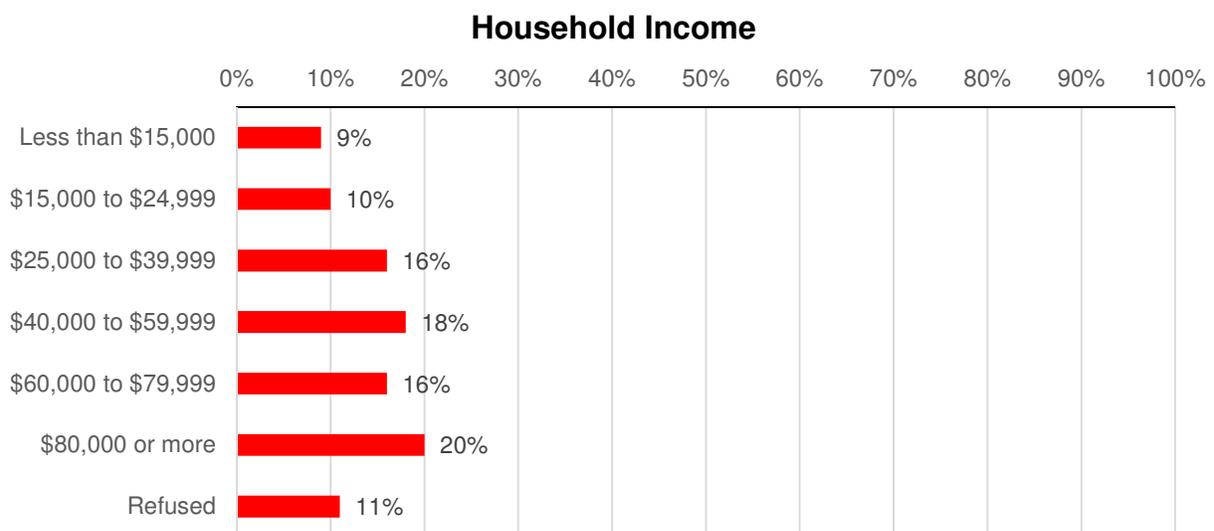
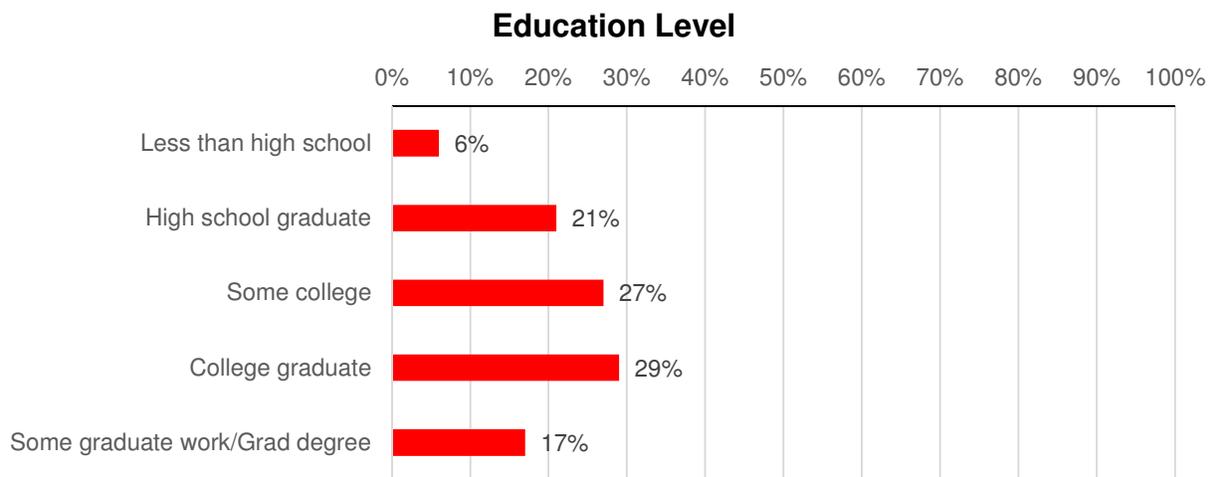
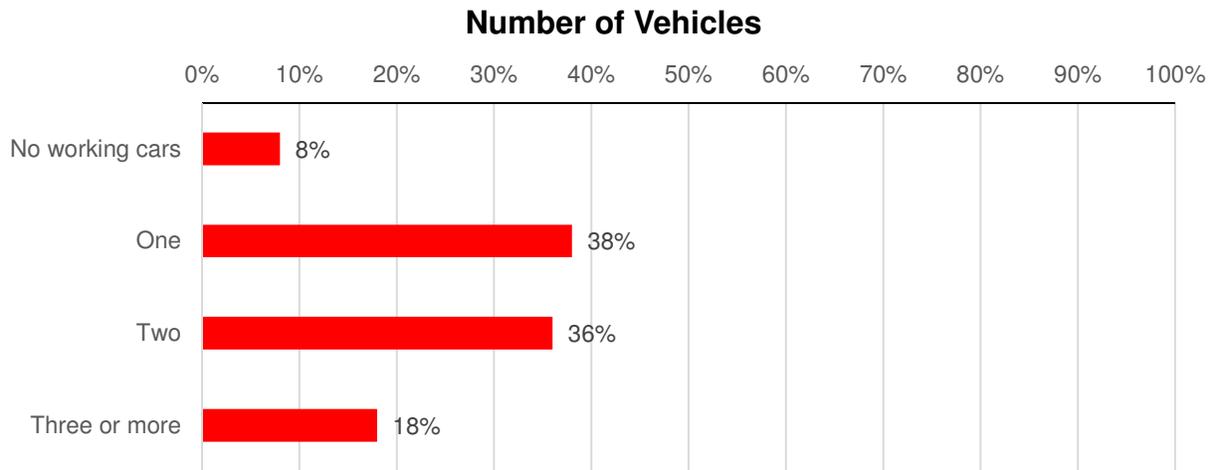
Sex



Display 1 (Cont'd) Demographic Profile of Respondents (Among the Total Sample)



Display 1 (Cont'd) Demographic Profile of Respondents (Among the Total Sample)



Awareness of Information About Air Quality/Pollution

Awareness of the Pima County “Clean Air” Program – Consistent with last year (43%), 42% in the 2020 study indicate an awareness of the Pima County “Clean Air” Program. Still, awareness remains lower than was measured from 2015 to 2018 (44%-50%).

Program awareness is directly related to the perception of a more serious air quality or stormwater pollution problem, and higher among households impacted by a breathing-related medical problem. Overall, there are fewer differences in awareness with respect to sex, age (lower only among those 66+) or ethnicity (marginally higher among non-Whites). Awareness is highest in the South or East zips and among those with some college (but no degree).

Table 12 **Awareness of the Pima County “Clean Air” Program**

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Yes	45%	50%	44%	46%	43%	42%
No	49%	42%	47%	47%	49%	48%
Don't know	6%	7%	9%	8%	8%	10%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Yes	48%	36%	38%	49%	59%	43%	33%
No	46%	52%	49%	41%	35%	46%	60%
Don't know	6%	12%	13%	10%	5%	11%	7%
	N=160	N=152	N=117	N=71	N=96	N=252	N=125

Question: Have you ever heard of or are you aware of the Pima County Department of Environmental Quality “Clean Air” Program?

Awareness of Various Clean Air Events or Activities – Consistent with last year, 82% are familiar with at least one event or activity used to promote clean air in the Tucson area. Still, awareness remains marginally lower than we found in 2018 (84%) and 2017 (86%).

Despite many being cancelled due to the COVID-19 outbreak, five of the six individual “Clean Air” events or activities evaluated in the 2020 survey have the same or higher awareness as compared to last year. The only event with lower familiarity was “Walk and Bike to School Day” (and this lower awareness might be explained, in part, by the early school closures). In addition, as we have found in past years, the awareness of individual events and activities remains significantly higher among those familiar with the “Clean Air” Program.

At least four of ten overall are familiar with the following “Clean Air” events/activities:

- **“Earth Day Festival”** (58% awareness, up slightly from 57% last year [when tested as “Earth Day Festival and Parade”]. East zone residents, women, 36 to 45 year-olds, Whites and the highest income households [\$80,000 or more] indicate the highest degree of familiarity.)
- **“Bike to Work Day”** (55% awareness, up from 52% last year. Awareness is generally consistent regardless of geography, and elevated among women, 46 to 65 year-olds and residents who perceive a progressively more severe air quality problem.)
- **“Walk and Bike to School Day”** (42% awareness, down from 46% last year. This event is more highly familiar to South zip residents, lower income households and those who think that Tucson has a progressively more severe air quality problem.)
- **“Bike Fest”** (41% awareness, unchanged since last year. East region residents, 16 to 25 year-olds and those who perceive that Tucson has a progressively more severe air quality problem are more likely to indicate increased awareness.)

Consistent with last year, 28% are familiar with **“Cyclovia.”** These tend to be Central residents, non-Whites, higher income households and residents who perceive a “major” air quality problem.

Compared to when it was first tested last year, awareness of the **“Travel Reduction Program”** has increased from 21% to 28%. Awareness is marginally higher among South zip residents, along with men, 26 to 45 year-olds, non-Hispanic minorities and those with annual household incomes of at least \$60,000.

Table 13

Awareness of Various Clean Air Events or Activities

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
"Earth Day Festival" ⁽¹⁾	59%	55%	62%	58%	57%	58%
"Bike to Work Day"	62%	60%	53%	56%	52%	55%
"Walk and Bike to School Day" ⁽²⁾	29%	32%	31%	31%	46%	42%
"Bike Fest"	52%	51%	47%	50%	41%	41%
"Cyclovia"	24%	24%	23%	25%	29%	28%
"Travel Reduction Program"	–	–	–	–	21%	28%
None of these	15%	17%	14%	16%	19%	18%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
"Earth Day Festival" ⁽¹⁾	61%	52%	53%	70%	62%	62%	48%
"Bike to Work Day"	54%	56%	54%	58%	69%	56%	42%
"Walk and Bike to School Day" ⁽²⁾	46%	41%	39%	39%	52%	40%	39%
"Bike Fest"	42%	39%	38%	45%	50%	40%	37%
"Cyclovia"	26%	26%	37%	20%	38%	26%	23%
"Travel Reduction Program"	30%	26%	27%	25%	41%	26%	22%
None of these	18%	21%	21%	7%	12%	16%	26%
	N=160	N=152	N=117	N=71	N=96	N=252	N=125

- (1) Was "Earth Day Festival and Parade" (5/15-5/19).
- (2) Was "Walk and Roll to School Day" (5/15-4/18).

Question: I am now going to read you some events or activities that are used to promote clean air in the Tucson area. As I read each, simply tell me if you have seen or heard of the event.

Household Participation in a “Clean Air” Campaign Event – Among the 82% of survey respondents familiar with at least one “Clean Air” campaign event, two of ten indicate that they or someone in their household participated in at least one such activity. This is the highest participation level recorded since 2015 (compared to 12%-18% in recent years).

Participation is marginally higher in the South or Northwest zips, as well as among men, 16 to 45 year-olds and non-Whites. Consistent with past years, household participation is significantly higher among residents aware of the “Clean Air” Program (34% versus 9% unaware).

Table 13a Participation of Anyone in Household in a Clean Air Campaign Event (Among Those Aware of at Least One Event)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Yes	20%	12%	18%	18%	15%	20%
No	79%	85%	77%	79%	80%	73%
Don't know	2%	3%	5%	3%	5%	7%
	N=425	N=417	N=432	N=418	N=406	N=410

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Yes	23%	22%	18%	15%	41%	16%	13%
No	67%	72%	74%	83%	55%	76%	85%
Don't know	10%	6%	8%	2%	4%	7%	2%
	N=132	N=120	N=92	N=66	N=85	N=212	N=92

Question: Did you or anyone in your household attend or participate in any of the clean air events in the past year?

Incidence of Changing Routines/Behaviors to Improve Air Quality After Participating in “Clean Air” Events – Among the 20% who report past participation in a “Clean Air” event or activity, six of ten indicate they have changed (or are considering changing) their daily routines or behaviors to help improve air quality. This compares to 75% last year and 64% in 2018.

Among the combined sample, this means that 10% report a change in their behavior after participating in a “Clean Air” event. This compares to 9% in 2019. More likely to indicate a behavior change in the current study are Central or East residents, non-Whites and 16 to 25 or 56 to 65 year-olds.

Table 13b Incidence of Changing Routines/Behaviors to Improve Air Quality After Participating in Clean Air Events
(Among Those With a Household Member Who Participated)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Yes	69%	80%	74%	64%	75%	59%
No	23%	8%	25%	34%	25%	34%
Don't know	8%	12%	1%	1%	0%	7%
	N=83	N=49	N=77	N=76	N=61	N=83

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Yes	53%	58%	65%	70%	66%	51%	58%
No	37%	38%	29%	20%	26%	40%	42%
Don't know	10%	4%	6%	10%	9%	9%	0%
	N=30	N=26	N=17	N=10	N=35	N=35	N=12

Question: After participating in a clean air event, did you or someone in your household take or consider any actions to change your daily routines or behaviors to help improve air quality?

Opinion of Activities/Events to Encourage Use of Other Modes of Transportation –

Overall, 88% familiar with at least one “Clean Air” event have a positive opinion of “events and activities that encourage people to use other modes of transportation or work from home instead of driving alone.” This is up slightly from last year (86%), although the percentage “very favorable” remains unchanged at 47%.

Central or East residents, women, those 56 or older, non-Hispanic minorities and college graduates are most likely to be highly favorable towards events and activities to encourage use of alternative transportation modes. Those who perceive a “major” or “moderate” air quality problem in Tucson are equally likely to be highly favorable of these events (51%-52%).

As we have found in past surveys, less than one of ten (7%) have a negative opinion (to any degree) of air quality related events and activities.

Table 13c Opinion of Activities/Events to Encourage Use of Other Modes of Transportation
(Among Those Aware of at Least One “Clean Air” Event)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Very favorable	47%	45%	52%	49%	47%	47%
Somewhat favorable	38%	43%	38%	38%	39%	41%
Not very favorable	7%	4%	5%	5%	7%	5%
Not at all favorable	3%	4%	2%	4%	1%	2%
Don't know/No answer	5%	4%	4%	4%	5%	4%
	N=425	N=417	N=432	N=418	N=406	N=410

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Very favorable	44%	46%	50%	53%	51%	52%	37%
Somewhat favorable	41%	41%	41%	42%	39%	41%	45%
Not very favorable	9%	7%	2%	0%	7%	4%	8%
Not at all favorable	2%	2%	1%	0%	1%	1%	5%
Don't know/No answer	4%	4%	5%	4%	2%	3%	5%
	N=132	N=120	N=92	N=66	N=85	N=212	N=92

Question: Overall, what is your opinion of these events and activities that encourage people to use other modes of transportation or work from home instead of driving alone? Is your opinion of the various Clean Air Campaign events and activities very favorable, somewhat favorable, not very favorable or not at all favorable?

Steps Taken to Reduce Air Pollution – Allowing for multiple responses, the steps most often taken to help reduce air pollution in the Tucson area include:

- **Generally reduced driving** (47%, up significantly from recent surveys [35%-38%]. This is the case regardless of geography or sex. Those 46 or older and non-Hispanics – along with those who perceive a progressively more severe air quality problem – are more likely to say they have generally reduced their driving.)
- **Keeping tires properly inflated** (42%, representing an incrementally progressive increase since the 2019 [40%], 2018 [34%] and 2017 [31%] studies. These are more likely to be Northwest residents, 56 to 65 year-olds, Whites and those who think Tucson has a “moderate” air quality problem.)
- **Keep car tuned** (41%, unchanged since last year. These tend to be men, 56 to 65 year-olds and Whites. Geographically, only East residents are somewhat less likely to indicate keeping their car tuned [35% versus 41%-43% elsewhere].)
- **Carpool/Less driving alone** (35%, down from 43% last year [but still consistent with 32%-38% in past surveys]. Carpooling is higher in the South or Central zips, and among women, 16 to 35 year-olds and those who think Tucson has a “major” air quality problem.)
- **Planted trees** (25%, up from 17%-20% in the past two studies. South region residents, 16 to 25 year-olds and those who perceive that Tucson has a progressively more severe air quality problem are more likely to have planted trees.)
- **Avoid excessive idling** (22%, basically unchanged since last year [23%]. These are more apt to be Northwest or East respondents, women, 46 to 65 year-olds and the newest Pima County residents [for less than two years].)
- **Bought more fuel efficient car** (21%, up progressively from 17% in 2019 and 13% in 2018. There are few differences based on geography, with an increased incidence among 16 to 45 year-olds, part-year Tucson residents, non-Hispanic minorities and those who perceive a progressively more serious air quality problem.)
- **Chosen one day a week not to drive** (17%, up from 12%-13% in the last two surveys. This is the case regardless of geography [lower only in the Central zips].)
- **Bought bicycles** (17%, up from 14%-15% in recent years. These tend to be South zip residents.)

Compared to last year, more say they are **using their BBQ grill less** (11%, up from 10%), **adjusted the emission control on their vehicle** (11%, up from 7%), **moved closer to work** (10%, up from 6%) and/or **using their fireplace/wood stove less** (8%, up from 7%). New to the current survey, 4% (more often South zip residents) report that they **purchased a battery-powered lawn mower**.

Overall, 11% say they have done **nothing** to reduce air pollution in the Tucson area (down from 15% last year). Once again, these tend to be residents who think that Tucson has a “minor” air quality problem.

Table 14

Steps Taken to Reduce Air Pollution

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Generally reduced driving/Driven less	35%	38%	38%	37%	35%	47%
Keep tires properly inflated	39%	35%	31%	34%	40%	42%
Keep car tuned	35%	39%	38%	34%	41%	41%
Carpool/Less driving alone	32%	33%	38%	35%	43%	35%
Planted trees	17%	21%	23%	17%	20%	25%
Avoid excessive idling	12%	12%	16%	16%	23%	22%
Bought more fuel efficient car	13%	13%	20%	13%	17%	21%
Chosen once a week not to drive	10%	12%	16%	13%	12%	17%
Bought bicycles	12%	12%	15%	15%	14%	17%
Using BBQ grill less	6%	9%	8%	7%	10%	11%
Adjusted vehicle's emission control equipment	10%	12%	14%	14%	7%	11%
Moved closer to work	8%	9%	8%	6%	6%	10%
Using fireplace/Wood stove less	5%	8%	8%	8%	7%	8%
Bought alternative-fueled car	4%	3%	5%	4%	5%	5%
Advocated alternative to cars	4%	2%	4%	3%	4%	5%
Purchased a battery-powered lawn mower	--	--	--	--	--	4%
Challenged friends/Co-workers to change	3%	2%	6%	4%	2%	3%
Walk more	1%	2%	2%	1%	2%	1%
Other	3%	4%	5%	7%	3%	3%
Nothing	16%	16%	12%	11%	15%	11%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Generally reduced driving/Driven less	46%	49%	46%	45%	52%	48%	43%
Keep tires properly inflated	38%	53%	36%	41%	41%	46%	37%
Keep car tuned	41%	41%	43%	35%	41%	46%	34%
Carpool/Less driving alone	37%	32%	38%	31%	49%	31%	32%
Planted trees	31%	21%	23%	21%	33%	25%	18%
Avoid excessive idling	18%	26%	20%	28%	24%	25%	18%
Bought more fuel efficient car	22%	19%	21%	21%	33%	21%	15%
Chosen once a week not to drive	19%	17%	13%	20%	25%	18%	12%
Bought bicycles	21%	14%	15%	16%	23%	15%	14%
Using BBQ grill less	11%	12%	11%	10%	18%	10%	8%
Adjusted vehicle's emission control equipment	12%	16%	5%	3%	22%	9%	6%
Moved closer to work	8%	13%	9%	7%	12%	10%	7%
Using fireplace/Wood stove less	9%	9%	8%	4%	12%	9%	5%
Bought alternative-fueled car	6%	7%	3%	6%	10%	4%	6%
Advocated alternative to cars	4%	5%	4%	4%	10%	4%	2%
Purchased a battery-powered lawn mower	8%	4%	0%	4%	3%	3%	9%
Challenged friends/Co-workers to change	4%	3%	1%	1%	5%	2%	2%
Walk more	1%	0%	2%	3%	1%	1%	2%
Other	4%	1%	4%	4%	2%	4%	2%
Nothing	11%	11%	9%	13%	6%	7%	21%
	N=160	N=152	N=117	N=71	N=96	N=252	N=125

Question: What, if anything, have you been able to do to help reduce air pollution in the Tucson area?

Presence of Children 5-18 in Household – One-third report that they have children between the ages of 5 and 18 living in their household. This represents an incremental and progressive increase since 2016 (24%). South zip code residents, men, 16 to 45 year-olds and non-Whites are more likely to indicate that they have young children living in their household.

Table 15 Presence of Children Ages 5-18 in Household

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Yes	26%	24%	28%	29%	30%	32%
No	74%	76%	72%	71%	70%	68%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Yes	39%	30%	31%	22%	43%	31%	24%
No	61%	70%	69%	78%	57%	69%	76%
	N=160	N=152	N=117	N=71	N=96	N=252	N=125

Question: Do children 5 to 18 years of age live in your household?

Incidence of Children Ages 5-18 Receiving Air Pollution Information From School

– Among households with children ages 5 to 18 (32% of the total sample), four of ten say that these young children “talked about or brought home materials from school about improving air quality.” This is up slightly from last year (38%), but remains well below prior findings (45%-53%). Recall in the current survey is higher in the South or Northwest zips, as well as among 16 to 45 year-olds, non-Hispanic minorities and those who are progressively more formally educated. As we have found in past years, residents aware of the “Clean Air” Program indicate much higher recall (48%) than those unfamiliar (34%).

Table 15a

Incidence of Children Ages 5-18 Receiving Information From School About Air Pollution
(Among Households With Children Ages 5-18)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Yes	45%	48%	50%	53%	38%	40%
No	47%	48%	43%	42%	53%	49%
Don't know	8%	3%	8%	5%	9%	11%
	N=131	N=120	N=141	N=144	N=150	N=160

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Yes	42%	44%	33%	38%	49%	40%	33%
No	53%	48%	47%	44%	51%	47%	60%
Don't know	5%	9%	19%	19%	0%	13%	7%
	N=62	N=46	N=36	N=16	N=41	N=78	N=30

Question: Have the children 5 to 18 years old in your home ever talked about or brought home materials from school about improving air quality – including school presentations or brochures?

Gasoline-Powered Lawn Mower Usage and Characteristics – Up slightly from last year (7%), 8% overall indicate they or someone in their household uses a gasoline-powered lawn mower to care for their home property. Usage is lower only in the East zip codes (1% versus 8%-10% elsewhere), and higher among men, 16 to 25 year-olds and Hispanics. Among these users who know, more say their gas-powered mower has a 2-stroke (42%) than 4-stroke (25%) engine (Table 16a) – with average monthly usage of 38 minutes (Table 16b).

Table 16 Use of Gasoline-Powered Lawn Mower to Care for Property

	05/16 Total*	05/17 Total*	04/18 Total*	05/19 Total	05/20 Total
Yes	8%	6%	6%	7%	8%
No	90%	92%	93%	90%	89%
Don't know	2%	2%	1%	3%	3%
	N=500	N=504	N=500	N=500	N=500

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Yes	9%	10%	8%	1%	21%	5%	5%
No	88%	88%	88%	96%	77%	92%	94%
Don't know	2%	3%	4%	3%	2%	3%	2%
	N=160	N=152	N=117	N=71	N=96	N=252	N=125

* Calculated from combination of use of gasoline-powered lawn & garden equipment and specific use of a gasoline-powered lawn mower among those users (5/16-4/18).

Question: Do you or anyone in your household use a *gasoline-powered* lawn mower to care for your home property?

Table 16a Type of Engine in Gasoline-Powered Lawn Mower Used

	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
2-stroke	38%	37%	72%	40%	42%
4-stroke	28%	20%	19%	43%	25%
Don't know	33%	43%	9%	17%	32%
	N=39	N=30	N=32	N=35	N=40

Question: Does your gasoline-powered lawn mower have a 2-stroke or a 4-stroke engine?

Table 16b

Minutes Per Month Gasoline-Powered Lawn Mower Used

	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
15 minutes or less	13%	57%	31%	14%	28%
16-30 minutes	61%	21%	50%	46%	25%
31 minutes-1 hour	18%	7%	12%	37%	35%
More than 1 hour	8%	14%	6%	3%	12%
	N=39	N=30	N=32	N=35	N=40

Question: In a typical month, how many minutes would you estimate that you use your gasoline-powered lawn mower?

Agreement With Various Statements Regarding PDEQ Programs and Air Pollution

– Like past surveys, respondents were asked to agree or disagree with a variety of statements related to various PDEQ clean air programs and air pollution. As we have found in past surveys, agreement with each statement is much higher (and often significantly so) among residents familiar with the “Clean Air” Program.

PDEQ and Rideshare Awareness –

- **You are aware of the Pima County Department of Environmental Quality (PDEQ)** (59% agreement. While basically unchanged since last year [60%], awareness remains lower than 2015-2018 levels [63%-68%]. South zip residents, those 56 or older and non-Hispanics indicate the highest awareness in the 2020 study.)
- **You are aware of the services provided by Sun Rideshare** (48% agreement, compared to 51%-58% in recent surveys. Awareness is highest in the East zips, as well as among 26 to 45 year-olds, non-Hispanic minorities and 6+ year Pima County residents.)

PDEQ Program and Campaign Awareness –

- **You have seen or heard information about the importance of keeping your tires properly inflated** (76% agreement. This is down from 82%-88% in past years. Still, awareness is generally consistent regardless of geography [elevated in the Central zips] or gender, with increased familiarity among those 46 or older and Whites.)
- **You have seen or heard the phrase “Healthy Air Is in Our Hands”** (35% agreement, up from three of ten last year. South region residents, 16 to 25 year-olds, Hispanics and households impacted by a breathing-related medical condition indicate increased awareness.)

Air Pollution Evaluations –

- **You are aware that the majority of our air pollution comes from motor vehicle use** (75% agreement, down slightly from 77% last year. There are few differences in agreement based on geography, sex, age, ethnicity or education – including those who perceive a “major” or “moderate” air quality problem.)
- **You have seen or heard information regarding clean air or air pollution** (73% agreement, down from 80%-84% in the past three surveys. Agreement is higher in the East or Northwest zip codes – along with those 46 or older, Whites and residents who perceive a “moderate” air quality problem.)

- **You have seen or heard information that vehicle engine idling causes air pollution** (72% agreement, reflecting an incremental and progressive decline from 2017 [90%]. Agreement is consistent regardless of geography, and higher among men, Whites, residents 56 or older and those who think Tucson has a “moderate” air quality problem.)
- **Because you want to reduce air pollution, you are generally driving less** (53% agreement, up slightly from last year [52%]. More apt to agree are South or Northwest region residents, 56 to 65 year-olds and non-Hispanics – with few differences among those who perceive a “major” or “moderate” air quality problem.)

COVID-19 Outbreak Driving Patterns –

- **Because of the COVID-19 outbreak, you are generally driving less** (74% agreement, regardless of age [somewhat lower only among 26 to 35 year-olds]. East zip residents, women and non-Hispanics are more likely to indicate driving less due to the pandemic.)

Table 17

**Agreement With Various Statements Regarding
PDEQ Programs and Air Pollution**

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
You have seen or heard information about the importance of keeping your tires properly inflated.	88%	83%	86%	88%	82%	76%
You are aware that the majority of our air pollution comes from motor vehicle use.	82%	83%	81%	82%	77%	75%
Because of the <i>COVID-19 outbreak</i> , you are generally driving less.	–	–	–	–	--	74%
You have seen or heard information regarding clean air or air pollution.*	66%	77%	84%	80%	82%	73%
You have seen or heard information that vehicle engine idling causes air pollution.	–	–	90%	88%	75%	72%
You are aware of the Pima County Department of Environmental Quality (PDEQ).	60%	68%	63%	66%	60%	59%
Because you want to <i>reduce air pollution</i> , you are generally driving less.	58%	58%	58%	58%	52%	53%
You are aware of the services provided by Sun Rideshare.	55%	58%	51%	55%	52%	48%
You have seen or heard the phrase "Healthy Air Is in Our Hands."	26%	36%	34%	32%	30%	35%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Air Quality Problem			Awareness of "Clean Air" Program	
	South	North-west	Central	East	Major	Moderate	Minor	Yes	No
You have seen or heard information about the importance of keeping your tires properly inflated.	72%	78%	80%	75%	81%	79%	74%	81%	74%
You are aware that the majority of our air pollution comes from motor vehicle use.	74%	76%	74%	78%	82%	81%	63%	79%	72%
Because of the <i>COVID-19 outbreak</i> , you are generally driving less.	71%	77%	68%	84%	72%	80%	71%	77%	73%
You have seen or heard information regarding clean air or air pollution.*	68%	77%	72%	75%	73%	78%	66%	81%	67%
You have seen or heard information that vehicle engine idling causes air pollution.	72%	72%	70%	72%	73%	78%	62%	80%	64%
You are aware of the Pima County Department of Environmental Quality (PDEQ).	66%	57%	56%	52%	64%	60%	56%	83%	37%
Because you want to <i>reduce air pollution</i> , you are generally driving less.	59%	54%	47%	45%	60%	57%	41%	56%	49%
You are aware of the services provided by Sun Rideshare.	47%	46%	44%	61%	51%	52%	39%	60%	39%
You have seen or heard the phrase "Healthy Air Is in Our Hands."	42%	35%	26%	32%	45%	35%	33%	53%	21%
	N=160	N=152	N=117	N=71	N=96	N=252	N=125	N=211	N=239

* Was "You have seen or heard commercials on TV or radio regarding clean air or air pollution" (5/15-5/16).

Question: As I read the following statements, simply tell me if you agree or disagree.

Estimated Daily Miles Not Driven Due to the COVID-19 Outbreak – Respondents who indicate that they are generally driving less due to the pandemic (74% overall) were asked, “On a typical day, because of the COVID-19 outbreak, approximately how many miles would you say you are *not* driving that you otherwise might?” Mileage estimates vary widely, from as little as 1 mile to 100+ miles per day. Overall, one-half say they their daily miles not driven is 5 miles or less (22%) or 6 to 10 miles (27%) – while most of the rest (46%) report not driving 15 or miles per day due to the outbreak. The average is 21.6 miles not driven on a daily basis because of the COVID-19 outbreak.

Table 17a Estimated Daily Miles Not Driven Due to COVID-19 Outbreak
(Among Those Who Are Generally Driving Less Due to the Outbreak)

	5/20 Total	Area				Air Quality Problem		
		South	Northwest	Central	East	Major	Moderate	Minor
5 miles or less	22%	18%	17%	38%	22%	22%	20%	24%
6 to 10 miles	27%	31%	24%	27%	28%	35%	28%	21%
11 to 14 miles	4%	4%	3%	5%	3%	3%	4%	4%
15 or more miles	46%	48%	56%	30%	47%	41%	47%	51%
	N=370	N=114	N=117	N=79	N=60	N=69	N=201	N=89

Question: On a typical day, because of the COVID-19 outbreak, approximately how many miles would you estimate you are not driving that you otherwise might?

Travel Behavior for Shopping – Prior to the COVID-19 outbreak, 57% of survey respondents said that they would generally **drive alone** to go shopping. This is down from last year (61%), but consistent with our 2018 findings (56%). Instead, a few more said that they (pre-pandemic) would **carpool with 1 to 4 other adults** (29%, up from 25% last year). While pre-pandemic **bus** ridership was unchanged from last year at 4%, a few more reported they used a **bicycle** (from 1% to 3%), **motorcycle** (from 1% to 2%) or **vanpool with 5 or more other adults** (from 0% to 1%). The share who said they **walk** (1%) has dipped from last year’s record of high of 7%.

East region residents, women, 56 to 65 year-olds and Whites are more likely to say they would drive alone to shop prior to the outbreak of COVID-19. South or Northwest zip code residents – along with the youngest (16 to 25) or oldest (66+) respondents – are more apt have carpooled. There was increased bus ridership among South region residents, 16 to 35 year-olds and non-Hispanic minorities.

Table 18 Travel Behavior for Shopping
(Prior to the COVID-19 Outbreak)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Drive alone	50%	60%	54%	56%	61%	57%
Carpool with 1 to 4 other adults	29%	27%	30%	30%	25%	29%
Bus	9%	5%	6%	6%	4%	4%
Bicycle	3%	1%	2%	2%	1%	3%
Motorcycle	1%	–	1%	1%	1%	2%
Vanpool with 5 or more other adults	2%	1%	1%	0%	0%	1%
Walk	4%	4%	5%	3%	7%	1%
Take the streetcar	1%	–	0%	2%	0%	0%
Other	1%	2%	1%	1%	1%	1%
	N=500	N=500	N=504	N=500	N=500	N=500

Question: Prior to the COVID-19 outbreak, what type of transportation did you generally use to go shopping?

Travel Behavior for Leisure Purposes – Before the pandemic outbreak, and consistent with 2019 findings, more continue to say they would generally **drive alone** (48%) than **carpool with 1 to 4 other adults** (38%) for leisure purposes (“such as dining out, meeting with friends, going to the movies, going to the gym, etc.”). In line with prior surveys, fewer say they would ride the **bus** (unchanged since last year at 4%), **bicycle** (3%, up from 0%), **vanpool with 5 or more other adults** (2%, up from 1%), **motorcycle** (unchanged at 2%) or **walk** (unchanged at 2%).

Pre-pandemic single passenger leisure travel is highest among Northwest or East zip residents, 36 to 45 or 56 to 65 year-olds and non-Hispanic minorities. Carpooling was somewhat lower only in the Northwest region (34% versus 39%-40% elsewhere) and elevated among those 66 or older and Hispanics. Central residents were more likely to take the bus.

Table 19 Travel Behavior for Leisure Purposes
(Prior to the COVID-19 Outbreak)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Drive alone	39%	45%	44%	42%	46%	48%
Carpool with 1 to 4 other adults	43%	44%	41%	43%	41%	38%
Bus	6%	3%	6%	5%	4%	4%
Bicycle	2%	2%	1%	2%	0%	3%
Vanpool with 5 or more other adults	1%	0%	1%	1%	1%	2%
Motorcycle	1%	0%	2%	3%	2%	2%
Walk	4%	3%	3%	2%	2%	2%
Take the streetcar	1%	–	–	1%	0%	1%
Other	2%	2%	2%	2%	3%	1%
	N=500	N=500	N=504	N=500	N=500	N=500

Question: Prior to the COVID-19 outbreak, what type of transportation did you generally use for leisure purposes, such as dining out, meeting with friends, going to the movies, going to the gym, etc.?

Perceived Seriousness of Air Quality Problem in Tucson Area – Like we found last year, two of ten (19%) think that Tucson has a “major” air quality problem. At the same time, a few more now perceive that air quality is a just “minor problem” (from 21% to 25%). Down from 54%-55% since 2016, one-half believe that the air quality problem is “moderate” issue (50%). The remaining 5% remain unsure.

South region residents, men, 16 to 25 year-olds and non-Whites are more likely to think that Tucson has a “major” air quality problem. In line with past surveys, the perception of a “major” air quality issue is higher among those aware of the “Clean Air” Program (27% versus 14% of those unfamiliar) – as well as residents who perceive a progressively more severe stormwater pollution problem. Households impacted by a breathing-related medical condition are also more likely to indicate that Tucson has a “major” air quality problem.

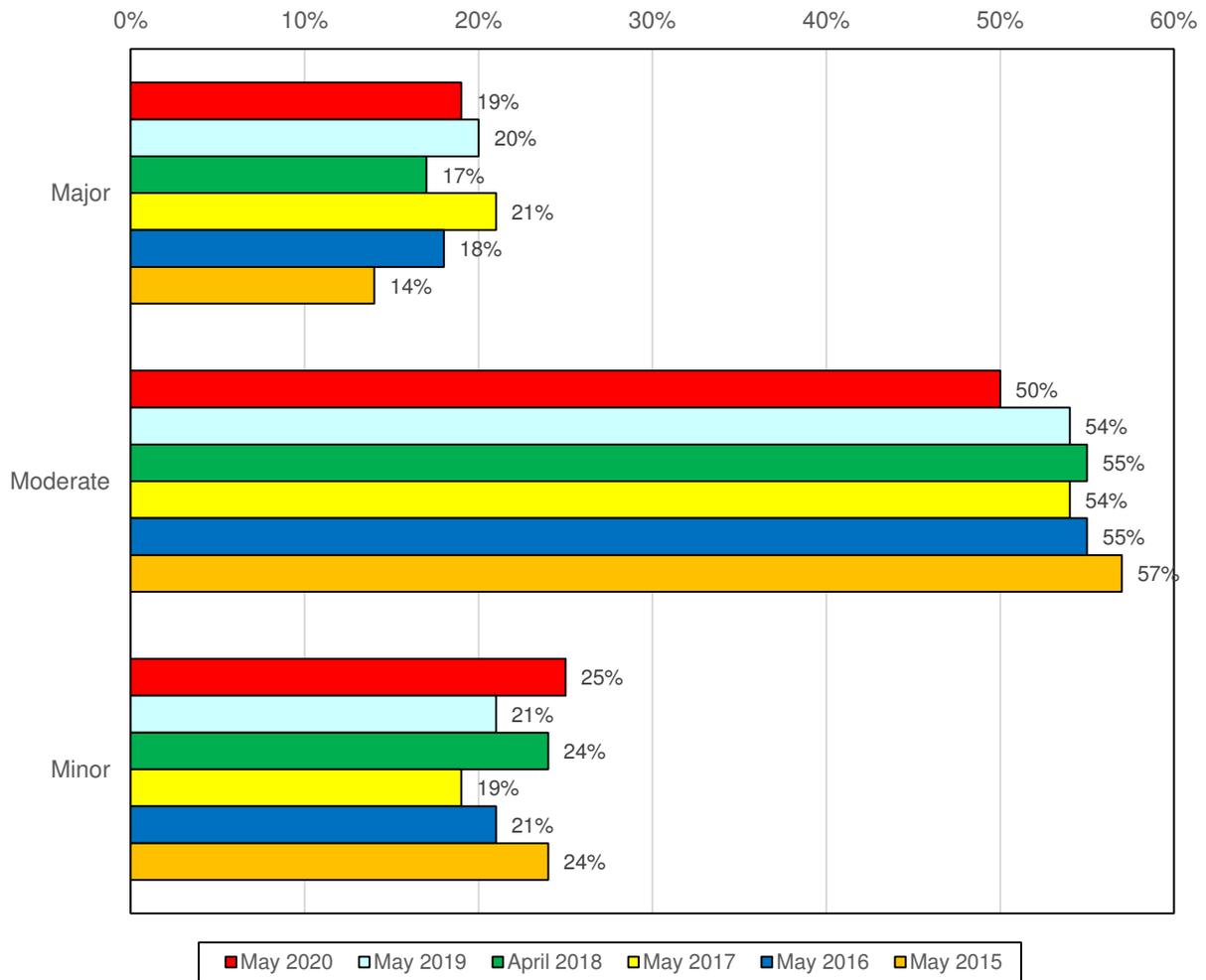
On the other hand, those who perceive a “minor” air quality problem are more apt to be Northwest region residents, older (56+), college graduates and high income types (\$80,000 or more).

Table 20 Perceived Seriousness of Air Quality Problem in Tucson Area

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Major problem	14%	18%	21%	17%	20%	19%
Moderate problem	57%	55%	54%	55%	54%	50%
Minor problem	24%	21%	19%	24%	21%	25%
Don't know	4%	6%	6%	4%	5%	5%
	N=500	N=500	N=504	N=500	N=500	N=500

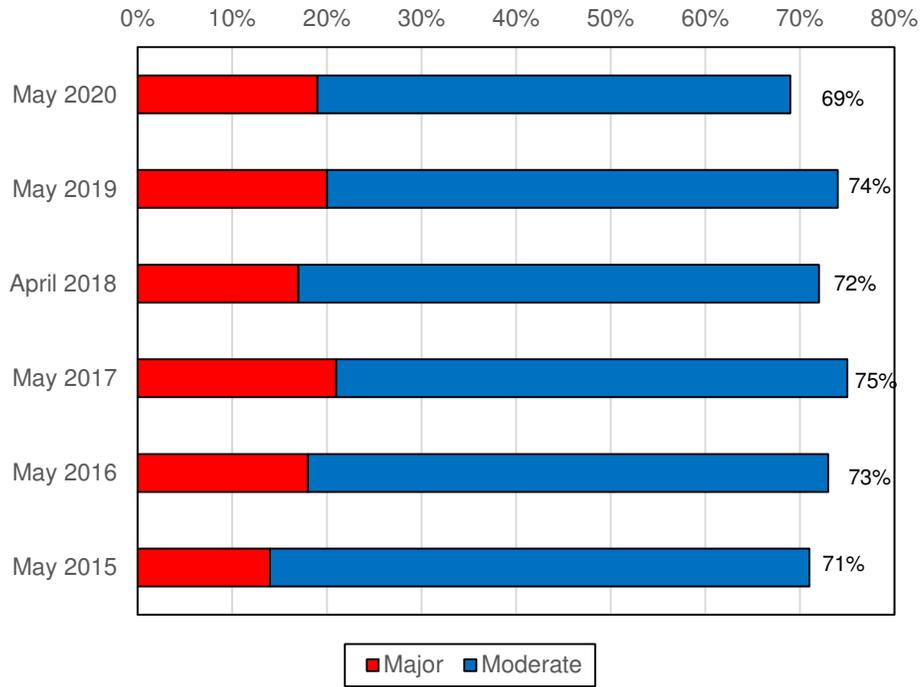
Question: How much of an air quality problem do you think exists in the Tucson area? Do you think this is a major problem, a moderate problem or a minor problem?

Display 20 Perceived Seriousness of Air Quality Problem in Tucson Area (Among the Total Sample)



Display 20

**Perceived Seriousness of
Air Quality Problem in Tucson Area**
Among the Total Sample – Sum of “Moderate” and “Major” Responses



Work Commuting Behavior During the COVID-19 Outbreak

For the 2020 survey, respondents were asked about their employment status and work/school commute behavior two separate times using the same series of questions: first, during the current COVID-19 outbreak and its various restrictions in place during May 2020; then, a second time, before the outbreak (“based on your life situation and behavior PRIOR to the COVID-19 outbreak”). To ensure proper understanding for survey respondents, each repeated question included a clear and specific time frame reference (to the present situation during the COVID-19 outbreak and prior to the outbreak).

Employment Status During the COVID-19 Outbreak – Allowing survey respondents to select more than one category of response, 30% say that they are currently employed full-time (30 hours or more each week) during the COVID-19 outbreak. Full-time employment is lower only in the East area, and is greater among men, 26 to 55 year-olds, non-Whites and those with a college degree or better. Another 12% are employed part-time (less than 30 hours each week), with little difference based on geography. Part-time workers skew female and are more apt to be 16 to 35 or 46 to 55. Another 12% report being currently unemployed, with another 7% who say they are now furloughed due to the COVID-19 outbreak.

More than one of four (27%) say they are retired, more often East area respondents and those 56+. The balance (17%) are students (9%) or homemakers (8%).

Table 21 **Employment Status During the COVID-19 Outbreak**
(Multiple Mentions Allowed)

	05/20 Total	Area				Air Quality Problem		
		South	Northwest	Central	East	Major	Moderate	Minor
Employed full-time (30 hours or more each week)	30%	31%	30%	34%	24%	38%	29%	31%
Employed part-time (Less than 30 hours each week)	12%	12%	14%	12%	10%	12%	12%	14%
A student	9%	12%	7%	8%	6%	9%	6%	11%
Retired	27%	27%	24%	25%	37%	22%	29%	30%
A homemaker	8%	9%	9%	8%	7%	5%	10%	8%
Currently furloughed due to outbreak of COVID-19	7%	4%	9%	5%	11%	8%	7%	6%
Currently unemployed	12%	11%	11%	14%	13%	7%	11%	12%
	N=500	N=160	N=152	N=117	N=71	N=96	N=252	N=125

Question: For these first few questions, please respond in the context of our **present** situation, with COVID-19 restrictions in place. Are you one or more of the following...

Location of Place of Employment During the COVID-19 Outbreak – Among those working full-time or part-time during the COVID-19 outbreak (42% of the total sample), 24% work exclusively for a home-based business. Among the rest, 73% work for another company exclusively, while 3% work both for another company and for a home-based business. South area residents are more apt to work exclusively for a home-based business, while few East area residents do (8%). Instead, employed East region residents are most apt to work exclusively for another company (83%).

Table 22 Location of Place of Employment During the COVID-19 Outbreak
(Among Those Employed)

	05/20 Total	Area				Air Quality Problem		
		South	Northwest	Central	East	Major	Moderate	Minor
Home-based business	24%	31%	22%	24%	8%	33%	22%	18%
Another company	73%	66%	76%	72%	83%	65%	74%	79%
Both	3%	3%	2%	4%	8%	2%	4%	4%
	N=213	N=68	N=67	N=54	N=24	N=49	N=101	N=56

Question: Do you **currently** (amidst COVID-19 restrictions) operate a home-based business or are you an employee of another company?

Incidence of Telecommuting During the COVID-19 Outbreak – Among those working outside the home during the COVID-19 outbreak (32% of the total sample), one-half say they have the option of telecommuting or teleworking (“working from home as an alternative to going in to your office or place of business during regular business hours”). COVID-19 telecommuters tend to be Northwest or East residents (54% each), as well as men, 26 to 45 or 56 to 65 year-olds, Whites and those with a college degree or better.

Table 23 Incidence of Telecommuting During the COVID-19 Outbreak
(Among Those Who Work Outside the Home)

	05/20 Total	Area				Air Quality Problem		
		South	Northwest	Central	East	Major	Moderate	Minor
Yes	49%	45%	54%	46%	54%	58%	49%	46%
No/Employer does not offer telecommuting/Don't know/Not sure	51%	55%	46%	54%	46%	42%	51%	54%
	N=162	N=47	N=52	N=41	N=22	N=33	N=79	N=46

Question: Some employers offer the option of telecommuting or teleworking – in other words, working from your home as an alternative to going in to your office or business location during regular business hours. The option of telecommuting could be a normal part of your routine or as a result of the COVID-19 outbreak. Right now, amidst COVID-19 restrictions, do you personally ever telecommute during regular business hours? This excludes working extra hours at home in your spare time – such as evenings or weekends.

Frequency of Telecommuting During the COVID-19 Outbreak – Among telecommuters during the COVID-19 outbreak, 48% do so 5+ days per week, while most of the rest (42%) telecommute 2 to 4 days a week. Among the rest, 5% telecommute about once a week and 4% do so 2 to 3 times a month, with the remaining 1% teleworking once a month.

Table 24 Frequency of Telecommuting During the COVID-19 Outbreak
(Among Those Who Telecommute)

	05/20 Total
5 days a week or more	48%
2 to 4 days a week	42%
About once a week	5%
2 to 3 times a month	4%
Once a month	1%
	N=80

Question: Amidst COVID-19 restrictions, how often do you typically telecommute or telework (or work at home instead of driving to the office) – excluding working extra hours at home in your spare time?

Current Work Schedule During the COVID-19 Outbreak – Six of ten full-time employees report working a “standard” schedule (8 hour days five days a week) during the COVID-19 outbreak. Another 11% work 10 hour days, 4 days a week, while 4% work 12 hour days, either 3 or 4 days a week. Just 2% say they work 80 hours over 9 days with the 10th day off. Meanwhile two of ten work some “other” workweek option or say their schedule varies (21%). South or East residents are more apt to utilize some type of compressed workweek during the COVID-19 outbreak.

Table 25 **Current Work Schedule During the COVID-19 Outbreak**
(Among Those Employed Full-Time)

	05/20 Total	Area				Air Quality Problem		
		South	Northwest	Central	East	Major	Moderate	Minor
8 hour day, 5 days a week	61%	66%	61%	59%	56%	65%	61%	58%
10 hour day, 4 days a week	11%	14%	11%	3%	19%	19%	12%	0%
12 hour day, 3 or 4 days a week	4%	3%	8%	0%	6%	8%	2%	6%
80 hours over 9 days with the 10 th day off	2%	3%	6%	0%	0%	4%	0%	6%
Varies/Other	21%	14%	14%	38%	19%	4%	26%	29%
	N=119	N=35	N=36	N=32	N=16	N=26	N=59	N=31

Question: Amidst COVID-19 restrictions, which of the following most closely describes your current work schedule?

Daily Usage of Transportation Methods for Traveling To and From Work or School During the COVID-19 Outbreak – Survey respondents who work outside the home or go to school during the COVID-19 outbreak were read a list of different travel methods and asked to indicate the number of days they use each one to travel to and from work or school. A summary of the data from this travel method question series is included in Table 26-S, with detailed daily usage in Table 26-D.

During the COVID-19 outbreak, 61% utilize **single passenger commuting to work or school**. The average frequency of use is 3.8 days. East and Northwest area residents are somewhat more likely to drive alone at least one day per week (65%-67%). On the other hand, Central residents are least apt to drive alone (53%).

Alternative commute travel methods during the COVID-19 outbreak measured by this survey include:

- **Work at home instead of driving to work** (41% telecommute, with a frequency of usage of 3.9 days. Teleworking is somewhat higher in the Northwest [45%] and East [48%] zips.)
- **Walk to work or school** (19% say they walk to work or school, at 2.6 average days. Walking to work or school is more common among South area residents.)
- **Carpool/Vanpool** (18% indicate they carpool or vanpool at least one day per week, with an average frequency of 2.5 days. South area residents are more apt to carpool [27%.])
- **Attend classes at home instead of going to school** (16% attend classes at home amidst the COVID-19 restrictions, with an average of 4.4 days. South and Central residents are more apt to attend classes from home instead of going to school.)
- **Ride a bike to work or school** (10% ride a bike to work or school, with an average frequency of 2.4 days. Bike riding is lower only the in East zips.)
- **Take the bus to work or school** (Bus ridership is at 9%, with 2.8 average days using this method. South and Central area residents are more apt to take the bus.)
- **Take the streetcar to work or school** (4% report taking the streetcar to work or school, with an average frequency of 2.1 days.)
- **Ride a motorcycle to work or school** (Overall, 3% indicate riding a motorcycle to work or school, with an average of 2.7 days.)

Table 26-S Summary of Usage of Transportation Methods for Traveling To and From Work or School During the COVID-19 Outbreak (Among Those Working Outside the Home or Going to School)

Travel Method	2020 COVID Usage* (N=191)	2020 COVID Average Frequency
Drive alone	61%	3.8 days
Carpool/Vanpool	18%	2.5 days
Walk	19%	2.6 days
Work at home instead of driving to work	41%	3.9 days
Attend classes at home instead of going to school	16%	4.4 days
Take the bus	9%	2.8 days
Ride a bike	10%	2.4 days
Take the streetcar	4%	2.1 days
Ride a motorcycle	3%	2.7 days

* Percentage who use each mode at least one day/week.

Table 26-D

**Detailed Daily Usage of Transportation
Methods for Traveling To and From Work or School
During the COVID-19 Outbreak
(Among Those Working Outside the Home or Going to School)**

	05/20 COVID Total	Area				Awareness of "Clean Air" Program	
		South	North- west	Central	East	Yes	No
Take the bus							
Not at all	91%	86%	97%	89%	96%	92%	89%
1-4 days/week	7%	11%	3%	9%	4%	8%	8%
5 days/week	2%	3%	0%	2%	0%	0%	3%
6+ days/week	0%	0%	0%	0%	0%	0%	0%
Ride a motorcycle							
Not at all	97%	94%	97%	100%	100%	97%	98%
1-4 days/week	2%	6%	2%	0%	0%	2%	2%
5 days/week	1%	0%	2%	0%	0%	1%	0%
6+ days/week	0%	0%	0%	0%	0%	0%	0%
Ride a bike							
Not at all	90%	89%	88%	89%	96%	90%	90%
1-4 days/week	9%	10%	12%	9%	4%	10%	8%
5 days/week	1%	2%	0%	2%	0%	0%	2%
6+ days/week	0%	0%	0%	0%	0%	0%	0%
Walk							
Not at all	81%	71%	90%	85%	78%	79%	86%
1-4 days/week	17%	24%	10%	15%	17%	18%	13%
5 days/week	1%	0%	0%	0%	4%	1%	0%
6+ days/week	2%	5%	0%	0%	0%	1%	1%
Work at home instead of driving to work							
Not at all	59%	64%	55%	59%	52%	53%	63%
1-4 days/week	21%	18%	28%	15%	22%	29%	14%
5 days/week	15%	13%	10%	20%	26%	17%	14%
6+ days/week	5%	5%	7%	6%	0%	1%	9%
Attend classes at home instead of going to school							
Not at all	84%	82%	88%	80%	87%	92%	78%
1-4 days/week	7%	6%	5%	15%	0%	2%	10%
5 days/week	5%	8%	3%	4%	4%	2%	9%
6+ days/week	3%	3%	3%	0%	9%	3%	3%
Take the streetcar							
Not at all	96%	92%	97%	100%	96%	94%	97%
1-4 days/week	4%	8%	3%	0%	4%	6%	3%
5 days/week	0%	0%	0%	0%	0%	0%	0%
6+ days/week	0%	0%	0%	0%	0%	0%	0%
	N=191	N=62	N=60	N=46	N=23	N=87	N=91

-Table 26-D continued on next page-

Table 26-D (Cont'd)

	05/20 COVID Total	Area				Awareness of "Clean Air" Program	
		South	North- west	Central	East	Yes	No
Drive or ride with people age 16 or older in a carpool							
Not at all	82%	73%	88%	83%	87%	80%	84%
1 day/week	6%	10%	3%	4%	9%	7%	4%
2 days/week	5%	8%	5%	2%	0%	3%	7%
3 days/week	3%	3%	2%	4%	4%	5%	2%
4 days/week	1%	0%	2%	2%	0%	2%	0%
5 days/week	3%	5%	0%	4%	0%	2%	2%
6+ days/week	1%	2%	0%	0%	0%	0%	1%
Drive alone							
Not at all	39%	47%	33%	39%	35%	30%	45%
1 day/week	9%	16%	8%	2%	9%	12%	8%
2 days/week	8%	3%	12%	11%	9%	10%	8%
3 days/week	8%	3%	8%	13%	13%	6%	10%
4 days/week	6%	2%	10%	6%	9%	8%	4%
5 days/week	19%	23%	18%	20%	13%	25%	16%
6+ days/week	9%	6%	10%	9%	13%	9%	9%
	N=191	N=62	N=60	N=46	N=23	N=87	N=91

Question: Amidst the current COVID-19 restrictions, how many days during an average week do you typically use each of the following travel methods to get to and from work or school?

Estimated Number of Daily Commuter Miles Saved Through Alternate Modes During the COVID-19 Outbreak – Tables 26-T and 26-1 reflect the combination of results related to modes of commuter travel and distances traveled with employment estimates (Source: Arizona Office of Economic Opportunity for April 2020) to provide an estimate of the number of vehicle miles saved daily through the use of alternative methods of transportation during the COVID-19 outbreak. The specific computations and data sources are described in the footnotes included with Table 26-1. As shown in Table 26-1’s column “I” (on the far right), **we estimate that the reduction of single-occupant vehicles commuting through the use of alternative methods of travel saves 4,632,871 vehicle miles per day during the COVID-19 outbreak – or 55% of total miles driven/not driven.** This is primarily due to the high number of workers and students telecommuting or attending classes from home during the outbreak.

Table 26-T Summary of Estimated Number of Daily Commuter Miles Saved Through Alternate Modes During the COVID-19 Outbreak

Year	Total Employed (Non-Home-Based)/ Students	% Who Single-Passenger Commute 1+ Days/Week	Average Single Occupant Auto Commute Distance	# of Commute Miles Driven/ Not Driven	# of Vehicle Miles Saved Daily	% of Miles Saved Through Alternate Mode Use
2020 (During COVID-19)	392,618	61%	12.1	8,493,334	4,632,871	55%

Table 26-1

Estimated Number of Daily Commuter Miles Saved Through
Alternative Modes During the COVID-19 Outbreak
(Among Employed Persons and Students)

	(A) # of Non-Home-Based Employed Persons/ Students	(B) # One-Way Commute Trips Per Week	(C) Estimated # of One- Way Trips Each Week	(D) Average Days/Week Commute Using Any Mode	(E) # of One-Way Commute Trips/Day	(F) Average Commute Distance	(G) Estimated # Commute Miles Driven/Not Driven	(H) Vehicle Miles Traveled Daily	(I) Vehicle Miles Saved Daily
<u>Travel Mode</u>									
Single Occupant (auto)	(61%) 239,497	3.82x2=7.64	1,829,757	6.2	295,122	12.1	3,570,976	3,570,976	-0-
Motorcycle	(3%) 11,779	2.67x2=5.34	62,900	6.2	10,145	8.2	83,189	83,189	-0-
<u>Alternative Modes:</u>									
Carpool	(18%) 70,671	2.51x2=5.02	354,768	6.2	57,221	10.1	577,932	199,287	378,645
Bus	(9%) 35,336	2.76x2=5.52	195,055	6.2	31,460	7.8	245,388	7,011	238,377
Bike	(10%) 39,262	2.35x2=4.70	184,531	6.2	29,763	9.4	279,772	-0-	279,772
Walk	(19%) 74,597	2.61x2=5.22	389,396	6.2	62,806	4.2	263,785	-0-	263,785
Streetcar	(4%) 15,705	2.13x2=4.26	66,903	6.2	10,791	7.4	79,853	-0-	79,853
Telecommute	(41%) 160,973	3.90x2=7.80	1,255,589	6.2	202,514	11.9	2,409,917	-0-	2,409,917
School from home	(16%) 62,819	4.40x2=8.80	552,807	6.2	89,162	9.1	811,374	-0-	811,374
Compressed workweek	(11%) 43,188	1.05x2=2.10	90,695	6.2	14,628	11.7	171,148	-0-	171,148
					803,612		8,493,334		4,632,871

(A) # employed persons in Pima County (est. @ 357,500 as of April, 2020 by Arizona Office of Economic Opportunity) x % non-home-based employees (76%) (Table 21) + # students 16+ (est. 120,918 in 2018 Census Bureau American Community Survey) x % of work/school commuters reported using each mode (Table 26).

(B) Average # of days/week mode used (Table 26) x 2 ways = estimate of average # of 1-way trips made each week per work/school commuter.

(C) (A) x (B)

(D) # of work/school commuters in survey x % using each mode x average # days/week mode used = Total days/week all modes ÷ # of work/school commuters in survey = average # days/week work/school commuters use any mode.

(E) (C) ÷ (D)

(F) From Table 26c. Reported commute miles ranged from 1 to 500 miles.

(G) (E) x (F)

(H) Vehicle miles/day:

Driving alone: Estimated # miles commuted

Bus: # miles/day ÷ average # rides/bus (peak hours) - (estimated at 35)

Carpool: # miles/day ÷ average # persons (2.9) in each carpool (Table 26b)

Bike/Walk/Telecommute/Streetcar/Compressed: -0- (no polluting vehicles used)

(I) (G) - (H)

Most Used Mode of Transportation for Work/School Commute During the COVID-19 Outbreak – Overall, 42% say that **single-passenger vehicle commuting** is their **most-used** method of transportation during the COVID-19 outbreak. Primary use of single-passenger commuting is higher among Northwest area residents, men and 36 to 65 year-olds.

Another 27% say their current primary commute mode is **telecommuting**, while one of ten indicate **attending classes from home instead of going to school** is their most-used commute method during the COVID-19 outbreak. Only South area residents are less apt to primarily telework. COVID-19 outbreak telecommuting is more common among men, 26 to 45 year-olds and those with household incomes over \$60,000. As might be expected, those who primarily take classes from home tend to be younger (16 to 25).

At the same time, 6% each are either primarily **carpooling** or **walking** during the COVID-19 outbreak. Those who carpool for their primary transportation are more apt to be South or Central zip residents and those with household incomes under \$40,000. South residents are also more apt to walk, as are the youngest respondents (16 to 25) and non-Whites.

Another 4% **take the bus** as their primary mode of transportation to work or school during the COVID-19 outbreak, while nearly as many report primarily **riding a bike** (3%). Few are primarily **taking the streetcar** or **riding a motorcycle** (1% each).

Table 26a Most Used Mode of Transportation for Work/School Commute During the COVID-19 Outbreak
(Among Those Working Outside the Home or Going to School)

	05/20 Total	Area				Air Quality Problem		
		South	Northwest	Central	East	Major	Moderate	Minor
Drive alone	42%	35%	51%	41%	39%	40%	42%	47%
Work at home instead of driving to work	27%	22%	29%	28%	35%	28%	33%	22%
Attend classes at home instead of going to school	10%	10%	10%	9%	13%	10%	8%	10%
Drive or ride in a carpool	6%	10%	0%	11%	4%	5%	7%	4%
Walk	6%	10%	3%	4%	4%	10%	1%	10%
Take the bus	4%	7%	2%	4%	4%	2%	8%	0%
Ride a bike	3%	5%	3%	2%	0%	2%	2%	6%
Ride a motorcycle	1%	0%	2%	0%	0%	0%	0%	2%
Take the streetcar	1%	2%	0%	0%	0%	2%	0%	0%
	N=188	N=60	N=59	N=46	N=23	N=40	N=89	N=51

Question: Amidst the current COVID-19 restrictions, how many days during an average week do you typically use each of the following travel methods to get to and from work or school? (Record most used mode based on number of days.)

Size of Work or School Commute Carpool During the COVID-19 Outbreak – Among carpoolers during the COVID-19 outbreak, the majority (57%) are travelling to work or school in a 2-person carpool. Another three of ten travel in three-person (17%) or four-person (14%) carpools, while 12% travel in a carpool of five or more people. The average COVID-19 outbreak carpool size is 2.9 people.

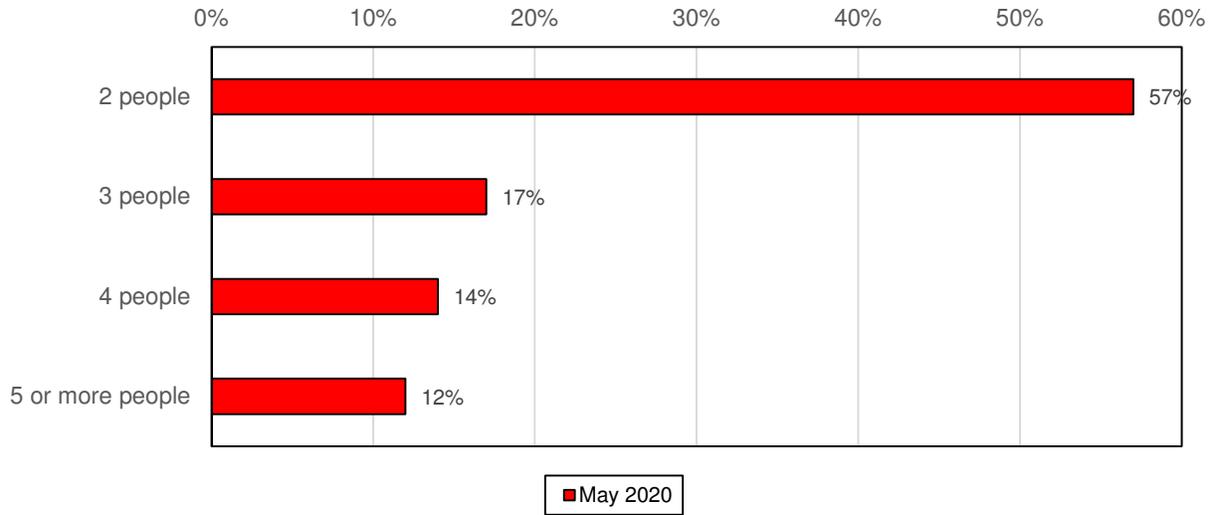
Table 26b

Size of Work or School Commute Carpool
During the COVID-19 Outbreak
 (Among Those Who Carpool)

	05/20 Total
2 people	57%
3 people	17%
4 people	14%
5 or more people	12%
	N=35

Question: Amidst COVID-19 restrictions, including yourself, how many people are typically in your carpool?

**Display 26b Size of Work or School Commute Carpool
During the COVID-19 Outbreak
(Among Those Who Carpool)**



Miles Traveled to Work or School During the COVID-19 Outbreak – During the COVID-19 outbreak, one of four (26%) say that they have a commute of 5 miles or less. Another 37% indicate they commute between 6 and 10 miles, and 10% say their commute is between 11 and 14 miles. The balance (27%) travel 15 miles or more. Geographically, Northwest area residents are most apt to report a commute of 15 or more miles (48%), while three of four East (74%) or Central (76%) zip code residents commute 10 miles or less.

Table 26c Miles Traveled to Work or School
During the COVID-19 Outbreak
 (Among Those Working Outside the Home or Going to School)

	05/20 Total	Area				Air Quality Problem		
		South	Northwest	Central	East	Major	Moderate	Minor
5 miles or less	26%	33%	7%	39%	30%	32%	25%	22%
6 to 10 miles	37%	33%	37%	37%	44%	38%	43%	29%
11 to 14 miles	10%	13%	8%	9%	9%	12%	12%	4%
15 or more miles	27%	20%	48%	15%	17%	18%	20%	45%
	N=188	N=60	N=59	N=46	N=23	N=40	N=89	N=51

Question: Amidst COVID-19 restrictions, approximately how many miles do you **currently** travel one-way from your home to the place where you work or go to school?

Work Commuting Behavior Prior to the COVID-19 Outbreak

Employment Status Prior to the COVID-19 Outbreak – When asked about their employment status *prior* to the COVID-19 outbreak, and again allowing survey respondents to select more than one category of response, 42% say that they were employed full-time (30 hours or more each week). This compares to 38% full-time employment in 2019. Pre-pandemic full-time employment was lower only in the East region, and higher among men, 26 to 55 year-olds, non-Whites and those with a college degree or better. Consistent with prior years, 12% report working part-time prior to the COVID-19 outbreak (less than 30 hours each week). Part-time employment was lower only in the South region, but greater among women, 16 to 35 or 46 to 65 year-olds and residents for less than five years. Unchanged since 2018, 9% say they were unemployed prior to the COVID-19 outbreak, with little difference based on area of residence.

Similar to last year, 26% in the current survey were retired prior to the COVID-19 outbreak, more often East region respondents and those 56+. In line with the past two years, about one of ten each were students (10%) or homemakers (8%).

Table 27 **Employment Status Prior to the COVID-19 Outbreak**
(Multiple Mentions Allowed)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Employed full-time (30 hours or more each week)	31%	29%	35%	38%	38%	42%
Employed part- time (Less than 30 hours each week)	13%	12%	12%	11%	12%	12%
A student	11%	8%	8%	8%	9%	10%
Retired	26%	36%	27%	28%	27%	26%
A homemaker	12%	12%	12%	7%	9%	8%
Currently unemployed	11%	8%	8%	9%	9%	9%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Employed full-time (30 hours or more each week)	41%	43%	45%	34%	51%	40%	41%
Employed part- time (Less than 30 hours each week)	8%	14%	14%	16%	12%	12%	14%
A student	13%	9%	9%	4%	10%	7%	12%
Retired	26%	24%	24%	32%	22%	28%	27%
A homemaker	9%	8%	8%	10%	6%	10%	6%
Currently unemployed	10%	9%	8%	10%	7%	10%	6%
	N=160	N=152	N=117	N=71	N=96	N=252	N=125

Question: Now, I am going to ask you the same questions a second time. However, this time answer each based on your life situation and behavior **PRIOR** to the COVID-19 outbreak. Prior to the COVID-19 outbreak, were you one or more of the following...

Location of Place of Employment Prior to the COVID-19 Outbreak – Among those who worked full-time or part-time prior to the COVID-19 outbreak (54% of the total sample), 19% worked exclusively for a home-based business. This is down slightly from last year (21%). Of those who worked outside the home prior to the COVID-19 outbreak (81%), 76% worked for another company exclusively, while 5% worked for both another company and a home-based business. South zip code residents were more apt to work exclusively for a home-based business (29% versus 9%-19% in other regions).

Table 28 Location of Place of Employment Prior to the COVID-19 Outbreak
(Among Those Employed)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Home-based business	14%	15%	21%	13%	21%	19%
Another company	78%	78%	71%	80%	73%	76%
Both	7%	7%	8%	7%	6%	5%
	N=218	N=209	N=238	N=246	N=250	N=269

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Home-based business	29%	19%	14%	9%	33%	16%	13%
Another company	66%	77%	80%	86%	63%	77%	83%
Both	5%	5%	6%	6%	3%	7%	4%
	N=79	N=86	N=69	N=35	N=60	N=129	N=69

Question: Prior to the COVID-19 outbreak, did you operate a home-based business or were you an employee of another company?

Incidence of Telecommuting Prior to the COVID-19 Outbreak – Up slightly from last year (17%), two of ten who worked outside the home prior to the COVID-19 outbreak indicate that they telecommuted. Teleworkers prior to the outbreak were more apt to be East area residents (28%), 16 to 45 year-olds, those with a college degree or better and from households with incomes over \$40,000.

Table 29 Incidence of Telecommuting Prior to the COVID-19 Outbreak
(Among Those Who Work Outside the Home)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Yes	18%	26%	26%	19%	17%	20%
No/Employer does not offer telecommuting/ Don't know/Not sure	82%	74%	74%	81%	83%	80%
	N=187	N=178	N=187	N=213	N=197	N=217

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Yes	20%	20%	15%	28%	28%	13%	27%
No/Employer does not offer telecommuting/ Don't know/Not sure	80%	80%	85%	72%	72%	87%	73%
	N=56	N=70	N=59	N=32	N=40	N=108	N=60

Question: Some employers offer the option of telecommuting or teleworking – in other words, working from your home as an alternative to going in to your office or business location during regular business hours. Prior to the current COVID-19 restrictions, did you personally ever telecommute during regular business hours? This excludes working extra hours at home in your spare time – such as evenings or weekends.

Frequency of Telecommuting Prior to the COVID-19 Outbreak – Among pre-pandemic telecommuters, seven of ten say they did so more than once a week. This represents progressive improvement from 58% last year and 44% in 2018. Another 26% teleworked (prior to the outbreak) about once a week (up from 12% last year).

Table 30 Frequency of Telecommuting Prior to the COVID-19 Outbreak
(Among Those Who Telecommute)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
More than once a week*	39%	70%	51%	44%	58%	70%
About once a week	39%	15%	24%	15%	12%	26%
2 to 3 times a month	12%	11%	10%	17%	24%	2%
Once a month	3%	2%	14%	15%	6%	2%
* 5 days a week or more	--	--	--	--	--	30%
2 to 4 days a week	--	--	--	--	--	40%
	N=33	N=47	N=49	N=41	N=33	N=43

Question: Prior to the current COVID-19 restrictions, how often did you typically telecommute (or work at home instead of driving to the office) – excluding working extra hours at home in your spare time?

Work Schedule Prior to the COVID-19 Outbreak – Prior to the COVID-19 outbreak, 69% of full-time employees report working a “standard” schedule (8 hour days five days a week). This is down somewhat from last year (75%), but consistent with 2018 (69%). Another 9% worked 10 hour days, 4 days a week (up from 6% last year), and 3% worked a 12 hour day, either 3 or 4 days a week (down slightly from 5% last year). Generally consistent with last year, 2% report working 80 hours over 9 days with the 10th day off. Up from 2019, 17% indicate some “other” workweek options or say their workweek varied prior to the COVID-19 outbreak. East or Northwest area residents are more apt to have utilized some type of compressed workweek prior to the COVID-19 outbreak.

Table 31 Work Schedule Prior to the COVID-19 Outbreak
(Among Those Employed Full-Time)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
8 hour day, 5 days a week	56%	65%	61%	69%	75%	69%
10 hour day, 4 days a week	14%	12%	12%	10%	6%	9%
12 hour day, 3 or 4 days a week	6%	3%	4%	5%	5%	3%
80 hours over 9 days with the 10 th day off	4%	3%	5%	4%	2%	2%
Varies/Other	20%	17%	17%	12%	12%	17%
	N=133	N=130	N=134	N=169	N=156	N=169

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
8 hour day, 5 days a week	71%	68%	68%	71%	76%	66%	73%
10 hour day, 4 days a week	12%	11%	0%	14%	9%	8%	7%
12 hour day, 3 or 4 days a week	2%	4%	2%	5%	6%	2%	2%
80 hours over 9 days with the 10 th day off	2%	4%	2%	0%	0%	2%	4%
Varies/Other	12%	13%	28%	10%	9%	21%	14%
	N=48	N=53	N=47	N=21	N=33	N=85	N=44

Question: Which of the following most closely described your work schedule prior to the COVID-19 restrictions?

Daily Usage of Transportation Methods for Traveling To and From Work or School Prior to the COVID-19 Outbreak – As in previous projects, survey respondents who work outside the home or go to school were read a list of different travel methods and asked to indicate the number of days they used each one (in this case, prior to the COVID-19 outbreak) to travel to and from work or school. A summary of this question series (including tracking data) is included in Table 32-S, with detailed daily usage in Table 32-D.

Down from last year (80%), 71% utilized **single passenger commuting to work or school** prior to the COVID-19 outbreak. The average frequency of use was 4.5 days, down just slightly from 4.6 last year. South area residents were somewhat *less* likely to drive alone at least one day per week prior to the COVID-19 outbreak (61% versus 69%-82% in other areas). At the same time, Northwest (49%) and Central (47%) residents were most apt to drive alone 5+ days per week.

Alternative commute travel methods prior to the COVID-19 outbreak tracked by this survey include:

- **Walk to work or school** (Up from last year [20%], 23% say they walked to work or school prior to the COVID-19 outbreak, with an increase in average days [from 2.4 to 2.8 days]. Walking to work or school was more common among South area residents.)
- **Carpool/Vanpool** (Up from last year [19%], 21% indicate they carpooled or vanpooled at least one day per week prior to the COVID-19 outbreak. Average frequency has also upticked [from 3.1 to 3.2 days]. Only Northwest area residents were *less* likely to carpool at least one day a week [18% versus 21%-23% in other areas].)
- **Work at home instead of driving to work** (Down slightly from last year [20%], 18% say they telecommuted prior to the COVID-19 outbreak – although frequency of usage has increased [from 2.8 to 3.0 days]. East zip residents were more apt to telework.)
- **Take the bus to work or school** (Bus ridership has rebounded to 2018 levels [15%, up from 12% last year], with an increase in average days as well [from 2.6 to 3.2]. South and Central area residents are more apt to take the bus.)
- **Ride a bike to work or school** (Down slightly from last year [13%], 11% indicate riding a bike to work or school prior to the COVID-19 outbreak. The frequency has ticked slightly upward [from 2.5 to 2.6 days]. Only East area residents are *less* apt to ride a bike to work or school.)
- **Attend classes at home instead of going to school** (About one of ten [9%] report attending classes at home instead of going to school prior to the COVID-19 outbreak, with a 3.5 day average frequency.)

- **Take the streetcar to work or school** (Up from last year [4%], 7% say they took the streetcar prior to the COVID-19 outbreak. However, the frequency of usage has decreased [from 3.2 days to 1.7 days].)
- **Ride a motorcycle to work or school** (Up from last year [4%], 6% indicate riding a motorcycle to work or school, with a slight decline in frequency [from 2.9 to 2.8 days].)

Table 32-S Summary of Usage of Transportation Methods for Traveling To and From Work or School Prior to the COVID-19 Outbreak (Among Those Working Outside the Home or Going to School)

Travel Method	2015 Usage* (N=226)	2015 Average Frequency	2016 Usage* (N=203)	2016 Average Frequency	2017 Usage* (N=219)	2017 Average Frequency
Drive alone	70%	4.3 days	70%	4.4 days	76%	4.3 days
Carpool/Vanpool	24%	3.6 days	24%	3.5 days	28%	3.1 days
Walk	21%	3.5 days	24%	2.8 days	24%	3.0 days
Work at home instead of driving to work	14%	2.5 days	24%	3.4 days	19%	3.4 days
Take the bus	14%	3.8 days	13%	4.4 days	18%	3.6 days
Ride a bike	12%	2.8 days	10%	2.4 days	10%	2.4 days
Take the streetcar	5%	2.2 days	4%	1.8 days	4%	2.0 days
Ride a motorcycle	4%	2.3 days	2%	1.4 days	6%	2.8 days

Travel Method	2018 Usage* (N=240)	2018 Average Frequency	2019 Usage* (N=230)	2019 Average Frequency	2020 Pre-COVID Usage* (N=245)	2020 Pre-COVID Average Frequency
Drive alone	81%	4.2 days	80%	4.6 days	71%	4.5 days
Carpool/Vanpool	23%	2.6 days	19%	3.1 days	21%	3.2 days
Walk	21%	2.8 days	20%	2.4 days	23%	2.8 days
Work at home instead of driving to work	19%	3.0 days	20%	2.8 days	18%	3.0 days
Attend class at home instead of going to school	--	--	--	--	9%	3.5 days
Take the bus	14%	2.6 days	12%	2.6 days	15%	3.2 days
Ride a bike	17%	2.9 days	13%	2.5 days	11%	2.6 days
Take the streetcar	11%	2.4 days	4%	3.2 days	7%	1.7 days
Ride a motorcycle	5%	1.5 days	4%	2.9 days	6%	2.8 days

* Percentage who use each mode at least one day/week.

Table 32-D

**Detailed Daily Usage and Tracking of Transportation
Methods for Traveling To and From Work or School
Prior to the COVID-19 Outbreak
(Among Those Working Outside the Home or Going to School)**

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Area				Awareness of "Clean Air" Program		
							South	North- west	Central	East	Yes	No	
Take the bus													
Not at all	86%	87%	82%	86%	88%	85%	77%	92%	81%	94%	84%	86%	
1-4 days/week	7%	5%	12%	11%	9%	10%	16%	6%	11%	3%	14%	6%	
5 days/week	4%	5%	3%	1%	3%	4%	7%	1%	6%	3%	2%	7%	
6+ days/week	3%	2%	3%	2%	0%	0%	0%	0%	2%	0%	0%	1%	
Ride a motorcycle													
Not at all	96%	98%	94%	95%	96%	94%	90%	92%	100%	91%	91%	96%	
1-4 days/week	3%	2%	6%	5%	3%	5%	10%	4%	0%	9%	8%	3%	
5 days/week	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	0%	
6+ days/week	0%	0%	1%	0%	0%	1%	0%	3%	0%	0%	0%	1%	
Ride a bike													
Not at all	88%	90%	90%	83%	87%	89%	86%	90%	88%	97%	91%	86%	
1-4 days/week	8%	8%	8%	12%	11%	9%	13%	10%	8%	3%	8%	12%	
5 days/week	1%	2%	1%	3%	1%	1%	1%	0%	3%	0%	0%	2%	
6+ days/week	2%	0%	0%	1%	0%	0%	0%	0%	2%	0%	1%	0%	
Walk													
Not at all	79%	76%	76%	79%	80%	77%	71%	80%	77%	82%	79%	79%	
1-4 days/week	14%	17%	18%	16%	18%	18%	24%	14%	19%	15%	18%	17%	
5 days/week	4%	4%	2%	2%	1%	4%	3%	5%	5%	3%	3%	3%	
6+ days/week	4%	3%	5%	2%	1%	1%	1%	1%	0%	0%	0%	1%	
Work at home instead of driving to work													
Not at all	86%	76%	81%	81%	80%	82%	84%	81%	86%	76%	77%	87%	
1-4 days/week	11%	14%	12%	14%	15%	12%	13%	13%	8%	18%	17%	9%	
5 days/week	1%	7%	4%	2%	3%	4%	1%	6%	2%	6%	5%	2%	
6+ days/week	2%	3%	3%	3%	2%	2%	1%	0%	5%	0%	1%	2%	
Attend classes at home instead of going to school													
Not at all	-	-	-	-	-	91%	89%	94%	91%	94%	94%	90%	
1-4 days/week	-	-	-	-	-	5%	7%	4%	6%	3%	3%	7%	
5 days/week	-	-	-	-	-	3%	3%	3%	3%	3%	2%	2%	
6+ days/week	-	-	-	-	-	0%	1%	0%	0%	0%	1%	0%	
Take the streetcar													
Not at all	95%	96%	96%	89%	96%	93%	91%	95%	95%	88%	91%	94%	
1-4 days/week	5%	4%	4%	10%	3%	7%	9%	5%	5%	12%	9%	6%	
5 days/week	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	
6+ days/week	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	
	N=226	N=203	N=219	N=241	N=230	N=245	N=70	N=78	N=64	N=33	N=105	N=122	

-Table 32-D continued on next page-

Table 32-D (Cont'd)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total	Area				Awareness of "Clean Air" Program	
							South	North- west	Central	East	Yes	No
Drive or ride with people age 16 or older in a carpool												
Not at all	76%	76%	72%	77%	81%	79%	77%	82%	78%	79%	80%	78%
1 day/week	5%	5%	10%	8%	4%	5%	4%	3%	6%	12%	9%	3%
2 days/week	2%	4%	4%	5%	5%	4%	4%	6%	5%	0%	5%	2%
3 days/week	4%	4%	4%	5%	1%	3%	3%	3%	2%	6%	1%	5%
4 days/week	2%	2%	2%	1%	4%	1%	1%	0%	2%	0%	1%	1%
5 days/week	7%	4%	6%	4%	4%	5%	6%	5%	6%	3%	4%	7%
6+ days/week	3%	4%	4%	1%	1%	2%	4%	1%	2%	0%	1%	3%
Drive alone												
Not at all	30%	30%	24%	19%	20%	29%	39%	24%	31%	18%	21%	34%
1 day/week	6%	8%	7%	8%	5%	4%	7%	4%	3%	0%	5%	2%
2 days/week	5%	7%	8%	9%	4%	3%	4%	1%	3%	6%	4%	3%
3 days/week	8%	4%	10%	5%	10%	11%	6%	10%	11%	24%	12%	10%
4 days/week	10%	8%	10%	12%	8%	8%	6%	12%	5%	12%	10%	6%
5 days/week	30%	27%	26%	34%	38%	31%	30%	31%	33%	30%	36%	30%
6+ days/week	11%	16%	15%	13%	15%	13%	9%	18%	14%	9%	12%	14%
	N=226	N=203	N=219	N=241	N=230	N=245	N=70	N=78	N=64	N=33	N=105	N=122

Question: Now I'd like to ask you some questions about your **previous** commuting behavior. Prior to the COVID-19 restrictions, how many days during an average week did you typically use each of the following travel methods to get to and from work or school?

2020 Estimated Number of Daily Commuter Miles Saved Through Alternate Modes Prior to the COVID-19 Outbreak – Tables 32-T and 32-1 reflect the combination of results related to modes of commuter travel and distances traveled with employment estimates (Source: Arizona Office of Economic Opportunity for February 2020) to provide an estimate of the number of vehicle miles saved daily through the use of alternative methods of transportation prior to the COVID-19 outbreak. The specific computations and data sources are described in the footnotes included with Table 32-1.

As shown in Table 32-1’s column “I” (on the far right), **we estimate that the reduction of single-occupant vehicles commuting through the use of alternative methods of travel saves 3,776,177 vehicle miles per day – or 38% of total miles driven/not driven prior to the COVID-19 outbreak.** As summarized in the tracking display below, the percentage of miles saved has increased from last year (30%), but tracks with results from 2018 (38%). This is due to a decrease in single-passenger travel (from 80% to 71%) and an increase in the participation rate and/or frequency of use of many of the alternate modes – as well as the addition of the alternate use category for attending classes from home.

Table 32-T Tracking Summary of Estimated Number of Daily Commuter Miles Saved Through Alternate Modes
(Prior to the COVID-19 Outbreak)

Year	Total Employed (Non-Home-Based)/ Students	% Who Single-Passenger Commute 1+ Days/Week	Average Single Occupant Auto Commute Distance	# of Commute Miles Driven/ Not Driven	# of Vehicle Miles Saved Daily	% of Miles Saved Through Alternate Mode Use
2020 (Prior to COVID-19)	441,354	71%	12.8	10,051,691	3,776,177	38%
2019	430,438	80%	12.5	9,691,879	2,877,389	30%
2018	455,682	81%	12.4	10,809,324	4,141,734	38%
2017	420,190	76%	14.5	10,276,836	3,569,409	35%
2016	441,320	70%	13.4	11,187,316	4,242,773	38%
2015	434,601	70%	15.6	11,382,426	3,840,196	34%

Table 32-1 **2020 Estimated Number of Daily Commuter Miles Saved Through Alternative Modes**
Prior to the COVID-19 Outbreak
(Among Employed Persons and Students)

	(A) # of Non-Home-Based Employed Persons/Students	(B) # One-Way Commute Trips Per Week	(C) Estimated # of One-Way Trips Each Week	(D) Average Days/Week Commute Using Any Mode	(E) # of One-Way Commute Trips/Day	(F) Average Commute Distance	(G) Estimated # Commute Miles Driven/Not Driven	(H) Vehicle Miles Traveled Daily	(I) Vehicle Miles Saved Daily
Travel Mode									
Single Occupant (auto)	(71%) 313,361	4.49x2=8.98	2,813,982	6.4	439,685	12.8	5,627,968	5,627,968	-0-
Motorcycle	(6%) 26,481	2.75x2=5.50	145,646	6.4	22,757	9.1	207,089	207,089	-0-
Alternative Modes:									
Carpool	(21%) 92,684	3.20x2=6.40	593,178	6.4	92,684	11.4	1,056,598	422,639	633,959
Bus	(15%) 66,203	3.14x2=6.28	415,755	6.4	64,962	9.6	623,635	17,818	605,817
Bike	(11%) 48,549	2.63x2=5.26	255,368	6.4	39,901	10.1	403,000	-0-	403,000
Walk	(23%) 101,511	2.75x2=5.50	558,311	6.4	87,236	4.6	401,286	-0-	401,286
Streetcar	(7%) 30,895	1.71x2=3.42	105,661	6.4	16,510	7.6	125,476	-0-	125,476
Telecommute	(18%) 79,444	3.00x2=6.00	476,664	6.4	74,479	14.4	1,072,498	-0-	1,072,498
School from home	(9%) 39,722	3.52x2=7.04	279,643	6.4	43,694	8.2	358,291	-0-	358,291
Compressed workweek	(10%) 44,135	1.02x2=2.04	90,035	6.4	14,068	12.5	175,850	-0-	175,850
					895,976		10,051,691		3,776,177

(A) # employed persons in Pima County (est. @ 395,600 as of February, 2020 by Arizona Office of Economic Opportunity) x % non-home-based employees (81%) (Table 28) + # students 16+ (est. 120,918 in 2018 Census Bureau American Community Survey) x % of work/school commuters reported using each mode (Table 32).

(B) Average # of days/week mode used (Table 32) x 2 ways = estimate of average # of 1-way trips made each week per work/school commuter.

(C) (A) x (B)

(D) # of work/school commuters in survey x % using each mode x average # days/week mode used = Total days/week all modes ÷ # of work/school commuters in survey = average # days/week work/school commuters use any mode.

(E) (C) ÷ (D)

(F) From Table 32c. Reported commute miles ranged from 1 to 500 miles.

(G) (E) x (F)

(H) Vehicle miles/day:
 Driving alone: Estimated # miles commuted Carpool: # miles/day ÷ average # persons (2.5) in each carpool (Table 32b)
 Bus: # miles/day ÷ average # rides/bus (peak hours) - (estimated at 35) Bike/Walk/Telecommute/Streetcar/Compressed: -0- (no polluting vehicles used)

(I) (G) - (H)

Most Used Mode of Transportation for Work/School Commute Prior to the COVID-19 Outbreak – Down from two-thirds in 2018 and 2019, 59% of pre-pandemic commuters indicate that **single-passenger vehicle commuting** was their *most-used* method of transportation. Primary use of single-passenger commuting was lowest among South region residents.

Returning to pre-2017 levels, 11% were primarily **carpooling** prior to the COVID-19 outbreak. Carpool primaries were more apt to be South zip residents, women and 16 to 35 year-olds.

Up from last year (5%), 8% report that **taking the bus** was their most used method of transportation prior to the COVID-19 outbreak. Those who primarily take the bus were more apt to be South or Central area residents, younger (16 to 35) and non-White.

Another 7% say they primarily **telecommuted** prior to the COVID-19 outbreak (unchanged from 2019 levels). Teleworking primaries tended to be 36 to 45 and have household incomes over \$80,000.

In line with last year, 5% were **walking** for their most used mode of commute transportation prior to the COVID-19 outbreak, regardless of area of residence. Down slightly from last year (5%), 4% were **riding a bike** as their primary mode of transportation to work or school, more often South or Central area residents and men. As many were primarily **riding a motorcycle** (4%, up from 1%), typically South area residents. Only one respondent indicated they primarily **took the streetcar** (down from 2%).

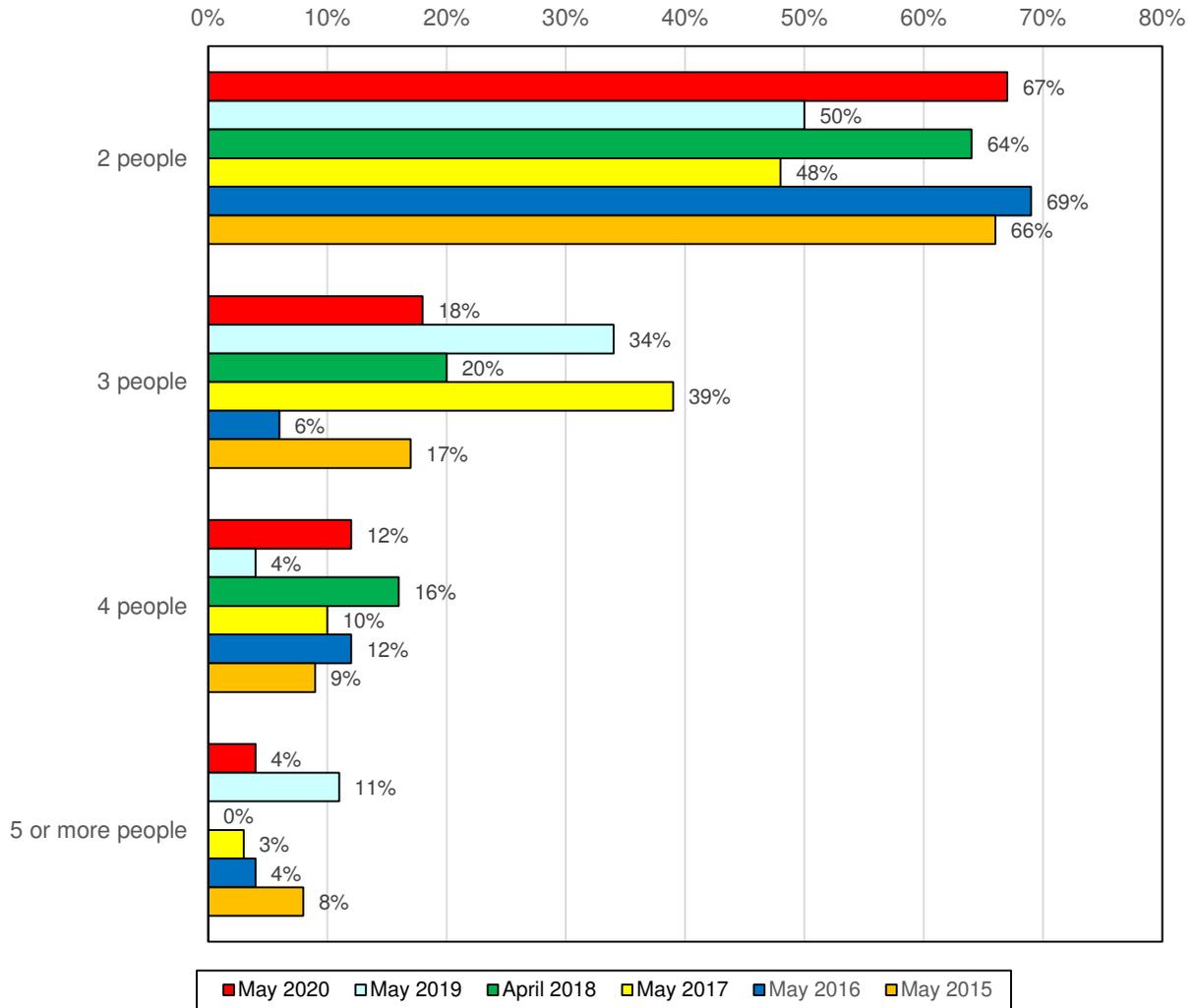
**Table 32a Most Used Mode of Transportation for Work/School Commute
Prior to the COVID-19 Outbreak
(Among Those Working Outside the Home or Going to School)**

	5/15 Total	5/16 Total	5/17 Total	4/18 Total	5/19 Total	5/20 Total
Drive alone	58%	61%	62%	66%	68%	59%
Drive or ride in a carpool	12%	11%	10%	7%	7%	11%
Take the bus	8%	9%	9%	4%	5%	8%
Work at home instead of driving to work	5%	11%	8%	7%	7%	7%
Walk	9%	4%	6%	6%	5%	5%
Ride a motorcycle	2%	–	1%	–	1%	4%
Ride a bike	3%	3%	2%	7%	5%	4%
Attend classes at home instead of going to school	–	–	–	–	–	2%
Take the streetcar	2%	–	1%	2%	2%	0%
	N=226	N=203	N=219	N=241	N=229	N=245

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
Drive alone	47%	68%	56%	67%	52%	66%	53%
Drive or ride in a carpool	13%	10%	11%	9%	7%	12%	12%
Take the bus	11%	4%	12%	3%	11%	8%	6%
Work at home instead of driving to work	7%	6%	8%	9%	9%	4%	10%
Walk	6%	5%	5%	6%	11%	3%	3%
Ride a motorcycle	7%	4%	0%	3%	4%	2%	7%
Ride a bike	6%	1%	6%	0%	4%	2%	6%
Attend classes at home instead of going to school	3%	0%	2%	3%	0%	1%	3%
Take the streetcar	0%	1%	0%	0%	0%	1%	0%
	N=70	N=78	N=64	N=33	N=44	N=119	N=68

Question: Now I'd like to ask you some questions about your **previous** commuting behavior. Prior to the COVID-19 restrictions, how many days during an average week did you typically use each of the following travel methods to get to and from work or school? (Record most used mode based on number of days.)

Display 32b Size of Work or School Commute Carpool Prior to the COVID-19 Outbreak (Among Those Who Carpool)



Miles Traveled to Work or School Prior to the COVID-19 Outbreak – Prior to the COVID-19 outbreak, one of four (26%) indicate they had a commute of 5 miles or less (down from 30% in 2019). Another one-third say their pre-pandemic commute was between 6 and 10 miles (compared to 23% last year), while 11% commuted 11 to 14 miles (down from 17%). Similar to last year, 30% traveled 15 miles or more. Geographically, Northwest area residents were most apt to have a pre-pandemic commute of 15+ miles (44%). Meanwhile, the vast majority of East (70%), Central (66%) and South (64%) zip code residents commuted 10 miles or less.

Table 32c Miles Traveled to Work or School Prior to the COVID-19 Outbreak
(Among Those Working Outside the Home or Going to School)

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
5 miles or less	31%	35%	36%	29%	30%	26%
6 to 10 miles	26%	29%	29%	30%	23%	33%
11 to 14 miles	7%	8%	8%	8%	17%	11%
15 or more miles	33%	27%	26%	30%	29%	30%
Don't know/Not sure	3%	2%	1%	2%	1%	-
	N=222	N=203	N=216	N=241	N=229	N=245

	Area				Air Quality Problem		
	South	Northwest	Central	East	Major	Moderate	Minor
5 miles or less	33%	13%	36%	24%	30%	27%	19%
6 to 10 miles	31%	32%	30%	46%	36%	35%	32%
11 to 14 miles	10%	12%	9%	12%	9%	13%	7%
15 or more miles	26%	44%	25%	18%	25%	25%	41%
	N=70	N=78	N=64	N=33	N=44	N=119	N=68

Question: Prior to the COVID-19 restrictions, approximately how many miles did you travel one-way from your home to the place where you work or go to school?

Stormwater Perceptions and Practices

Perception of Where Stormwater That Flows Into Tucson Storm Drains Ends Up –

In line with past years, all survey participants were informed that “some streets in the Tucson area are equipped with storm drains.” Immediately afterwards, respondents were asked to specify where (to the best of their knowledge) water that flows into these storm drains ends up. Allowing for more than one answer, ranked responses include:

- **River or wash** (51%, up slightly from last year [49%], and just short of the record high mention of 53% recorded in 2018. East region residents, 46 to 65 year-olds and Whites are more likely to think that water that flows into storm drains ends up in a river or wash. Consistent with last year, there is no difference based on the perception of Tucson’s stormwater pollution problem.)
- **Groundwater** (17%, a slight increase over the past two surveys [15% each]. These tend to be non-Hispanic minorities, the most formally educated and those who perceive a “major” stormwater pollution problem. There are fewer differences based on geography [slightly lower only in the Northwest zips].)
- **Water treatment plants** (14%, up incrementally from 2018 [10%] and 2019 [12%] levels. Northwest residents, non-Hispanics and the most formally educated respondents are more likely to believe that stormwater ends up in water treatment plants.)
- **Sewage plants** (13%, up slightly 11% last year. This perception is elevated in the South zip codes, as well as among men, 16 to 35 year-olds, non-Hispanic minorities and those who think that Tucson has a progressively more serious stormwater pollution problem.)
- **Canals** (9%, slight increase from 7% in the last two surveys. Similar to past years, these tend to be South region residents – as well as 16 to 25 year-olds, non-Hispanic minorities and those who perceive a “serious” stormwater pollution problem.)

Consistent with the last two surveys, one of four indicate that they **do not know** where stormwater that flows into a storm drain ends up. These are more apt to be Central or East zip code residents, women, 36 to 45 or 66+ year-olds and those with less formal education. In addition, those who perceive a “moderate” or non-existent stormwater pollution problem are also more likely to be unsure of where stormwater flows (28%-29%).

Table 33

Perception of Where Stormwater That Flows Into Tucson Storm Drains Ends Up

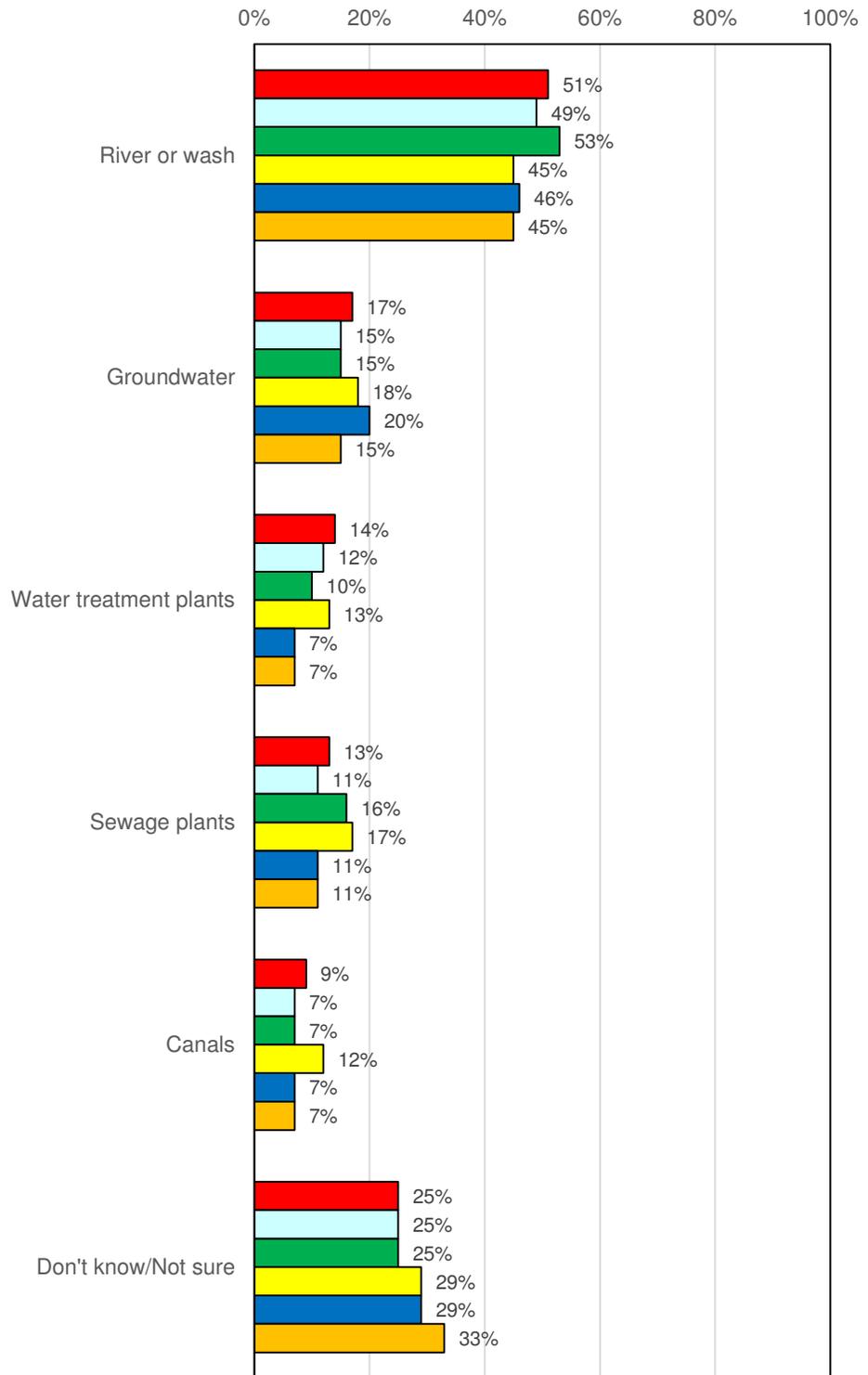
	05/15 Total	05/16 Total	05/17 Total	04/18 Total	04/19 Total	04/20 Total	Area			
							South	North- west	Central	East
River or wash	45%	46%	45%	53%	49%	51%	47%	53%	50%	56%
Groundwater	15%	20%	18%	15%	15%	17%	19%	15%	17%	18%
Water treatment plants	7%	7%	13%	10%	12%	14%	11%	19%	14%	11%
Sewage plants	11%	11%	17%	16%	11%	13%	17%	11%	14%	8%
Canals	7%	7%	12%	7%	7%	9%	16%	9%	5%	4%
Don't know/Not sure	33%	29%	29%	25%	25%	25%	24%	23%	28%	28%
	N=500	N=500	N=504	N=500	N=500	N=500	N=160	N=152	N=117	N=71

	Stormwater Pollution Problem		
	Serious Problem	Moderate Problem	Not a Problem
River or wash	51%	51%	51%
Groundwater	22%	15%	15%
Water treatment plants	16%	13%	17%
Sewage plants	19%	12%	6%
Canals	16%	6%	6%
Don't know/Not sure	20%	28%	29%
	N=167	N=268	N=65

Question: Some streets in the Tucson area are equipped with storm drains. To the best of your knowledge, where does the stormwater that flows into these drains end up?

Display 33

Perception of Where Stormwater That Flows Into Tucson Storm Drains Ends Up



■ May 2020 ■ May 2019 ■ April 2018 ■ May 2017 ■ May 2016 ■ May 2015

Green Infrastructures Implemented/Installed at Home or Business – As in prior surveys, respondents were provided a listing of seven different types of Green Infrastructures and asked if each one has been implemented or installed at their home or business.

Consistent with past years, the most often implemented Green Infrastructure is **landscaping with native plants** (53%). This is down from last year's record mention (65%), but in line with years prior (52%-55%). In the current survey, use of native plants is lower only in the South zips (41% versus 57%-61% elsewhere) and is elevated among those 46 or older, Whites, high income households (\$80,000 or more) and residents who perceive a "moderate" stormwater pollution problem.

One of four or so (especially those who perceive a "serious" stormwater pollution problem) indicate that these three Green Infrastructures have been implemented or installed at home or their place of business:

- **Landscaped depressions that collect stormwater** (27%, highly consistent with recent surveys [24%-29%]. Implemented more often by East residents, men and higher income households.)
- **Connecting runoff from a roof or paved surface to a basin or to water plants** (26%, down just slightly from 29% last year. These tend to be South zip code residents and the most formally educated.)
- **Porous pavements or bricks** (24%, returning to 2018 levels after a record mention in 2019 [34%]. South region residents, men, 16 to 25 or 36 to 45 year-olds and higher income households.)

Other Green Infrastructures implemented at home or business include:

- **A trench that is filled with gravel to collect stormwater** (19%, generally consistent with the last three surveys [18%-21%]. Once again, these tend to be East region residents – as well as women, those 46 or older and college graduates. There are few differences based on the perceived severity of the stormwater pollution problem.)
- **Natural areas protected from clearing and grading** (16%, down from 20%-24% in the last two studies. South or East zip residents, 36 to 45 year-olds, non-Whites, college graduates or better and those who perceive a "serious" stormwater pollution problem are more likely to have implemented this Green Infrastructure.)
- **Water harvesting using rain barrels or cisterns** (16%, down incrementally from 2019 [19%] and 2018 [22%] findings. More likely to have utilized rain barrels or cisterns are South area residents, 16 to 25 or 36 to 45 year-olds, non-Whites and those who think Tucson has a "serious" stormwater pollution problem.)

Table 34

Green Infrastructures
Implemented/Installed at Home or Business

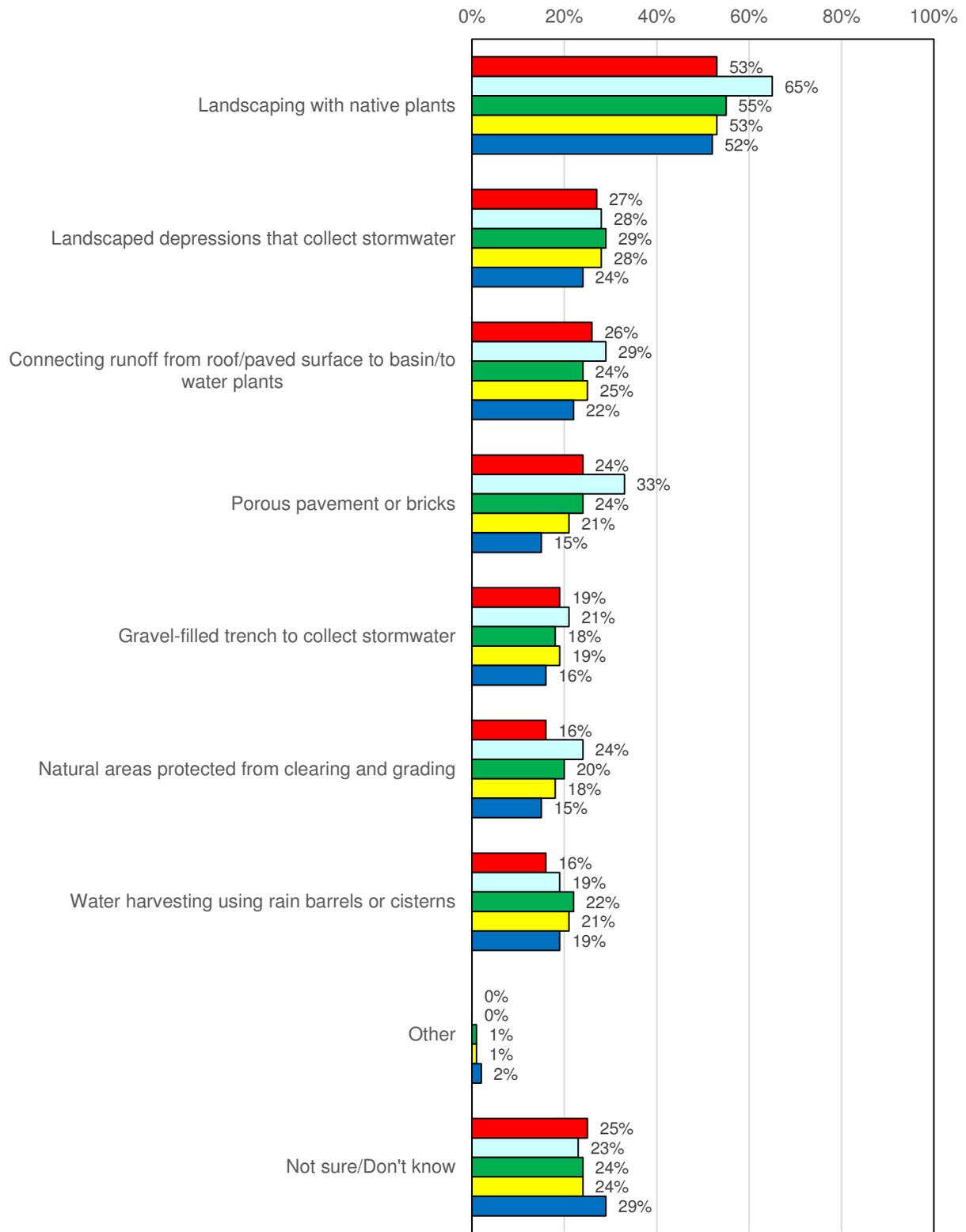
	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
Landscaping with native plants	52%	52%	53%	55%	65%	53%
Landscaped depressions that collect stormwater	26%	24%	28%	29%	28%	27%
Connecting runoff from a roof or paved surface to a basin or to water plants	20%	22%	25%	24%	29%	26%
Porous pavements or bricks	20%	15%	21%	24%	33%	24%
A trench that is filled with gravel to collect stormwater	14%	16%	19%	18%	21%	19%
Natural areas protected from clearing and grading	16%	15%	18%	20%	24%	16%
Water harvesting using rain barrels or cisterns	20%	19%	21%	22%	19%	16%
Other	2%	2%	1%	1%	--	--
Not sure/Don't know	30%	29%	24%	24%	23%	25%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Stormwater Pollution Problem		
	South	Northwest	Central	East	Serious Problem	Moderate Problem	Not a Problem
Landscaping with native plants	41%	57%	58%	61%	48%	56%	49%
Landscaped depressions that collect stormwater	26%	28%	23%	32%	30%	25%	25%
Connecting runoff from a roof or paved surface to a basin or to water plants	34%	23%	22%	24%	40%	19%	20%
Porous pavements or bricks	31%	21%	22%	20%	34%	21%	11%
A trench that is filled with gravel to collect stormwater	16%	21%	15%	28%	19%	19%	18%
Natural areas protected from clearing and grading	21%	14%	10%	18%	22%	13%	14%
Water harvesting using rain barrels or cisterns	25%	13%	10%	11%	23%	12%	15%
Not sure/Don't know	19%	28%	26%	28%	17%	26%	38%
	N=160	N=152	N=117	N=71	N=167	N=268	N=65

Question: I am now going to read you a list of different types of Green Infrastructures. After each, simply tell me if this practice has been implemented or installed at your home or business.

Display 34

Green Infrastructures Implemented/Installed at Home or Business



■ May 2020 ■ May 2019 ■ April 2018 ■ May 2017 ■ May 2016

Awareness of the “Clean Water Starts With Me” Campaign – In line with past studies, all respondents were asked to agree or disagree with a statement related to PDEQ’s Clean Water Campaign. The campaign “Clean Water Starts With Me” was developed through the Stormwater Management Working Group. Pima Association of Governments hosts the meeting for the eight jurisdictions within Pima County that manage stormwater.

Similar to last year, four of ten indicate awareness of the “Clean Water Starts With Me” campaign. These tend to be South zip residents, non-Hispanic minorities and those who perceive a “serious” stormwater pollution problem. There are fewer differences in awareness based on sex or age (somewhat higher among 16 to 25 year-olds). As we found last year, there is significantly greater campaign awareness among residents familiar with the “Clean Air” Program (59% versus 26% unfamiliar).

Table 34a Awareness of the “Clean Water Starts With Me” Campaign

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
You are aware of the “Clean Water Starts With Me” campaign.	47%	57%	55%	50%	41%	40%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Stormwater Pollution Problem		
	South	Northwest	Central	East	Serious Problem	Moderate Problem	Not a Problem
You are aware of the “Clean Water Starts With Me” campaign.	48%	38%	33%	38%	46%	37%	35%
	N=160	N=152	N=117	N=71	N=167	N=268	N=65

Question: As I read the following statements, simply tell me if you agree or disagree.

Perceived Seriousness of Stormwater Pollution Problem in the Tucson Area –

Overall, 87% of survey respondents perceive that there is at least a “moderate” problem in the Tucson area “with polluting materials entering storm drains.” While this is generally consistent with 2019 results (90%), there has been a decline in the share who perceive that such pollution is a “serious problem” (33%, down from 44%). Still, as in past surveys, just 13% think stormwater pollution is “not a problem.” This yields a 5.7 average score on the “1-to-9” rating scale (down from 6.0 in 2019).

The perception of a “serious” stormwater pollution problem is (on average) higher among South or East zip residents, 36 to 45 year-olds and higher income households.

As in past years, survey respondents who perceive a progressively more serious air quality problem are also more likely to indicate a seriously more progressive stormwater pollution problem.

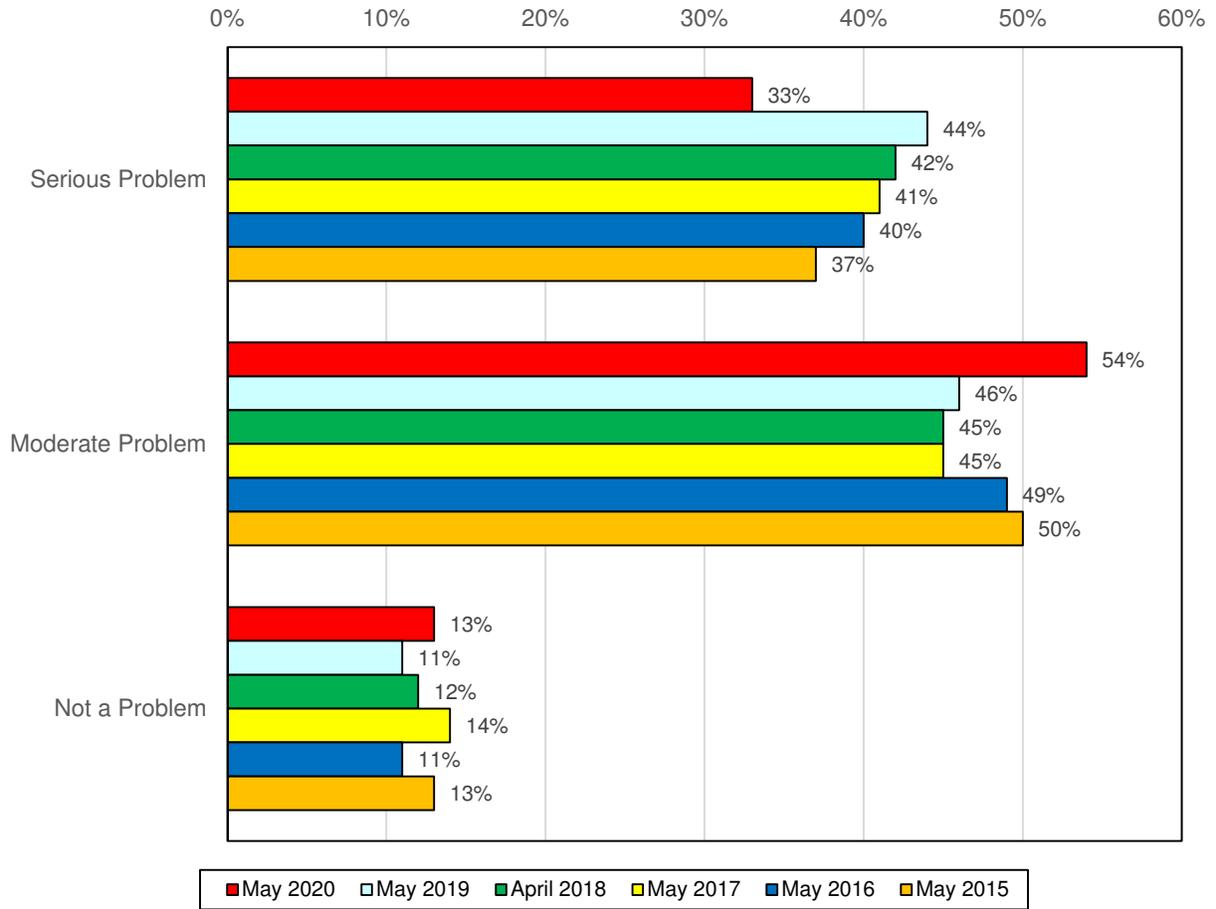
Table 35 Perceived Seriousness of Stormwater Pollution Problem in Tucson Area

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	04/19 Total	04/20 Total	Area			
							South	North- west	Central	East
Serious problem (7-9)	37%	40%	41%	42%	44%	33%	42%	28%	27%	35%
Moderate problem (4-6)	50%	49%	45%	45%	46%	54%	49%	54%	56%	59%
Not a problem (1-3)	13%	11%	14%	12%	11%	13%	9%	18%	17%	6%
Average score on 1-9 scale	5.7	5.8	5.8	5.9	6.0	5.7	6.1	5.4	5.5	6.1
	N=500	N=500	N=504	N=500	N=500	N=500	N=160	N=152	N=117	N=71

Question: On a scale of “1-to-9” where “9” means “a serious problem” and “1” means “not a problem,” how much of a problem do you think there is in the Tucson area with polluting materials entering storm drains? You can give me any number between “1” and “9.”

Display 35

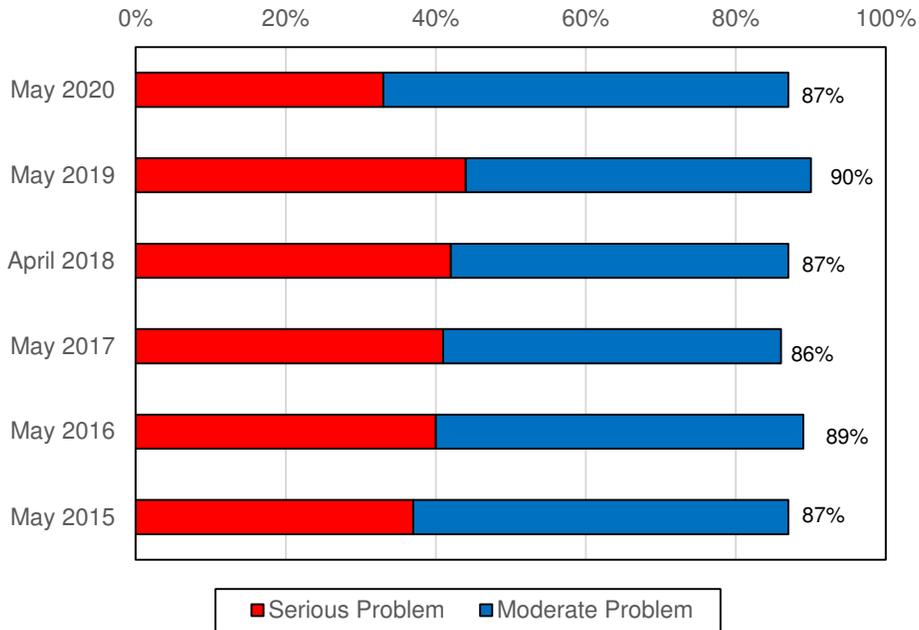
**Perceived Seriousness of Stormwater Pollution Problem in Tucson Area
(Among the Total Sample)**



Display 35

**Perceived Seriousness of Stormwater
Pollution Problem in Tucson Area**

Among the Total Sample – Sum of “Moderate” and “Serious” Responses



Methods Used to Dispose of Various Types of Household Hazardous Wastes – As we have found in 2018 and earlier (when this question was last asked), the five most often commonly used methods of disposing of household wastes such as “household chemicals, automotive fluids and lawn & garden chemicals” include:

- **Hazardous waste collection site** (49% usage, down from 2017-2018 levels [52%-53%], but higher than was found in 2016 [42%]. Usage in the 2020 survey is higher in the Northwest or East zip codes, as well as among 56 to 65 year-olds, Whites and residents with some college or more.)
- **Auto parts store** (39% usage, lower than was found in 2018 [45%] and 2017 [42%]. East zip residents, men, 46 to 65 year-olds and non-Whites are more likely to dispose of hazardous waste at an auto parts store. There are few differences based on perception of the stormwater pollution problem.)
- **Put in the garbage** (34% usage, nearly unchanged from 2018 [35%]. Once again, these tend to be South area residents. Men, 16 to 25 year-olds, non-Whites and residents who perceive a progressively more severe stormwater pollution problem are more likely to utilize this method of disposal.)
- **Service station** (24% usage, down just slightly from 2017-2018 levels [26% each]. As we found in 2018, service station usage is lower only in the Northwest region [20% versus 24%-27% elsewhere]. Men, 16 to 45 year-olds and those who perceive a “serious” stormwater pollution problem are more likely to utilize a service station to dispose of household hazardous waste.)
- **Landfill** (17% usage, down from 22% in 2018. Landfill users are more apt to be South region residents, 16 to 25 year-olds and non-Whites – with fewer differences based on perceived stormwater pollution problem.)

Overall, 16% report that they dispose of household hazardous wastes by **pouring them down the drain**. This is up slightly from 2018 (14%), but lower than 2017 levels (18%). South residents, 16 to 45 year-olds, non-Whites and those who perceive a “serious” stormwater pollution problem are more apt to utilize this disposal method.

Up from one of ten in both 2017 and 2018, 14% in the current study say that they **do not use** items such as household chemicals, automotive fluids or lawn & garden chemicals (or finishing them all up when they do). Overall, 5% remain not sure how they dispose of these types of household wastes.

Table 36

Methods Used to Dispose of
Various Types of Household Hazardous Waste

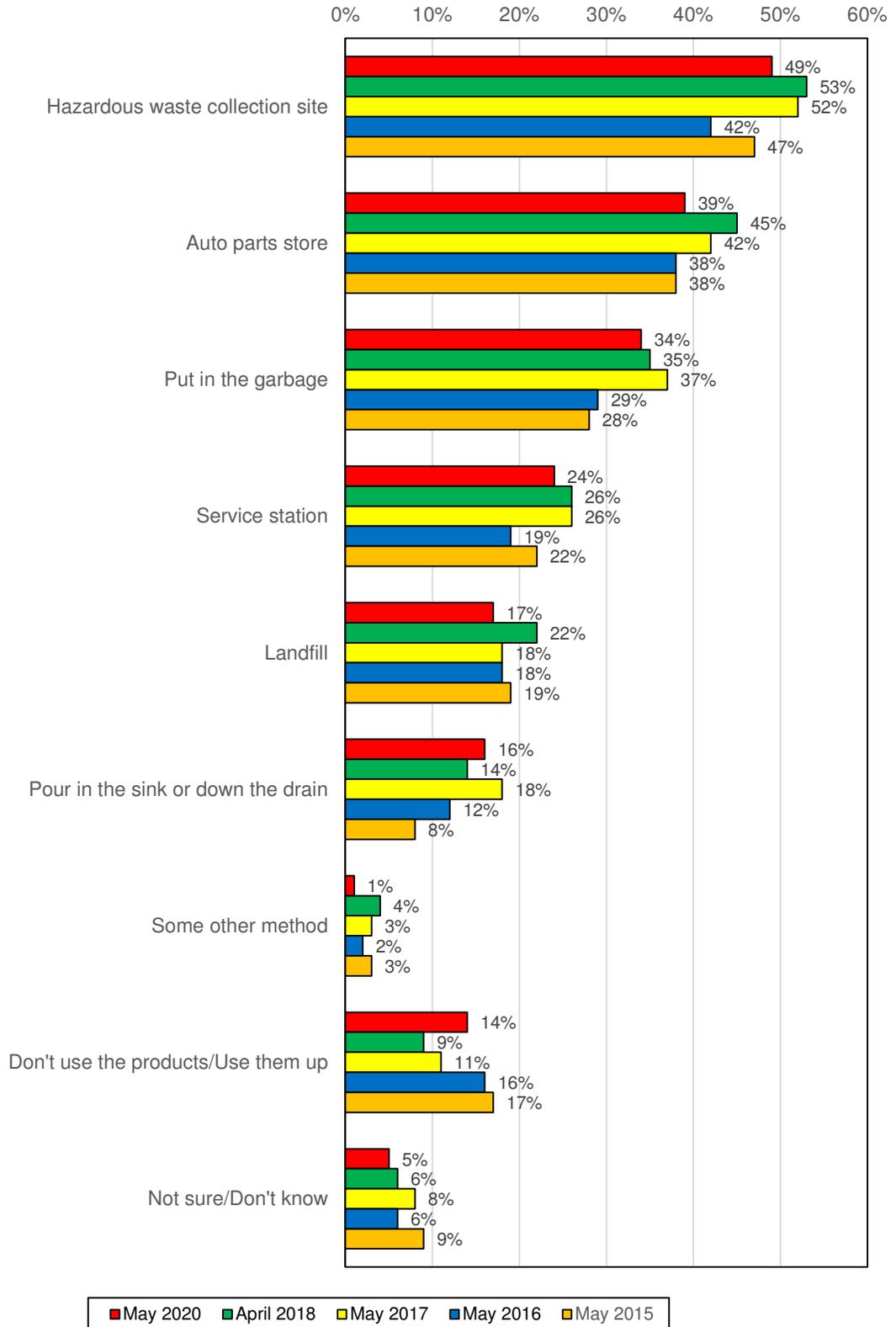
	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/20 Total
Hazardous waste collection site	47%	42%	52%	53%	49%
Auto parts store	38%	38%	42%	45%	39%
Put in the garbage	28%	29%	37%	35%	34%
Service station	22%	19%	26%	26%	24%
Landfill	19%	18%	18%	22%	17%
Pour in the sink or down the drain	8%	12%	18%	14%	16%
Some other method	3%	2%	3%	4%	1%
Don't use these products/Use them up	17%	16%	11%	9%	14%
Not sure/Don't know	9%	6%	8%	6%	5%
	N=500	N=500	N=504	N=500	N=500

	Area				Stormwater Pollution Problem		
	South	Northwest	Central	East	Serious Problem	Moderate Problem	Not a Problem
Hazardous waste collection site	49%	53%	40%	58%	50%	50%	43%
Auto parts store	38%	37%	41%	45%	39%	40%	38%
Put in the garbage	42%	30%	32%	25%	41%	31%	26%
Service station	25%	20%	24%	27%	31%	21%	15%
Landfill	24%	19%	7%	16%	17%	18%	14%
Pour in the sink or down the drain	24%	14%	14%	4%	23%	14%	5%
Some other method	1%	0%	2%	3%	1%	1%	2%
Don't use these products/Use them up	11%	18%	14%	11%	12%	13%	25%
Not sure/Don't know	4%	4%	9%	6%	4%	6%	8%
	N=160	N=152	N=117	N=71	N=167	N=268	N=65

Question: I am now going to read you a list of different methods that people use to dispose of items such as household chemicals, automotive fluids and lawn & garden chemicals. After each, simply tell me if you or someone in your household use this method to dispose of these items.

Display 36

Methods Used to Dispose of Various Types of Household Hazardous Waste



Rating of Various Contributors to Stormwater Pollution Problem in the Tucson Area

– Respondents were again asked to rate the perceived severity of eight contributors to the problem of stormwater pollution in Tucson. The same “1-to-9” scale was again used, where “1” means “not a problem” and “9” means a “serious problem.”

Similar to past years, there is a direct relationship between the severity of the stormwater pollution problem in Tucson and the degree to which each of these factors is perceived to contribute to the problem. This is also the case among non-Hispanic minorities.

The factors evaluated include:

- **Chemicals and materials from industrial facilities** (38% “serious” contributor to stormwater pollution, down just slightly from 39% in 2019 – resulting in a 5.5 average score on the “1-to-9” rating scale [identical to last year]. These tend to be 56 to 65 year-olds, non-Hispanics and high income households. Geographically, only Central area residents are less likely to indicate a lower degree of perceived causation.)
- **Automotive fluids such as oil, gasoline and brake fluid** (36% “serious” contributor to stormwater pollution, down from 42% in 2019 – 5.4 average score [down from 5.7]. These are more likely to be South or East area residents, 36 to 45 year-olds and higher income households.)
- **Pesticides, fertilizers and debris from lawns and gardens** (35% “serious” contributor to stormwater pollution, down from 42% in 2019 – 5.4 average score [down from 5.6]. These tend to be South or East zip residents, 26 to 45 year-olds and those most formally educated.)
- **Chemicals and materials from construction sites** (35% “serious” contributor to stormwater pollution, down from 40% in 2019 – 5.4 average score [down from 5.6]. East zone residents and college graduates or better are more apt to perceive that chemicals and materials from construction sites are a “serious” contributor to the stormwater pollution problem in Tucson.)
- **Household trash and bulky items like mattresses, sofas and tires** (36% “serious” contributor to stormwater pollution, down from 39% in 2019 – 5.3 average score [down from 5.6]. Perceived causation is slightly lower only in the Central zip codes, and higher among 36 to 45 year-olds and the most formally educated.)
- **Household products such as cleaning fluids, detergents, paints, degreasers and bleaches** (34% “serious” contributor to stormwater pollution, down from 40% in 2019 – 5.2 average score [down from 5.5]. South or East region residents and higher income households are more apt to say household products contribute to stormwater pollution.)

- **Animal waste from household pets** (22% “serious” contributor to stormwater pollution, up slightly from 20% in 2019 – 4.4 average score [up from 4.3]. Consistent with last year, six of ten perceive that animal waste contributes to stormwater pollution to some extent. This compares to 39% who say it is a non-factor. Geographically, South zip code residents are more likely to say that animal waste is a contributor to stormwater pollution.)
- **Copper from brake pads made with copper** (18% “serious” contributor to stormwater pollution – 4.2 average score [identical to 2019]. As we have found in prior surveys, significantly more think that is “not a problem” [39%] than a “serious” contributor [18%] to the stormwater pollution problem in Tucson.)

Table 37

Rating of Various Contributors to
Stormwater Pollution Problem in Tucson Area

(5/20 N=500) (5/19 N=500) (4/18 N=500)	(5/17 N=504) (5/16 N=500) (5/15 N=500)	Serious Problem (7-9)	Moderate Problem (4-6)	Not a Problem (1-3)	Average Score on 1-9 Scale
Chemicals and materials from industrial facilities					
5/20		38%	42%	21%	5.5
5/19		39%	37%	25%	5.5
4/18		46%	35%	19%	5.9
5/17		45%	38%	17%	5.9
5/16		43%	40%	17%	5.9
5/15		39%	42%	19%	5.7
Automotive fluids such as oil, gasoline and brake fluid					
5/20		36%	45%	19%	5.4
5/19		42%	37%	22%	5.7
4/18		45%	38%	17%	5.9
5/17		44%	41%	15%	5.9
5/16		42%	42%	16%	5.9
5/15		41%	40%	19%	5.7
Pesticides, fertilizers and debris from lawns and gardens					
5/20		35%	44%	20%	5.4
5/19		42%	35%	23%	5.6
4/18		37%	44%	19%	5.6
5/17		43%	39%	18%	5.8
5/16		36%	45%	19%	5.6
5/15		36%	42%	23%	5.4
Chemicals and materials from construction sites					
5/20		35%	45%	21%	5.4
5/19		40%	40%	20%	5.6
4/18		43%	39%	18%	5.8
5/17		46%	40%	14%	6.0
5/16		40%	46%	14%	5.9
5/15		40%	43%	17%	5.7
Household trash and bulky items like mattresses, sofas and tires					
5/20		36%	41%	23%	5.3
5/19		39%	37%	24%	5.6
4/18		42%	34%	23%	5.5
5/17		40%	37%	23%	5.5
5/16		37%	39%	23%	5.5
5/15		35%	43%	22%	5.5
Household products such as cleaning fluids, detergents, paints, degreasers and bleaches					
5/20		34%	41%	26%	5.2
5/19		40%	36%	24%	5.5
4/18		43%	39%	18%	5.8
5/17		45%	37%	18%	5.9
5/16		37%	43%	20%	5.6
5/15		37%	42%	20%	5.5

-Table 37 continued on next page-

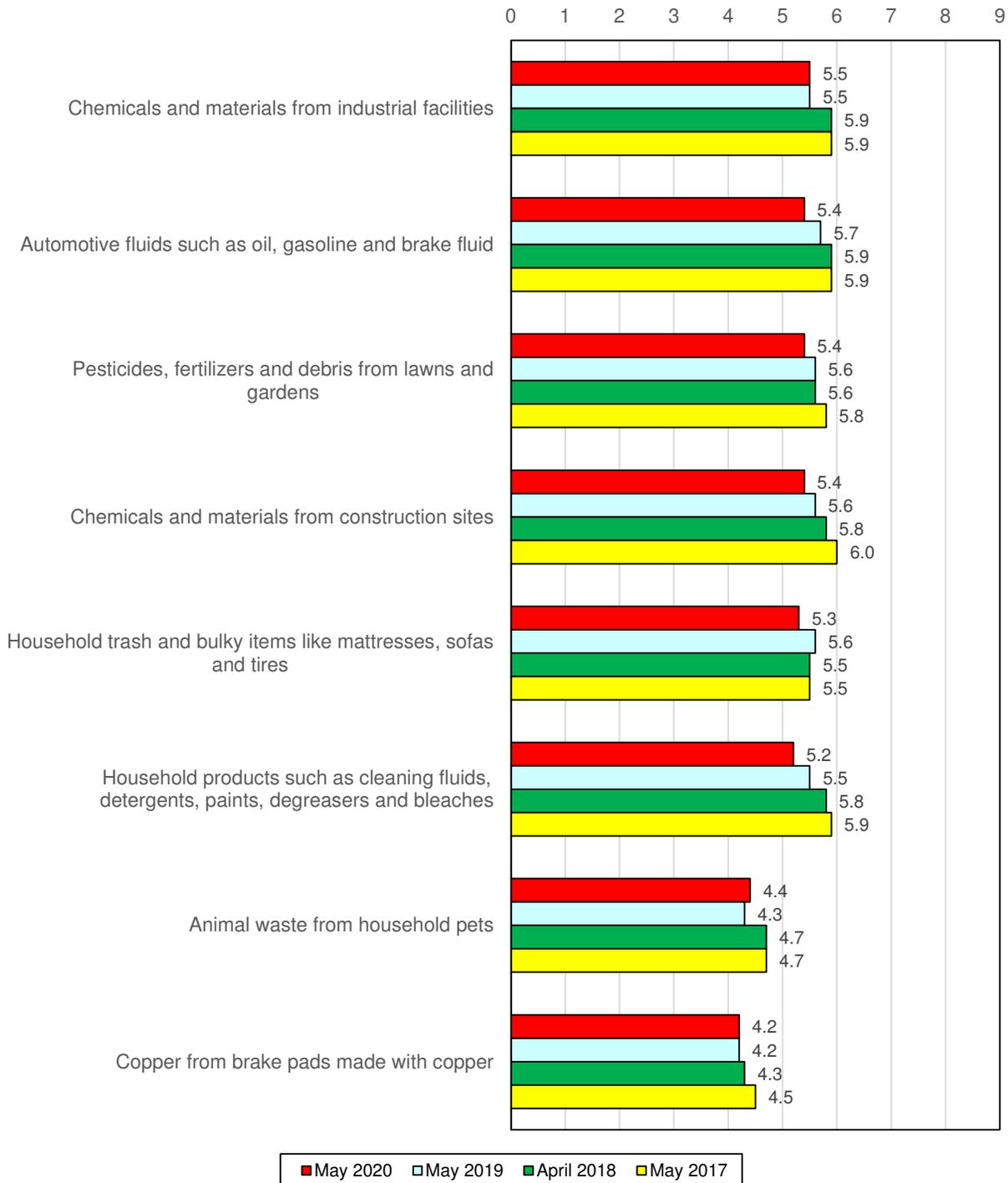
Table 37 (Cont'd)

(5/20 N=500) (5/19 N=500) (4/18 N=500)	(5/17 N=504) (5/16 N=500) (5/15 N=500)	Serious Problem (7-9)	Moderate Problem (4-6)	Not a Problem (1-3)	Average Score on 1-9 Scale
Animal waste from household pets					
5/20		22%	39%	39%	4.4
5/19		20%	39%	41%	4.3
4/18		26%	41%	33%	4.7
5/17		25%	41%	34%	4.7
5/16		26%	41%	33%	4.7
5/15		22%	39%	39%	4.5
Copper from brake pads made with copper					
5/20		18%	43%	39%	4.2
5/19		17%	41%	42%	4.2
4/18		22%	41%	38%	4.3
5/17		21%	42%	37%	4.5

Question: Using the same “1-to-9” scale – where “9” means “a serious problem” and “1” means “not a problem” - how much do you think each of the following contributes to the problem of stormwater pollution in the Tucson area? You can give me any number between “1” and “9.”

Display 37

**Rating of Various Contributors to Stormwater Pollution Problem in Tucson Area
(By Average Score on 1-9 Scale)**



Government Entity to Call If Witness Someone Dumping Trash or Chemicals in a Storm Drain – One of four say they are **unsure** who they would contact if they saw someone dumping trash or chemicals in a storm drain. This is down from 28% in 2019, and nearly equals the all-time low recorded in 2018 (22%). Those unsure in the current survey tend to be less formally educated, with few differences with respect to geography sex or ethnicity.

Unchanged since last year, 38% indicate that they would contact **911/Police department** to report storm drain dumping. These tend to be Northwest residents, 46 to 65 year-olds, Whites and 11+ year Pima County denizens

Others report they would contact these government-oriented agencies or departments:

- **City government** (18%, up from 15%-16% in the last two surveys. Lower only in the South zips [14% versus 18%-20% elsewhere], with increased mentions among 16 to 35 year-olds and Hispanics.)
- **County government** (16%, up from 2019 [12%] and 2018 [14%] levels. Northwest residents and snowbirds are more likely to say they would contact county government to report storm drain dumping.)
- **Water department** (15%, up from 11% in 2019. These tend to be South region residents and 16 to 35 year-olds.)
- **Sanitation department** (12%, up slightly from 9%-10% in the last two studies. Lower only in the Central zip codes [6% versus 11%-16% everywhere else].)
- **Health department** (12%, an increase from 8%-9% in 2018-2019. This is generally consistent regardless of geography.)
- **Flood Control district** (4%, up from 1% last year.)

Overall, 5% indicate they would **not report** dumping of trash or chemicals in a storm drain. This is up from 2%-3% in the last two years.

Table 38

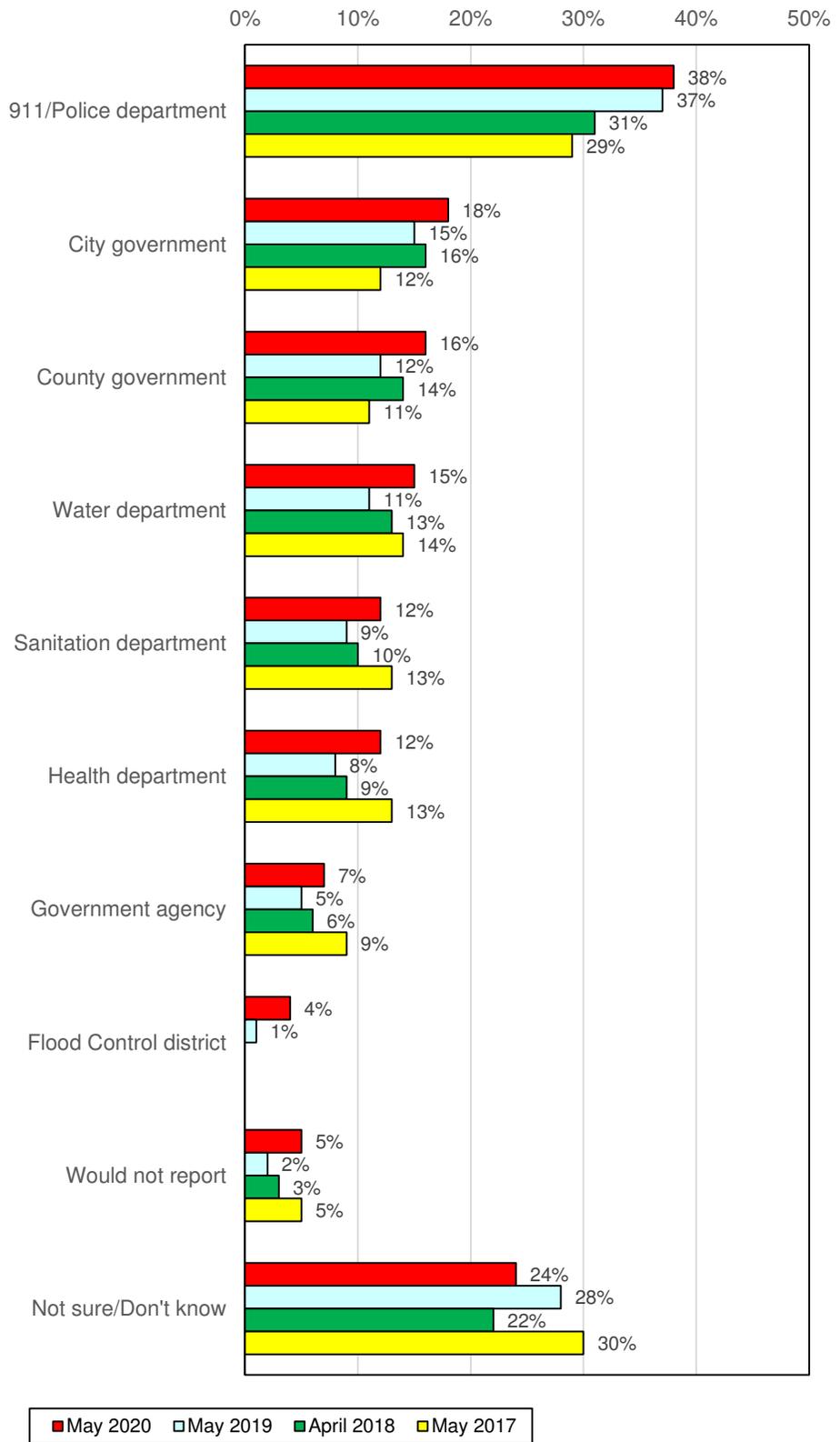
Government Entity to Call If Witness Someone Dumping Trash or Chemicals in a Storm Drain

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	05/19 Total	05/20 Total
911/Police department	30%	31%	29%	31%	37%	38%
City government	10%	8%	12%	16%	15%	18%
County government	9%	10%	11%	14%	12%	16%
Water department	13%	13%	14%	13%	11%	15%
Sanitation department	11%	11%	13%	10%	9%	12%
Health department	10%	11%	13%	9%	8%	12%
Government agency	5%	3%	9%	6%	5%	7%
Fire department	3%	2%	4%	2%	1%	5%
Flood Control district	–	–	–	–	1%	4%
Would not report	4%	3%	5%	3%	2%	5%
Not sure/Don't know	33%	30%	30%	22%	28%	24%
	N=500	N=500	N=504	N=500	N=500	N=500

	Area				Stormwater Pollution Problem		
	South	Northwest	Central	East	Serious Problem	Moderate Problem	Not a Problem
911/Police department	34%	43%	36%	39%	38%	35%	49%
City government	14%	20%	18%	20%	20%	16%	17%
County government	14%	21%	13%	13%	20%	15%	11%
Water department	18%	13%	14%	13%	21%	12%	8%
Sanitation department	16%	11%	6%	16%	15%	12%	6%
Health department	12%	11%	14%	10%	9%	13%	15%
Government agency	9%	7%	7%	4%	9%	7%	6%
Fire department	6%	5%	5%	4%	6%	5%	3%
Flood Control district	8%	3%	1%	3%	5%	4%	2%
Would not report	4%	6%	4%	7%	6%	3%	11%
Not sure/Don't know	26%	22%	23%	25%	19%	30%	12%
	N=160	N=152	N=117	N=71	N=167	N=268	N=65

Question: If you saw someone dumping trash or chemicals into a storm drain or a wash and wanted to report them, who would you call to report the incident?

Display 38 Government Entity to Call If Witness Someone Dumping Trash or Chemicals in a Storm Drain



Likelihood of Taking Part in Various Activities to Help Keep Stormwater Clean –

This question series returns to the 2020 survey after a hiatus last year. Compared to prior surveys, the percentage of respondents “very likely” to take part in activities to help keep stormwater clean trends lower – although most remain highly likely to engage in these four activities:

- **Safely dispose of chemicals** (67% “very likely,” down from 71%-77% in recent years. These tend to be Central or East region residents, women, Whites and progressively older respondents.)
- **If you have a dog, using a doggie bag to clean up after them** (67% “very likely,” down from 76%-80% in recent years. This is particularly true in the Central or East regions, as well as among women and 56 to 65 year-olds.)
- **Report a spill** (54% “very likely,” down from 58%-63% in recent years. Slightly lower only in the Northwest zip codes [49% versus 55%-59% elsewhere]. Older respondents [56 or older] are also more likely to be “very willing” to report a spill.)
- **Replacing a toxic compound with a non-toxic compound** (52% “very likely,” down from 56%-62% in recent years. These are more apt to be Northwest or East residents, women, 56 to 65 year-olds 11+ year Pima County denizens.)

Down from about one-half in recent surveys, four of ten in the current study are “very likely” to say they would **gather stormwater to use for watering plants**. Two of ten are “not at all likely” (compared to 17%-19% between 2016 and 2018). South zip residents, women, 56 to 65 year-olds and non-Hispanic minorities indicate the highest degree of strong likelihood for gathering stormwater.

Compared to recent surveys, fewer indicate that they would be likely (to some degree) to **install Green Infrastructure** – both overall (from 66%-78% to 60%) and the percentage “very likely” (from 33%-43% to 24%). One of four now say they are “not at all likely” (up from 18%-21% the last two years), more often Central residents and the oldest (66+) respondents. On the other hand, South region residents, 16 to 45 year-olds and Hispanics are more apt to be “very likely” to install Green Infrastructure.

Table 39

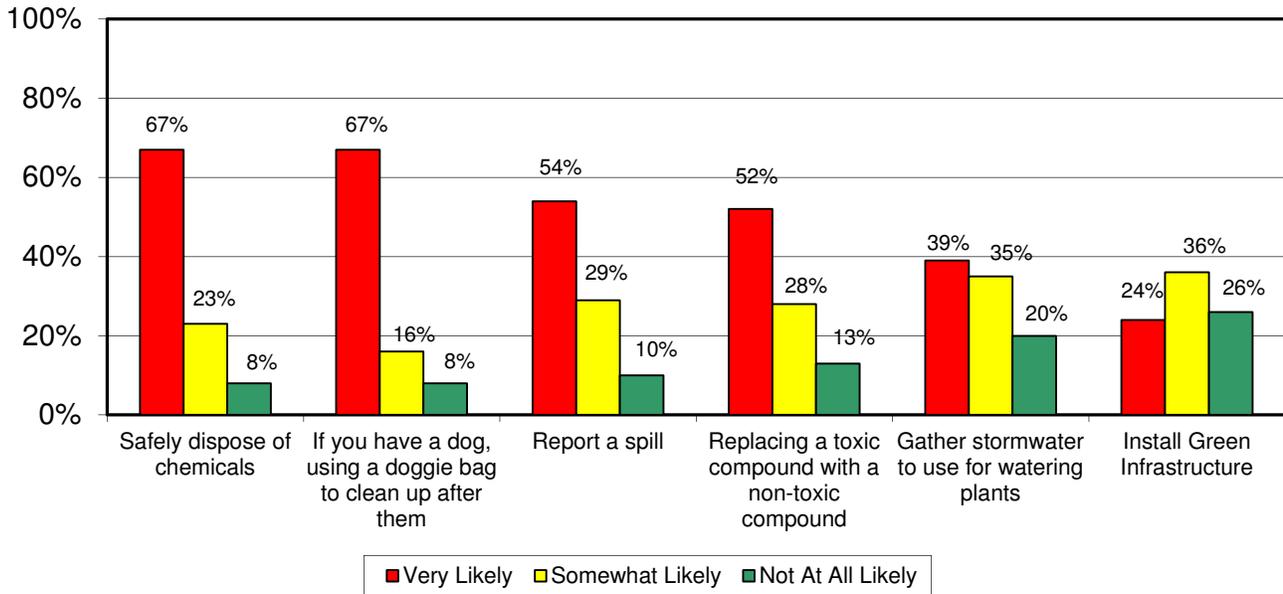
Likelihood of Taking Part in Various Activities
To Help Keep Stormwater Clean

	05/15 Total	05/16 Total	05/17 Total	04/18 Total	04/20 Total	Area			
						South	North- west	Central	East
Safely dispose of chemicals									
Very likely	76%	71%	75%	77%	67%	58%	66%	74%	76%
Somewhat likely	18%	22%	19%	18%	23%	26%	24%	18%	20%
Not at all likely	4%	4%	4%	4%	8%	12%	7%	7%	0%
Don't know/Not sure	2%	4%	2%	1%	3%	4%	3%	1%	4%
If you have a dog, using a doggie bag to clean up after them									
Very likely	76%	80%	80%	77%	67%	59%	68%	74%	70%
Somewhat likely	10%	8%	11%	12%	16%	24%	12%	9%	14%
Not at all likely	6%	5%	4%	4%	8%	9%	10%	7%	4%
Don't know/Not sure	9%	8%	4%	6%	9%	8%	9%	10%	11%
Report a spill									
Very likely	58%	63%	60%	62%	54%	55%	49%	57%	59%
Somewhat likely	29%	26%	29%	28%	29%	24%	35%	30%	28%
Not at all likely	8%	6%	9%	8%	10%	15%	9%	8%	6%
Don't know/Not sure	5%	5%	3%	3%	6%	6%	7%	4%	7%
Replacing a toxic compound with a non-toxic compound									
Very likely	56%	58%	62%	62%	52%	49%	56%	46%	59%
Somewhat likely	29%	27%	22%	26%	28%	28%	28%	28%	25%
Not at all likely	8%	6%	9%	7%	13%	13%	11%	15%	10%
Don't know/Not sure	7%	8%	6%	5%	8%	9%	5%	10%	6%
Gathering stormwater to use for watering plants									
Very likely	53%	49%	49%	50%	39%	45%	34%	40%	38%
Somewhat likely	31%	29%	29%	30%	35%	32%	40%	34%	32%
Not at all likely	13%	17%	19%	17%	20%	19%	18%	20%	25%
Don't know/Not sure	3%	5%	3%	4%	6%	4%	9%	6%	4%
Install Green Infrastructure*									
Very likely	41%	43%	33%	37%	24%	28%	25%	20%	21%
Somewhat likely	37%	34%	33%	35%	36%	32%	42%	29%	41%
Not at all likely	11%	11%	21%	18%	26%	26%	21%	30%	28%
Don't know/Not sure	11%	12%	13%	10%	15%	15%	12%	20%	10%
	N=500	N=500	N=504	N=500	N=500	N=160	N=152	N=117	N=71

* Was "Implement Low Impact Development practices" (5/15-5/16).

Question: I am now going to read you a list of activities that people can do to help keep stormwater clean. As I read each activity, simply tell me how likely you would be to take part – very likely, somewhat likely or not at all.

Display 39 Likelihood of Taking Part in Various Activities to Help Keep Stormwater Clean



**EVALUATION OF THE 2019-2020
PIMA COUNTY CLEAN AIR PROGRAM CAMPAIGN AND
CLEAN WATER PROGRAM CAMPAIGN SURVEY**
(May 2020)

Appendix

**Survey
Methodology
and Sample
Selection**

This survey consists of a 500-person, randomly-selected and statistically-projectable sample of the 16 years and older male and female residents in designated Pima County zip code areas. This study utilized a dual-methodology sampling plan, with Telephone (N=250) and Internet (N=250) interviews. Before 2015, all surveys in this tracking study series were conducted via telephone.

All Telephone and Internet interviews were conducted during late May 2020. Regardless of the sample source, the survey instrument and screening criteria were identical. Neither the interviewer nor the interviewee had any knowledge of the study sponsor.

Telephone Interviews – The Telephone interviews were distributed on the basis of geographic population density in the market, with specific steps taken to ensure a proportionate number of interviews in each survey “region.” The sample distribution in each region was developed using recent population estimate projections. The final in-tab geographic proportions are reflective of these actual population estimates. A similar sampling plan (based on household distribution) was also developed to ensure the ethnic composition of the final sample was as close as possible to actual proportions in Pima County.

Telephone respondents included in this survey were selected through a random sampling procedure that allows equal probability of selection. This technique ensures that area residents who are not yet listed in a telephone directory (or choose not to be listed) are still eligible for selection. All interviews were conducted and validated by the FMR Field staff. Each Telephone interview lasted approximately 17 minutes.

Cell Phone Only Households – To address “cell phone only” households (households without a land line that utilize a cell phone exclusively), FMR interviewers manually dialed randomly-generated cell phone numbers (based on known cell phone exchanges) and attempted to interview these households for the Telephone portion of the survey. Potential respondents reached through manual dialing were given three options: to proceed with the interview using their cell phone provider’s calling plan minute allocations; allow for a call-back at a mutually arranged time on a

land line; or to call the cell phone back when minutes are “free” (i.e., weekends, evenings, etc.).

Internet Interviews – Online surveys were conducted via the Internet utilizing a questionnaire administered by FMR Associates and hosted on an independent website partner of FMR Associates (with completed surveys downloaded directly to FMR for data processing and analysis). Respondents were contacted through a third party database Internet panel company that emailed invitations to their “opt in” panelists who reside in Pima County. Each Internet interview lasted approximately 13 minutes.

Spanish-Language Interviews – Where relevant, respondents were asked if they preferred their interview to be conducted in English or Spanish. A Spanish-language version of the survey was developed by FMR Associates, and made available to both Telephone and Internet respondents. A total of 168 non-White respondents were interviewed in the project, including 131 Hispanics. Overall, 13 respondents (3%) requested that their survey be conducted in Spanish by a bilingual interviewer. This compares to 2% in the 2019 survey.

Statistical Reliability

The statistics in this report are subject to a degree of variation that is determined by sample (or sub-sample) size. All research data are subject to a certain amount of variation for this reason. This does not mean that the figures represented in the various tables are wrong. It means that each percentage represents a possible “range” of response. This is because the random sampling process, as well as human behavior itself, can never be perfect. For this sample, at N=500, the statistical variation is $\pm 4.5\%$ under the most extreme circumstances – with a 95% confidence level. That is, when the percentages shown in the tables are near 50% (the most conservative situation), the actual behavior or attitude may range from 45.5% to 54.5%. The 95% confidence level means that if the survey were repeated 100 times, in 95 cases the same range of response would result. Those percentages that occur at either extreme (for example, 10% or 90%) are subject to a smaller degree of statistical fluctuation (in this case, $\pm 2.7\%$).

Sub-samples, such as age groups or sex, have a higher degree of statistical fluctuation due to the smaller number of respondents in those groupings.

Confidence Intervals for a Given Percent
(at the 95% confidence level)

N (Base for %)	Reported Percentage				
	10 or 90%	20 or 80%	30 or 70%	40 or 60%	50%
500	2.7%	3.6%	4.1%	4.4%	4.5%
400	2.9%	3.9%	4.5%	4.8%	4.9%
300	3.3%	4.5%	5.1%	5.5%	5.7%
200	4.2%	5.5%	6.4%	6.8%	6.9%
100	5.9%	7.8%	9.0%	9.6%	9.8%
50	8.3%	11.1%	12.7%	13.6%	13.9%
25	11.8%	15.7%	18.0%	19.2%	19.6%

Example: If the table shows that 20% of all respondents (when N=500) have a positive or negative attitude about a question category, the chances are 95 out of 100 that the true value is 20% ± 3.6 percentage points; that is, the range of response would be 16.4% to 23.6%.

Significance of Difference Between Percentages
(at the 95% confidence level)

Average of the Bases of Percentages Being Compared	Reported Percentage				
	10 or 90%	20 or 80%	30 or 70%	40 or 60%	50%
400	4.4%	5.6%	6.5%	7.1%	7.2%
250	5.2%	7.1%	8.1%	8.6%	8.8%
200	5.9%	7.8%	8.9%	9.6%	9.8%
150	6.8%	9.1%	10.3%	11.0%	11.3%
100	8.3%	11.0%	12.7%	13.6%	13.9%
50	11.7%	15.7%	18.0%	19.2%	19.7%
25	16.7%	22.2%	25.5%	27.2%	27.7%

Example:
(Within Survey)

If a table indicates that 34% of Internet respondents have a positive attitude toward a category of response, and that 25% of Telephone respondents have the same attitude, the following procedure should be used to determine if this attitude is due to chance:

The average base is 250 for the reported percentages $(250+250)/2=250$. The average of the percentages is $30.0\% - (34+25)/2=29.5\%$. The difference between the percentages is 9%. Since 9% is greater than 8.1% (the figure in the table for this base and this percentage), the chances are 95 out of 100 that the attitude is significantly different between Internet and Telephone respondents.

2020 PIMA CLEAN AIR/CLEAN WATER REGION DEFINITIONS

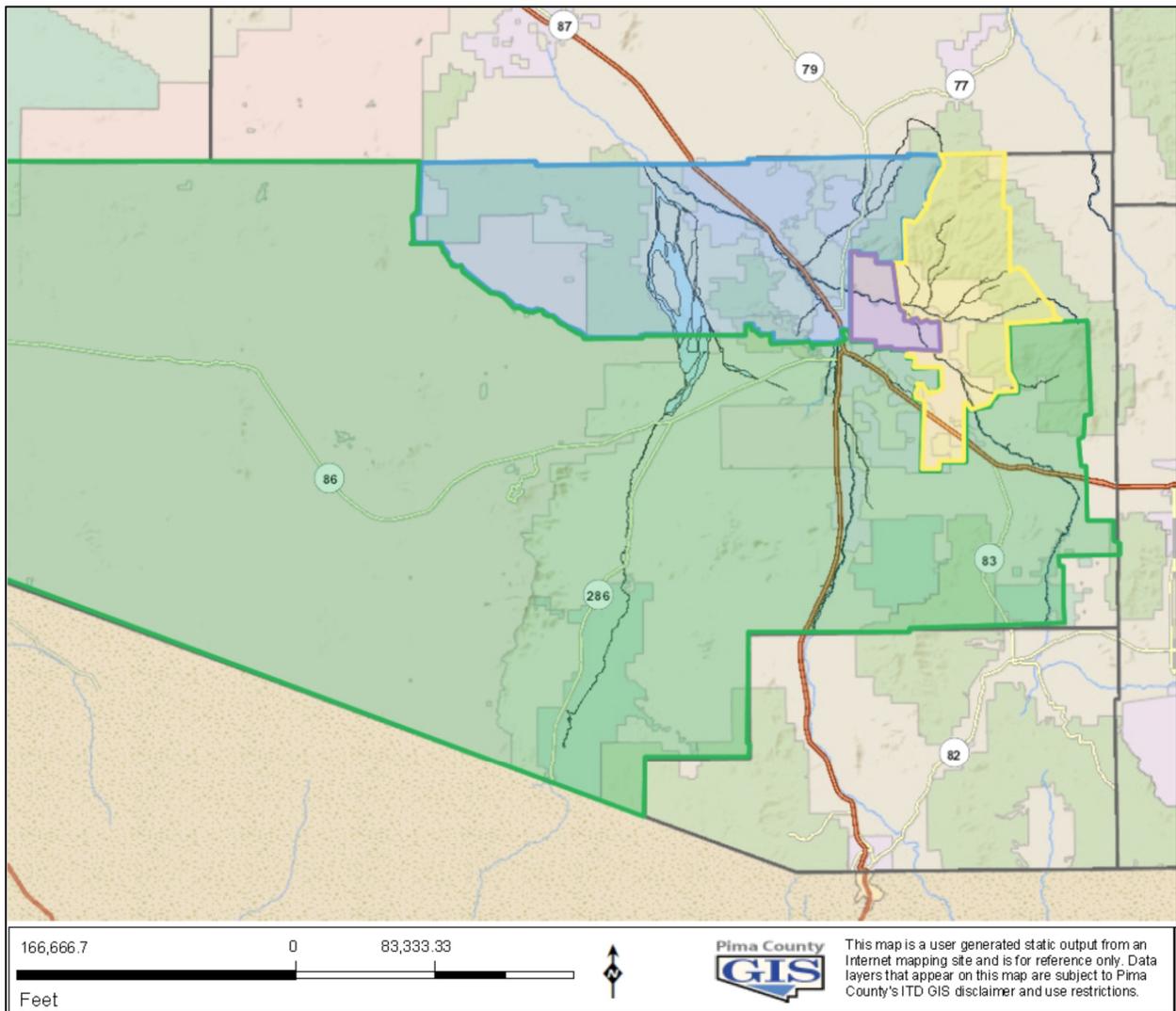
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85658
85704
85705
85737
85739
85741
85742
85743
85745
85755

Central: 85710
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85712
85716
85718
85719

South: 85321
85614
85622
85629
85634
85641
85701
85706
85707
85708
85713
85714
85735
85736
85746
85756
85757
85341
85601
85633
85639
85645

East: 85619
85715
85730
85747
85748
85749
85750

2020 Pima Clean Air/Clean Water Region Definitions – Map



Blue = Northwest
Purple = Central
Yellow = East
Green = South