

**EVALUATION OF THE 2017-2018 PIMA COUNTY  
CLEAN AIR PROGRAM CAMPAIGN  
AND  
CLEAN WATER CAMPAIGN SURVEY**

(April 2018)

***Executive Summary***

*Prepared for:*

PIMA COUNTY DEPARTMENT OF  
ENVIRONMENTAL QUALITY

Tucson, Arizona

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**Methodology Overview and Tracking** – This split-methodology annual tracking survey, conducted for the Pima County Department of Environmental Quality (PDEQ), includes a 500-respondent, randomly-selected and statistically-projectable sample of adult (16 or older) residents of Pima County, Arizona. Consistent with the last three years, the 2018 survey included a dual-methodology sample, with 260 Telephone and 240 Internet interviews. All projects conducted prior to 2015 were exclusively Telephone surveys.

The Telephone and Internet survey instruments and screening criteria were identical. Fielding for this project was conducted during March and early April 2018. A Spanish-language version of the final questionnaire design was prepared and made available to survey respondents (both Telephone and Internet) who requested it.

Telephone surveys were conducted among randomly-selected adults (16+) who reside in Pima County. Once again, Telephone respondents were further randomized by interviewing only “the male or female in your household who is 16 or older and most recently celebrated a birthday.” There was just one Telephone interview conducted per household. All Telephone interviews were distributed on the basis of geographic population density in Pima County, with specific steps taken to ensure a proportionate number of interviews (based on population estimates) in each of four zip code-defined survey “regions” (Northwest, Central, South and East).

Internet surveys were conducted utilizing a questionnaire administered by FMR Associates and hosted on an independent website. Potential survey respondents were contacted through a third party database Internet panel sample company that emailed invitations to their “opt in” panelists who reside in Pima County zip codes.

This project analyzed and tracked the overall effectiveness of the “Clean Air” Program after 28 campaign sessions. For the sixth consecutive year, the project measured and tracked key issues related to stormwater management, land use behaviors and household item disposal for PDEQ’s “Clean Water” Program.

**Awareness of the Pima County “Clean Air” Program** – Overall, 46% of survey respondents indicate that they are familiar with the Pima County “Clean Air” Program. This is up slightly from last year (44%), but short of 2016 findings (50%). Program awareness is highest in the South zips (52%). Familiarity is directly related to the perception of a progressively more severe air quality or stormwater problem. Program awareness is also higher among households impacted by a medical-related breathing condition.

**Awareness of Various Clean Air Events or Activities** – Once again, the vast majority (84% overall) are familiar with at least one event or activity that is used to promote clean air in the Tucson area. This is highly consistent with 2017 (86%) and 2016 (83%) findings. Similar to past years, awareness of individual events/activities is significantly higher among respondents familiar with the “Clean Air” Program.

These three “Clean Air” events/activities continue to elicit the highest levels of awareness:

- **“Earth Day Festival and Parade”** (58% familiarity, down just slightly from 62% last year. Still, awareness is lower only in the Northwest zip codes [49% versus 60%-62% elsewhere].)
- **“Bike to Work Day”** (56% familiarity, up from 53% last year. There are relatively few differences in recall based on area.)
- **“Bike Fest”** (50% familiarity, up from 47% last year. Recall is consistent across geography.)

The remaining three events/activities are familiar to at least one of four overall, including:

- **“Walk and Roll to School Day”** (31% familiarity, unchanged since last year. This event is more highly familiar to South region residents.)
- **“Car-Free Day”** (29% familiarity, down slightly from 33% last year. South zip residents are more likely to indicate increased awareness.)
- **“Cyclovía”** (25% familiarity, up from 23% last year. Elevated awareness in the Central or East zips.)

**Clean Air Campaign Event Participation and Actions Taken** – Among the 84% familiar with at least one “Clean Air” campaign event, 18% say that they or someone in their household participated in at least one of these activities. This is unchanged since last year. Geographically, participation is lower only among residents of the East zip codes (15% versus 18%-20% elsewhere). Participants tend to be 26 to 35 year-olds, non-Whites and those who perceive a progressively more severe air quality problem.

Among the 18% who indicate past participation in a “Clean Air” event or activity, nearly two-thirds say that they have changed (or are considering to change) their daily routines or behaviors to help improve air quality (64%). This is down from last year (74%) and the record mention recorded in 2016 (80%). However, when calculated among the total sample, this decline in post-participation changed behavior is only slight – 10%, down from the all-time high recorded in 2017 (11%). Who is most apt to indicate a change in behavior to help improve air quality after attending a “Clean Air” Program event? South region residents, women, 16 to 35 year-olds and non-Whites.

**Opinion of Activities/Events** – Fully 87% aware of at least one “Clean Air” Program event indicate a favorable opinion of “events and activities that encourage people to use other modes of transportation or work from home instead of driving alone.” This is down just slightly from last year’s record mention of 90% positive opinion – with the decline among those “very favorable” (from 52% in 2017 to 49% now). Central residents are most likely to be “very favorable” of activities and events to encourage telecommuting or use of alternative modes of transportation. For the fourth consecutive year, less than one of ten have an unfavorable opinion of campaign related events and activities.

**Steps Taken to Reduce Air Pollution** – Consistent with recent surveys, and allowing for multiple response mentions, the four actions taken most often to help reduce air pollution in the Tucson area include:

- **Generally reduced driving** (37%, very consistent with the 38% recorded in the last two surveys. These tend to be Northwest residents.)
- **Carpool/Less driving alone** (35%, down slightly from 38% last year. South residents are more to report increased carpooling.)
- **Keep car tuned** (34%, down from 38%-39% in the last two studies. There are few differences based on geography.)
- **Keep tires properly inflated** (34%, up from 31% last year. Again, there are few differences based on area of residence.)

In lesser numbers, others report that they have **planted trees** (17%, down from a record 23% mention last year), **avoid excessive idling** (unchanged at 16%), **bought bicycles** (unchanged at 15%), **adjusted vehicle’s emission control equipment** (unchanged at 14%), **chosen once a week not to drive** (13%, down from 16%) and/or **bought a more fuel efficient car** (13%, down from 20%). Similar to last year, just less than one of ten are **using fireplace/wood stove less** (8%) and/or **using BBQ grill less** (7%).

A record low 11% now say that they have done **nothing** to reduce air pollution (down from 12% last year). As we have found in past years, these tend to be residents who perceive a “minor” air quality problem and those unaware of the “Clean Air” Program.

**School Materials Recall Among Children 5-18** – Nearly identical to 2017 findings (28%), 29% in the 2018 survey report that they have children between the ages of 5 and 18 living in their household. Residents of the South or East zip codes and non-Whites are more apt to indicate the presence of children in their homes.

Among these households with children 5 to 18, 53% indicate that these children have “talked about or brought home materials from school about improving air quality.” This represents a progressive, incremental increase since 2015 (45%). Recall of air pollution information received from school in the current study is highest in the South or East zips.

**Gasoline-Powered Lawn & Garden Equipment** – Among the total sample, 14% indicate that they (or someone in their household) use gasoline-powered lawn & garden equipment to care for their home property. This is up from 9% last year, but identical to 2016 findings (14%). Usage of gasoline-powered lawn & garden equipment is highest in the South region. The following is a usage profile of equipment operators:

	<b>Usage (Among Equipment Users)</b>	<b>Total Usage (Among the Total Sample)</b>	<b>% 2-Stroke Engine (Among Equipment Users)</b>	<b>Average Monthly Usage (Minutes) (Among Equipment Users)</b>
<b>Gasoline-powered leaf blower or vacuum</b>				
<b>2018</b>	<b>46%</b>	<b>7%</b>	<b>54%</b>	<b>70</b>
2017	36%	3%	53%	40
2016	36%	5%	58%	25
<b>Gasoline-powered lawn mower</b>				
<b>2018</b>	<b>45%</b>	<b>6%</b>	<b>72%</b>	<b>32</b>
2017	64%	6%	37%	37
2016	54%	8%	38%	38
<b>Gasoline-powered chainsaw</b>				
<b>2018</b>	<b>39%</b>	<b>6%</b>	<b>75%</b>	<b>27</b>
2017	40%	4%	58%	35
2016	26%	4%	42%	39
<b>Gasoline-powered string trimmer</b>				
<b>2018</b>	<b>31%</b>	<b>4%</b>	<b>64%</b>	<b>61</b>
2017	34%	3%	62%	48
2016	24%	3%	59%	33
<b>Gasoline-powered hedge trimmers</b>				
<b>2018</b>	<b>14%</b>	<b>2%</b>	<b>60%</b>	<b>56</b>
2017	19%	2%	56%	62
2016	21%	3%	47%	31

**Statement Evaluations** – The following is a summary of respondent agreement/disagreement with a series of statements related to program awareness, pollution awareness, topics and general knowledge:

**PDEQ and Rideshare Awareness –**

- **You are aware of the Pima County Department of Environmental Quality** (Two-thirds agree, up from 63% last year and just shy of the 68% recorded in 2016. Agreement is lower only in the Central zips [59% versus 66%-70% elsewhere]. Once again, awareness is significantly higher among those who are familiar with the “Clean Air” Program [85% versus 46% unfamiliar].)
- **You are aware of the services provided by Sun Rideshare** (55% agree, up from 51% last year. There are relatively few differences based on geography [slightly lower only in the South zips]. Most likely to agree are residents familiar with the “Clean Air” Program [71% versus 42% unfamiliar].)

## **PDEQ Program and Campaign Awareness –**

- **You have seen or heard information about the importance of keeping your tires properly inflated** (88% agreement, representing incremental improvement from 2017 [86%] and 2016 [83%]. As we found last year, agreement is consistent regardless of geography. It is highest among residents aware of the “Clean Air” Program [93% versus 83% unaware].)
- **You are aware of the “Clean Water Starts With Me” campaign** (50% agree, down from 55%-57% in the last two surveys. Still, agreement is again directly related to the perception of a progressively more severe stormwater pollution problem. South or East residents are most apt to agree – as are those familiar with the “Clean Air” Program [77% versus 24% unfamiliar].)
- **You have seen or heard the phrase “Healthy Air Is in Our Hands”** (One-third agree with this statement, down from 2017 [34%] and 2016 [36%] levels. Recall continues to be highest in the South zips and among those aware of the “Clean Air” Program [50% versus 15% unaware] – as well as residents who perceive a progressively more severe air quality problem.)

## **Air Pollution Evaluations –**

- **You are aware that air pollution causes health problems** (Consistent with past surveys, nearly everyone [94%] agrees.)
- **You have seen or heard information that vehicle engine idling causes air pollution** (Added to the survey last year, nine of ten continue to agree [88%] – regardless of geography. This includes the vast majority of residents aware [92%] or unaware [84%] of the “Clean Air” Program.)
- **You understand what an air pollution advisory means** (Unchanged since last year, 86% agree. This is the case regardless of geography.)
- **You have seen or heard information regarding clean air or air pollution** (80% agreement, down just slightly from the record 84% mention last year. Northwest or East residents and respondents familiar with the “Clean Air” Program [86% versus 74% unfamiliar] are most likely to agree.)
- **You are aware that the majority of our air pollution comes from motor vehicle use** (82% agree, very much consistent with recent surveys [81%-83%]. Agreement is directly related to the perception of a progressively more severe air quality problem, and is higher among those aware of the “Clean Air” Program [88% versus 76% unaware]. Central or South residents are also more apt to agree.)

- **You are aware of air pollution advisories in Pima County** (Like last year, two-thirds agree – with few differences based on geography. Fully 85% of residents familiar with the “Clean Air” Program are aware of air pollution advisories [compared to just 47% unaware].)
- **Because you want to reduce air pollution, you are generally driving less** (58% agreement, unchanged over the last three surveys. South residents and those who think Tucson has a progressively more severe air quality problem are most likely to agree – as do respondents familiar with the “Clean Air” Program [71% versus 49% unfamiliar].)

**Travel Behavior for Shopping** – Shopping travel behavior in the current survey is generally consistent with last year. Specifically, a majority again report that they generally **drive alone** for shopping (56%, up slightly from 54%). Three of ten **carpool with 1 to 4 other adults**, while others ride the **bus** (6%), **walk** (3%), **bicycle** (2%), **take the streetcar** (2%) or ride a **motorcycle** (1%).

**Travel Behavior for Leisure Purposes** – In a reversal from the last two surveys, slightly more now **carpool with 1 to 4 other adults** (43%) than **drive alone** (42%) for leisure purposes (“such as dining out, meeting with friends, going to movies, going to the gym, etc.”). Among the rest, and generally consistent with past surveys, fewer ride the **bus** (5%), drive a **motorcycle** (3%), **walk** (2%), **bicycle** (2%), **vanpool with 5 or more other adults** (1%) or **take the streetcar** (1%).

**Perceived Seriousness of Air Quality Problem** – Returning to 2016 levels, 17% in the current study think that the Tucson area has a “major” air quality problem. This is down from 21% in 2017. Instead, compared to the last two years, more now believe that air quality is a “minor” issue (24%, up from 19%-21%). Still, most (55%) continue to characterize air quality in Tucson as a “moderate” problem.

As we found last year, there are few differences in the perception of a “major” air quality problem with respect to geography. However, residents aware of the “Clean Air” Program (25% versus 11% unaware) are most likely to think that Tucson has a significant air quality problem. This is also true among residents who perceive that Tucson has a progressively more severe stormwater pollution problem. Once again, East residents are more likely to rate air quality as a “minor problem.”

**Work Commuting Behavior** – With survey respondents allowed to select more than one category of response, 38% say that they are employed full-time (30 hours or more each week). This is up 35% last year. Full-time employment is similar regardless of area of residence. Similar to last year, 11% work part-time (less than 30 hours a week). Central residents are more apt to be part-time employees. Also in line with last year, 9% report being currently unemployed. These tend to Central or South region residents. Consistent with 2017 findings, 28% in the current survey say they are retired, more often Northwest or East region residents. While the percentage of students (8%) remains unchanged from last year, fewer report being homemakers (7%, down from 12%).

Representing an increase from recent years, 69% of full-time employees in the current survey say they work a “standard” schedule (8 hour days five days a week). Another one of ten work a 10 hour day, 4 days a week (down slightly from 12% last year), while 9% indicate working either a 12 hour day, 3 or 4 days a week (5%, up slightly from 4%) or working 80 hours over 9 days, with the 10<sup>th</sup> day off (4%, down slightly from 5%). Overall, 12% continue to indicate some “other” workweek options or say their workweek varies (down from 17% last year).

Up from last year (76%), 81% utilize **single passenger commuting to work or school**. The average frequency of use is 4.2 days, down slightly from last year (4.3). Only Central area residents are less likely to drive alone at least one day per week (78% versus 83%-84% in other areas). Meanwhile, East (56%) and Northwest (55%) residents are most apt to drive alone 5+ days a week.

Why do single occupant vehicle commuters drive alone to work or school? Down slightly from last year (43%), 40% say that “**convenience**” is the reason they drive alone. This reason is cited more often among East area residents and those who perceive a “minor” air quality problem. Another two of ten indicate that they drive alone because of “**no one to carpool with**” (22%, up slightly from 19% in 2017), regardless of area of residence. Nearly as many in the current survey say that they “**like to drive alone**” (19%, up from 17%) – particularly South area residents. Meanwhile, significantly fewer cite “**irregular work hours**” for driving alone (16%, down from 31%). Down slightly from last year (15%), 13% say they “**need their car for business.**” One of ten cite “**personal errands**” as the reason they drive alone.

**Use of Alternative Work/School Commute Travel Methods** – The following is a summary of the usage of alternative modes for commute travel as measured in this survey:

- **Carpool/Vanpool** (Down from last year [28%], but similar to 2015-2016 [24%], 23% indicate they carpool or vanpool at least one day per week. Average frequency has dropped from last year [from 3.1 to 2.6 days]. South and East area residents are more apt to carpool at least one day a week.)
- **Walk to work or school** (Down slightly from 24% last year, 21% say they walk to work or school, with a slight dip in average days as well [from 3.0 to 2.8 days]. Walking to work or school is more common among South area residents.)
- **Work at home instead of driving to work** (Identical to last year, 19% telecommute. However, frequency of usage has declined [from 3.4 to 3.0 days]. South and Northwest area residents are somewhat more apt to telecommute.)
- **Take the bus to work or school** (Bus ridership has declined from last year [from 18% to 14%], but is in line with 2016 [13%]. The average days using this method has also decreased [from 3.6 last year to 2.6]. South area residents are more apt to take the bus.)



- **Ride a bike to work or school** (Up from the last two years [10%], 17% indicate riding bikes to work or school, with an increase in frequency as well [from 2.4 days to 2.9 days]. South area residents and 16 to 25 year-olds are more apt to ride a bike to work or school.)
- **Take the streetcar to work or school** (Up significantly from the last few years [4%-5%], 11% say they take the streetcar – with an increase in frequency as well [from 2.0 to 2.4 days].)
- **Ride a motorcycle to work or school** (Similar to last year, 5% indicate riding a motorcycle to work or school, but with a decline in frequency [from 2.8 to 1.5 days].)

**Most Used Mode of Transportation for Work/School Commute** – Up from recent years (58%-62%), the percentage of commuters who indicate that **single-passenger vehicle commuting** is their *most-used* method of transportation is 66%.

More are **riding a bike** as their primary mode of transportation to work or school (from 2% last year to 7% now), more often South region residents. Consistent with last year, 7% are **telecommuting** most often, primarily Central or East area residents. Down from last year (10%), 7% are **carpooling** most often. These are more apt to be Northwest or South area residents. Similar to last year, 6% utilize **walking** as their most-used mode. Meanwhile, fewer primarily use **bus riding** for work/school transportation (from 9% to 4%). In lesser numbers, a few indicate that **taking the streetcar** (2%, up from 1%) is their primary mode of commuting to work or school.

**Miles Traveled to Work or School** – Three of ten indicate they have a commute of 5 miles or less (29%, down from 36% last year), and a similar share report their commute is between 6 and 10 miles (30%, up slightly from 29%). Another 8% continue to say they travel 11 to 14 miles (unchanged from 2017), and three of ten indicate they travel 15 miles or more (up from 26%). Geographically, Northwest (37%) and South (36%) area residents are more apt to have a commute of 15+ miles, while the vast majority of Central (63%) or East (79%) residents travel 10 miles or less.

**Telecommuting** – Down from the last two years (26% each), but similar to 2015 findings (18%), 19% who work outside the home say that they telecommute. Telecommuters are more likely to be East (29%) area residents. Down from 2017 (51%) and 2016 (70%) levels, but still higher than we found in 2015 (39%), 44% of telecommuters indicate they do so more than once a week. Another 15% telecommute about once a week (down from last year [24%] but similar to 2016), and 17% report telecommuting 2-3 times a month (up from previous years [10%-12%]). Similar to last year, 15% say they telecommute only once a month.

**“Compressed Workweek” Programs** – Among those working outside the home, and consistent with last year (30%), 29% say they have the option of a “compressed workweek” program. South region residents and men are more apt to say they have a compressed workweek program available to them.

**Daily Commuter Miles Saved Through Alternate Modes** – Based on the combination of results related to the modes of commuter travel and distances traveled with employment estimates (Source: Arizona Office of Employment and Population Statistics), **we estimate that the reduction of single-occupant vehicles commuting through the use of alternative methods of travel saves 4,141,734 vehicle miles per day – or 38% of total miles driven/not driven. This is up from a 35% savings in 2017.**

Not only has the percentage of miles saved through the use of alternate modes increased from 35% to 38%, but the actual number of vehicle miles saved daily has increased by 16% as well (from 3,569,409 to 4,141,734) – primarily due to a decrease in the average single-passenger commute distance (from 14.5 to 12.4 miles).

**2018 Estimated Number of Work/School Miles Saved Through Alternative Modes**

Mode	(A) % Take Mode	(B) # Daily Commuter Trips	(C) Average Commuter Miles	(D) Total Miles Traveled	(E) Miles Driven	(E) Miles Not Driven
Drive alone	81%	490,214	12.4	6,078,654	6,078,654	-0-
Motorcycle	5%	10,680	13.2	140,976	140,976	-0-
Carpool	23%	84,173	12.8	1,077,414	430,966	646,448
Bus	14%	50,837	11.7	594,793	16,994	577,799
Bicycle	17%	70,688	10.9	770,499	-0-	770,499
Walk	21%	82,236	7.2	592,099	-0-	592,099
Streetcar	11%	38,220	9.4	359,268	-0-	359,268
Telecommute	19%	81,169	12.0	974,028	-0-	974,028
Compressed workweek	13%	19,438	11.4	221,593	-0-	221,593
<b>TOTALS:</b>	<b>--</b>	<b>927,655</b>	<b>--</b>	<b>10,809,324</b>	<b>6,667,590</b>	<b>4,141,734</b>

- (A) From Table 26.
- (B) Based on number of work/school commuters in survey, percentage using mode and number of days/week mode used.
- (C) From Table 26c.
- (D) (D) = (B) x (C).
- (E) Carpool: based on workers average carpool/vanpool of 2.5 (from Table 26b). Bus: based on average of 35 riders/bus. Walk/bicycle/streetcar/telecommute/compressed workweek: no polluting vehicles used.

**Daily Shopping/Leisure Miles Saved Through Alternate Modes** – Combining trip frequency/length estimates provided by Pima Association of Governments with the “most used” methods of transportation (Tables 18/18a in our report), we can further estimate daily vehicle miles saved through the use of alternative modes for shopping and leisure purposes. As summarized in the display below, we estimate that the reduction of single-occupant vehicles commuting through the use of alternative methods of travel for **shopping** saves 600,123 vehicle miles per day, or 30% of total miles driven/not driven (down from 32% in 2016, due primarily to increased levels of single passenger vehicle travel). The number of **leisure** travel miles saved daily is 3,147,143 – 37% of total miles driven/not driven (unchanged since last year). These compare to a savings of 4,141,734 vehicle miles per day in **travel to work or school** (or 38% of total miles driven/not driven).

**2018 Estimated Number of Shopping Miles Saved Through Alternative Modes**

Mode	(A) % Take Mode Most Often	(B) # Daily Shopping Trips	(C) Average Shopping Miles	(D) Total Miles Traveled	(E) Miles Driven	(E) Miles Not Driven
Drive alone	55.8%	398,487	5.00	1,111,779	1,111,779	0
Motorcycle	0.8%	398,487	5.00	15,939	15,939	0
Carpool/Vanpool	29.8%	398,487	5.00	593,746	237,498	356,248
Bus	5.6%	398,487	5.00	111,576	3,188	108,388
Walk	3.4%	398,487	5.00	67,743	0	67,744
Bicycle	1.8%	398,487	5.00	35,864	0	35,864
Streetcar	1.6%	398,487	5.00	31,879	0	31,879
<b>TOTALS:</b>	--	--	--	<b>1,968,526</b>	<b>1,368,404</b>	<b>600,123</b>

- (A) From Table 18.
- (B) Source: Pima Association of Governments.
- (C) Source: Pima Association of Governments.
- (D) (D) = (A) x (B) x (C).
- (E) Carpool: based on workers average carpool/vanpool of 2.5 (from Table 26b). Bus: based on average of 35 riders/bus. Walk/bicycle/streetcar: no polluting vehicles used.

**2018 Estimated Number of Leisure Miles Saved Through Alternative Modes**

Mode	(A) % Take Mode Most Often	(B) # Daily Leisure Trips	(C) Average Leisure Miles	(D) Total Miles Traveled	(E) Miles Driven	(E) Miles Not Driven
Drive alone	41.6%	1,518,736	5.78	3,651,770	3,651,770	0
Motorcycle	2.8%	1,518,736	5.78	245,792	245,792	0
Carpool/Vanpool	44.0%	1,518,736	5.78	3,862,449	1,544,980	2,317,469
Bus	5.2%	1,518,736	5.78	456,471	13,042	443,429
Walk	1.6%	1,518,736	5.78	140,453	0	140,453
Bicycle	2.0%	1,518,736	5.78	175,566	0	175,566
Streetcar	0.8%	1,518,736	5.78	70,226		70,226
<b>TOTALS:</b>	--	--	--	<b>8,602,727</b>	<b>5,455,584</b>	<b>3,147,143</b>

- (A) From Table 18a.
- (B) Source: Pima Association of Governments.
- (C) Source: Pima Association of Governments.
- (D) (D) = (A) x (B) x (C).
- (E) Carpool: based on workers average carpool/vanpool of 2.5 (from Table 26b). Bus: based on average of 35 riders/bus. Walk/bicycle/streetcar: no polluting vehicles used.

***Final Air Quality Campaign Observations***

Awareness of the Pima County “Clean Air” Program has increased from 44% in 2017 to 46% this year. In addition, 84% overall are familiar with at least one “Clean Air” event. As we have found in past surveys, there continues to be a significant difference in key attitudes and behaviors related to air quality among those aware of the “Clean Air” Program and those unaware (46% and 47%, respectively). This relationship is again readily apparent, as summarized in the comparative displays below.

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Air” Program</u>	
		<u>Aware</u> (46%)	<u>Unaware</u> (47%)
<b><i>Air Quality Event Awareness</i></b>			
• <u>Car-Free Day</u>			
<b>2018</b>	<b>+121%</b>	<b>42%</b>	<b>19%</b>
2017	+231%	53%	16%
• <u>Walk and Roll to School Day</u>			
<b>2018</b>	<b>+110%</b>	<b>42%</b>	<b>20%</b>
2017	+156%	46%	18%
• <u>Bike Fest</u>			
<b>2018</b>	<b>+64%</b>	<b>64%</b>	<b>39%</b>
2017	+82%	62%	34%
• <u>Bike to Work Day</u>			
<b>2018</b>	<b>+56%</b>	<b>70%</b>	<b>45%</b>
2017	+109%	73%	35%
• <u>Earth Day Festival &amp; Parade</u>			
<b>2018</b>	<b>+55%</b>	<b>73%</b>	<b>47%</b>
2017	+40%	74%	53%
• <u>Cyclovia</u>			
<b>2018</b>	<b>+48%</b>	<b>31%</b>	<b>21%</b>
2017	+76%	30%	17%
• <u>Participation in a “Clean Air” event</u>			
<b>2018</b>	<b>+108%</b>	<b>25%</b>	<b>12%</b>
2017	+238%	27%	8%

✓ **On average, there is an 80% higher awareness and/or participation in “Clean Air” events or programs among those familiar with the “Clean Air” Program (compared to 133% in 2017).**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Air” Program</u>	
		<u>Aware</u> (46%)	<u>Unaware</u> (47%)

***PDEQ and Sun Rideshare Awareness***

- Aware of PDEQ

<b>2018</b>	<b>+85%</b>	<b>85%</b>	<b>46%</b>
2017	+100%	84%	42%
  - Aware of Sun Rideshare services

<b>2018</b>	<b>+69%</b>	<b>71%</b>	<b>42%</b>
2017	+74%	66%	38%
- ✓ **On average, there is a 77% greater awareness of PDEQ and Sun Rideshare services among those aware of the “Clean Air” Program (compared to 87% in 2017).**

***PDEQ Activity Understanding***

- Aware of Pima County air pollution advisories

<b>2018</b>	<b>+81%</b>	<b>85%</b>	<b>47%</b>
2017	+105%	90%	44%
  - Aware that majority of air pollution comes from motor vehicle use

<b>2018</b>	<b>+16%</b>	<b>88%</b>	<b>76%</b>
2017	+20%	90%	75%
  - Understand air pollution advisory meaning

<b>2018</b>	<b>+16%</b>	<b>93%</b>	<b>80%</b>
2017	+18%	94%	80%
  - Seen or heard information regarding clean air or air pollution

<b>2018</b>	<b>+16%</b>	<b>86%</b>	<b>74%</b>
2017	+18%	91%	77%
  - Seen or heard information about the importance of keeping tires properly inflated

<b>2018</b>	<b>+12%</b>	<b>93%</b>	<b>83%</b>
2017	+16%	93%	80%
  - Seen or heard information that vehicle engine idling causes air pollution

<b>2018</b>	<b>+10%</b>	<b>92%</b>	<b>84%</b>
2017	+11%	94%	85%
- ✓ **On average, there is a 25% higher understanding of PDEQ activities among those aware of the “Clean Air” Program (compared to 31% in 2017).**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Air” Program</u>	
		<u>Aware</u> (46%)	<u>Unaware</u> (47%)
<b><i>Steps Taken to Reduce Air Pollution</i></b>			
• <u>Using fireplace/wood stove less</u>			
<b>2018</b>	<b>+140%</b>	<b>12%</b>	<b>5%</b>
2017	+67%	10%	6%
• <u>Planted trees</u>			
<b>2018</b>	<b>+83%</b>	<b>22%</b>	<b>12%</b>
2017	+100%	32%	16%
• <u>Choose one day/week to not drive</u>			
<b>2018</b>	<b>+78%</b>	<b>16%</b>	<b>9%</b>
2017	+46%	19%	13%
• <u>Bought bicycles</u>			
<b>2018</b>	<b>+58%</b>	<b>19%</b>	<b>12%</b>
2017	+50%	18%	12%
• <u>Carpool more/Less solo driving</u>			
<b>2018</b>	<b>+48%</b>	<b>43%</b>	<b>29%</b>
2017	+44%	46%	32%

✓ **There is an 81% greater likelihood of taking specific steps to reduce air pollution among those aware of the “Clean Air” Program (up from 71% in 2017).**

**Air Quality Perceptions** – As in past years, we find that the vast majority of those aware (80%) and unaware (67%) of the “Clean Air” Program think that Tucson has at least a “moderate” air quality problem. However, those aware of the program are much more likely to think the problem is a “major” one (25% versus 11% unaware, 127% higher).

**Once again, we conclude that these survey findings and tracking results again suggest that the “Clean Air” Program increases awareness, belief and actions related to improving air quality.** As a result, targeting those *unaware* of the program continues to be a key recommendation of this project. Those unaware of the “Clean Air” Program tend to be Central area residents, 16 to 35 year-olds and newer Pima residents (for less than five years). As a result, promotional, communication and awareness-building efforts should be targeted towards these groups.

**Tire Inflation Education Campaign** – Representing incremental growth from 2016 (83%) and 2017 (86%), 88% in the current survey “have seen or heard information about the importance of keeping your tires properly inflated.” In addition, 34% report that they are keeping their tires properly inflated to help reduce air pollution in the Tucson (up from 31% last year).

***What is the direct impact of this action taken to keep tires properly inflated?*** There are an estimated 658,906 working vehicles (automobiles, vans and trucks of one-ton capacity or less for household use) in Pima County (source: 2016 American Community Survey). According to PDEQ, a vehicle will save 144 gallons of gasoline per year with properly inflated tires.

If 34% are keeping their tires properly inflated, this yields an annual reduction of 32,260,038 gallons of gasoline not purchased (along with the pollutants this gasoline would release).

## ***Stormwater Perceptions and Practices***

**Perception of Where Stormwater That Flows Into Tucson Storm Drains Ends Up** – After being told (via the survey text) that “streets in the Tucson area are equipped with storm drains,” a majority (53%, up from 45%-46% in prior years) believe (to the best of their knowledge) that stormwater that flows into these drains ends up in a **river or wash**. This is the case regardless of geography.

Allowing for multiple responses, other respondents indicate that stormwater that flows into storm drains ends up in:

- **Sewage plants** (16%, basically unchanged since last year [17%]. These tend to be South zip residents.)
- **Groundwater** (15%, down incrementally from 20% in 2016 and 18% in 2017. Generally, this perception is consistent regardless of geography.)
- **Water plants** (10%, down from 13% last year. There are few differences in perception based on area of residence.)
- **Canals** (7%, down from 12% last year. Once again, South region residents are more likely to think that stormwater ends up in canals.)

Down from 29% the last two years, one of four (regardless of geography or gender) in the 2018 survey indicate that they **do not know** where stormwater that runs into a storm drain ends up.

**Green Infrastructures Implemented/Installed at Home or Business** – Consistent with past years, **landscaping with native plants** is the Green Infrastructure most often implemented at home or business (55%, up from 52%-53% in 2015-2017). Northwest residents and those who perceive a “serious” stormwater pollution problem are most apt to landscape with native plants.

Other Green Infrastructures implemented at home or business include:

- **Landscaped depressions that collect stormwater** (29%, up slightly from 28% last year. These tend to be South or Northwest residents.)
- **Connecting runoff from a roof or paved surface to a basin or to water plants** (24% implementation, a dip from 25% last year. There are few differences based on geography [only slightly higher in South zips].)
- **Porous pavements or bricks** (24%, up from 21% last year [and the highest mention to date]. South zip residents are more apt to have installed porous pavements or bricks.)



- **Water harvesting using rain barrels or cisterns** (22%, up incrementally from 2016 [19%] and 2017 [21%] totals. Again, these are most likely to be South residents.)
- **Natural areas protected from clearing and grading** (20%, again representing progressive improvement from 2016 [15%] and 2017 [18%]. Implementation is consistent regardless of geography.)
- **A trench that is filled with gravel to collect stormwater** (18%, down slightly from last year [19%] – but still higher than 2015-2016 totals [14%-16%]. Usage is lower only in the Central zips [12% versus 19%-22% elsewhere].)

**Perceived Seriousness of Stormwater Pollution Problem in the Tucson Area** – Highly consistent with all past surveys, fully 87% perceive that there is a problem (to some degree) in the Tucson area “with polluting materials entering storm drains.” This includes 42% who think the problem is “serious,” increasing incrementally from 37% in 2015. At the same time, fewer than last year indicate it is “not a problem” (from 14% to 12%). This results in a 5.9 average score on the “1-to-9” rating scale (up from 5.8 the last two years). Central or South residents are most apt to perceive a “serious” pollution problem.

**Rating of Various Contributors to Stormwater Pollution Problem** – On the same “1-to-9” scale, these six factors (on average) elicit the highest degree of perceived causation (especially in the Central region) of the stormwater pollution problem in the Tucson area:

- **Chemicals and materials from industrial facilities** (46% “serious” cause of stormwater pollution, up slightly from 45% in 2017 – resulting in a 5.9 average score [unchanged from last year].)
- **Automotive fluids such as oil, gasoline and brake fluid** (45% “serious” cause of stormwater pollution, a slight increase from 44% in 2017 – resulting in a 5.9 average score [unchanged from last year].)
- **Chemicals and materials from construction sites** (43% “serious” cause of stormwater pollution, down from 46% in 2017 – resulting in a 5.8 average score [down from 6.0 last year].)
- **Household products such as cleaning fluids, detergents, paints, degreasers and bleaches** (43% “serious” cause of stormwater pollution, down from 45% in 2017 – resulting in a 5.8 average score [down from 5.9].)
- **Pesticides, fertilizers and debris from lawns and gardens** (37% “serious” cause of stormwater pollution, down from 43% in 2017 – resulting in a 5.6 average score [down from 5.8].)
- **Household trash and bulky items like mattresses, sofas and tires** (42% “serious” cause of stormwater pollution, up from 40% in 2017 – resulting in a 5.5 average score [unchanged from last year]. This represents incremental improvement in the perception of a “serious” contributor since 2015 [35%].)

As we have found in prior years, two-thirds perceive that **animal waste from household pets** contributes to stormwater pollution to some degree – including 26% who say it is a “serious problem.” Still, a larger percentage (more often East residents) continue to say it is a non-factor (33%), resulting in a 4.7 average score (unchanged from past surveys).

Consistent with 2017 findings, more say that **copper from brake pads made with copper** are a non-factor (38%) than a “serious” contributor (22%) to stormwater pollution (4.3 average score).

**Methods Used to Dispose of Various Types of Household Hazardous Wastes** – In line with past surveys, the five most utilized methods of disposing of household wastes such as “household chemicals, automotive fluids and lawn & garden chemicals” include:

- **Hazardous waste collection site** (53%, very consistent with last year [52%] – highest in the Northwest zip codes. Usage remains lowest in the Central area [44%.])
- **Auto parts store** (45%, up incrementally from 2016 [38%] and 2017 [42%]. Usage is lower only in the East zips [38% versus 43%-48% elsewhere].)
- **Put in the garbage** (35%, down slightly from the all-time high of 37% recorded last year. Geographically, South region residents are most likely to utilize this method of disposal.)
- **Service station** (Unchanged from 26% last year, which was the highest mention to-date. Service station usage is lower only in the Northwest region.)
- **Landfill** (22%, up from 18%-19% in prior surveys. Usage is lowest in the Central zip codes [14% versus 24%-27% elsewhere].)

Down from a record 18% mention last year, 14% indicate that they dispose of household hazardous wastes by **pouring them down the drain**. Central or South residents are more apt to use this disposal method.

Like last year, about one of ten indicate that they do not use items such as household chemicals, automotive fluids or lawn & garden chemicals (or finishing them all up when they do). Overall, 6% are not sure how they dispose of these types of household wastes.

**Government Entity to Call If Witness to Someone Dumping Trash or Chemicals in a Storm Drain** – Compared to past years, fewer say they are **unsure** who they would contact if they saw someone dumping trash or chemicals in a storm drain (from 30%-33% to 22% now). Instead, more now indicate they would contact **911/Police Department** (31%, up slightly from 29% last year). Geographically, only East region residents are less likely to dial 911 (24% versus 31%-34% elsewhere).

Others specify that they would contact the following government entities:

- **City government** (16%, up from 8% in 2016 and 12% in 2017. These tend to be South or East zip residents.)
- **County government** (14%, up from 9%-11% in past years. South or Northwest residents are more apt to say they would contact County government.)
- **Water Department** (13%, consistent with past surveys – with few differences based on geography.)
- **Sanitation Department** (10%, down from 13% last year.)
- **Health Department** (9%, down from 11%-13% in the last two surveys. South residents are more likely to contact the Health Department.)

In line with past years, only 3% say they would not report dumping of trash or chemicals in a storm drain.

**Likelihood of Taking Part in Various Activities to Help Keep Stormwater Clean** – In line with prior surveys, we find that residents (especially those who perceive a progressively more severe stormwater pollution problem) are “very likely” to take part in these activities to help keep stormwater clean:

- **Safely dispose of chemicals** (77% “very likely,” up from 2016 [71%] and 2017 [75%] levels. These are most apt to be East residents.)
- **If you have a dog, using a doggie bag to clean up after them** (77% “very likely,” down just slightly from the 80% record mention recorded in 2016-2017. Response is highly positive regardless of area [especially in the East zips].)
- **Report a spill** (62% “very likely,” up from 60% last year. Strong likelihood of taking action is lower only in the South zips [54%].)
- **Replacing a toxic compound with a non-toxic compound** (62% “very likely,” unchanged from last year. These are particularly apt to be East residents.)

Similar to the last two years, one-half are “very likely” to say they would **gather stormwater to use for watering plants**. This is especially true among Central residents.

Overall, 72% say they would be likely (to some degree) to **install Green Infrastructure**. This is up from last year – both overall (from 66% to 72%) and those “very likely” (from 33% to 37%). East residents say they would be “very likely” to implement this type infrastructure.

### ***Final Clean Water Program Campaign Observations***

One-half of Pima County residents surveyed are familiar with the “Clean Water Starts With Me” campaign (down from 55% last year). Still, as we have found in past surveys, there continue to be significant positive differences between those aware of the “Clean Water Starts With Me” campaign (50%) and those who are not (50%) with respect to key perceptions and actions related to stormwater pollution.

Consistent with past surveys, residents familiar with the “Clean Water Starts With Me” campaign remain far more likely to perceive that Tucson has a “serious” stormwater pollution problem (48% versus 37% of those unfamiliar, 30% higher).

In terms of resident perceptions of where stormwater that flows into Tucson storm drains end up, there are few differences (again) in the ordinal ranking of survey responses. The largest share (regardless of campaign awareness) continue to think that stormwater flows in a river or wash (53% overall). However, consistent with previous findings, significantly more unfamiliar with the “Clean Water Starts With Me” campaign indicate they “don’t know” where stormwater ends up (31% versus 20% of those familiar).

With respect to Green Infrastructures implemented or installed at home or business, we find fewer differences (relative to past years) between those aware/unaware of the “Clean Water Starts With Me” campaign. A majority (regardless of campaign awareness) are landscaping with native plants (55%). Still, those familiar with the campaign remain more likely to harvest water using rain barrels or cisterns (26% versus 18% unfamiliar).

As indicated in the displays below, there continue to be key differences related to the perceived factors that contribute to the stormwater pollution problem and the strong likelihood of taking specific actions to help keep stormwater clean.

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Water Starts With Me”</u>	
		<u>Aware</u> (50%)	<u>Unaware</u> (50%)
<b><i>“Serious” Contributors to Stormwater Pollution</i></b>			
<u>Copper from copper brake pads</u>			
<b>2018</b>	<b>+87%</b>	<b>28%</b>	<b>15%</b>
2017	+53%	26%	17%
<u>Animal waste from household pets</u>			
<b>2018</b>	<b>+48%</b>	<b>31%</b>	<b>21%</b>
2017	+27%	28%	22%
<u>Household trash and bulky items</u>			
<b>2018</b>	<b>+30%</b>	<b>48%</b>	<b>37%</b>
2017	+48%	46%	31%
<u>Construction site chemicals/materials</u>			
<b>2018</b>	<b>+29%</b>	<b>49%</b>	<b>38%</b>
2017	+31%	51%	39%
<u>Household products</u>			
<b>2018</b>	<b>+23%</b>	<b>48%</b>	<b>39%</b>
2017	+31%	51%	39%
<u>Industrial facility chemicals/materials</u>			
<b>2018</b>	<b>+19%</b>	<b>50%</b>	<b>42%</b>
2017	+32%	50%	38%
<u>Pesticides/Fertilizers/Lawn &amp; garden debris</u>			
<b>2018</b>	<b>+15%</b>	<b>39%</b>	<b>34%</b>
2017	+43%	50%	35%
<u>Automotive fluids</u>			
<b>2018</b>	<b>+9%</b>	<b>47%</b>	<b>43%</b>
2017	+32%	49%	47%

- ✓ There is a 32% higher rating/awareness of “serious” contributors to the stormwater pollution problem in the Tucson area among those aware of the “Clean Water Starts With Me” campaign (compared to 37% last year).

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Water Starts With Me”</u>	
		<u>Aware</u> (50%)	<u>Unaware</u> (50%)
<b>“Very Likely” to Take Actions to Help Keep Stormwater Clean</b>			
<u>Install Green Infrastructures</u>			
<b>2018</b>	<b>+31%</b>	<b>42%</b>	<b>32%</b>
2017	+50%	39%	26%
<u>Gathering stormwater to use for watering plants</u>			
<b>2018</b>	<b>+13%</b>	<b>53%</b>	<b>47%</b>
2017	+37%	56%	41%
<u>Report a spill</u>			
<b>2018</b>	<b>+12%</b>	<b>65%</b>	<b>58%</b>
2017	+27%	66%	52%

- ✓ **There is a 19% higher strong likelihood of taking specific actions to help keep stormwater clean among those aware of the “Clean Water Starts With Me” campaign (down from 38% last year). Regardless of campaign awareness, the majority are “very likely” to take the following actions: safely dispose of chemicals (77%), use a doggie bag to clean after a pet (77%) and replace a toxic compound with a non-toxic compound (62%).**

Residents familiar with the “Clean Water Starts With Me” campaign remain more likely to dispose of household hazardous waste by taking it to a hazardous waste collection site (59% versus 47% of those unfamiliar) or landfill (27% versus 17% of those unfamiliar). However, there are few differences based on campaign awareness between those who dispose of household hazardous waste by taking it to an auto parts store (45% overall), service station (26% overall) or pouring waste down the sink/drain (14% overall). However, for the first time, residents aware of the “Clean Water Starts With Me” campaign are now more likely to report they dispose of household hazardous waste by placing it in the garbage (40% versus 30% unaware) – suggesting a need for better education (particularly in the South region).

These findings do (once again) suggest that “Clean Water Starts With Me” campaign awareness does have a positive impact on the perceptions and willingness to act related to the stormwater pollution problem in Tucson.

As a result, we suggest targeting those not currently aware of the “Clean Water Starts With Me” campaign for future outreach/education efforts – including Northwest or Central area residents and the newest (for less than two years) Pima County citizens. Meanwhile, South region residents and 16 to 25 year-olds are among those who are more likely to dispose of household hazardous waste by putting it in the garbage. Central residents and 16 to 35 year-olds are more likely to pour waste down the sink.