EVALUATION OF THE 2015-2016 PIMA COUNTY CLEAN AIR PROGRAM CAMPAIGN AND CLEAN WATER CAMPAIGN SURVEY

(May 2016)

Prepared for:

PIMA COUNTY DEPARTMENT OF
ENVIRONMENTAL QUALITY

Tucson, Arizona

Prepared by:

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Tucson, Arizona

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(May 2016)

Digest of the Contents

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Appendix

EVALUATION OF THE 2015-2016 PIMA COUNTY CLEAN AIR PROGRAM CAMPAIGN AND CLEAN WATER CAMPAIGN SURVEY

(May 2016)

Detailed Perceptual Tables

Explanation of Detailed Perceptual Table Format

EVALUATION OF THE 2015-2016 PIMA COUNTY CLEAN AIR PROGRAM CAMPAIGN AND CLEAN WATER CAMPAIGN SURVEY
(May 2016)

Detailed Perceptual Tables (Cont'd)

EVALUATION OF THE 2015-2016 PIMA COUNTY CLEAN AIR PROGRAM CAMPAIGN AND CLEAN WATER PROGRAM CAMPAIGN SURVEY

(May 2016)

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 2015-2016 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 26th 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 4th annual installment of the effort to raise awareness to keep stormwater clean.

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 travel behavior (commuting/ telecommuting/compressed work weeks) in Pima County and measuring changes from previous studies.

2. 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.

3. 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.

4. 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.

5. Measuring the awareness of the Clean Air Program in Pima County and various clean air special events or activities.

6. Tracking the perception or awareness of stormwater destinations, level of seriousness for local stormwater pollution and land use behaviors influencing stormwater quality.

7. 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.

8. 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 May 2016. 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

Interview Language – In line with previous surveys, 98% of interviews were conducted in English. The remaining 2% (11 surveys overall) were Spanish-language interviews – including 6 Telephone and 5 Internet. All Spanish surveys were conducted among self-identified Hispanic respondents, who typically live in the Central or South zip codes. (See Table 4 for zip code zone definitions.)

Table 1 Type of Interview

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
English	99%	96%	99%	99%	98%	98%	98%	98%	**98%**	98%	98%
Spanish	1%	4%	1%	1%	2%	2%	2%	2%	**2%**	2%	2%
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	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?

Method of Interview – Similar to last year, and per the sampling plan, interviews were conducted both via telephone and online (250 each, for a combined in-tab of 500 respondents). Prior to 2015, all surveys were 100% telephone interviews. Internet surveys were conducted utilizing a panel company which sent a link to randomly-selected panelists (who opt in to receive invitations and are provided an incentive of some sort to participate in surveys for which they qualify). Telephone survey respondents were randomly-selected for participation, with interviews conducted by the FMR field staff.

The two methodologies utilized the same screening criteria (Pima County residents 16 or older who live in specific zip codes) and survey instrument. The only difference in the survey design relates to questions with unaided responses. Specifically, in the Telephone survey, unaided question response options are not read to respondents – whereas, in the Internet surveys, all response options are provided to respondents to choose from.

Table 2 Method of Interview

	05/15 Total	**05/16 Total**
Telephone	50%	**50%**
Internet	50%	**50%**
	N=500	**N=500**

Self-Identified Ethnicity – As in previous surveys, specific sampling quotas were used for the Telephone sub-sample in terms of self-identified ethnicity. The 2016 Telephone sample is broken down by ethnicity as follows: 67% White, 26% Hispanic, 3% African-American, 2% Native American and 2% Asian/Pacific Islanders. These are consistent with last year's results, and with Telephone sampling quotas. While the Internet portion did not include a quota for ethnicity, it did include 24% non-Whites (including 18% Hispanics). Like last year, the greatest share of non-Whites reside in the South zip code region (41%).

Table 3 Racial Background of Respondents

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
White	77%	75%	76%	78%	74%	71%	67%	72%	**71%**	67%	76%
Hispanic	19%	20%	19%	17%	20%	24%	24%	20%	**22%**	26%	18%
African-American	2%	2%	2%	1%	2%	3%	5%	3%	**3%**	3%	2%
Native American	2%	1%	2%	2%	4%	2%	2%	3%	**2%**	2%	2%
Asian, Pacific Islander	1%	2%	2%	2%	1%	1%	2%	2%	**2%**	2%	2%

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 – Regardless of interview method, the geographic distribution of the sample is very consistent with the sampling plan: 31% Central, 27% South, 27% Northwest and 15% East. As in past surveys, sampling quotas for the telephone sub-sample were based on population density in Pima County. There were no geographic quotas for the Internet sub-sample.

Table 4 Area of Residence

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Central 85710 85711 85712 85716 85718 85719	26%	28%	27%	29%	28%	30%	28%	31%	**31%**
South 85321 85614 85622 85629 85634 85641 85701 85706 85707 85708 85713 85714 85735 85736 85746 85756 85757 85341 85601 85633 85639	32%	31%	27%	30%	28%	29%	28%	27%	**27%**
Northwest 85653 85654 85658 85704 85705 85737 85739 85741 85742 85743 85745 85755 85652 85738	28%	25%	29%	26%	28%	27%	28%	27%	**27%**
East 85619 85715 85730 85747 85748 85749 85750	15%	16%	17%	16%	16%	14%	16%	15%	**15%**
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	N=500	**N=500**

	Air Quality Problem			Sample	
	Major	Moderate	Minor	Telephone	Internet
Central 85710 85711 85712 85716 85718 85719	35%	29%	30%	30%	31%
South 85321 85614 85622 85629 85634 85641 85701 85706 85707 85708 85713 85714 85735 85736 85746 85756 85757 85341 85601 85633 85639	24%	30%	21%	28%	27%
Northwest 85653 85654 85658 85704 85705 85737 85739 85741 85742 85743 85745 85755 85652 85738	28%	26%	30%	27%	26%
East 85619 85715 85730 85747 85748 85749 85750	14%	15%	20%	15%	16%
	N=89	N=276	N=105	N=250	N=250

Gender – Consistent with last year, the 2016 Telephone sub-sample is divided nearly equally between men and women. As in past Telephone studies, there was only one survey conducted per household and all respondents contacted to participate were further randomized by interviewing "the male or female in your household who is 16 or older and most recently celebrated a birthday." The Internet sub-sample skews female (63%, down from 65%), which is typical for most online surveys. Similar to last year, the combined sample is comprised of 56% women and 44% men. While the gender mix is nearly balanced in the Central and Northwest regions, there are fewer men in the South (38%) or East (36%).

Table 5 Gender of Respondents

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
Men	46%	46%	44%	47%	44%	45%	50%	42%	**44%**	52%	37%
Women	54%	54%	56%	53%	56%	55%	50%	58%	**56%**	48%	63%

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 Distribution – Consistent with the last three surveys, one-half of the 2016 Telephone sub-sample is 26 to 55 (48%). Among the rest, more Telephone respondents are older (56+) (40%) than younger (under 26) (9%). In comparison, the Internet sub-sample skews younger (with 20% under the age of 26) – with fewer 66+ (15% versus 24% in the Telephone sample). Consequently, the median age of the Internet sample is younger (45.5 years) than the Telephone sample (50.3 years). This finding is consistent with our other split-methodology studies.

Table 6 Age of Respondents

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
16 to 25	15%	13%	14%	10%	10%	13%	10%	16%	**14%**	9%	20%
26 to 35	16%	18%	16%	17%	15%	19%	17%	16%	**17%**	17%	16%
36 to 45	19%	17%	17%	20%	19%	19%	18%	15%	**16%**	16%	15%
46 to 55	14%	13%	16%	17%	16%	14%	15%	14%	**15%**	17%	14%
56 to 65	13%	13%	14%	14%	15%	14%	16%	18%	**18%**	16%	20%
66 to 75	15%	16%	14%	15%	17%	15%	16%	15%	**14%**	16%	12%
76 or over	8%	9%	8%	6%	8%	6%	8%	6%	**6%**	8%	3%

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

Length of Residence – Two-thirds say that they have lived in Pima County for 11 or more years (67%), with little difference in regard to sub-sample (Telephone or Internet). Among the rest, 23% are 2-to-5 (9%) or 6-to-10 (14%) year residents. Similar to last year, 7% are "new" Pima County residents (less than two years). The remainder are part-year residents (4%).

Table 7 Length of Residence in Pima County

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
Part year	9%	5%	6%	2%	3%	8%	3%	4%	**4%**	5%	2%
Less than 2 years	9%	4%	6%	4%	2%	6%	6%	8%	**7%**	5%	8%
2 to 5 years	18%	10%	15%	16%	10%	9%	12%	11%	**9%**	9%	8%
6 to 10 years	14%	11%	13%	12%	12%	14%	14%	13%	**14%**	14%	14%
11 or more years	49%	70%	60%	65%	73%	62%	66%	64%	**67%**	67%	66%

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, four of ten survey respondents (regardless of interview method) indicate that someone in their household suffers from a breathing-related medical condition. This is up from last year (34%), but consistent with 2013-2014 levels (37%-38%). Allowing for multiple mentions, 21% say that they themselves have a breathing-related medical condition, while 28% indicate that children (11%) or other family members (17%) are affected. There is little difference based on geography.

In line with prior surveys, there is a very strong correlation between the incidence of impacted household members and the perception of a "major" air quality problem in the Tucson area.

Table 8 Household Member With Breathing-Related Medical Condition

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
Yes	34%	40%	37%	37%	33%	37%	38%	34%	**40%**	42%	38%
Respondent	(16%)	(16%)	(15%)	(19%)	(14%)	(19%)	(20%)	(18%)	**(21%)**	(22%)	(21%)
Children	(11%)	(12%)	(14%)	(11%)	(12%)	(12%)	(10%)	(9%)	**(11%)**	(12%)	(10%)
Other family member	(14%)	(19%)	(19%)	(17%)	(15%)	(16%)	(16%)	(13%)	**(17%)**	(21%)	(14%)
No	65%	59%	62%	62%	66%	62%	59%	64%	**58%**	57%	60%
Don't know/ Not sure	1%	1%	1%	1%	1%	1%	3%	2%	**2%**	1%	2%
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	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 – Consistent with last year, just less than two of ten households have three or more motor vehicles owned or leased (16% versus 17% in 2015). The number of single-vehicle households, meanwhile, has increased (from 36% in 2015 to 41% now). Overall, 37% report having two motor vehicles (compared to 40% last year). Down slightly from 2015, just 6% (more often Internet respondents and Central area residents) report that no one in their household owns or rents a motor vehicle in working condition. Geographically, East area residents are most apt to have three or more vehicles (25%), while single-vehicle homes are more common in the South region.

Table 9 Number of Motor Vehicles Owned or Leased

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
No working cars	3%	2%	4%	6%	5%	6%	9%	8%	**6%**	2%	11%
One	28%	30%	27%	30%	25%	28%	32%	36%	**41%**	42%	39%
Two	42%	43%	44%	40%	46%	40%	38%	40%	**37%**	36%	38%
Three or more	27%	24%	26%	24%	24%	27%	21%	17%	**16%**	20%	12%

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

Education Level – In line with the last two years, and regardless of sample methodology, three of four respondents have at some college level education. Telephone respondents are more likely to have some graduate work or a degree (18% versus 12% of Internet panelists), while Internet respondents were more apt to have some college (but no degree) (36% versus 30% of Telephone). East zip code zone residents are more likely to be college graduates or better.

Regardless of interview method, about two of ten are high school graduates (19%, up from 16% in 2015), while few have less than a high school diploma (4%, down from 7% last year).

Table 10 Education Level of Respondents

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
Less than high school	5%	10%	8%	8%	9%	8%	9%	7%	**4%**	4%	4%
Completed high school/Trade school	18%	24%	19%	19%	18%	19%	13%	16%	**19%**	18%	20%
Some college	28%	25%	25%	29%	26%	28%	28%	31%	**33%**	30%	36%
College graduate	29%	23%	31%	27%	28%	29%	29%	28%	**27%**	27%	28%
Some graduate work or graduate degree	20%	16%	16%	15%	18%	14%	18%	17%	**15%**	18%	12%

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

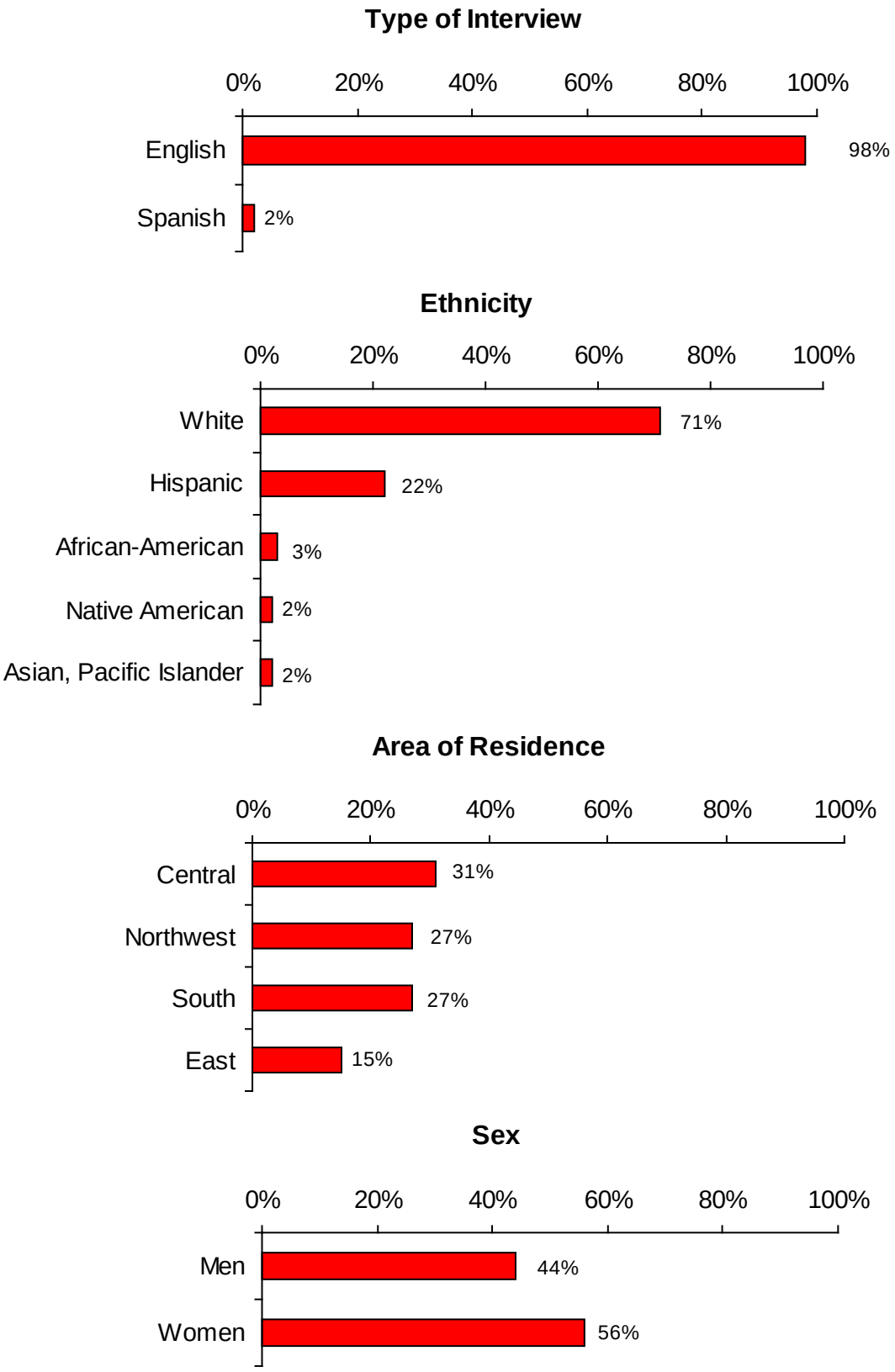
Annual Household Income – Down from last year (13%), just 11% refused to indicate their broad annual household income category – more often Telephone respondents (20% versus 2% of Internet panelists). For the combined 2015 sample, median annual household income is $43,974 – once again much higher among Telephone ($55,313) than Internet ($37,065) respondents. Those in the highest income category ($80,000+) tend to reside in the Northwest zip code region.

Table 11 Household Income

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
Less than $15,000	8%	7%	5%	8%	5%	9%	8%	12%	**11%**	6%	16%
$15,000 to $24,999	10%	12%	8%	9%	7%	9%	10%	14%	**13%**	9%	18%
$25,000 to $39,999	18%	12%	15%	16%	15%	16%	9%	16%	**17%**	16%	18%
$40,000 or more*	48%	49%	50%	49%	47%	46%	53%	46%	**48%**	50%	45%
No answer/Refused	16%	20%	21%	18%	25%	21%	20%	13%	**11%**	20%	2%
* $40,000 to $59,999	19%	20%	16%	19%	13%	15%	15%	14%	**16%**	13%	18%
$60,000 to $79,999	10%	11%	12%	12%	12%	10%	11%	11%	**12%**	11%	12%
$80,000 or more	19%	18%	22%	18%	22%	21%	27%	21%	**20%**	26%	14%

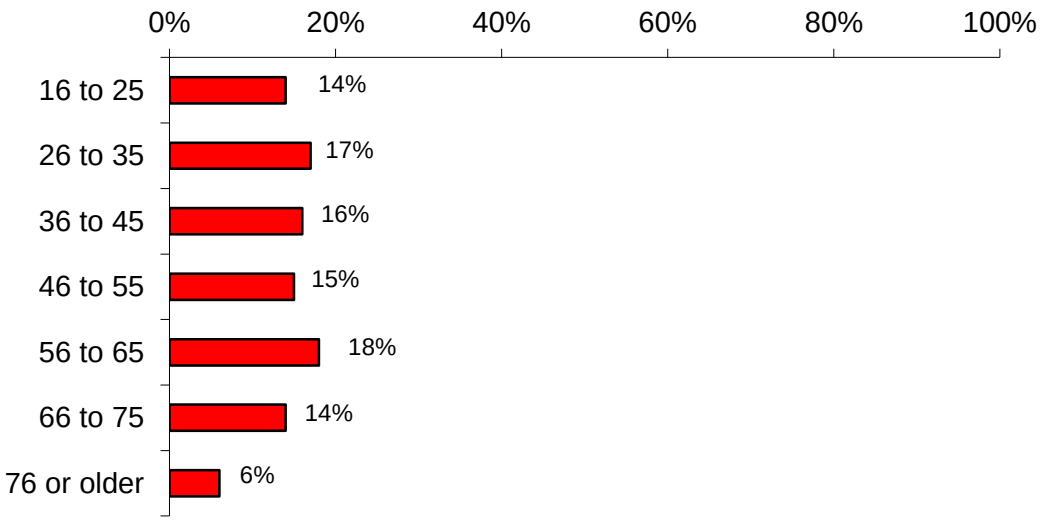
Question: As I read the following categories, please tell me into which group your total annual household income falls. We are not interested in your exact income, just your household income category...from all sources before taxes.

Display 1 **Demographic Profile of Respondents**
(Among the Total Sample)

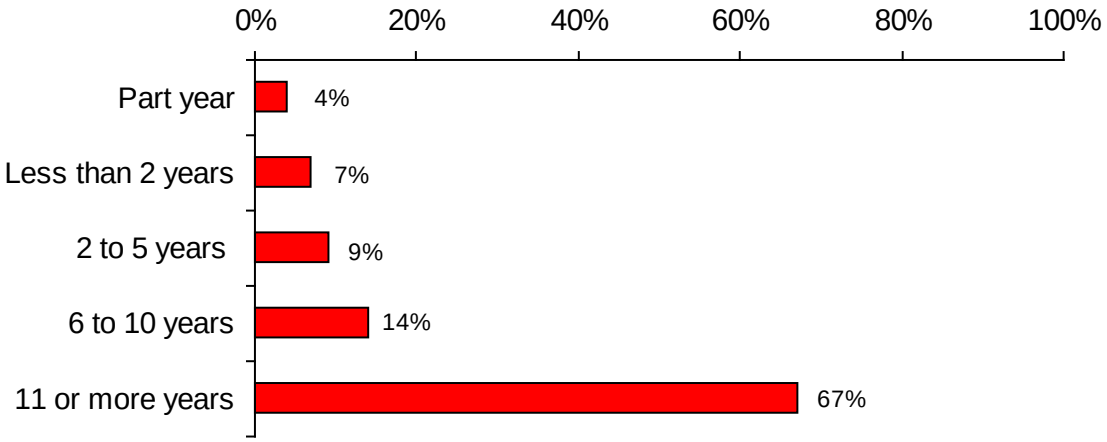


Display 1 (Cont'd) **Demographic Profile of Respondents**
(Among the Total Sample)

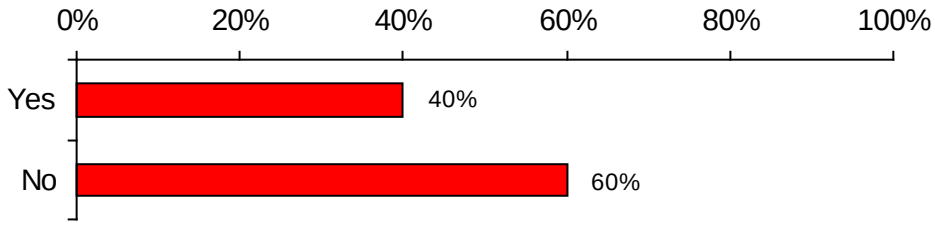
Age



Length of Pima County Residence

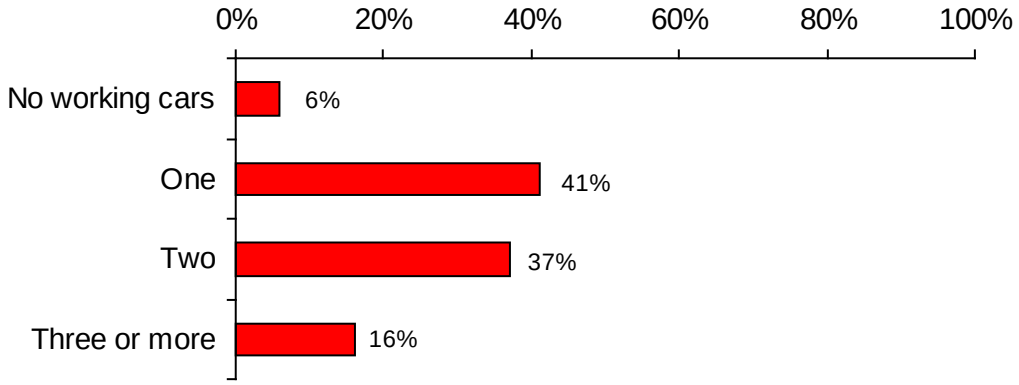


Household Member With Breathing-Related Medical Condition

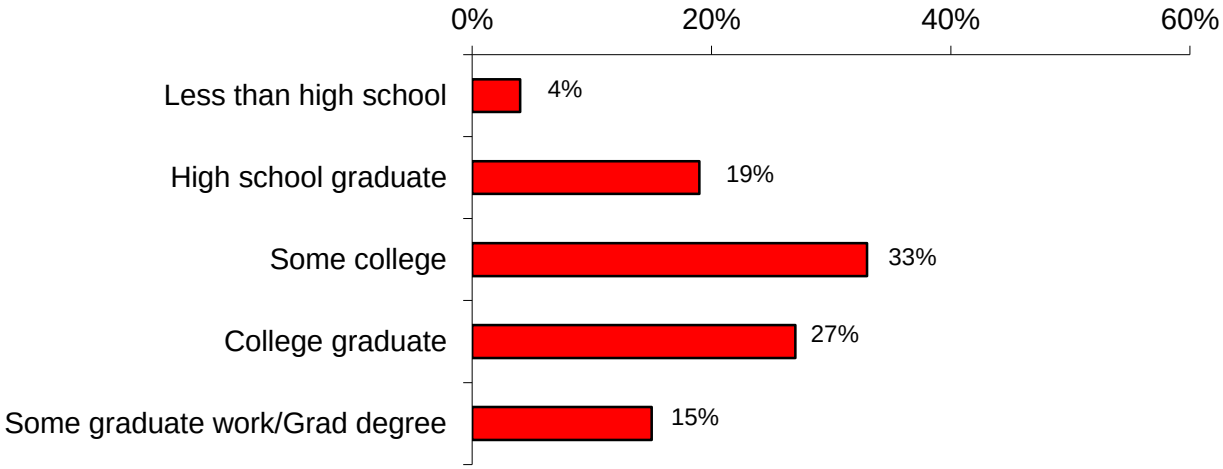


Display 1 (Cont'd) **Demographic Profile of Respondents**
(Among the Total Sample)

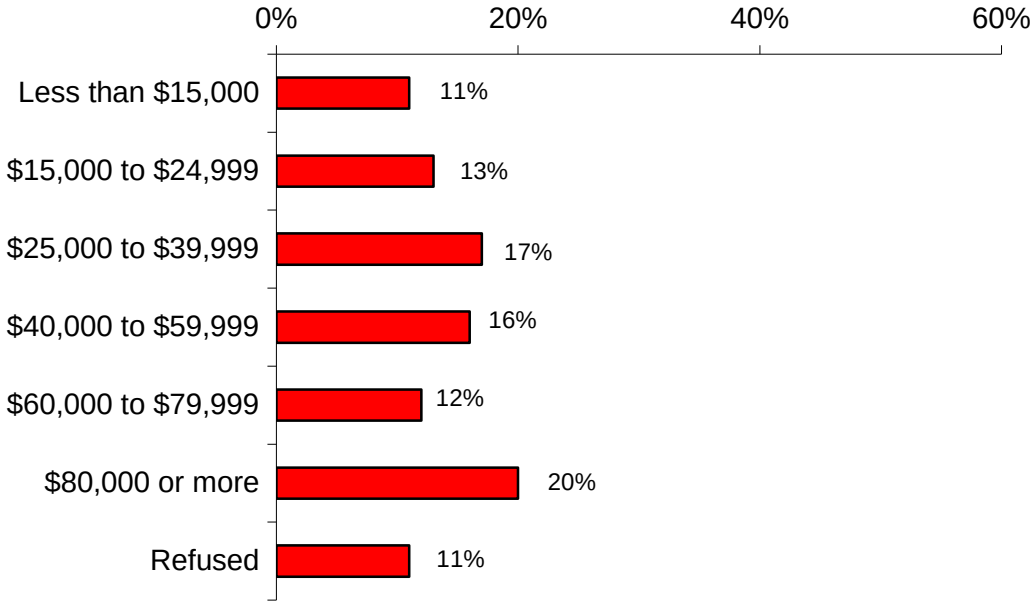
Number of Vehicles



Education Level



Household Income



Awareness of Information About Air Quality/Pollution

Awareness of the Pima County "Clean Air" Program – Overall, one-half are familiar with the Pima County "Clean Air" Program, with no difference between Telephone and Internet respondents. This is up from 45% last year, but in line with 2014 results (52%).

Awareness is greatest in the Northwest (59%) zip codes, as well as among those who perceive that the Tucson area has a progressively more severe air quality or stormwater pollution problem. Program awareness is higher among Whites (50%) or Hispanics (54%) than among other non-Hispanic minorities (36%). Awareness is also elevated among women (53% versus 47% of men) and 36 to 45 year-olds (62%).

Table 12 Awareness of the Pima County "Clean Air" Program

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Yes	53%	59%	59%	46%	52%	43%	52%	45%	**50%**
No	41%	37%	36%	46%	43%	52%	45%	49%	**42%**
Don't know	6%	4%	5%	7%	5%	5%	3%	6%	**7%**
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	N=500	**N=500**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Yes	44%	48%	59%	52%	60%	56%	36%	50%	50%
No	46%	41%	38%	46%	35%	37%	62%	46%	38%
Don't know	10%	11%	3%	3%	6%	7%	2%	4%	11%
	N=154	N=136	N=133	N=77	N=89	N=276	N=105	N=250	N=250

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 – Overall, more than eight of ten report familiarity with at least one "Clean Air" event or activity (83%). This is highly consistent with last year (85%). As we have found in past studies, awareness of specific events or activities continues to be significantly higher among respondents familiar with the "Clean Air" Program.

Consistent with prior surveys, the three "Clean Air" events with the highest degree of familiarity include:

- **"Bike to Work Day"** (60% awareness [56% Telephone versus 65% Internet], only slightly lower than 2015 [62%] or 2014 [63%] levels. Recall is highest in the Northwest or East zips, as well as among women, 46 to 55 year-olds and those who perceive a "major" or "moderate" air quality problem.)

- **"Earth Day Festival and Parade"** (55% awareness [60% Telephone versus 50% Internet], down from 59% last year. Awareness is greater in the East area and among men, with few differences among 16 to 65 year-olds.)

- **"Bike Fest"** (51% awareness [58% Telephone versus 44% Internet], virtually unchanged from last year [52%]. Awareness is higher in the South and East regions, and elevated among the youngest respondents [16 to 25] and those who perceive a "moderate" air quality problem.)

One of four or more are familiar with the remaining events:

- **"Car-Free Day"** (33% awareness [38% Telephone versus 28% Internet], up from 27% last year. Awareness is higher among South or East area residents, women, those 36 or older, Hispanics and those who perceive a progressively more severe air quality problem.)

- **"Walk and Roll to School Day"** (32% awareness [35% Telephone versus 28% Internet], up from last year [29%] but in line with 2014 findings [32%]. South or East zip residents, women, 36 to 45 year-olds and non-Whites indicate the highest degree of awareness – as do those who think Tucson has a progressively more severe air quality problem.)

- **"Cyclovia"** (24% [with few differences based on sample methodology], unchanged from last year. Northwest or Central residents are more apt to be aware of this event, with few differences based on gender or age. Awareness is higher among Hispanics and residents who think that Tucson has a "moderate" air quality problem.)

Table 13 Awareness of Various Clean Air Events or Activities

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
"Bike to Work Day"	50%	56%	55%	61%	57%	54%	63%	62%	**60%**
"Earth Day Festival and Parade"	70%	66%	74%	72%	68%	66%	68%	59%	**55%**
"Bike Fest"	–	–	–	30%	53%	48%	45%	52%	**51%**
"Car-Free Day"	–	–	–	–	–	–	30%	27%	**33%**
"Walk and Roll to School Day"*	29%	38%	22%	33%	34%	36%	32%	29%	**32%**
"Cyclovia"	–	–	–	–	13%	11%	21%	24%	**24%**
None of these	11%	12%	10%	7%	12%	10%	10%	15%	**17%**
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	N=500	**N=500**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
"Bike to Work Day"	51%	60%	64%	69%	66%	67%	46%	56%	64%
"Earth Day Festival and Parade"	50%	56%	53%	66%	60%	56%	53%	60%	50%
"Bike Fest"	42%	58%	49%	61%	53%	57%	41%	58%	44%
"Car-Free Day"	27%	37%	33%	39%	40%	35%	29%	38%	28%
"Walk and Roll to School Day"*	30%	34%	29%	36%	47%	34%	19%	35%	28%
"Cyclovia"	28%	20%	27%	20%	24%	28%	17%	25%	24%
None of these	25%	15%	13%	8%	12%	12%	26%	17%	16%
	N=154	N=136	N=133	N=77	N=89	N=276	N=105	N=250	N=250

* Was "Walk Our Children to School Day" (5/04-5/06).

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 83% familiar with at least one "Clean Air" event or activity, 12% (regardless of interview method) say that they or someone in their household participated in at least one of these events. While this is lower than last year (20%), it is in line with 2014 (12%).

Who is more likely to indicate participation in a "Clean Air" event? Central zip residents, women, 16 to 45 year-olds, and Pima County residents of 6+ years. Past participation continues to be directly related to the perceived seriousness of the air quality problem, and remains much higher among residents aware of the "Clean Air" Program (16% versus 5% unaware).

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

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	**06/13 Total**	06/14 Total	05/15 Total	**05/16 Total**
Yes	10%	9%	11%	10%	17%	**17%**	12%	20%	**12%**
No	86%	88%	86%	88%	82%	**83%**	84%	79%	**85%**
Don't know	4%	4%	3%	2%	1%	**1%**	3%	2%	**3%**
	N=447	N=444	N=455	N=374	N=354	**N=452**	N=450	N=425	**N=417**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Yes	17%	7%	11%	11%	22%	11%	6%	12%	12%
No	82%	87%	86%	87%	78%	85%	91%	88%	83%
Don't know	1%	6%	3%	1%	0%	4%	3%	1%	5%
	N=115	N=115	N=116	N=71	N=78	N=244	N=78	N=208	N=209

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 12% who report participation in a "Clean Air" event, eight of ten say that they have changed (or are considering actions to change) their daily routines or behaviors to help improve air quality. This is up from 69% last year, and is the highest percentage of change recorded since 2008 (81%). Both Telephone (83%) and Internet (76%) respondents report a behavior or routine change.

Among the total sample, this means that 10% report a change in their behavior after participating in a "Clean Air" event, down only slightly from 11% last year (which tied the all-time high). Willingness to change in the 2016 study is greater among Northwest or East area residents and households impacted by a breathing-related medical condition.

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)

	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area			
								Central	South	North-west	East
Yes	65%	81%	57%	76%	55%	69%	**80%**	75%	75%	85%	88%
No	27%	11%	41%	23%	39%	23%	**8%**	5%	12%	15%	0%
Don't know	8%	8%	2%	1%	5%	8%	**12%**	20%	12%	0%	12%
	N=52	N=36	N=61	N=75	N=56	N=83	**N=49**	N=20	N=8	N=13	N=8

	Air Quality Problem			Sample	
	Major	Moderate	Minor	Telephone	Internet
Yes	82%	77%	80%	83%	76%
No	6%	12%	0%	17%	0%
Don't know	12%	12%	20%	0%	24%
	N=17	N=26	N=5	N=24	N=25

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 – Fully 88% of residents familiar with at least one "Clean Air" event (regardless of sample methodology) 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 (85%). Of those with a positive opinion, 45% are "very favorable" of such events in the current survey (down only slightly from 47% last year).

Geographically, only East side residents are less highly favorable of activities and events to encourage use of other modes of transportation. More apt to be "very favorable" of such events are 36 to 65 year-olds and residents who perceive a "major" or "moderate" air quality problem.

In line with recent surveys, only 8% have a negative opinion (to any extent) of air quality events and activities.

Table 13c

Opinion of Activities/Events to Encourage Use of Other Modes of Transportation
(Among Those Aware of at Least One Event)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Very favorable	39%	43%	45%	46%	42%	45%	38%	47%	**45%**
Somewhat favorable	39%	40%	39%	36%	44%	40%	35%	38%	**43%**
Not very favorable	7%	4%	5%	5%	7%	6%	5%	7%	**4%**
Not at all favorable	3%	3%	3%	3%	6%	4%	6%	3%	**4%**
Don't know/No answer	11%	10%	8%	9%	1%	5%	15%	5%	**4%**
	N=447	N=444	N=455	N=374	N=354	N=452	N=450	N=425	**N=417**

	Area				Air Quality Problem			Sample	
	Central	Northwest	South	East	Major	Moderate	Minor	Telephone	Internet
Very favorable	48%	46%	47%	37%	49%	48%	36%	43%	47%
Somewhat favorable	40%	41%	44%	49%	40%	45%	44%	41%	44%
Not very favorable	3%	4%	7%	1%	3%	3%	8%	5%	3%
Not at all favorable	3%	4%	1%	10%	6%	0%	10%	7%	1%
Don't know/No answer	7%	5%	2%	3%	3%	3%	3%	3%	5%
	N=115	N=115	N=116	N=71	N=78	N=244	N=78	N=208	N=209

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 mentions (unaided in the Telephone survey and aided in the Internet survey), the four steps most often taken by residents (especially those aware of the "Clean Air" Program) to help reduce air pollution in the Tucson area include:

- **Keep car tuned** (39%, up from 35% last year [and the highest mention to-date]. Most likely to keep their car tuned are East residents, women, those 56 or older and Internet respondents [46% versus 32% Telephone]. Respondents who perceive a "moderate" or "minor" air quality problem are more apt to say they keep their car tuned than those who perceive a "major" problem.)

- **Generally reduced driving** (38%, up from 35% last year. These are more likely to be Northwest area residents, women, 46 to 65 year-olds and Internet respondents [45% versus 31% Telephone], as well as those who perceive a "moderate" air quality problem.)

- **Keep tires inflated properly** (35%, down from 39% in 2015. More apt to keep their tires properly inflated are East area residents, women, Whites and those who perceive a "moderate" or "minor" air quality problem – as well as Internet respondents [48% versus 22% Telephone].)

- **Carpool/Less driving alone** (33%, virtually unchanged from last year [32%]. Internet respondents [36% versus 30% of Telephone], Northwest or East region residents, women, 16 to 25 year-olds and those who have perceive a "major" or "moderate" air quality problem are more likely to be carpooling more.)

Another two of ten indicate that they have **planted trees** to help reduce air pollution (21%, up from 17%). Other significant actions taken include: **bought a more fuel efficient car** (13%, unchanged since the previous two surveys), **adjusted vehicle's emission control equipment** (12%, up slightly from 10%), **avoid excessive idling** (unchanged at 12%), **bought bicycles** (unchanged at 12%), **choose one day a week not to drive** (12%, up from 10%), **moved closer to work** (9%, up slightly from 8%), and/or **use BBQ grill less** (9%, up from 6%).

Consistent with the last two years, 16% overall say that they have done **nothing** to reduce air pollution. These tend to be residents unaware of the "Clean Air" Program (22% versus 12% familiar) and those who perceive a "minor" air quality problem (20%).

Table 14 Steps Taken to Reduce Air Pollution

	05/05 Total	05/06 Total	05/07 Total	05/13 Total	05/14 Total	05/15 Total	**05/16 Total**
Keep car tuned	20%	31%	28%	12%	25%	35%	**39%**
Generally reduced driving/Driven less	33%	39%	39%	37%	44%	35%	**38%**
Keep tires properly inflated	5%	13%	14%	7%	22%	39%	**35%**
Carpool/Less driving alone	19%	32%	40%	28%	28%	32%	**33%**
Planted trees	5%	10%	12%	5%	12%	17%	**21%**
Bought more fuel efficient car	5%	8%	11%	7%	13%	13%	**13%**
Adjusted vehicle's emission control equipment	8%	12%	7%	3%	11%	10%	**12%**
Avoid excessive idling	4%	6%	6%	4%	12%	12%	**12%**
Bought bicycles	6%	8%	5%	8%	6%	12%	**12%**
Chosen once a week not to drive	3%	2%	4%	5%	6%	10%	**12%**
Moved closer to work	1%	4%	2%	2%	2%	8%	**9%**
Using BBQ grill less	1%	2%	6%	1%	2%	6%	**9%**
Using fireplace/Wood stove less	2%	4%	6%	3%	3%	5%	**8%**
Ride the bus/Public transportation	1%	1%	0%	1%	2%	1%	**3%**
Bought alternative-fueled car	–	2%	3%	4%	3%	4%	**3%**
Challenged friends/Co-workers to change	–	0%	3%	1%	2%	3%	**2%**
Advocated alternative to cars	1%	1%	1%	1%	1%	4%	**2%**
Walk	3%	3%	1%	2%	2%	1%	**2%**
Other	8%	7%	5%	7%	4%	3%	**4%**
Nothing	29%	15%	14%	21%	15%	16%	**16%**
	N=502	N=502	N=503	N=504	N=502	N=500	**N=500**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Keep car tuned	31%	35%	43%	53%	26%	41%	46%	32%	46%
Generally reduced driving/Driven less	38%	34%	42%	39%	32%	45%	27%	31%	45%
Keep tires properly inflated	31%	33%	37%	46%	22%	40%	36%	22%	48%
Carpool/Less driving alone	32%	31%	35%	35%	36%	37%	23%	30%	36%
Planted trees	16%	23%	21%	25%	22%	21%	17%	17%	24%
Bought more fuel efficient car	5%	10%	20%	23%	9%	17%	10%	11%	16%
Adjusted vehicle's emission control equipment	10%	10%	14%	17%	8%	14%	11%	10%	14%
Avoid excessive idling	12%	11%	14%	10%	7%	14%	13%	5%	19%
Bought bicycles	12%	7%	16%	17%	15%	13%	10%	6%	18%
Chosen once a week not to drive	10%	15%	8%	14%	14%	13%	9%	7%	16%
Moved closer to work	10%	5%	9%	14%	9%	10%	10%	4%	14%
Using BBQ grill less	8%	10%	5%	13%	8%	9%	9%	4%	13%
Using fireplace/Wood stove less	8%	5%	6%	14%	7%	10%	5%	4%	11%
Ride the bus/Public transportation	5%	4%	1%	0%	4%	3%	2%	3%	3%
Bought alternative-fueled car	1%	4%	4%	4%	0%	5%	1%	2%	4%
Challenged friends/Co-workers to change	1%	2%	3%	5%	2%	4%	0%	1%	4%
Advocated alternative to cars	4%	2%	2%	1%	0%	4%	1%	0%	4%
Walk	3%	2%	2%	3%	4%	2%	1%	2%	2%
Other	6%	5%	2%	3%	3%	5%	6%	8%	1%
Nothing	21%	17%	13%	12%	16%	13%	20%	23%	10%
	N=154	N=136	N=133	N=77	N=89	N=276	N=105	N=250	N=250

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 – Overall, 24% report that they have children between the ages of 5 and 18 living in their household. This is down slightly from 26% last year, but still higher than we found in 2014 (22%). Those with young children in their household tend to be South or East residents, 16 to 45 year-olds and non-Whites.

Table 15 Presence of Children Ages 5-18 in Household

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Yes	28%	30%	30%	30%	27%	33%	22%	26%	**24%**
No	72%	70%	70%	70%	73%	67%	78%	74%	**76%**
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	N=500	**N=500**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Yes	16%	32%	20%	32%	27%	27%	15%	24%	24%
No	84%	68%	80%	68%	73%	73%	85%	76%	76%
	N=154	N=136	N=133	N=77	N=89	N=276	N=105	N=250	N=250

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 young children (24% of the total sample), 48% indicate that these 5 to 18 year-olds have "talked about or brought home materials from school about improving air quality." This is up from last year (45%), but still lower than we found in 2014 (54%). Recall of school material in 2016 is lower only among South region residents, and higher among Hispanics, those who perceive a "major" air quality problem and residents aware of the "Clean Air" Program (61% versus 33% unfamiliar).

Table 15a Incidence of Children Ages 5-18 Receiving Information From School About Air Pollution
(Among Households With Children Ages 5-18)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Yes	34%	36%	36%	29%	36%	40%	54%	45%	**48%**
No	61%	59%	50%	64%	59%	51%	34%	47%	**48%**
Don't know	4%	5%	14%	7%	6%	9%	11%	8%	**3%**
	N=139	N=149	N=153	N=119	N=109	N=168	N=110	N=131	**N=120**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Yes	54%	39%	56%	52%	67%	48%	38%	44%	52%
No	42%	54%	44%	48%	33%	47%	62%	54%	43%
Don't know	4%	7%	0%	0%	0%	5%	0%	2%	5%
	N=24	N=44	N=27	N=25	N=24	N=75	N=16	N=59	N=61

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 & Garden Equipment – Overall, 14% indicate that they (or someone in their household) use gasoline-powered lawn & garden equipment to care for their home property (Table 16). Usage is generally consistent regardless of geography (slightly higher in the Northwest or East zips), gender, age or sample. It is elevated among Hispanics and low-income households.

What types of gasoline-powered lawn & garden equipment are most often used? What type of engine (2-stroke or 4-stroke) does it have? How many minutes is it used in a typical month? Among the 14% who report having such equipment, the most commonly used gasoline-powered items include (Tables 16a-c):

- **Lawn mower** (54% usage [or 8% among the total sample], 38% report that it is a 2-stroke engine, used for an average of 38 minutes per month.)

- **Leaf blower or vacuum** (36% usage [or 5% among the total sample], 58% report that it is a 2-stroke engine, used for an average of 25 minutes per month.)

- **Chainsaw** (26% usage [or 4% among the total sample], 42% report that it is a 2-stroke engine, used for an average of 39 minutes per month.)

- **String trimmer** (24% usage [or 3% among the total sample], 59% report that it is a 2-stroke engine, used for an average of 33 minutes per month.)

- **Hedge trimmers** (21% usage [or 3% among the total sample], 47% report that it is a 2-stroke engine, used for an average of 31 minutes per month.)

Overall, four respondents (6%) specify using some "**other**" piece of gasoline-powered lawn & garden equipment – including a tiller and "weed eater," used (on average) for 26 minutes per month.

Table 16 Use of Gasoline-Powered Lawn & Garden Equipment to Care for Property

	05/16 Total	Area			
		Central	South	Northwest	East
Yes	**14%**	12%	13%	16%	17%
No	**84%**	86%	84%	83%	83%
Don't know	**2%**	2%	3%	1%	0%
	N=500	N=154	N=136	N=133	N=77

	Air Quality Problem			Sample	
	Major	Moderate	Minor	Telephone	Internet
Yes	17%	14%	12%	16%	13%
No	82%	84%	88%	83%	85%
Don't know	1%	1%	0%	1%	2%
	N=89	N=276	N=105	N=250	N=250

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

Table 16a Types of Gasoline-Powered Lawn & Garden Equipment Used to Care for Property

	05/16 Total	Area			
		Central	Northwest	South	East
Gasoline-powered lawn mower	**54%**	47%	39%	68%	62%
Gasoline-powered leaf blower or vacuum	**36%**	47%	44%	23%	31%
Gasoline-powered chainsaw	**26%**	37%	33%	23%	8%
Gasoline-powered string trimmer	**24%**	5%	28%	46%	8%
Gasoline-powered hedge trimmers	**21%**	26%	22%	23%	8%
Other gasoline-powered equipment	**6%**	0%	17%	4%	0%
	N=72	N=19	N=18	N=22	N=13

	Air Quality Problem			Sample	
	Major	Moderate	Minor	Telephone	Internet
Gasoline-powered lawn mower	53%	55%	54%	52%	56%
Gasoline-powered leaf blower or vacuum	53%	30%	38%	45%	25%
Gasoline-powered chainsaw	40%	28%	15%	30%	22%
Gasoline-powered string trimmer	20%	32%	0%	12%	38%
Gasoline-powered hedge trimmers	60%	10%	15%	25%	16%
Other gasoline-powered equipment	7%	5%	8%	5%	6%
	N=15	N=40	N=13	N=40	N=32

Question: As I read each type of gasoline-powered lawn & garden equipment, please tell me if you currently use it to care for your home property.

Table 16b Type of Engine in Gasoline-Powered Lawn & Garden Equipment Used

	2-Stroke	4-Stroke	Don't Know
Gasoline-powered lawn mower (N=39)	38%	28%	33%
Gasoline-powered leaf blower or vacuum (N=26)	58%	15%	27%
Gasoline-powered chainsaw (N=19)	42%	16%	42%
Gasoline-powered string trimmer (N=17)	59%	12%	29%
Gasoline-powered hedge trimmers (N=15)	47%	27%	27%
Other gasoline-powered equipment (N=4)	25%	25%	50%

Question: Does that have a 2-stroke or a 4-stroke engine?

Table 16c Minutes Per Month Gasoline-Powered Lawn & Garden Equipment Used

	15 Minutes or Less	16-30 Minutes	31 Min-1 Hour	More Than 1 Hour
Gasoline-powered lawn mower (N=39)	13%	61%	18%	8%
Gasoline-powered leaf blower or vacuum (N=26)	46%	27%	23%	4%
Gasoline-powered chainsaw (N=19)	47%	21%	10%	21%
Gasoline-powered string trimmer (N=17)	41%	24%	24%	12%
Gasoline-powered hedge trimmers (N=15)	40%	20%	33%	7%
Other gasoline-powered equipment (N=4)	25%	50%	25%	0%

Question: In a typical month, how many minutes would you estimate that you use this piece of equipment?

Agreement With Various Statements Regarding PDEQ Programs and Air Pollution – As in prior studies, respondents were asked to agree or disagree with a variety of statements related to various PDEQ programs (including clean air and clean water).

PDEQ and Rideshare Awareness –

- **You are aware of the Pima County Department of Environmental Quality** (68% agreement, rebounding to 2014 levels [up from 60% in 2015]. Northwest residents, men, 46 to 55 year-olds and Telephone respondents [73% versus 63% Internet] are most apt to agree. As we have found in the past, 86% of those aware of the "Clean Air" Program also indicate an awareness of PDEQ [compared to 52% who are unaware of the program].)

- **You are aware of the services provided by Sun Rideshare** (58% agree, representing progressively higher agreement each year since 2013 [45%]. Agreement is highest in the Northwest zips and among Internet respondents [61% versus 54% Telephone] – as well as among 26 to 55 year-olds, non-Hispanics, the most formally educated and those aware of the "Clean Air" Program [72% versus 40% unaware].)

PDEQ Program and Campaign Awareness –

- **You have seen or heard information about the importance of keeping your tires properly inflated** (83% agree. This represents a slight decline from 2014 [90%] and 2015 [88%] levels. Still, recall is marginally lower only in the South zips [79% versus 83%-86% elsewhere], and highest among men, non-Hispanics, Telephone respondents [87% versus 79% Internet] and those familiar with the "Clean Air" Program [91% versus 76% unfamiliar].)

- **You are aware of the "Clean Water Starts With Me" campaign** (Agreement increased from 47% in 2014-2015 to 57% now – with agreement directly related to the perception of a progressively more severe stormwater pollution problem. Once again, campaign awareness is much higher among those familiar with the "Clean Air" Program [80% versus 30% unfamiliar]. There are few differences based on interview method or geography.)

- **You have seen or heard of the phrase "Keep Our Blue Skies Blue"** (48% agreement, up from 43% in the 2015 survey. Recall is lower only in the Central zips [40% versus 50%-54% elsewhere]. It is elevated among 16 to 45 year-olds, Hispanics and those who perceive a progressively more severe air quality problem. In addition, recall is significantly higher among those aware of the "Clean Air" Program [68% versus 27% who are not].)

- **You have seen or heard the phrase "Healthy Air Is in Our Hands"** (36% indicate agreement – up from 26% in 2015. There is recall regardless of geography [highest in the Northwest or South zips], gender or sample. Familiarity is directly related to

the perception of a progressively more severe air quality problem, and includes a majority of those aware of the "Clean Air" Program [54% versus 17% unaware].)

Air Pollution Evaluations –

- **You are aware that air pollution causes health problems** (Fully 96% agree with the statement, up slightly from last year [95%].)

- **You understand what an air pollution advisory means** (89% agree, tying the all-time mention recorded in 2013 [up from 85% in 2015].)

- **You are aware that the majority of our air pollution comes from motor vehicle use** (83% agree, highly consistent with the past three surveys [81%-82%]. Agreement is consistent regardless of geography, gender or sample. It is higher among those familiar with the "Clean Air" Program [88% versus 79% unfamiliar], as well as those who consider Tucson to have a progressively more severe air quality problem.)

- **You have seen or heard commercials on TV or radio regarding clean air or air pollution** (77% agreement – up from last year [66%], and nearly equal to the 2014 total [80%]. Again, recall is higher among Telephone respondents [83% versus 72% Internet] and those aware of the "Clean Air" Program [88% versus 68% unaware]. Northwest residents, men and higher income households are also more apt to have seen or heard commercials.)

- **You are aware of air pollution advisories in Pima County** (72% indicate awareness. This is up from last year's total [64%], but short of 2014 levels [78%]. Awareness is elevated among Northwest residents, those 46 or older, non-Hispanics and households impacted by a breathing-related medical condition. Similar to past studies, awareness is higher among those aware of the "Clean Air" Program [88%] than not [59%].)

- ***Because you want to reduce air pollution,* you are generally driving less** (Unchanged since last year, 58% agree. These tend to be South region residents, women and Internet respondents [64% versus 53% Telephone] – as well as those who perceive a progressively more serious air quality problem and are aware of the "Clean Air" Program [72% versus 44% unaware].)

Table 17 Agreement With Various Statements Regarding PDEQ Programs and Air Pollution

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
You are aware that air pollution causes health problems.*	–	–	98%	96%	98%	99%	94%	95%	**96%**
You understand what an air pollution advisory means.**	88%	83%	83%	79%	87%	89%	87%	85%	**89%**
You have seen or heard information about the importance of keeping your tires properly inflated.	–	–	–	–	–	–	90%	88%	**83%**
You are aware that the majority of our air pollution comes from motor vehicle use.	–	–	–	–	79%	81%	82%	82%	**83%**
You have seen or heard commercials on TV or radio regarding clean air or air pollution.	74%	75%	76%	69%	74%	68%	80%	66%	**77%**
You are aware of air pollution advisories in Pima County.***	74%	70%	74%	79%	75%	75%	78%	64%	**72%**
You are aware of the Pima County Department of Environmental Quality (PDEQ).****	45%	48%	65%	70%	69%	64%	68%	60%	**68%**
Because you want to *reduce air pollution*, you are generally driving less	–	–	–	55%	48%	53%	55%	58%	**58%**
You are aware of the services provided by Sun Rideshare.	–	–	–	–	48%	45%	49%	55%	**58%**
You are aware of the "Clean Water Starts With Me" campaign.	–	–	–	–	–	–	47%	47%	**57%**
You have seen or heard the phrase "Keep Our Blue Skies Blue."	–	–	–	–	–	–	–	43%	**48%**
You have seen or heard the phrase "Healthy Air Is in Our Hands."	–	–	–	–	–	–	–	26%	**36%**
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	N=500	**N=500**

	Area				Air Quality Problem			Sample	
	Central	South	North-west	East	Major	Moderate	Minor	Telephone	Internet
You are aware that air pollution causes health problems.*	97%	94%	96%	97%	96%	97%	97%	99%	93%
You understand what an air pollution advisory means.**	87%	85%	92%	96%	88%	92%	87%	92%	86%
You have seen or heard information about the importance of keeping your tires properly inflated.	86%	79%	84%	83%	78%	87%	84%	87%	79%
You are aware that the majority of our air pollution comes from motor vehicle use.	82%	85%	85%	82%	93%	86%	77%	82%	85%
You have seen or heard commercials on TV or radio regarding clean air or air pollution.	75%	72%	88%	73%	75%	84%	69%	83%	72%
You are aware of air pollution advisories in Pima County.***	71%	65%	81%	69%	76%	75%	69%	76%	68%
You are aware of the Pima County Department of Environmental Quality (PDEQ).****	64%	68%	75%	64%	68%	72%	64%	73%	63%
Because you want to *reduce air pollution*, you are generally driving less	56%	65%	55%	57%	73%	64%	34%	53%	64%
You are aware of the services provided by Sun Rideshare.	54%	54%	64%	60%	58%	63%	50%	54%	61%
You are aware of the "Clean Water Starts With Me" campaign.	53%	59%	59%	54%	62%	64%	38%	58%	55%
You have seen or heard the phrase "Keep Our Blue Skies Blue."	40%	50%	54%	51%	56%	51%	37%	49%	47%
You have seen or heard the phrase "Healthy Air Is in Our Hands."	32%	38%	40%	31%	45%	37%	28%	36%	35%
	N=154	N=136	N=133	N=77	N=89	N=276	N=105	N=250	N=250

* Was "You are aware that airborne dust causes health problems" (5/07-5/08).
** Was ""You understand what an air pollution advisory means, issued as part of an Air Quality Action Day" (6/03-5/08).
*** Was "in Tucson" (6/03-6/14).
**** Was "You are **knowledgeable** about the Pima County Department of Environmental Quality (PDEQ)" (6/03-5/06).

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

Travel Behavior for Shopping – Up from last year (50%), six of every ten indicate they generally **drive alone** for shopping. One of four **carpool with 1 to 4 other adults** (27%, down slightly from 29%), while others take the **bus** (5%, down from 9%), **walk** (unchanged at 4%), **bicycle** (1%, down from 3%) or **vanpool with 5 or more other adults** (1%, down slightly from 2%). Internet respondents are more apt to carpool (32% versus 23% of Telephone respondents) and less apt to drive alone (48% versus 71% of Telephone).

The incidence of driving alone for shopping is greater among Northwest or East area residents, those 46 or older and progressively higher income households. Meanwhile, carpooling for shopping is greater in the South zips, and is elevated among 16 to 25 year-olds and Hispanics. Central or South residents, men and 16 to 25 year-olds are more apt to take the bus.

Table 18 Travel Behavior for Shopping

	05/05 Total	05/06 Total	05/07 Total	05/15 Total	**05/16 Total**	Sample	
						Telephone	Internet
Drive alone	73%	77%	77%	50%	**60%**	71%	48%
Carpool with 1 to 4 other adults	20%	19%	18%	29%	**27%**	23%	32%
Bus	1%	1%	1%	9%	**5%**	3%	8%
Walk	3%	1%	1%	4%	**4%**	1%	7%
Bicycle	2%	1%	1%	3%	**1%**	0%	2%
Vanpool with 5 or more other adults	0%	0%	1%	2%	**1%**	0%	1%
Motorcycle	0%	0%	1%	1%	–	–	–
Take the streetcar	–	–	–	1%	–	–	–
Other	1%	–	0%	1%	**2%**	1%	3%

Question: What type of transportation do you generally use to go shopping?

Travel Behavior for Leisure Purposes – For leisure purposes ("such as dining out, meeting with friends, going to the movies, going to the gym, etc."), slightly more now **drive alone** (45%) rather than **carpool with 1 to 4 other adults** (44%). This is a reversal from what we found in 2015 (39% versus 43%, respectively). As we found last year, Internet respondents are especially apt to carpool (49% versus 35% drive alone), while the Telephone sample is more likely to drive alone (54%) than carpool (38%). In lesser numbers (and regardless of sample), others say they take the **bus** (3%, down from 6%), **walk** (3%, down slightly from 4%) or **bicycle** (unchanged at 2%) for leisure purposes.

Single passenger leisure travel is highest in the East zip codes, as well as among those who perceive a "minor" air quality problem (58%) and respondents unaware of the "Clean Air" Program (54% versus 38% of those aware). Carpooling for leisure purposes is higher in the South or Northwest regions, as well as among women, 16 to 25 year-olds and Hispanics. Central residents and lower income-types are more apt to take the bus

Table 18a Travel Behavior for Leisure Purposes

	05/05 Total	05/06 Total	05/07 Total	05/15 Total	**05/16 Total**	Sample	
						Telephone	Internet
Drive alone	56%	60%	60%	39%	**45%**	54%	35%
Carpool with 1 to 4 other adults	32%	30%	30%	43%	**44%**	38%	49%
Bus	2%	1%	2%	6%	**3%**	2%	5%
Walk	2%	3%	2%	4%	**3%**	1%	6%
Bicycle	4%	2%	2%	2%	**2%**	2%	2%
Vanpool with 5 or more other adults	1%	0%	1%	1%	**0%**	0%	0%
Motorcycle	0%	1%	1%	1%	**0%**	0%	0%
Take the streetcar	–	–	–	1%	–	–	–
Other	3%	–	–	2%	**2%**	1%	3%

Question: What type of transportation do 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 – Among the Telephone sub-sample, two of ten indicate that Tucson has a "major" air quality problem – up from the past few surveys (17%-18%). Among the 2016 Internet sub-sample, 16% perceive a "major problem," up from just 11%. Among the combined Internet-Telephone sample, this results in an overall 18% "major problem" response (up from 14% last year, but in line with 2011-2014 [17%-19%]). Overall, slightly fewer indicate that a "moderate problem" exists (from 57% in 2015 to 55% now), more often Internet respondents (63%) – while slightly fewer overall think it is a "minor" issue (from 24% to 21%).

Central or Northwest region residents, 36 to 65 year-olds, Hispanics and households impacted by a breathing-related medical condition are more apt to say that Tucson has a "major" air quality problem. So are those aware of the "Clean Air" Program (21% versus 15% unfamiliar) and residents who perceive there to be a "serious" stormwater pollution problem.

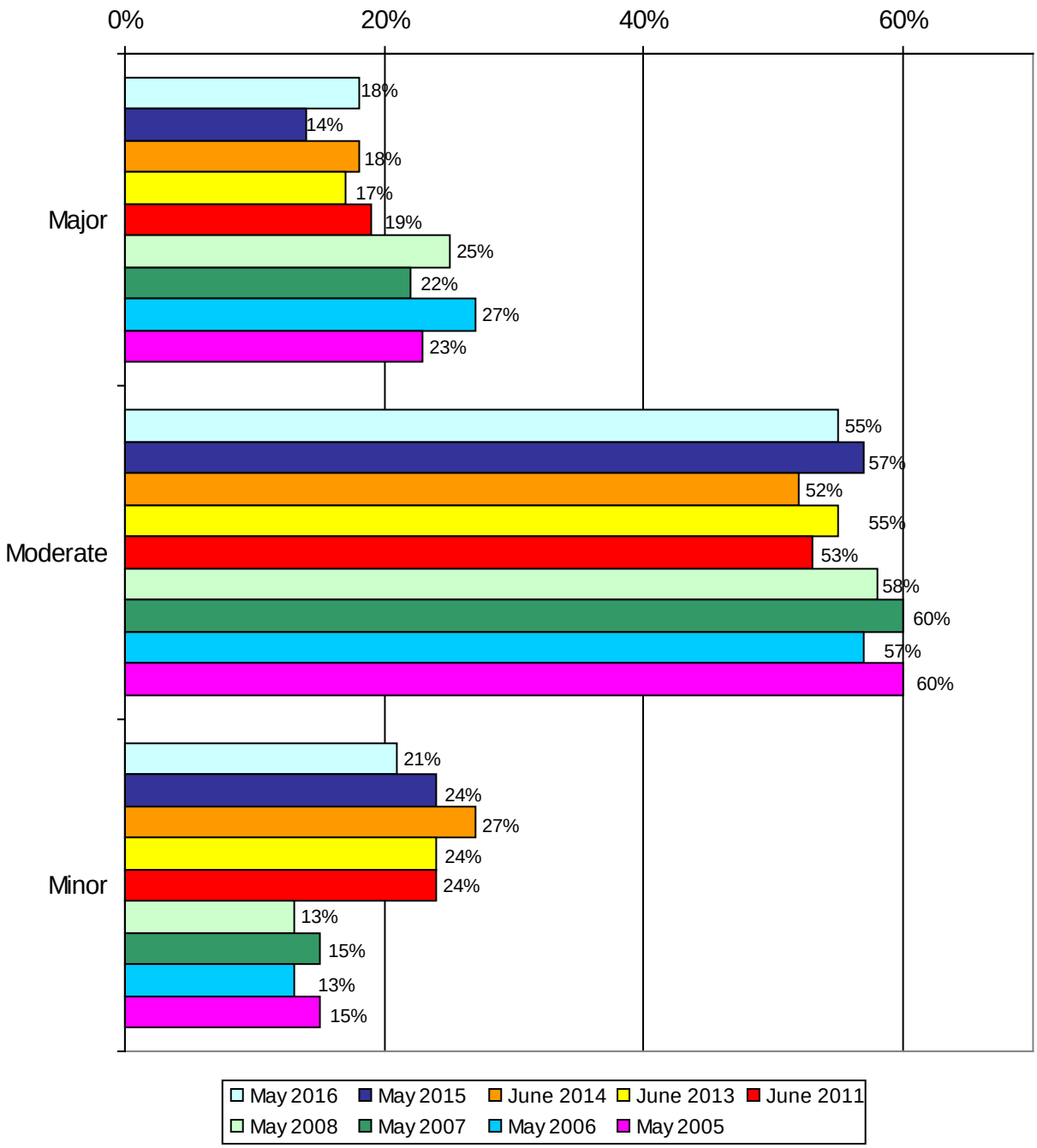
The perception of a "minor" air quality problem is greater in the East zips (27% versus 16%-23% elsewhere), and elevated among men, older (56+) respondents and those with a college degree or more.

Table 19 Perceived Seriousness of Air Quality Problem in Tucson Area

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
Major problem	23%	27%	22%	25%	19%	17%	18%	14%	**18%**	20%	16%
Moderate problem	60%	57%	60%	58%	53%	55%	52%	57%	**55%**	47%	63%
Minor problem	15%	13%	15%	13%	24%	24%	27%	24%	**21%**	27%	15%
Don't know	2%	3%	2%	4%	4%	5%	4%	4%	**6%**	6%	6%

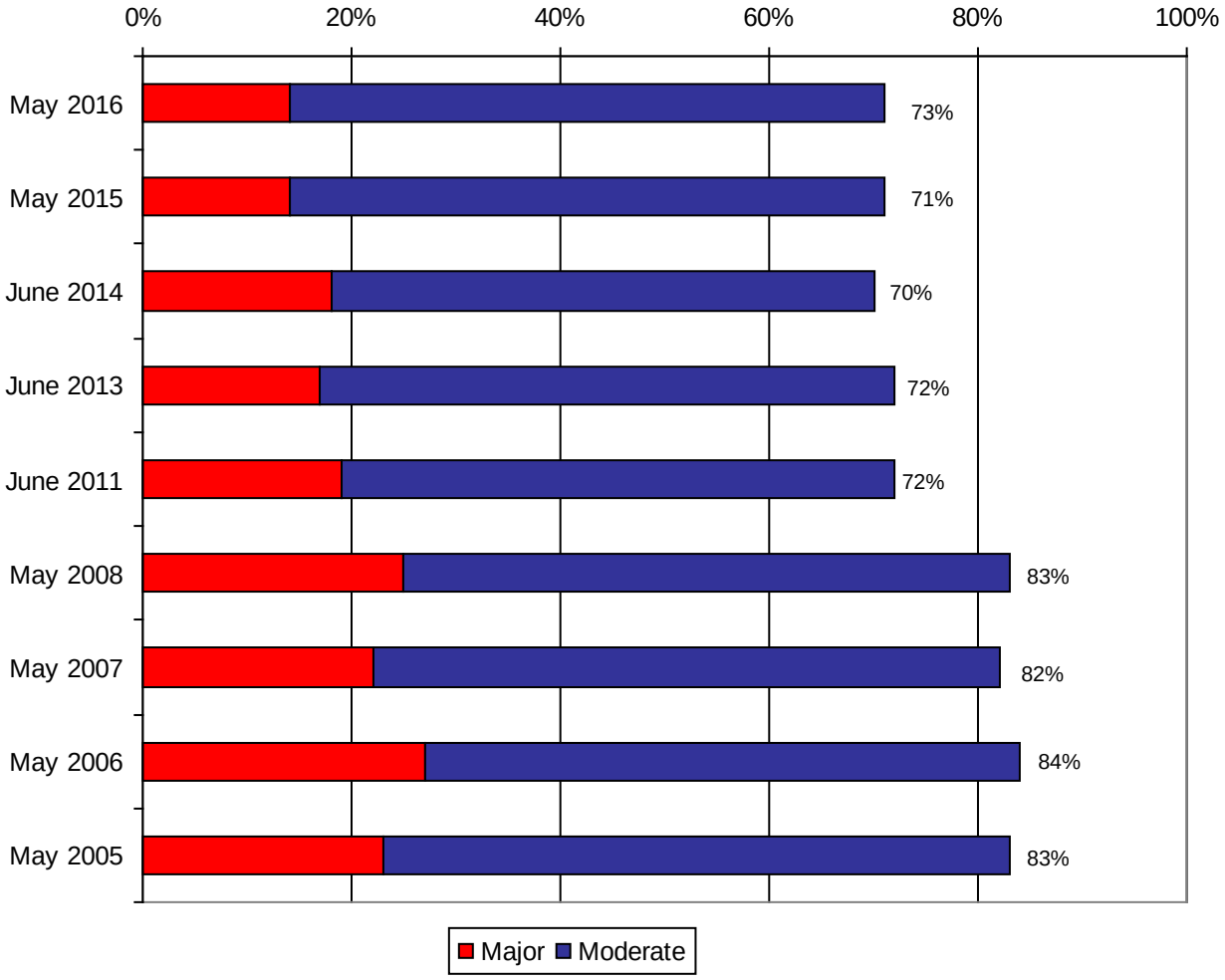
Question: How much of an air quality problem do you think exists in the Tucson area? Do you think this is a major problem, a moderate problem or a minor problem?

Display 19 Perceived Seriousness of Air Quality Problem in Tucson Area
(Among the Total Sample)



Display 19 **Perceived Seriousness of Air Quality Problem in Tucson Area**

Among the Total Sample – Sum of "Moderate" and "Major" Responses



Work Commuting Behavior

Employment Status – With respondents allowed to select more than one category of response, and consistent with the two previous studies (30% in 2014 and 31% in 2015), 29% in the 2016 survey say they are employed full-time (30 hours or more each week). Central (39%) or East (35%) zip code zone residents are more apt to be employed full-time (versus 21%-23% in the South and Northwest), as are men, 26 to 45 year-olds and those with a college degree or better. Another 12% report working part-time (less than 30 hours a week), essentially unchanged from last year (13%). Part-time employees are more apt to be Internet respondents and 35 or younger, with few differences based on geographic region. Another 8% say they are currently unemployed (down from 11%), more often those who reside in the South or Central regions.

Up from last year (26%), but consistent with 2014 (38%), 36% in the current survey indicate they are retired, more often those 65+, Telephone respondents and Northwest residents. Overall, 12% are homemakers (unchanged from last year). Another 8% report being students – down slightly from last year (11%).

Table 20

Employment Status
(Multiple Mentions Allowed)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Employed full-time (30 hours or more each week)	28%	34%	35%	29%	35%	27%	30%	31%	**29%**
Employed part- time (Less than 30 hours each week)	9%	11%	11%	12%	8%	11%	8%	13%	**12%**
A student	15%	11%	10%	9%	9%	9%	4%	11%	**8%**
Retired	33%	32%	31%	34%	35%	31%	38%	26%	**36%**
A homemaker	13%	12%	10%	12%	9%	13%	9%	12%	**12%**
Currently unemployed	6%	4%	4%	8%	6%	10%	11%	11%	**8%**
	N=502	N=502	N=503	N=402	N=403	N=504	N=502	N=500	**N=500**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Employed full-time (30 hours or more each week)	39%	21%	23%	35%	32%	32%	29%	23%	36%
Employed part-time (Less than 30 hours each week)	12%	15%	11%	10%	8%	13%	15%	10%	15%
A student	5%	15%	7%	4%	6%	10%	7%	8%	8%
Retired	29%	32%	47%	35%	38%	31%	43%	52%	19%
A homemaker	10%	12%	10%	16%	6%	12%	10%	6%	17%
Currently unemployed	10%	11%	7%	4%	14%	9%	2%	4%	12%
	N=154	N=136	N=133	N=77	N=89	N=276	N=105	N=250	N=250

Question: Are you one or more of the following...

Location of Place of Employment – Among those employed full-time or part-time (42% of the total sample), 15% work exclusively for a home-based business (basically unchanged from 14% last year). The remaining employees work outside the home for another company exclusively (78%) or in conjunction with a home-based business (7%). South or East area residents are more apt to work outside the home.

Table 21 Location of Place of Employment
(Among Those Employed)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Home-based business	17%	18%	17%	15%	15%	12%	22%	14%	**15%**
Another company	79%	78%	78%	82%	82%	84%	78%	78%	**78%**
Both	4%	4%	5%	4%	3%	4%	0%	7%	**7%**
	N=190	N=227	N=233	N=163	N=170	N=193	N=188	N=218	**N=209**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Home-based business	22%	2%	17%	14%	14%	12%	24%	22%	10%
Another company	72%	94%	67%	86%	66%	84%	72%	70%	84%
Both	6%	4%	15%	0%	20%	4%	4%	8%	6%
	N=79	N=49	N=46	N=35	N=35	N=123	N=46	N=82	N=127

Question: Do you operate a home-based business or are you an employee of another company?

Incidence of Telecommuting – One of four who work outside the home indicate that they telecommute ("working from home as an alternative to going in to your office or place of business during regular business hours") (26%), up from the four previous surveys (17%-19%). Most apt to telecommute are Northwest area residents, 36 to 45 year-olds and those with some graduate work or a graduate degree.

Table 22 Incidence of Telecommuting
(Among Those Who Work Outside the Home)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Yes	8%	4%	14%	9%	19%	19%	17%	18%	**26%**
No/Employer does not offer telecommuting/ Don't know/Not sure	92%	96%	86%	91%	81%	81%	83%	82%	**74%**
	N=157	N=185	N=193	N=139	N=144	N=170	N=146	N=187	**N=178**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Yes	24%	19%	47%	17%	17%	26%	34%	34%	22%
No/Employer does not offer telecommuting/ Don't know/Not sure	76%	81%	53%	83%	83%	74%	66%	66%	78%
	N=62	N=48	N=38	N=30	N=30	N=108	N=35	N=64	N=114

Question: Some employers offer the option of telecommuting – in other words, working from your home as an alternative to going in to your office or business location during regular business hours. 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 – Seven of ten telecommuters indicate that they do so more than once a week. This is up from 39% last year, but in line with 2014 findings (64%). Another 15% telecommute about once a week, and 11% report telecommuting 2-3 times a month. Just 2% say they telecommute only once a month.

Table 23 Frequency of Telecommuting
(Among Those Who Telecommute)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Sample	
										Telephone	Internet
More than once a week	46%	62%	52%	31%	26%	52%	64%	39%	**70%**	77%	64%
About once a week	23%	25%	15%	23%	33%	12%	8%	39%	**15%**	18%	12%
2 to 3 times a month	23%	12%	15%	31%	15%	21%	12%	12%	**11%**	0%	20%
Once a month	8%	0%	18%	15%	26%	15%	16%	3%	**2%**	0%	4%
	N=13	N=8	N=27	N=13	N=27	N=33	N=25	N=33	**N=47**	N=22	N=25

Question: How often do you typically telecommute (or work at home instead of driving to the office) – excluding working extra hours at home in your spare time?

Availability of "Compressed Workweek" Programs – Among those working outside the home, 32% indicate they have the option of a "compressed workweek" program. This is up from 2015 (27%) and 2014 (23%) findings, but in line with 2013 (32%). Residents of the Northwest and East regions, men and 36 to 45 year-olds are more likely to say they have a compressed workweek program available to them.

Table 24 Availability of "Compressed Workweek" Programs
(Among Those Who Work Outside the Home)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Yes	31%	35%	31%	27%	33%	32%	23%	27%	**32%**
No	69%	65%	69%	73%	67%	68%	77%	73%	**68%**
	N=157	N=185	N=193	N=139	N=144	N=170	N=146	N=187	**N=178**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Yes	26%	23%	47%	37%	33%	31%	37%	36%	29%
No	74%	77%	53%	63%	67%	69%	63%	64%	71%
	N=62	N=48	N=38	N=30	N=30	N=108	N=35	N=64	N=114

Question: Does your employer either require or offer any form of "COMPRESSED WORKWEEK"? For example, working four 10-hour days each week, rather than five 8-hour days.

Current Work Schedule – Up from the last two years (56% each), but consistent with 2013 findings (67%), 65% of full-time employees in the current survey say they work a "standard" schedule (8 hour days five days a week). Another 12% work a 10 hour day, 4 days a week (down from 14% last year), while 6% indicate working either a 12 hour day, 3 or 4 days a week (3%, down from 6%) or working 80 hours over 9 days, with the 10th day off (3%, down slightly from 4% in 2015). Overall, 17% indicate some "other" workweek options or say their workweek varies – consistent with last year (20%). Northwest residents are more apt to utilize compressed workweek options.

Table 25 Current Work Schedule
(Among Those Employed Full-Time)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
8 hour day, 5 days a week	68%	62%	68%	64%	72%	67%	56%	56%	**65%**
10 hour day, 4 days a week	6%	6%	6%	11%	10%	9%	10%	14%	**12%**
12 hour day, 3 or 4 days a week	2%	10%	7%	6%	5%	2%	5%	6%	**3%**
80 hours over 9 days with the 10th day off	3%	1%	3%	3%	2%	3%	4%	4%	**3%**
Varies/Other	21%	20%	17%	16%	11%	19%	26%	20%	**17%**
	N=121	N=138	N=146	N=100	N=118	N=125	N=115	N=133	**N=130**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
8 hour day, 5 days a week	62%	72%	59%	70%	73%	66%	52%	65%	66%
10 hour day, 4 days a week	13%	10%	18%	4%	8%	10%	20%	15%	10%
12 hour day, 3 or 4 days a week	2%	0%	4%	7%	12%	1%	0%	0%	5%
80 hours over 9 days with the 10th day off	2%	3%	7%	0%	0%	3%	8%	6%	1%
Varies/Other	21%	14%	11%	18%	8%	20%	20%	15%	18%
	N=47	N=29	N=27	N=27	N=26	N=77	N=25	N=48	N=82

Question: Which of the following most closely describes your current work schedule?

Daily Usage of Transportation Methods for Traveling To and From Work or School – As in past 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 use each one to travel to and from work or school. A summary of the data from this question series (including tracking data) is included in Table 26-S, with detailed daily usage in Table 26-D.

Consistent with last year, and tied for the lowest total to-date, seven of ten utilize **single passenger commuting to work or school** – with little difference based on survey methodology. The average frequency of use is 4.4, up slightly from last year (4.3), but still somewhat lower than 2011-2014 levels (4.5 each). Northwest area residents are most likely to drive alone at least one day a week (83%), while East area residents are *least* apt to drive alone 5+ days a week (36% versus 43%-46% in other regions).

Other commute travel methods measured by this survey include:

- **Carpool/Vanpool** (Unchanged from 2015, 24% say they carpool or vanpool at least one day per week. Average frequency has dipped only slightly from last year [from 3.6 to 3.5 days]. The incidence of carpooling remains greater in the Northwest and South areas.)

- **Walk to work or school** (The share who walk to work or school has increased slightly [from 21% to 24%], but with a decrease in average days [from 3.5 days to 2.8]. Still, this average is higher than in 2014 [2.3]. Consistent with last year, Central or South area residents are most likely to walk to work or school.)

- **Work at home instead of driving to work** (Telecommuting has increased to its highest recorded level [24%, up from 14%], while frequency of usage has returned to 2014 levels [3.4, up from 2.5 last year]. Northwest residents are especially apt to telecommute [47%].)

- **Ride the bus to work or school** (Bus ridership has remained virtually unchanged at 13%. The average days using this method has increased from 3.8 last year to 4.4. Internet respondents are more apt to take the bus, as are Central area residents.)

- **Ride a bike to work or school** (There has been a slight decline in the share riding bikes to work or school [from 12% to 10%] and frequency of doing so [from 2.8 days to 2.4]. South and East area residents and 16 to 25 or 36 to 45 year-olds are more apt to ride a bike to work or school.)

- **Take the streetcar to work or school** (Compared to last year, slightly fewer take the streetcar [from 5% to 4%], and those who do so take it less often [from 2.2 days to 1.8 days].)

- **Ride a motorcycle to work or school** (Fewer are riding a motorcycle to work or school [from 4% to 2%], and less frequently [from 2.3 days to 1.4 days].)

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

Travel Method	2005 Usage* (N=210)	2005 Average Frequency	2006 Usage* (N=219)	2006 Average Frequency	2007 Usage* (N=229)	2007 Average Frequency
Drive alone	77%	4.3 days	81%	4.4 days	78%	4.1 days
Carpool/Vanpool	24%	3.6 days	24%	4.4 days	30%	3.4 days
Walk to work	15%	3.9 days	9%	3.2 days	14%	3.6 days
Work at home instead of driving to work	8%	3.2 days	6%	3.5 days	10%	2.7 days
Take the bus	8%	4.0 days	6%	3.9 days	7%	3.8 days
Ride a bike	13%	3.3 days	6%	2.8 days	9%	2.8 days
Ride a motorcycle	3%	2.8 days	3%	4.2 days	2%	3.6 days

Travel Method	2008 Usage* (N=159)	2008 Average Frequency	2011 Usage* (N=171)	2011 Average Frequency	2013 Usage* (N=205)	2013 Average Frequency
Drive alone	74%	4.7 days	84%	4.5 days	79%	4.5 days
Carpool/Vanpool	22%	3.9 days	28%	4.0 days	26%	3.9 days
Walk to work	14%	3.4 days	15%	4.0 days	12%	3.7 days
Work at home instead of driving to work	12%	3.2 days	9%	3.3 days	15%	3.5 days
Take the bus	11%	3.7 days	5%	3.1 days	9%	3.8 days
Ride a bike	8%	3.5 days	7%	3.7 days	9%	2.1 days
Ride a motorcycle	1%	1.0 days	2%	2.7 days	5%	2.6 days

Travel Method	2014 Usage* (N=162)	2014 Average Frequency	2015 Usage* (N=226)	2015 Average Frequency	**2016 Usage* (N=203)**	**2016 Average Frequency**
Drive alone	83%	4.5 days	70%	4.3 days	**70%**	**4.4 days**
Carpool/Vanpool	10%	3.1 days	24%	3.6 days	**24%**	**3.5 days**
Walk to work	6%	2.3 days	21%	3.5 days	**24%**	**2.8 days**
Work at home instead of driving to work	7%	3.5 days	14%	2.5 days	**24%**	**3.4 days**
Take the bus	10%	3.1 days	14%	3.8 days	**13%**	**4.4 days**
Ride a bike	1%	1.5 days	12%	2.8 days	**10%**	**2.4 days**
Take the streetcar	–	–	5%	2.2 days	**4%**	**1.8 days**
Ride a motorcycle	7%	2.3 days	4%	2.3 days	**2%**	**1.4 days**

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

Table 26-D Detailed Daily Usage and Tracking of Transportation Methods for Traveling To and From Work or School
(Among Those Working Outside the Home or Going to School)

	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area				Awareness of "Clean Air" Program	
								Central	South	North-west	East	Yes	No
Take the bus													
Not at all	93%	89%	95%	91%	90%	86%	**87%**	80%	88%	96%	87%	86%	88%
1-4 days/week	4%	6%	4%	5%	8%	7%	**5%**	9%	3%	2%	3%	5%	4%
5 days/week	3%	3%	2%	2%	1%	4%	**5%**	8%	5%	2%	6%	6%	5%
6+ days/week	1%	2%	0%	2%	1%	3%	**2%**	3%	3%	0%	3%	3%	3%
Ride a motorcycle													
Not at all	98%	99%	98%	95%	93%	96%	**98%**	98%	97%	98%	97%	97%	99%
1-4 days/week	1%	1%	1%	4%	7%	3%	**2%**	2%	3%	2%	3%	3%	1%
5 days/week	1%	0%	1%	1%	1%	0%	**0%**	0%	0%	0%	0%	0%	0%
6+ days/week	0%	0%	0%	0%	0%	0%	**0%**	0%	0%	0%	0%	0%	0%
Ride a bike													
Not at all	91%	92%	93%	91%	99%	88%	**90%**	92%	85%	96%	87%	86%	95%
1-4 days/week	6%	5%	6%	8%	1%	8%	**8%**	6%	13%	4%	6%	11%	5%
5 days/week	3%	2%	0%	1%	0%	1%	**2%**	2%	2%	0%	6%	4%	0%
6+ days/week	0%	1%	1%	0%	0%	2%	**0%**	0%	0%	0%	0%	0%	0%
Walk													
Not at all	86%	86%	85%	88%	94%	79%	**76%**	73%	69%	83%	84%	74%	79%
1-4 days/week	11%	9%	9%	7%	6%	14%	**17%**	14%	28%	15%	6%	17%	17%
5 days/week	0%	3%	1%	3%	0%	4%	**4%**	8%	0%	2%	6%	4%	4%
6+ days/week	4%	2%	4%	1%	0%	4%	**3%**	5%	3%	0%	3%	4%	0%
Work at home instead of driving to work													
Not at all	90%	88%	91%	85%	93%	86%	**76%**	78%	84%	53%	90%	73%	81%
1-4 days/week	8%	8%	5%	9%	4%	11%	**14%**	8%	7%	38%	3%	17%	8%
5 days/week	1%	2%	3%	4%	2%	1%	**7%**	11%	8%	2%	6%	5%	9%
6+ days/week	0%	1%	1%	1%	1%	2%	**3%**	3%	2%	6%	0%	4%	1%
Take the streetcar													
Not at all	–	–	–	–	–	95%	**96%**	92%	97%	100%	97%	96%	97%
1-4 days/week	–	–	–	–	–	5%	**4%**	8%	3%	0%	3%	4%	3%
5 days/week	–	–	–	–	–	0%	**0%**	0%	0%	0%	0%	0%	0%
6+ days/week	–	–	–	–	–	0%	**0%**	0%	0%	0%	0%	0%	0%
	N=229	N=159	N=171	N=205	N=162	N=226	**N=203**	N=64	N=61	N=47	N=31	N=111	N=75

-Table 26-D continued on next page-

Table 26-D (Cont'd)

	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area				Awareness of "Clean Air" Program	
								Central	South	North-west	East	Yes	No
Drive or ride with people age 16 or older in a carpool													
Not at all	70%	78%	72%	74%	90%	76%	**76%**	83%	72%	68%	81%	76%	76%
1 day/week	4%	2%	2%	1%	1%	5%	**5%**	5%	3%	11%	3%	8%	3%
2 days/week	7%	3%	4%	4%	4%	2%	**4%**	5%	2%	4%	6%	5%	1%
3 days/week	4%	2%	3%	4%	1%	4%	**4%**	0%	8%	8%	0%	6%	1%
4 days/week	6%	3%	5%	5%	1%	2%	**2%**	3%	2%	2%	0%	1%	3%
5 days/week	9%	11%	12%	10%	4%	7%	**4%**	2%	8%	2%	6%	3%	7%
6+ days/week	0%	1%	2%	2%	0%	3%	**4%**	3%	5%	4%	3%	1%	9%
Drive alone													
Not at all	22%	26%	16%	21%	17%	30%	**30%**	36%	33%	17%	32%	35%	24%
1 day/week	5%	2%	4%	6%	4%	6%	**8%**	9%	7%	6%	10%	10%	7%
2 days/week	6%	4%	7%	5%	2%	5%	**7%**	5%	7%	13%	6%	4%	13%
3 days/week	11%	8%	6%	10%	11%	8%	**4%**	0%	5%	8%	6%	5%	4%
4 days/week	17%	12%	15%	10%	11%	10%	**8%**	6%	7%	11%	10%	6%	7%
5 days/week	31%	38%	41%	33%	47%	30%	**27%**	33%	23%	26%	23%	30%	23%
6+days/week	7%	11%	12%	16%	8%	11%	**16%**	11%	20%	20%	13%	10%	23%
	N=229	N=159	N=171	N=205	N=162	N=226	**N=203**	N=64	N=61	N=47	N=31	N=111	N=75

Question: During a typical week, how many days do you typically use each of the following travel methods to get to and from work or school?

2016 Estimated Number of Daily Commuter Miles Saved Through Alternate Modes – 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 Employment and Population Statistics) to provide an estimate of the number of vehicle miles saved daily through the use of alternative methods of transportation. 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 4,242,773 vehicle miles per day – or 38% of total miles driven/not driven.** As summarized in the tracking display below, the percentage of miles saved has increased from 34% in 2015 to 38% in 2016.

While the percentage of miles saved through the use of alternate modes has increased from 34% to 38%, the actual number of vehicle miles saved daily has increased by 10% (from 3,840,196 to 4,242,773) – primarily due to the increase in some reported alternate modes (particularly telecommuting), as well as increases in frequency of usage of these alternate modes.

Table 26-T Tracking Summary of Estimated Number of Daily Commuter Miles Saved Through Alternate Modes

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
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%
2014	401,281	83%	15.0	11,461,091	1,780,430	16%
2013	449,057	79%	11.6	9,977,822	3,195,589	32%
2011	419,555	84%	14.8	10,915,750	2,739,932	25%
2008	439,394	74%	11.9	9,695,554	2,864,682	30%
2007	437,911	78%	11.4	9,162,668	2,796,391	30%
2006	423,986	81%	11.2	9,276,739	2,477,921	27%
2005	422,141	77%	13.3	9,448,097	2,317,878	25%
2004	429,532*	84%	14.9	11,560,391	2,483,773	21%

* Based on May, 2004 DES estimates to allow for direct year-to-year tracking.

Table 26-1 2016 Estimated Number of Daily Commuter Miles Saved Through Alternative Modes (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)	(70%) 308,924	4.38x2=8.76	2,706,174	5.8	466,582	13.4	6,252,199	6,252,199	-0-
Motorcycle	(2%) 8,826	1.40x2=2.80	24,713	5.8	4,261	6.0	25,566	25,566	-0-
Alternative Modes:									
Carpool	(24%) 105,917	3.49x2=6.98	739,301	5.8	127,466	13.3	1,695,298	652,038	1,043,260
Bus	(13%) 57,372	4.42x2=8.84	507,168	5.8	87,443	5.9	515,914	14,740	501,174
Bike	(10%) 44,132	2.45x2=4.90	216,247	5.8	37,284	7.5	279,630	-0-	279,630
Walk	(24%) 105,917	2.78x2=5.56	588,899	5.8	101,534	5.6	568,590	-0-	568,590
Streetcar	(4%) 17,653	1.75x2=3.50	61,786	5.8	10,653	6.7	71,375	-0-	71,375
Telecommute	(24%) 105,917	3.43x2=6.86	726,591	5.8	125,274	11.7	1,465,706	-0-	1,465,706
Compressed workweek	(11%) 48,545	1.00x2=2.00	97,090	5.8	16,740	18.7	313,038	-0-	313,038
					977,237		11,187,316		4,242,773

(A) # employed persons in Pima County (est. @ 381,700 as of April, 2016 by Arizona Office of Employment & Population Statistics) x % non-home-based employees (85%) (Table 21) + # students 16+ (est. 116,875 in 2014 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 113 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 (2.6) 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 – Consistent with last year, the share who say **single-passenger vehicle commuting** is their ***most-used*** method of commuting is 61%, up slightly from last year (58%). Primary use of single-passenger commuting is lower among Central or South region residents and 16 to 25 year-olds, while Northwest respondents are particularly reliant on driving alone (72%). Those with household incomes over $40,000 and 26 to 35 year-olds are also more apt to primarily use single-passenger commuting.

Consistent with the increase in overall **telecommuting**, this year also has the highest share of those who say they are doing so most often (11%, up from 5%), particularly 36 to 55 year-olds. Consistent with last year, 11% are **carpooling** most often. These are more apt to be South area residents and women. **Bus riding** is also consistent with last year at 9%, with greater primary usage among Central area residents and men.

Fewer primarily utilize **walking** as their most-used mode (from 9% to 4%).

In lesser numbers, others indicate that **riding a bike** (unchanged at 3%) is their primary mode of commuting to work or school. No one in the current survey specified **riding a motorcycle** or **taking the streetcar** as their primary mode.

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

	5/05 Total	5/06 Total	5/07 Total	5/08 Total	6/11 Total	6/13 Total	6/14 Total	5/15 Total	**5/16 Total**
Drive alone	64%	66%	66%	70%	71%	66%	80%	58%	**61%**
Work at home instead of driving to work	2%	3%	3%	6%	4%	8%	4%	5%	**11%**
Drive or ride in a carpool	14%	16%	17%	11%	10%	12%	5%	12%	**11%**
Take the bus	7%	6%	4%	6%	2%	6%	6%	8%	**9%**
Walk	7%	4%	5%	4%	8%	5%	2%	9%	**4%**
Ride a bike	5%	2%	4%	3%	4%	1%	1%	3%	**3%**
Ride a motorcycle	1%	3%	2%	–	1%	2%	2%	2%	–
Take the streetcar	–	–	–	–	–	–	–	2%	–
	N=210	N=219	N=229	N=159	N=171	N=205	N=162	N=226	**N=203**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Drive alone	56%	56%	72%	64%	64%	60%	68%	63%	60%
Work at home instead of driving to work	16%	8%	13%	6%	0%	8%	25%	17%	8%
Drive or ride in a carpool	6%	16%	11%	10%	18%	10%	5%	5%	14%
Take the bus	12%	10%	4%	10%	12%	11%	2%	7%	11%
Walk	6%	3%	0%	6%	6%	5%	0%	1%	6%
Ride a bike	3%	7%	0%	3%	0%	6%	0%	7%	2%
	N=64	N=61	N=47	N=31	N=33	N=124	N=40	N=76	N=127

Question: During a typical week, how many days 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.)

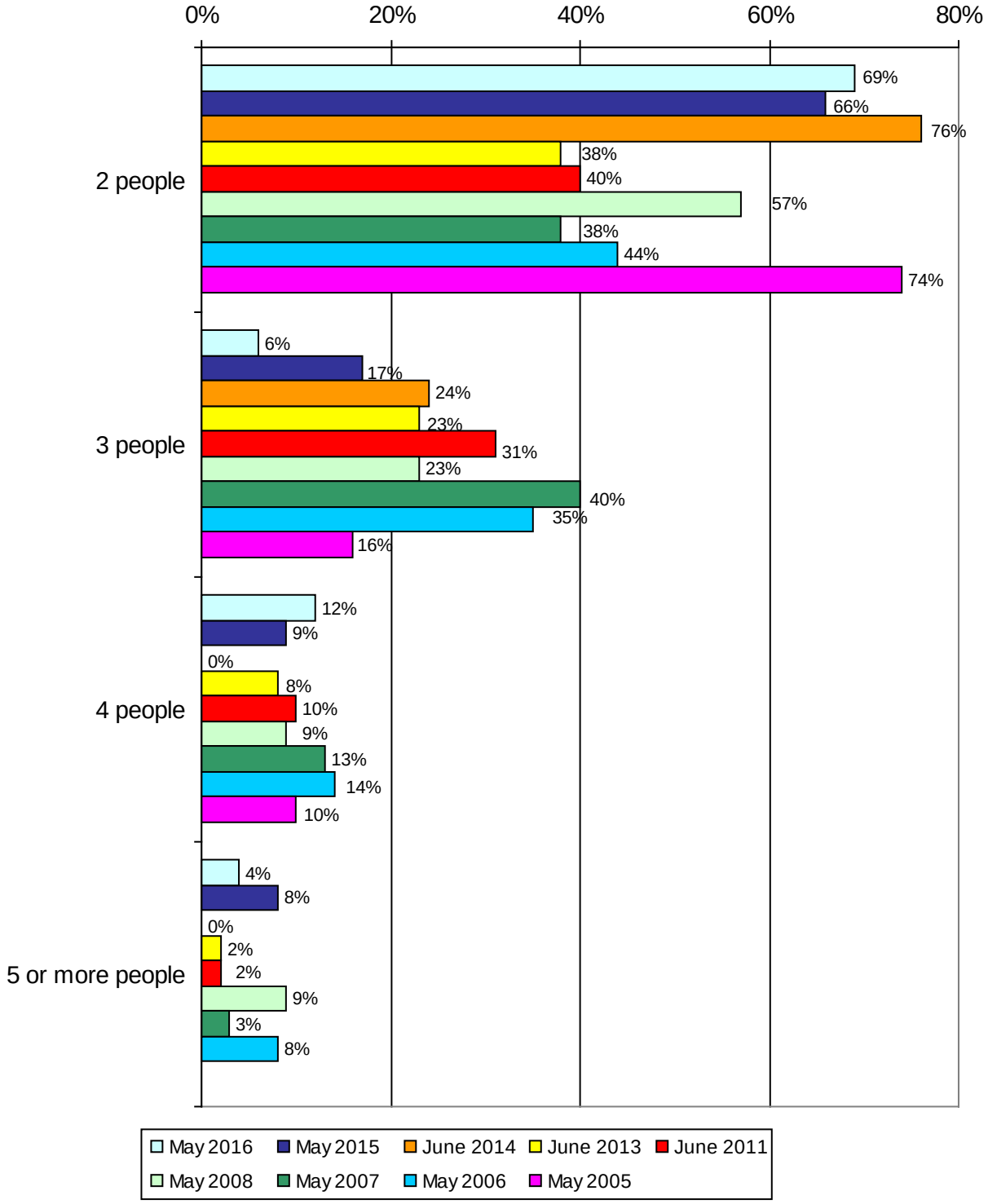
Size of Work or School Commute Carpool – Among carpoolers, a few more are travelling to work or school in a 2-person carpool (from 66% in 2015 to 69%) – although this is still fewer than in 2014 (76%). Others are commuting in carpools of 3 people (6%, down from 17%), 4 people (12%, up from 9%) or 5 or more people (4%, down from 8%). Overall, 8% say their carpool size varies. Among those who cite a carpool size, the average remains unchanged from last year at 2.6 (an increase over 2.2 in 2014).

Table 26b Size of Work or School Commute Carpool
(Among Those Who Carpool)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
2 people	74%	44%	38%	57%	40%	38%	76%	66%	**69%**
3 people	16%	35%	40%	23%	31%	23%	24%	17%	**6%**
4 people	10%	14%	13%	9%	10%	8%	0%	9%	**12%**
5 or more people	–	8%	3%	9%	2%	2%	0%	8%	**4%**
Varies	–	–	6%	3%	17%	30%	0%	0%	**8%**
	N=51	N=52	N=68	N=35	N=48	N=53	N=17	N=53	**N=49**

Question: Including yourself, how many people are typically in your carpool?

Display 26b Size of Work or School Commute Carpool
(Among Those Who Carpool)



Miles Traveled to Work or School – Once again, work commute distances skew shorter than last year, with distances more consistent with 2007-2008 findings. As reflected in Table 26c, one-third say they have a commute of 5 miles or less (35%, up from 31% in 2015), while another three of ten indicate their commute is between 6 and 10 miles (29%, up from 26%). Another 8% report travelling 11 to 14 miles (up slightly from 7%). One of four indicate they travel 15 miles or more (27%, down from 33%). As we saw last year, Telephone respondents tend to have longer commute distances than Internet respondents. Geographically, South (34%) and Northwest (32%) area residents are more apt to have a commute of 15+ miles, while seven of ten Central (70%) or East (67%) residents travel 10 miles or less.

Table 26c Miles Traveled to Work or School
(Among Those Working Outside the Home or Going to School)

	05/05 Total	05/06 Total	05/07 Total	05/08 Total	06/11 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
5 miles or less	33%	35%	36%	34%	27%	29%	14%	31%	**35%**
6 to 10 miles	20%	24%	25%	26%	28%	32%	26%	26%	**29%**
11 to 14 miles	3%	10%	5%	4%	6%	10%	9%	7%	**8%**
15 or more miles	32%	29%	28%	24%	38%	23%	41%	33%	**27%**
Don't know/Not sure	12%	4%	6%	11%	2%	5%	9%	3%	**2%**
	N=210	N=219	N=229	N=159	N=169	N=203	N=162	N=222	**N=203**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
5 miles or less	42%	26%	28%	48%	27%	34%	42%	28%	39%
6 to 10 miles	28%	30%	34%	19%	39%	29%	15%	24%	31%
11 to 14 miles	10%	10%	6%	3%	9%	9%	6%	10%	6%
15 or more miles	17%	34%	32%	22%	24%	26%	32%	33%	23%
Don't know/Not sure	3%	0%	0%	6%	0%	2%	5%	5%	0%
	N=64	N=61	N=47	N=31	N=33	N=124	N=40	N=111	N=75

Question: Approximately how many miles do you travel one-way from your home to the place where you work or go to school?

Reasons for Driving Alone To and From Work or School – As in previous surveys, respondents who commute in a single occupant vehicle at least one day a week were asked to explain why. Like last year, for Telephone respondents this was an unaided question, while Internet respondents were provided a list of responses to choose from.

Identical to 2015 (32%), one-third say that **"convenience"** is the reason they drive alone. This remains especially true among Internet respondents (who were offered an aided list to choose from), as well as residents of the Central region and those who think the air quality problem in Pima County is only minor. Unchanged from last year, **"irregular work hours"** remains a close second at 30%. Irregular work hours has some elevated mention among Northwest or East respondents, with little difference based on sample methodology. Another one of four indicate that **"no one to carpool with"** is the reason they drive alone (25%, down slightly from 26%), more often Telephone respondents and Central or South zip code residents.

Up from last year (15%), 19% say they **"need their car for business,"** while 17% (up from 11%) cite **"personal errands."** Telephone respondents and South or Northwest area residents are more apt to use their car for business, while personal errands are cited more often among Internet respondents and Northwest residents.

Down from 16% last year, 13% now say that they **"like to drive alone"** – lower only among East area residents, and greater among Telephone respondents. Meanwhile, more now cite a **"child drop off"** (12%, up from 7%), especially Northwest area residents and Internet respondents.

Less than one of ten say there is **"no bus service in the area"** (7%, down slightly from 8%) or they **"work overtime"** (6%, up from 2%). South region residents are more apt to cite a lack of bus service, while working overtime is more common among the Northwest residents.

Table 26d Reasons for Driving Alone To and From Work or School
(Among Single-Car Commuters)

	05/05 Total	05/06 Total	05/07 Total	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**
Convenience	32%	30%	32%	33%	20%	32%	**32%**
Irregular work hours	18%	19%	23%	25%	27%	30%	**30%**
No one to carpool with	27%	24%	24%	24%	27%	26%	**25%**
Need car for business	6%	15%	15%	12%	9%	15%	**19%**
Personal errands	7%	3%	7%	7%	2%	11%	**17%**
Like to drive alone	5%	12%	7%	9%	25%	16%	**13%**
Child drop off	4%	1%	4%	6%	2%	7%	**12%**
No bus service in area	11%	6%	8%	4%	13%	8%	**7%**
Work overtime	–	–	–	–	–	2%	**6%**
Other	8%	7%	6%	4%	2%	6%	**5%**
	N=161	N=177	N=178	N=162	N=135	N=157	**N=142**

	Area				Air Quality Problem			Sample	
	Central	South	Northwest	East	Major	Moderate	Minor	Telephone	Internet
Convenience	44%	24%	28%	29%	32%	28%	43%	26%	35%
Irregular work hours	27%	29%	33%	33%	14%	35%	30%	30%	31%
No one to carpool with	32%	29%	15%	24%	7%	28%	33%	28%	24%
Need car for business	7%	27%	26%	14%	21%	21%	13%	22%	17%
Personal errands	17%	10%	31%	5%	21%	18%	10%	11%	20%
Like to drive alone	12%	15%	15%	5%	7%	11%	20%	17%	10%
Child drop off	5%	10%	20%	14%	4%	20%	0%	6%	16%
No bus service in area	2%	15%	8%	0%	7%	8%	3%	4%	9%
Work overtime	7%	2%	10%	0%	11%	5%	3%	6%	6%
Other	7%	7%	0%	5%	14%	2%	3%	9%	2%
	N=41	N=41	N=39	N=21	N=28	N=82	N=30	N=54	N=88

Question: What is the main reason you drive alone?

Stormwater Perceptions and Practices

Perception of Where Stormwater That Flows Into Tucson Storm Drains Ends Up – As in prior surveys, survey respondents were told that "streets in the Tucson are equipped with storm drains." Immediately after, respondents were asked (to the best of their knowledge, unaided for the Telephone sample and aided for the Internet sample) where water that flows into these storm drains ends up. Allowing for multiple responses, ranked responses include:

- **River or wash** (46%, highly consistent with 2015 findings [45%]. These tend to be East region residents, men, Internet respondents [52% versus 40% Telephone] and progressively lower income types.)

- **Groundwater** (20%, up progressively from 2015 [15%] and 2014 [8%] results. Again, these are more apt to be Internet respondents [31% versus 8% Telephone] – along with those who perceive at least a "moderate" stormwater pollution problem.)

- **Sewage plants** (11%, unchanged over the last three surveys [with few differences based on sample]. Northwest residents are more likely to think stormwater that flows into a storm drain ends up in a sewage plant.)

- **Water plants** (7%, no change since 2015 – typically Internet respondents [11% versus 3% of Telephone].)

- **Canals** (7%, identical to last year. More often Northwest residents and Internet respondents [10% versus 3% Telephone].)

Down from one-third in the previous three studies, 29% in the current survey say they **do not know** where stormwater that flows into storm drains ends up – including a significant share of both Telephone (32%) and Internet (25%) respondents. Who else is not sure? South residents, women, the oldest respondents (66+), the newest or part-year Pima County residents and those who think that stormwater pollution is "not a problem."

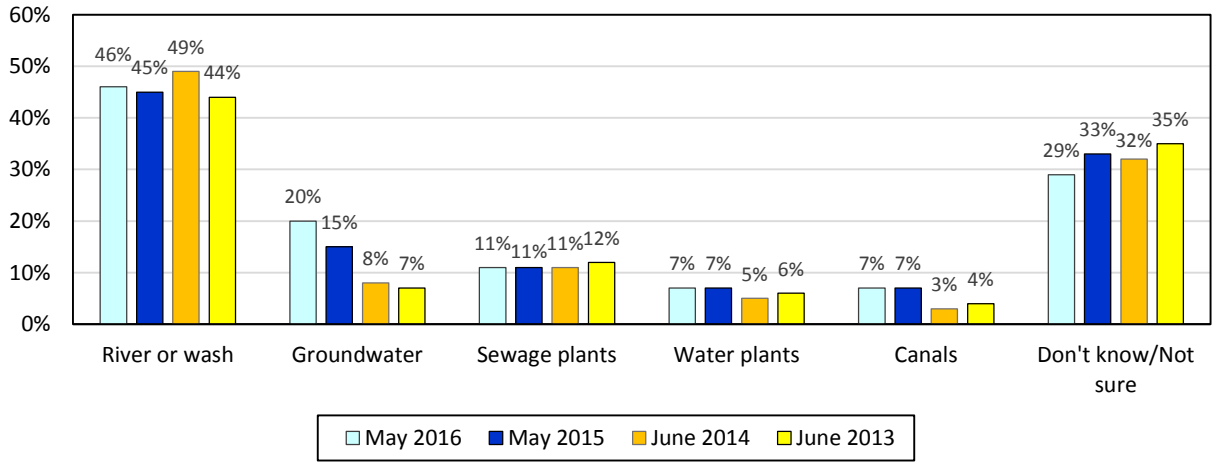
Table 27 Perception of Where Stormwater That Flows Into Tucson Storm Drains Ends Up

	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area			
					Central	South	North-west	East
River or wash	44%	49%	45%	**46%**	44%	42%	44%	60%
Groundwater	7%	8%	15%	**20%**	21%	17%	17%	25%
Sewage plants	12%	11%	11%	**11%**	8%	10%	17%	8%
Water plants	6%	5%	7%	**7%**	6%	8%	5%	9%
Canals	4%	3%	7%	**7%**	4%	6%	11%	5%
Don't know/Not sure	35%	32%	33%	**29%**	30%	38%	24%	18%
	N=504	N=502	N=500	**N=500**	N=154	N=136	N=133	N=77

	Stormwater Pollution Problem			Sample	
	Not a Problem	Moderate Problem	Serious Problem	Telephone	Internet
River or wash	47%	43%	48%	40%	52%
Groundwater	4%	21%	23%	8%	31%
Sewage plants	9%	12%	11%	10%	12%
Water plants	7%	8%	6%	3%	11%
Canals	4%	9%	6%	3%	10%
Don't know/Not sure	40%	30%	24%	32%	25%
	N=57	N=245	N=198	N=250	N=250

Question: 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 27 Perception of Where Stormwater That Flows Into Tucson Storm Drains Ends Up



Low Impact Development Practices Implemented/Installed at Home or Business – Survey participants were again provided a listing of seven different Low Impact Development (LID) practices asked if each one has been implemented at their home or business. Results are summarized in Table 28.

- **Landscaping with native plants** (Unchanged from 52% last year. Again, these tend to be Telephone respondents [59% versus 44%] – as well as higher income households and those who perceive a "serious" stormwater pollution problem. Implementation is generally consistent across geography.)

- **Landscape depressions that collect stormwater** (24%, off slightly from 26% in 2015 – with higher implementation among Telephone [31%] than Internet [16%] respondents. Implementation is lower only in the Central zips [13% versus 27%-32% elsewhere] and higher among households with at least $40,000 in annual income.)

- **Connecting runoff from a roof or paved surface to a basin or to water plants** (22%, up from 20% in 2015. Increased implementation among Telephone respondents [31% versus 14% Internet], East residents, men and 36 to 45 year-olds.)

- **Water harvesting with rain barrels or cisterns** (19%, highly consistent with last year [20%]. Telephone respondents [23% versus 14% Internet], Northwest or East residents and 36 to 45 year-olds are more likely to utilize rain barrels or cisterns.)

- **A trench that is filled with gravel to collect stormwater** (16%, up slightly from 14% in the last survey – with higher implementation rates among Telephone respondents [22% versus 11% Internet], Northwest residents, 46 to 55 year-olds and high income households.)

- **Porous pavements or bricks** (15%, down from 20% in 2015. Implementation continues to be greatest among high income households and Telephone respondents [21% versus 9% Internet] – as well as among Northwest residents and the most formally educated.)

- **Natural areas protected from clearing and grading** (15%, basically unchanged since last year [16%]. In addition to Telephone respondents [20% versus 10%], Whites and progressively higher income households are more likely to have set aside natural areas. Geographically, implementation is lower only in the South zips [10% versus 14%-18% elsewhere].)

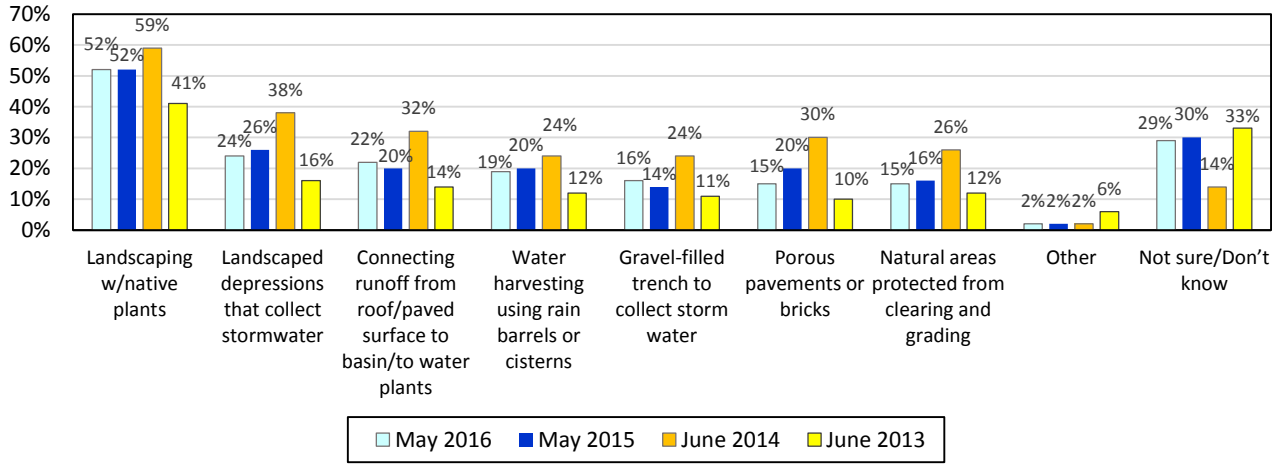
Table 28 Low Impact Development Practices
Implemented/Installed at Home or Business

	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area			
					Central	South	North-west	East
Landscaping with native plants	41%	59%	52%	**52%**	54%	48%	54%	51%
Landscaped depressions that collect storm water	16%	38%	26%	**24%**	13%	27%	27%	32%
Connecting runoff from a roof or paved surface to a basin or to water plants	14%	32%	20%	**22%**	17%	18%	26%	35%
Water harvesting using rain barrels or cisterns	12%	24%	20%	**19%**	12%	17%	25%	23%
A trench that is filled with gravel to collect storm water	11%	24%	14%	**16%**	14%	13%	21%	18%
Porous pavements or bricks	10%	30%	20%	**15%**	11%	15%	22%	10%
Natural areas protected from clearing and grading	12%	26%	16%	**15%**	18%	10%	16%	14%
Other	6%	2%	2%	**2%**	2%	2%	1%	3%
Not sure/Don't know	33%	14%	30%	**29%**	35%	33%	22%	20%
	N=504	N=502	N=500	**N=500**	N=154	N=136	N=133	N=77

	Stormwater Pollution Problem			Sample	
	Not a Problem	Moderate Problem	Serious Problem	Telephone	Internet
Landscaping with native plants	51%	48%	57%	59%	44%
Landscaped depressions that collect storm water	16%	23%	26%	31%	16%
Connecting runoff from a roof or paved surface to a basin or to water plants	19%	21%	25%	31%	14%
Water harvesting using rain barrels or cisterns	10%	18%	22%	23%	14%
A trench that is filled with gravel to collect storm water	14%	19%	14%	22%	11%
Porous pavements or bricks	16%	15%	15%	21%	9%
Natural areas protected from clearing and grading	19%	11%	17%	20%	10%
Other	0%	2%	2%	1%	2%
Not sure/Don't know	33%	33%	22%	20%	37%
	N=57	N=245	N=198	N=250	N=250

Question: I am now going to read you a list of Low Impact Development practices. After each, simply tell me if this practice has been implemented or installed at your home or business.

Display 28 Low Impact Development Practices Implemented/Installed at Home or Business



Perceived Seriousness of Stormwater Pollution Problem in the Tucson Area – In line with past years, the vast majority of survey respondents (89%) indicate that there is a "moderate" (49%) or "serious" (40%) problem in the Tucson area regarding "polluting materials entering storm drains." In fact, a few more (relative to last year) perceive a "serious" problem (from 37% to 40%) – while slightly less consider it to be "not a problem" (from 13% to 11%). This results in a 5.8 average score (on the "1-to-9" scale), up from 5.7 in 2015.

South region residents, 36 to 55 year-olds and the most formally educated respondents are most likely to perceive a "serious" stormwater pollution problem (44%-46%) – with no real difference based on survey method.

Once again, those who perceive a progressively more serious air quality problem are almost more likely to indicate a seriously more progressive stormwater pollution problem.

Table 29 Perceived Seriousness of Stormwater Pollution Problem in Tucson Area

	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area			
					Central	South	North-west	East
Serious problem (7-9)	41%	38%	37%	**40%**	37%	46%	39%	34%
Moderate problem (4-6)	43%	51%	50%	**49%**	45%	46%	54%	54%
Not a problem (1-3)	16%	11%	13%	**11%**	18%	8%	7%	12%
Average score on 1-9 scale	5.7	5.8	5.7	**5.8**	5.6	6.1	6.0	5.7
	N=504	N=502	N=500	**N=500**	N=154	N=136	N=133	N=77

	Sample	
	Telephone	Internet
Serious problem (7-9)	41%	38%
Moderate problem (4-6)	44%	54%
Not a problem (1-3)	16%	7%
Average score on 1-9 scale	5.7	5.9
	N=250	N=250

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."

Rating of Various Contributors to Stormwater Pollution Problem in the Tucson Area – As in prior surveys, respondents were asked to rate a variety of contributors to the severity of the stormwater pollution problem in the Tucson area. On the "1-to-9" rating scale, "1" means "not a problem" and "9" represents a "serious problem." Once again, there was a direct relationship between perceived severity of Tucson's stormwater pollution problem and the degree to which each of these factors contribute to the issue – with higher scores among South region residents and Internet respondents. Results are summarized in Table 30.

On average, these five contributors were rated higher (relative to last year) in their perceived degree of causation:

- **Chemicals and materials from industrial facilities** (43% "serious" contributor to stormwater pollution, up from 39% last year – 5.9 average score [up from 5.7 in 2015]. These are most apt to be non-Whites.)

- **Automotive fluids such as oil, gasoline and brake fluid** (42% "serious" contributor to stormwater pollution, up slightly from 41% last year – 5.9 average score [up from 5.7 in 2015]. Who is more likely to believe that automotive fluids contribute to the stormwater pollution problem? Women, 36 to 45 year-olds and non-Whites.)

- **Chemicals and materials from construction sites** (40% "serious" contributor to stormwater pollution, unchanged since last year – 5.9 average score [up from 5.7 in 2015]. These tend to be 46 to 55 year-olds and households impacted by a breathing-related medical condition.)

- **Household products such as cleaning fluids, detergents, paints, degreasers and bleaches** (37% "serious" contributor to stormwater pollution, unchanged since last year – 5.6 average score [up from 5.5 in 2015]. While there are fewer differences based on ethnicity, 36 to 45 year-olds are more likely to indicate increased perceived causation.)

- **Pesticides, fertilizers and debris from lawns and gardens** (36% "serious" contributor to stormwater pollution, unchanged since last year – 5.6 average score [up from 5.4 in 2015]. These tend to be Northwest or South region residents, women and 36 to 45 year-olds.)

In line with last year, 76% believe that **household trash and bulky items like mattresses, sofas and tires** contribute (to some degree) to stormwater pollution. This includes 37% who rate these items as a "serious" contributor (up slightly from 35% last year), resulting in a 5.5 average score (unchanged since 2015). These are more likely to be Hispanics and 26 to 45 year-olds.

Compared to previous surveys, a few more think that **animal waste from household pets** is a "serious" contributor to stormwater pollution (from 22%-23% to 26%). At the

same time, just one-third perceive it to be a non-factor (down from 39%-43%) – resulting in a 4.7 average score (up from 4.3-4.5).

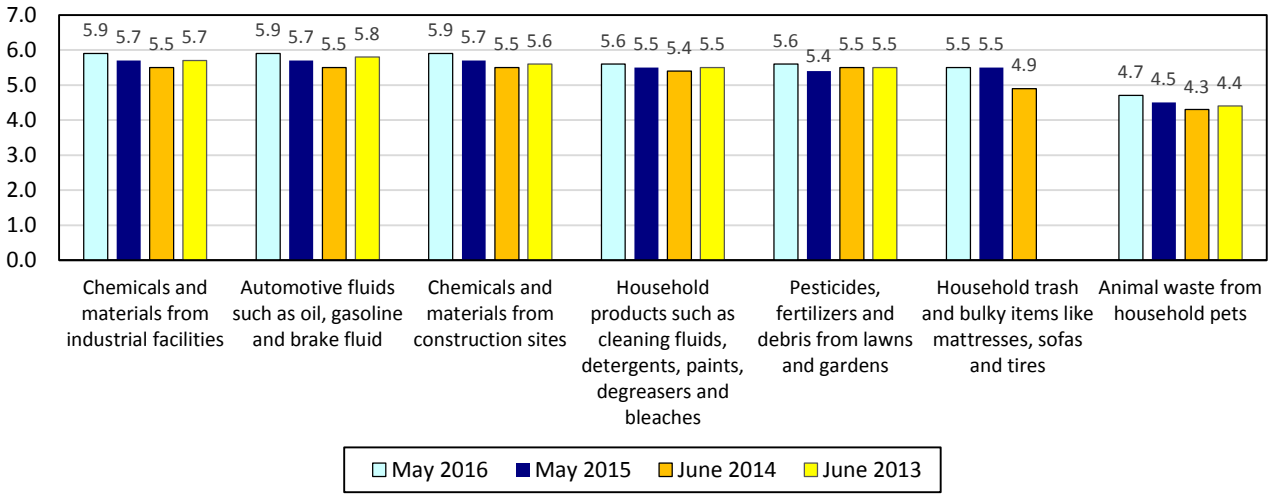
Table 30 Rating of Various Contributors to Stormwater Pollution Problem in Tucson Area

(5/16 N=500) (5/15 N=500) (6/14 N=502) (6/13 N=504)	Serious Problem	Moderate Problem	Not a Problem	Average Score on 1-9 Scale
Chemicals and materials from industrial facilities				
5/16	**43%**	**40%**	**17%**	**5.9**
5/15	39%	42%	19%	5.7
6/14	38%	38%	24%	5.5
6/13	40%	38%	21%	5.7
Automotive fluids such as oil, gasoline and brake fluid				
5/16	**42%**	**42%**	**16%**	**5.9**
5/15	41%	40%	19%	5.7
6/14	38%	37%	24%	5.5
6/13	45%	34%	21%	5.8
Chemicals and materials from construction sites				
5/16	**40%**	**46%**	**14%**	**5.9**
5/15	40%	43%	17%	5.7
6/14	38%	39%	23%	5.5
6/13	39%	42%	19%	5.6
Household products such as cleaning fluids, detergents, paints, degreasers and bleaches				
5/16	**37%**	**43%**	**20%**	**5.6**
5/15	37%	42%	20%	5.5
6/14	34%	43%	23%	5.4
6/13	38%	39%	23%	5.5
Pesticides, fertilizers and debris from lawns and gardens				
5/16	**36%**	**45%**	**19%**	**5.6**
5/15	36%	42%	23%	5.4
6/14	39%	38%	22%	5.5
6/13	37%	42%	22%	5.5
Household trash and bulky items like mattresses, sofas and tires				
5/16	**37%**	**39%**	**23%**	**5.5**
5/15	35%	43%	22%	5.5
6/14	29%	40%	31%	4.9
Animal waste from household pets				
5/16	**26%**	**41%**	**33%**	**4.7**
5/15	22%	39%	39%	4.5
6/14	23%	35%	43%	4.3
6/13	23%	36%	41%	4.4

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

(By Average Score on 1-9 Scale)



Methods Used to Dispose of Various Types of Household Hazardous Wastes – Consistent with 2015 findings, the most-often used methods to dispose of household wastes (such as "household chemicals, automotive fluids and lawn & garden chemicals") include:

- **Hazardous waste collection site** (42%, down from 47%-59% in the last two surveys. Usage is again lowest in the Central zips [32%], and highest in the East region [57%] – as well as among men, 36 to 65 year-olds and those with progressively higher household incomes.)

- **Auto parts store** (38%, unchanged since last year – lower only in the Northwest zips [30% versus 38%-43% elsewhere], with increased usage among 26 to 45 year-olds. There are few differences in usage with respect to gender or ethnicity.)

- **Put in the garbage** (29%, a progressive [but slight] increase from 2014 [26%] and 2015 [28%] levels. These tend to be South or Northwest zip residents [33%-34%], along with younger respondents [16 to 35], non-Hispanic minorities and those who think stormwater pollution is "not a problem.")

- **Service station** (19%, down from 22% last year. Geographically, only Northwest residents are less likely to dispose of household waste at a service station [14% versus 21%-22% elsewhere]. Men and higher income households are more likely to utilize this option.)

- **Landfill** (18%, basically unchanged since 2015 [19%]. Landfill users are more apt to live in the Northwest zips and tend to be 6+ year Pima County residents.)

As we found last year, Telephone respondents (relative to Internet) are more likely to utilize each of these methods of disposal.

Up from 8% in 2015, 12% in the current study (regardless of sample) dispose of household hazardous wastes by **pouring in the sink or down the drain**.

Among the rest, 6% are unsure how they dispose of such wastes (down from 9% last year) – while 16% (down slightly from 17%) report not using these types of household products at all (or finishing them all up when they do).

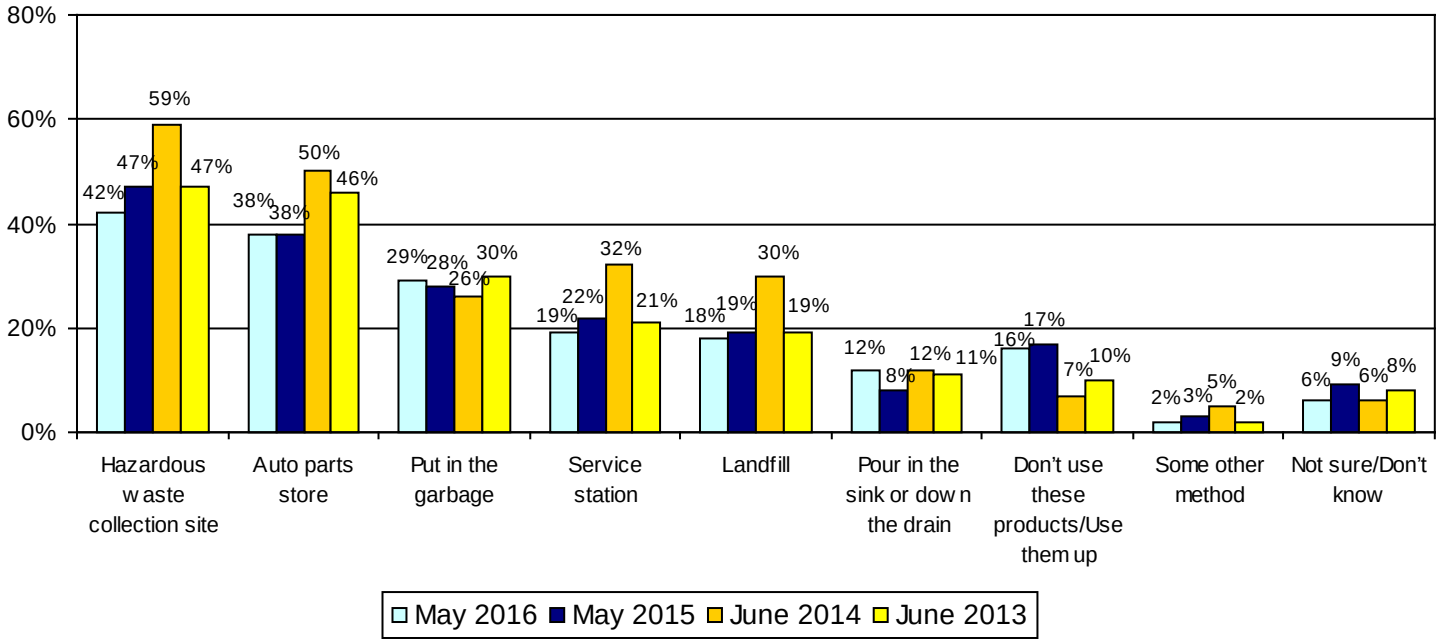
Table 31 Methods Used to Dispose of Various Types of Household Hazardous Waste

	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area			
					Central	South	North-west	East
Hazardous waste collection site	47%	59%	47%	**42%**	32%	42%	47%	57%
Auto parts store	46%	50%	38%	**38%**	38%	42%	30%	43%
Put in the garbage	30%	26%	28%	**29%**	25%	34%	33%	22%
Service station	21%	32%	22%	**19%**	21%	21%	14%	22%
Landfill	19%	30%	19%	**18%**	14%	19%	22%	18%
Pour in the sink or down the drain	11%	12%	8%	**12%**	9%	15%	14%	8%
Some other method	2%	5%	3%	**2%**	2%	1%	3%	0%
Don't use these products/Use them up	10%	7%	17%	**16%**	21%	16%	14%	12%
Not sure/Don't know	8%	6%	9%	**6%**	9%	5%	5%	4%
	N=504	N=502	N=500	**N=500**	N=154	N=136	N=133	N=77

	Stormwater Pollution Problem			Sample	
	Not a Problem	Moderate Problem	Serious Problem	Telephone	Internet
Hazardous waste collection site	39%	38%	48%	50%	35%
Auto parts store	47%	35%	38%	42%	34%
Put in the garbage	35%	30%	27%	31%	28%
Service station	28%	18%	18%	25%	13%
Landfill	26%	18%	16%	19%	17%
Pour in the sink or down the drain	5%	14%	11%	12%	12%
Some other method	2%	2%	2%	2%	1%
Don't use these products/Use them up	12%	18%	15%	8%	24%
Not sure/Don't know	10%	7%	4%	5%	7%
	N=57	N=245	N=198	N=250	N=250

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 31 Methods Used to Dispose of Various Types of Household Hazardous Waste



Government Entity to Call If Witness Someone Dumping Trash or Chemicals in a Storm Drain – Down slightly from last year (33%), three of ten in the 2016 survey remain **unsure** about who they would contact if they saw someone dumping trash or chemicals into a storm drain and wanted to report it. South residents, women and the youngest survey participants are more likely to be unsure whom to call – including a significant share of both Telephone (27%) and Internet (33%) respondents.

Among those who specify a particular entity, results are highly consistent with last year, including:

- **911/Police Department** (31%, more often Central residents and those with a high school diploma or less.)
- **Water Department** (13%, lower only in the East zips [5% versus 12%-17% elsewhere].)
- **Sanitation Department** (11%, regardless of area of residence [slightly higher in the South zips].)
- **Health Department** (11%, with few differences based on geography.)

Again, there are a number of "government" references – including **county government** (10%, up slightly from 9% last year), **city government** (8%, down from 10%) or a **government agency** (3%, down from 5%).

In line with prior surveys, only 3% indicate that they would *not* report illegal waste disposal or dumping.

Table 32 Government Entity to Call If Witness Someone Dumping Trash or Chemicals in a Storm Drain

	06/13 Total	06/14 Total	05/15 Total	**05/16 Total**	Area			
					Central	South	North-west	East
911/Police department	28%	30%	30%	**31%**	36%	29%	29%	27%
Water department	5%	4%	13%	**13%**	12%	12%	17%	5%
Sanitation department	6%	6%	11%	**11%**	9%	15%	10%	10%
Health department	4%	4%	10%	**11%**	12%	11%	10%	12%
County government	7%	9%	9%	**10%**	7%	9%	14%	12%
City government	8%	7%	10%	**8%**	8%	8%	10%	8%
Government agency	3%	6%	5%	**3%**	4%	3%	2%	4%
Would not report	4%	4%	4%	**3%**	4%	2%	3%	3%
Not sure/Don't know	35%	30%	33%	**30%**	27%	38%	32%	18%
	N=504	N=502	N=500	**N=500**	N=154	N=136	N=133	N=77

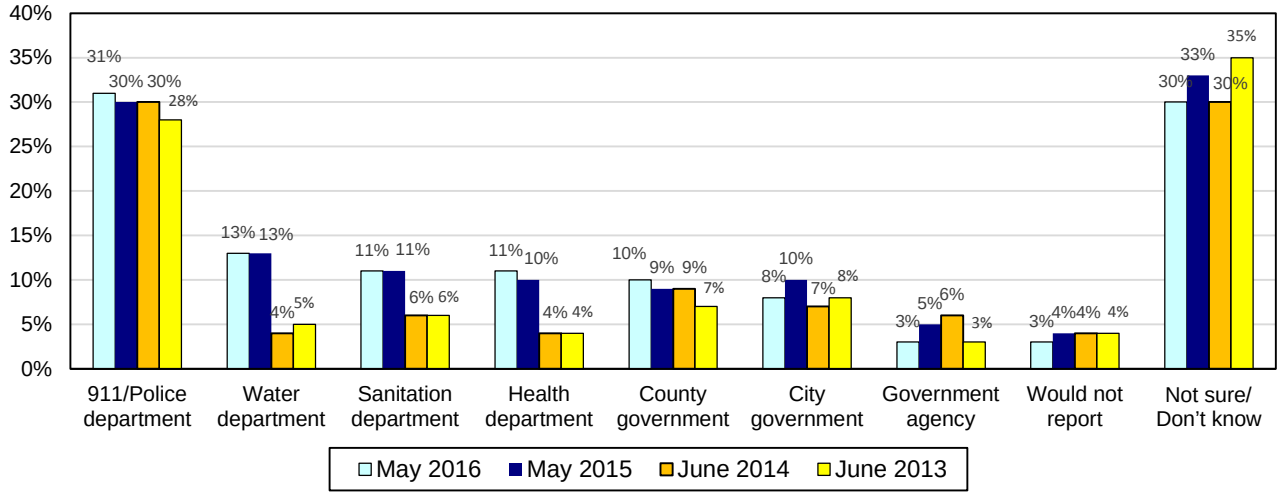
-Table 32 continued on next page-

Table 32 (Cont'd)

	Stormwater Pollution Problem			Sample	
	Not a Problem	Moderate Problem	Serious Problem	Telephone	Internet
911/Police department	28%	30%	32%	29%	32%
Water department	16%	12%	13%	8%	18%
Sanitation department	7%	13%	11%	7%	15%
Health department	10%	14%	7%	6%	16%
County government	10%	11%	9%	10%	10%
City government	7%	9%	9%	7%	10%
Government agency	9%	2%	3%	3%	3%
Would not report	7%	4%	1%	2%	4%
Not sure/Don't know	25%	29%	33%	27%	33%
	N=57	N=245	N=198	N=250	N=250

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 32 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 – Six of ten or more (especially Telephone respondents) indicate that they would be "very likely" (with no more than 6% "not at all likely") to take part in the following activities to help keep stormwater clean:

- **If you have a dog, using a doggie bag to clean up after them** (80% "very likely" to take part, up from 76% in 2015. These tend to be East or Northwest residents and women.)

- **Safely dispose of chemicals** (71% "very likely" to take part, down from 76% in 2015. Participation is generally consistent regardless of geography.)

- **Report a spill** (63% "very likely" to take part, up from 58% in 2015. These are more likely to be Central residents [68% versus 57%-62% elsewhere], men and respondents 46 or older.)

- **Replacing a toxic compound with a non-toxic compound** (58% "very likely" to take part, up slightly from 56% in 2015. This is particularly true among 36 to 55 year-olds, with fewer differences based on geography [marginally lower only in the South zips].)

Down from 53% last year, 49% say they would be "very likely" to **gather stormwater to use for watering plants**. These tend to be those 45 or younger, Hispanics and low income households – with fewer differences based on geography.

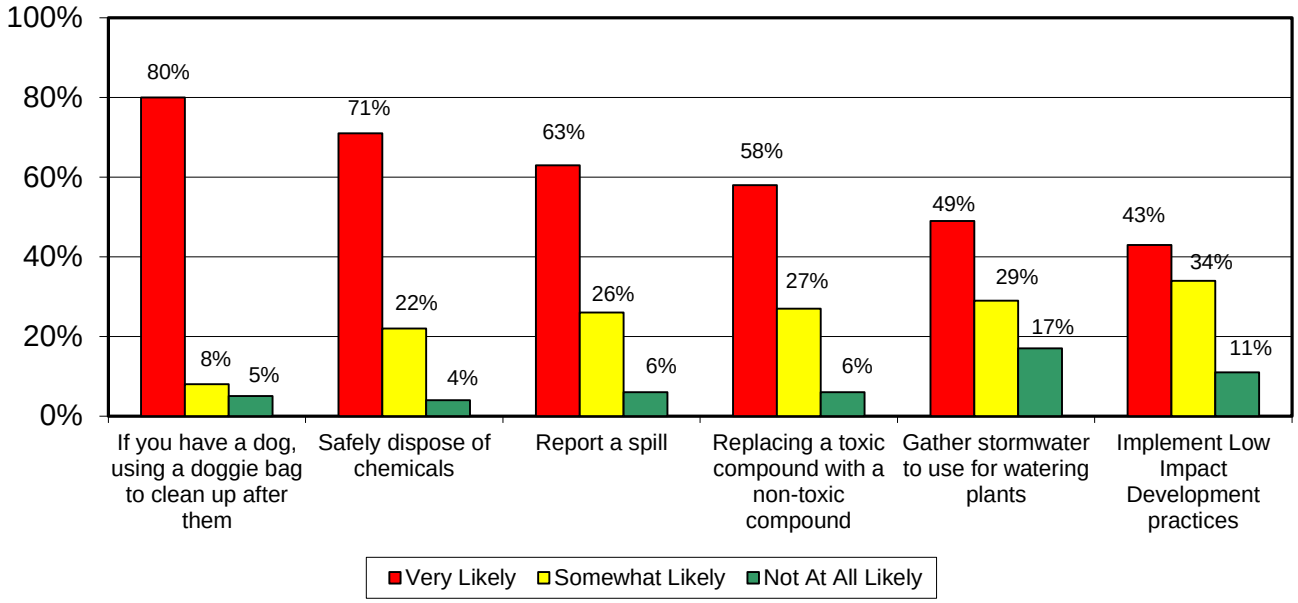
In line with last year, slightly more than four of ten would be "very likely" to **implement Low Impact Development practices** (43%, up from 41%). "Definite" participation is lower in the East zips (32% versus 41%-46% elsewhere), and highest among 36 to 45 year-olds and the most formally educated.

Table 33 Likelihood of Taking Part in Various Activities To Help Keep Stormwater Clean

	06/14 Total	05/15 Total	**05/16 Total**	Area			
				Central	South	North-west	East
If you have a dog, using a doggie bag to clean up after them							
Very likely	80%	76%	**80%**	75%	76%	86%	83%
Somewhat likely	5%	10%	**8%**	8%	9%	7%	9%
Not at all likely	4%	6%	**5%**	9%	4%	2%	3%
Don't know/Not sure	11%	9%	**8%**	8%	11%	5%	5%
Safely dispose of chemicals							
Very likely	82%	76%	**71%**	68%	71%	73%	74%
Somewhat likely	11%	18%	**22%**	23%	21%	23%	16%
Not at all likely	4%	4%	**4%**	4%	2%	2%	8%
Don't know/Not sure	3%	2%	**4%**	4%	5%	2%	3%
Report a spill							
Very likely	75%	58%	**63%**	68%	62%	60%	57%
Somewhat likely	14%	29%	**26%**	20%	24%	33%	31%
Not at all likely	6%	8%	**6%**	6%	5%	4%	8%
Don't know/Not sure	5%	5%	**5%**	6%	8%	2%	4%
Replacing a toxic compound with a non-toxic compound							
Very likely	67%	56%	**58%**	60%	54%	61%	57%
Somewhat likely	19%	29%	**27%**	25%	29%	27%	30%
Not at all likely	6%	8%	**6%**	8%	7%	4%	4%
Don't know/Not sure	8%	7%	**8%**	7%	10%	8%	9%
Gathering stormwater to use for watering plants							
Very likely	–	53%	**49%**	49%	52%	50%	47%
Somewhat likely	–	31%	**29%**	28%	29%	28%	32%
Not at all likely	–	13%	**17%**	18%	14%	19%	17%
Don't know/Not sure	–	3%	**5%**	6%	6%	4%	4%
Implement Low Impact Development practices							
Very likely	54%	41%	**43%**	46%	41%	46%	32%
Somewhat likely	23%	37%	**34%**	27%	41%	32%	35%
Not at all likely	8%	11%	**11%**	14%	7%	10%	17%
Don't know/Not sure	15%	11%	**12%**	13%	10%	12%	16%
	N=502	N=500	**N=500**	N=154	N=136	N=133	N=77

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



EVALUATION OF THE 2015-2016
PIMA COUNTY CLEAN AIR PROGRAM CAMPAIGN AND
CLEAN WATER PROGRAM CAMPAIGN SURVEY
(May 2016)

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 target audience in designated Pima County zip code areas. This study utilized a dual-methodology sampling plan, with Telephone and Internet interviews (250 each). Prior to 2015, all surveys in this tracking study series were all conducted via telephone.

All Telephone and Internet interviews were conducted during May 2016. 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 15 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 the sgizmo.com website (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 144 non-White respondents were interviewed in the project, including 111 Hispanics. Overall, 11 respondents (2%) requested that their survey be conducted in Spanish by a bilingual interviewer. This is identical to the 2015 survey (2%).

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 ±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, ±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	Reported Percentage				
(Base for %)	**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.

2016 PIMA AIR QUALITY/CLEAN WATER REGION DEFINITIONS

Northwest:	85653
	85654
	85658
	85704
	85705
	85737
	85739
	85741
	85742
	85743
	85745
	85755
	85652
	85738
Central:	85710
	85711
	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
East:	85619
	85715
	85730
	85747
	85748
	85749
	85750