



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

(May 2016)

***Executive Summary***

*Prepared for:*

PIMA COUNTY DEPARTMENT OF  
ENVIRONMENTAL QUALITY

Tucson, Arizona

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Tucson, Arizona

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**Methodology Overview and Tracking** – This annual tracking survey, conducted for the Pima County Department of Environmental Quality (PDEQ), consists of a 500-person, randomly-selected and statistically-projectable sample of adult (16 or older) Pima County, Arizona residents. Like 2015, the 2016 survey utilized a split-methodology sampling plan, with an equal number of Telephone and Internet interviews (250 each). Projects conducted before 2015 were all Telephone surveys.

Regardless of the sample source, the 2016 survey instrument and screening criteria were identical. All surveys were conducted during May 2016. A Spanish-language version of the final questionnaire design was prepared and made available to Telephone/Internet survey respondents who requested it.

Telephone surveys were fielded among randomly-selected men and women (16+) who live in Pima County. As in the past, all Telephone survey respondents were further randomized by interviewing “the male or female in your household who is 16 or older and most recently celebrated a birthday.” There was only one Telephone interview conducted per household. 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 in each of four zip code-defined survey “regions” (Northwest, Central, South and East) based on recent population estimates. The 2016 Telephone sub-sample is highly representative of these geographic sampling quotas.

Internet surveys were conducted online utilizing a questionnaire administered by FMR Associates and hosted on the sgizmo.com 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 26 campaign sessions. Also, for the fourth consecutive year, the survey measured and tracked key issues related to stormwater management and hazardous waste disposal for PDEQ’s Clean Water Program.

**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.

**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.)
- **“Earth Day Festival and Parade”** (55% awareness [60% Telephone versus 50% Internet], down from 59% last year. Awareness is greater in the East area.)
- **“Bike Fest”** (51% awareness [58% Telephone versus 44% Internet], virtually unchanged from last year [52%]. Awareness is higher in the South and East regions.)

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.)
- **“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 indicate the highest degree of awareness.)
- **“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.)

**“Clean Air” Campaign Event Participation and Actions Taken** – 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%). Event participants are more likely to be Central zip residents, women, 16 to 45 year-olds and Pima County residents of 6+ years.

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.

**Opinion of Activities/Events** – Nearly nine of ten (88%) 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. Similar to recent surveys, only 8% have a negative opinion (to any extent) of air quality events and activities.

**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 and Internet respondents [46% versus 32% Telephone].)
- **Generally reduced driving** (38%, up from 35% last year. These are more likely to be Northwest area residents and Internet respondents [45% versus 31% Telephone].)
- **Keep tires inflated properly** (35%, down from 39% in 2015. More apt to keep their tires properly inflated are East area residents and Internet respondents [48% versus 22% Telephone].)
- **Carpool/Less driving alone** (33%, virtually unchanged from last year [32%]. Internet respondents [36% versus 30% of Telephone] and Northwest or East region residents 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%).

**School Materials Recall Among School Age Children** – 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 and non-Whites.

About one-half of households with young children (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).

**Gasoline-Powered Lawn & Garden Equipment** – New to the current survey, 14% overall indicate that they (or someone in their household) use gasoline-powered lawn & garden equipment to care for their home property. Usage is generally consistent regardless of geography (slightly higher in the Northwest or East zips). Among the 14% who report having such equipment, the most commonly used gasoline-powered items include:

- **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.)

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

#### **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, Telephone respondents [73% versus 63% Internet] and those aware of the “Clean Air” Program are most apt to agree.)
- **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 those aware of the “Clean Air” Program.)

#### **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 Telephone respondents [87% versus 79% Internet] and those familiar with the “Clean Air” Program.)

- **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. 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 those who perceive a progressively more severe air quality problem and respondents aware of the “Clean Air” Program.)
- **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] or sample. Familiarity is directly related to the perception of a progressively more severe air quality problem, and is much higher among those aware of the “Clean Air” Program.)

#### **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 or sample. It is higher among those familiar with the “Clean Air” Program, 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%]. Recall is higher among Telephone respondents [83% versus 72% Internet], those aware of the “Clean Air” Program and Northwest residents.)
- **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 and those aware of the “Clean Air” Program.)
- **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 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.)

**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).

**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.

**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) – while slightly fewer overall think it is a “minor” issue (from 24% to 21%).

Central or Northwest region residents 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).

**Work Commuting Behavior** – 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). Another 12% report working part-time (less than 30 hours a week), essentially unchanged from last year (13%). Overall, 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. Overall, 12% are homemakers (unchanged from last year). Another 8% report being students – down slightly from last year (11%).

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 10<sup>th</sup> 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%).

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).

Why is it that single occupant vehicle commuters drive alone to and from work or school? Identical to 2015 (32%), one-third say that “**convenience**” is the reason they drive alone. This remains especially true among Internet respondents, as well as residents of the Central region. 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. Another one of four indicate that “**no one to carpool with**” is the reason they drive alone (25%, down slightly from 26%). Up from last year (15%), 19% say they “**need their car for business,**” while 17% (up from 11%) cite “**personal errands.**” Down from 16% last year, 13% now say that they “**like to drive alone**” – while more now cite a “**child drop off**” (12%, up from 7%). 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%).

**Use of Alternative Work/School Commute Modes** – The following is a summary of the use of alternative modes for commute travel:

- **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].)
- **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].)
- **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.)
- **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].)
- **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].)



**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%). Northwest residents are particularly reliant on driving alone (72%).

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%). Consistent with last year, 11% are **carpooling** most often. **Bus riding** is also consistent with last year at 9%. 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.

**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.

**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. 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.

**“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 are more likely 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 modes of commuter travel and distances traveled with employment estimates (Source: Arizona Office of Employment & Population Statistics), 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. The percentage of miles saved has increased from 34% in 2015 to 38% now.

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.

**2016 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	70%	466,582	13.4	6,252,199	6,252,199	-0-
Motorcycle	2%	4,261	6.0	25,566	25,566	-0-
Carpool	24%	127,466	13.3	1,695,298	652,038	1,043,260
Bus	13%	87,443	5.9	515,914	14,740	501,174
Bicycle	10%	37,284	7.5	279,630	-0-	279,630
Walk	24%	101,534	5.6	568,590	-0-	568,590
Streetcar	4%	10,653	6.7	71,375	-0-	71,375
Telecommute	24%	125,274	11.7	1,465,706	-0-	1,465,706
Compressed workweek	11%	16,740	18.7	313,038	-0-	313,038
<b>TOTALS:</b>		977,237		<b>11,187,316</b>	<b>6,954,543</b>	<b>4,242,773</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 2.6 (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** – Utilizing trip frequency/length estimates provided by Pima Association of Governments in combination 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 indicated below, we estimate that the reduction of single-occupant vehicles commuting through the use of alternative methods of travel for **shopping** saves 551,732 vehicle miles per day, or 27.7% of total miles driven/not driven (down from 35.8% in 2015, due primarily to higher levels of single passenger vehicle travel). The number of **leisure** travel miles saved daily is 3,202,155 – 36.5% of total miles driven/not driven (down slightly from 41.5%). These compare to a savings of 4,242,773 vehicle miles per day in **travel to work or school** (or 38% of total miles driven/not driven).

**2016 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	61.1%	398,487	5.00	1,218,278	1,218,278	0
Carpool/Vanpool	28.6%	398,487	5.00	570,431	219,397	351,034
Bus	5.3%	398,487	5.00	105,937	3,027	102,910
Walk	4.1%	398,487	5.00	81,490	0	81,490
Bicycle	0.8%	398,487	5.00	16,298	0	16,298
<b>TOTALS:</b>	--	--	--	<b>1,992,434</b>	<b>1,440,702</b>	<b>551,732</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 2.6 (from Table 26b). Bus: based on average of 35 riders/bus. Walk/bicycle/streetcar: no polluting vehicles used.

**2016 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	45.9%	1,518,736	5.78	4,027,900	4,027,900	0
Motorcycle	0.2%	1,518,736	5.78	18,062	18,062	0
Carpool/Vanpool	45.1%	1,518,736	5.78	3,955,651	1,521,404	2,434,247
Bus	3.5%	1,518,736	5.78	307,060	8,773	298,287
Walk	3.5%	1,518,736	5.78	307,060	0	307,060
Bicycle	1.9%	1,518,736	5.78	162,561	0	162,561
<b>TOTALS:</b>	--	--	--	<b>8,778,294</b>	<b>5,576,139</b>	<b>3,202,155</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 2.6 (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 by 11% since 2015, from 45% to 50%. In addition, more than eight of ten (83%) are familiar with at least one “Clean Air” event. In line with past years, 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 (50% and 42%, respectively). This relationship continues to be 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> (50%)	<u>Unaware</u> (42%)
<b><i>Air Quality Event Awareness</i></b>			
Car-Free Day			
<b>2016</b>	<b>+182%</b>	48%	17%
2015	+246%	45%	13%
Walk and Roll to School Day			
<b>2016</b>	<b>+150%</b>	45%	18%
2015	+159%	44%	17%
Bike Fest			
<b>2016</b>	<b>+86%</b>	67%	36%
2015	+43%	63%	44%
Bike to Work Day			
<b>2016</b>	<b>+67%</b>	75%	45%
2015	+49%	76%	51%
Earth Day Festival & Parade			
<b>2016</b>	<b>+64%</b>	69%	42%
2015	+45%	71%	49%
Cyclovia			
<b>2016</b>	<b>+61%</b>	29%	18%
2015	+82%	31%	17%
• Participation in a “Clean Air” event			
<b>2016</b>	<b>+220%</b>	16%	5%
2015	+71%	24%	14%

✓ **On average, there is a 119% higher awareness and/or participation in “Clean Air” events or programs among those familiar with the “Clean Air” Program – up from 99% in 2015.**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Air” Program</u>	
		<u>Aware</u> (50%)	<u>Unaware</u> (42%)

***PDEQ and Sun Rideshare Awareness***

• Aware of PDEQ			
<b>2016</b>	<b>+65%</b>	86%	52%
2015	+118%	85%	39%
• Aware of Sun Rideshare services			
<b>2016</b>	<b>+80%</b>	72%	40%
2015	+50%	66%	44%

✓ **On average, there is an 73% greater awareness of PDEQ and Sun Rideshare services among those aware of the “Clean Air” Program.**

***PDEQ Activity Understanding***

• Aware of Pima County air pollution advisories			
<b>2016</b>	<b>+49%</b>	88%	59%
2015	+60%	80%	50%
• Seen or heard TV/radio commercials regarding clean air or air pollution			
<b>2016</b>	<b>+29%</b>	88%	68%
2015	+52%	82%	54%
• Seen or heard information about the importance of keeping tires properly inflated			
<b>2016</b>	<b>+20%</b>	91%	76%
2015	+6%	91%	86%
• Understand air pollution advisory meaning			
<b>2016</b>	<b>+14%</b>	95%	83%
2015	+16%	92%	79%

✓ **On average, there is a 28% higher understanding of PDEQ activities among those aware of the “Clean Air” Program.**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Air” Program</u>	
		<u>Aware</u> (50%)	<u>Unaware</u> (42%)
<b><i>Steps Taken to Reduce Air Pollution</i></b>			
• Choose one day/week to not drive			
<b>2016</b>	<b>+114%</b>	15%	7%
2015	+200%	15%	5%
• Carpool more/Less solo driving			
<b>2016</b>	<b>+63%</b>	39%	24%
2015	+39%	39%	28%
• Keeping tires properly inflated			
<b>2016</b>	<b>+38%</b>	40%	29%
2015	+23%	43%	35%
• Keep car tuned			
<b>2016</b>	<b>+14%</b>	41%	36%
2015	+22%	39%	32%
• Driven less/Reduced Driving			
<b>2016</b>	<b>+14%</b>	40%	35%
2015	+19%	38%	32%

✓ **There is a 49% greater likelihood of taking specific steps to reduce air pollution among those aware of the “Clean Air” Program.**

***Air Quality Perceptions***

• Perceive that Tucson area has a “moderate” or “major” air quality problem			
<b>2016</b>	<b>+30%</b>	82%	63%
2015	+18%	77%	65%

✓ **There is a 30% greater perception of air quality problems in the Tucson area among those aware of the “Clean Air” Program.**

**Once again, these survey findings and tracking results 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 study. Those unaware of the program tend to be Central area residents, 16 to 25 or 56 to 65 year-olds and non-Hispanic minorities. These same sub-groups – along with Northwest or East residents and Hispanics – are also among those most likely to indicate a change in behavior as a result of their participation in “Clean Air” Program activities. As a result, promotional, communication and awareness-building efforts should be targeted towards these groups.

This study again highlights the increased benefit of greater promotional, marketing, branding and advertising efforts – to the extent possible – in order to expand awareness of the “Clean Air” Program (as well as awareness of and participation in specific events), especially to reach the sub-groups identified above.

**Tire Inflation Education Campaign** – More than eight of ten “have seen or heard information about the importance of keeping your tires properly inflated” (83%). In addition, 35% indicate that they are keeping their tires properly inflated to help reduce air pollution in the Tucson (down slightly from the record 39% mention in 2015).

***What is the direct impact of this action taken to keep tires properly inflated?***

There are an estimated 643,293 working vehicles (automobiles, vans and trucks of one-ton capacity or less for household use) in Pima County (source: 2014 American Community Survey). A vehicle will save 144 gallons of gasoline per year with properly inflated tires (source: PDEQ).

If 35% are keeping their tires properly inflated, this yields an annual reduction of 32,421,967 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 that “streets in the Tucson area are equipped with storm drains,” 46% indicate that (to the best of their knowledge) the water that flows into these drains ends up in a **river or wash** (basically unchanged from 45% in 2015). These tend to be East zone residents.

Allowing for multiple answers, others think that stormwater that flows into storm drains ends up in:

- **Groundwater** (20%, up progressively from 2015 [15%] and 2014 [8%] results.)
- **Sewage plants** (11%, unchanged over the last three surveys. 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.)
- **Canals** (7%, identical to last year. More often Northwest residents.)

Most of the rest (29%, down slightly from 32%-33% in the past two surveys) **do not know** where stormwater ends up. These tend to be South zip residents.

**Low Impact Development (LID) Practices Implemented/Installed** – Generally speaking, usage of Low Impact Development (LID) practices (at home or business) is consistent with 2015 findings, including:

- **Landscaping with native plants** (Unchanged from 52% last year. Implementation is generally consistent across geography.)
- **Landscape depressions that collect stormwater** (24%, off slightly from 26% in 2015. Implementation is lower only in the Central zips [13% versus 27%-32% elsewhere].)
- **Connecting runoff from a roof or paved surface to a basin or to water plants** (22%, up from 20% in 2015. Increased implementation among East residents.)
- **Water harvesting with rain barrels or cisterns** (19%, highly consistent with last year [20%]. Northwest or East residents 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 Northwest residents.)
- **Porous pavements or bricks** (15%, down from 20% in 2015. Implementation is higher among Northwest residents.)

- **Natural areas protected from clearing and grading** (15%, basically unchanged since last year [16%]. Geographically, implementation is lower only in the South zips [10% versus 14%-18% elsewhere].)

**Perceived Seriousness of Storm Water Pollution Problem in 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%).

**Rating of Various Contributors to Storm Water Pollution Problem in the Tucson Area** – Using the same “1-to-9” scale, these five contributors were rated higher (relative to last year) in their perceived degree of causation of stormwater pollution:

- **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].)
- **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].)
- **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].)
- **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].)
- **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].)

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).

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).

**Methods Used to Dispose of Various Types of Household Hazardous Waste –** Consistent with last year, 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%.])
- **Auto parts store** (38%, unchanged since last year – lower only in the Northwest zips [30% versus 38%-43% elsewhere].)
- **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%.])
- **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].)
- **Landfill** (18%, basically unchanged since 2015 [19%]. Landfill users are more apt to live in the Northwest zips.)

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).

**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 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.)
- **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%).

**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.)
- **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].)
- **Replacing a toxic compound with a non-toxic compound** (58% “very likely” to take part, up slightly from 56% in 2015. There are few differences in participation 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.**

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 only in the East zips (32% versus 41%-46% elsewhere).

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

Nearly six of ten (57%) indicate awareness of the “Clean Water Starts With Me” campaign, up from 47% last year (representing an increase of 22%). Once again, there are key differences between those familiar with the “Clean Water Starts With Me” campaign (57%) and those who are not (43%) with respect to key perceptions and actions related to stormwater pollution.

Residents aware of the “Clean Water Starts With Me” campaign are more apt to perceive that Tucson has a “serious” stormwater pollution problem (42% versus 36% of those unaware).

Are there differences related to the perception of where stormwater that flows into Tucson storm drains end up? Not really – once again, the largest share (regardless of campaign awareness) think that stormwater flows in a river or wash (46%). However, more unaware of the “Clean Water Starts With Me” campaign are unsure where stormwater ends up (33% versus 25% of those aware).

As indicated in the following displays, there are some additional differences related to the perceived factors that contribute to the stormwater pollution problem and the 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> (57%)	<u>Unaware</u> (43%)
<b><i>Low Impact Development Practices Implemented/Installed at Home/Business</i></b>			
Water harvesting using rain barrels/ cisterns	<b>+77%</b>	23%	13%
Natural areas protected from clearing and grading	<b>+42%</b>	17%	12%
Connecting runoff from a roof or paved surface to a basin or to water plants	<b>+20%</b>	24%	20%
Trench that is filled with gravel to collect stormwater	<b>+20%</b>	18%	15%

✓ **There is a 40% higher usage of Low Impact Development Practices among those aware of the “Clean Water Starts With Me” campaign.**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Water Starts With Me”</u>	
		<u>Aware</u> (57%)	<u>Unaware</u> (43%)
<b>“Serious” Contributors to Stormwater Pollution...</b>			
Animal waste from household pets	<b>+50%</b>	30%	20%
Household trash and bulky items	<b>+43%</b>	43%	30%
Household products	<b>+28%</b>	41%	32%
Pesticides/Fertilizers/Lawn & garden debris	<b>+26%</b>	39%	31%
Construction site chemicals/materials	<b>+19%</b>	43%	36%
Industrial facility chemicals/materials	<b>+18%</b>	46%	39%
Automotive fluids	<b>+8%</b>	43%	40%

- ✓ **There is a 27% 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.**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Water Starts With Me”</u>	
		<u>Aware</u> (57%)	<u>Unaware</u> (43%)
<b>“Very Likely” to Take Actions to Help Keep Stormwater Clean</b>			
Report a spill	<b>+28%</b>	69%	54%
Replacing a toxic compound with a non-toxic compound	<b>+28%</b>	64%	50%
Gathering stormwater to use for watering plants	<b>+23%</b>	54%	44%
Implement Low Impact Development practices	<b>+21%</b>	46%	38%

- ✓ **There is a 23% higher strong likelihood of taking specific actions to help keep stormwater clean among those aware of the “Clean Water Starts With Me” campaign. Significantly, eight of ten – regardless of campaign awareness – are “very likely” to use a doggie bag to clean up after a pet.**

Those aware of the “Clean Water Starts With Me” campaign are more likely to dispose of household hazardous waste by taking it to a hazardous waste collection site (47% versus 36% of those unaware), auto parts store (42% versus 32% of those unaware) or landfill (21% versus 15% of those unaware). At the same time, there are few differences based on campaign awareness between those who dispose of household hazardous waste by putting it in the garbage (29% overall) or down the sink/drain (12% overall).

All of these findings do (again) suggest that “Clean Water Starts With Me” campaign awareness does have a positive impact on the perceptions, knowledge 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 56 to 65 year-olds, non-Hispanic minorities, new (for less than two years) or 6-to-10 year Pima County residents and the most highly educated (with at least some graduate work or an advanced degree). Non-Hispanic minorities – along with residents of the South or Northwest zips – are also among those who are more likely to dispose of household hazardous waste by putting it in the garbage or down the sink.