



**EVALUATION OF THE 2020-2021 PIMA COUNTY
CLEAN AIR PROGRAM CAMPAIGN
AND
CLEAN WATER CAMPAIGN SURVEY**

(May 2021)

Executive Summary

Prepared for:

PIMA COUNTY DEPARTMENT OF
ENVIRONMENTAL QUALITY

Tucson, Arizona

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Methodology Overview and Tracking – This annual tracking study, conducted for the Pima County Department of Environmental Quality (PDEQ), is comprised of a 500-person, randomly-selected and statistically-projectable sample of adult (16 or older) residents of Pima County, Arizona. Since 2016, this study has included a dual-methodology sample, split evenly between Telephone interviews and Internet surveys (250 each). Projects conducted prior to 2015 were exclusively Telephone-based.

This survey analyzed and tracked the overall effectiveness of the “Clean Air” Program after 31 campaign sessions. For the ninth consecutive year, the study also measured and tracked key issues related to stormwater management, perceptions, behaviors and actions impacting stormwater quality for PDEQ’s “Clean Water” Program.

The 2020 and 2021 surveys were conducted during the COVID-19 pandemic. The 2020 study was conducted during the most severe portion of the outbreak and the many restrictions it imposed on the workplace and schools (thus impacting commute-related patterns). To elicit the most complete results, the 2020 survey measured both current (during COVID-19 restrictions) and pre-COVID-19 employment/commuting patterns. The 2021 survey was conducted as many of these restrictions were being relaxed or lifted. The 2021 survey measured current (not past) employment, school and commuting patterns amidst the remaining COVID-19 restrictions. For comparative purposes, the work commuting behavior tables summarize 2020 Pre-COVID (prior to the pandemic), 2020 COVID and 2021 (amidst current/relaxed restrictions) results.

Once again, the Telephone and Internet survey instruments and screening criteria for each methodology were identical. Fielding for this project was conducted from mid-May to early June 2021. A Spanish-language version of the final questionnaire design was prepared and made available to Telephone or Internet survey respondents who requested it.

All surveys for this project were conducted among randomly-selected adults (16 years or older) who reside in Pima County.

Telephone interview 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 only one Telephone interview conducted per household.

Internet surveys were 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.

Regardless of methodology, all surveys 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). The geographic composition of the 2021 sample is again highly representative of these quotas: 32% South, 30% Northwest, 24% Central and 14% East.

Awareness of the Pima County “Clean Air” Program – Overall, 41% say they are aware of the Pima County “Clean Air” Program. This represents incrementally lower awareness since the 2018 survey (46%). In line with prior years, awareness of the “Clean Air” Program is directly related to the perception of a more serious air quality problem – as well as among those who live in households impacted by a breathing-related medical condition. Central zip residents, 56 to 65 year-olds, non-Hispanics and more formally educated respondents (college degree or better) are also more apt to indicate increased awareness of the program.

Awareness of Various Clean Air Events or Activities – Three of four are aware of at least one event or activity to promote clean air in the Tucson area. This is down from 82%-86% in recent years. Awareness of individual events evaluated trends generally lower – no doubt influenced by the pandemic (with many such in-person events cancelled due to COVID-19). Still, as we have found in past years, event awareness remains significantly higher among residents familiar with the “Clean Air” Program.

The event with the highest degree of awareness continues to be the **Earth Day Festival** (51%, down from 57%-58% in 2019-2020). Central or South region residents indicate increased awareness of this event.

About four of ten overall are familiar with three “Clean Air” events:

- **“Bike to Work” Day** (45% awareness, down from 52%-55% in 2019-2020. These tend to be Central region residents.)
- **“Walk and Bike to School Day”** (41%, down just slightly from 2020 [42%] – compared to 46% in 2019. Awareness is highest in the South zips.)
- **“Bike Fest”** (38%, down from 41% in 2019-2020. Central zip code residents indicate increased awareness.)

New to the current study, 27% indicate familiarity with the **“This is Clean Air” Challenge**. Awareness is generally consistent regardless of geography.

Two of ten indicate awareness with the following activities or programs:

- **“Travel Reduction Program”** (21% awareness. While down from last year [28%], awareness is identical to 2019 levels. Central residents are more likely to be familiar with this program.)

- **“Healthy Air Is In Our Hands Drive-Less Pledge”** (Two of ten indicate awareness of this newly tested program. Geographically, awareness is lower only in the East zip codes.)
- **“Cyclovia”** (20% awareness, down from 28%-29% in 2019-2020. Central residents are more apt to be familiar with this event.)

Clean Air Campaign Event Participation and Actions Taken – Among the three of four survey respondents aware of at least one “Clean Air” campaign event, 12% say that they (or someone in their household) participated in at least one such activity. Consistent with reduced event awareness overall, this is the lowest participation rate recorded since 2016 (12% versus 15%-20% in recent years). Participation is higher among Central region residents, men, progressively younger respondents and non-Hispanic minorities.

Among the 12% who indicate past participation in a “Clean Air” event or activity, fully 86% report they have changed (or are considering changing) their daily routine or behaviors to help improve air quality. This is the highest percentage recorded in recent surveys (up from 59% last year and 75% in 2019). Among the combined sample, this means that 7% report a change in their behavior after participating in a “Clean Air” Program event. This compares to 9%-10% in the last two surveys.

Opinion of Activities/Events – Overall, 86% familiar with at least one “Clean Air” event have 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 compares to 88% last year. Still, the percentage of residents “very favorable” has dipped to 40% (down from 45%-52% in recent years). South region residents are most likely to be highly favorable towards events and activities to encourage use of alternative transportation modes. In line with past years, less than one of ten (7%) have a negative opinion (to any degree) of air quality related events and activities.

Steps Taken to Reduce Air Pollution – In line with last year, 46% indicate they have **generally reduced driving** to help reduce air pollution in the Tucson area. This is true regardless of geography. It is likely that “driving less” has increased to a degree because of the COVID-19 pandemic, as in prior surveys these findings were consistently between 35% and 38%.

Similarly, it is apparent (even allowing for multiple responses) that the pandemic has impacted the likelihood of taking specific actions to reduce air pollution. Nearly across-the-board, significantly fewer report:

- **Keep tires properly inflated** (29%, down from 42% last year. These tend to be Central or East region residents.)
- **Keep car tuned** (28%, down from 41% last year. Somewhat lower only in the Central zips [23% versus 27%-31% elsewhere].)

- **Carpool/Less driving alone** (20%, progressively lower than we found in 2020 [35%] and 2019 [43%]. These carpoolers are more apt to live in the Central zip codes.)
- **Avoid excessive idling** (15%, down from 22% last year. This is the case regardless of geography.)
- **Planted trees** (13%, down from 25% last year.)
- **Bought a more fuel-efficient car** (12%, down from 21% last year. East region residents are more likely to have purchased a more fuel-efficient vehicle.)
- **Chosen once a week not to drive** (11%, down from 17% last year. These are more likely to be Northwest residents.)

In addition, fewer say they are **using their BBQ grill less** (9%, down from 11%), **bought bicycles** (8%, down from 17%), **moved closer to work** (6%, down from 10%), **using their fireplace or wood stove less** (from 8% to 5%) or **adjusted their vehicle's emission control equipment** (5%, down from 11%).

While fewer may be taking specific actions, just 15% overall say they are doing **nothing** to reduce air pollution (consistent with 11%-16% in recent years).

School Materials Recall Among Children 5-18 – Overall, 27% indicate that they have children between the ages of 5 and 18 living in their household. This is down slightly from the past two surveys (30%-32%), but consistent with years prior. South region residents, 26 to 45 year-olds and non-Whites are more likely to report that they have children 5-18 in their household.

Among these households with children ages 5 to 18, 35% say that these young children “talked about or brought home materials from school about improving air quality.” This is down from 40% last year (likely influenced to a degree by the pandemic). Recall in the 2021 survey is higher in the Central or East zip codes.

Gasoline-Powered Lawn Mower Usage and Characteristics – Unchanged since 2020, 8% of residents indicate that they or someone in their household uses a gasoline-powered lawn mower to care for their home property. Similar to last year, usage is lower only in the East zip codes (3% versus 7%-10% elsewhere). Among those who know, a nearly equal share of users say their mower has a 2-stroke (36%) or 4-stroke (38%) engine – with average monthly usage of 25 minutes.

Statement Evaluations – The following is a summary of the percentage of 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 (PDEQ)** (51% agree, down from 59%-60% in the last two years. Awareness is highest in the Central zip codes.)
- **You are aware of the services provided by Sun Rideshare** (51% agree, a slight improvement since last year [48%] and consistent with 2019 findings [52%]. Northwest or Central residents indicate increased awareness.)

PDEQ Program Awareness –

- **You have seen or heard information about the importance of keeping your tires properly inflated** (81% agree, rebounding to 2019 levels [up from 76% last year]. There is strong recall regardless of geography.)

Air Pollution Evaluations –

- **You have seen or heard information regarding clean air or air pollution** (79% agree, up from 73% last year and similar to 2019 findings [82%]. Agreement is generally consistent across geography.)
- **You are aware that the majority of our air pollution comes from motor vehicle use** (75% agree, unchanged since last year. Central or East region residents are more apt to indicate agreement.)
- **You have seen or heard information that vehicle engine idling causes air pollution** (71% agree, basically unchanged since last year [72%]. There are few differences based on zip code [with slightly lower agreement in only the South region].)
- **Because you want to reduce air pollution, you are generally driving less** (54% agree, marginally higher than the 2019 [52%] and 2020 [53%] studies. Agreement is lower only in the East zips [41% versus 54%-57% elsewhere].)

COVID-19 Outbreak Driving Patterns –

- **Because of COVID-19 restrictions, you are generally driving less** (52% agree. This compares to 74% in 2020 who agreed with the statement “because of the COVID-19 outbreak, you are generally driving less.” Agreement in the 2021 study is higher among East zip residents. How many additional miles do those now driving less anticipate driving as COVID-19 restrictions are relaxed or lifted? Estimates range from 1 to 700 additional miles each week – with an average of 38.1 miles.)

Travel Behavior for Shopping – Nearly two-thirds (64%) indicate they generally **drive alone** to go shopping. This compares to 57% last year (when asked to recall their typical travel behavior *prior* to the COVID-19 outbreak). Fewer report **carpooling (with 1 to 4 other adults)** when shopping (from 29% to 21%). As we have found in past surveys, fewer overall ride the **bus** (6%, up from 4%), **walk** (4%, up from 1%), **bicycle** (2%, down slightly from 3%) or **vanpool with 5+ adults** (unchanged at 1%). None in the 2021 study typically travel via motorcycle or the streetcar for shopping purposes.

Travel Behavior for Leisure Purposes – Consistent with last year (measuring behavior before the pandemic), just less than one-half (49%) report they generally **drive alone** for leisure purposes (“such as dining out, meeting with friends, going to the movies, going to the gym, etc.”). At the same time, slightly fewer say they **carpool with 1 to 4 other adults** for leisure purposes (from 38% to 35%). Less than one of ten overall ride the **bus** (6%, up from 4%), **walk** (3%, up from 2%), **bicycle** (2%, down from 3%), **van pool with 5 or more adults** (1%, down from 2%) or **take the streetcar** (unchanged at 1%).

Perceived Seriousness of Air Quality Problem in Tucson Area – Consistent with 2019-2020 findings, two of ten (21%) residents perceive that there is a “major” air quality problem in the Tucson area. Compared to last year, fewer think there is a “minor problem” (from 25% to 20%). Instead, slightly more now consider air quality to be a “moderate problem” (from 50% to 52%) – while a few more are unsure (7%, up from 5%).

South or Central region residents, men, 26 to 55 year-olds and college graduates or better are more apt to think that Tucson has a “major” air quality problem. There are few differences based on ethnicity. Households impacted by a breathing-related medical condition – along with those who perceive a progressively more severe stormwater pollution problem – are also more likely indicate a serious air quality problem. In line with past surveys, the perception of a “major” air quality program is much higher among those aware of the “Clean Air” Program (30% versus 15% unfamiliar). Meanwhile, those who perceive a “minor” air quality problem are more apt to be East zip residents and 56 to 65 year-olds.

Work Commuting Behavior Amidst Current COVID-19 Conditions – When asked about their employment status, and allowing survey respondents to select more than one category of response, 34% indicate that they are employed full-time (30 hours or more each week). This is higher than the 2020 COVID finding (30%), but well short of pre-pandemic full-time employment (42%). Full-time employment in the 2021 study is slightly higher in the South region (38% versus 31%-34% elsewhere), and is greater among men, 26 to 55 year-olds and non-Whites. Overall, 8% report working part-time (down from 12% each for 2020 pre- and post-COVID levels). Up slightly from last year’s pandemic level (12%), 14% report being unemployed, with another 2% (down from 7%) who say they are furloughed due to COVID-19. (Some of this increase in unemployment may be previously “temporary” furloughs that turned into full unemployment.) Similar to the last two years (including both COVID and pre-COVID numbers), 27% in the current survey are retired. In line with the past few surveys, about one of ten each are students (10%) or homemakers (8%).

Among those who work full-time or part-time (43% of the total sample), 17% work exclusively for a home-based business. This is down slightly from both COVID (24%) and pre-COVID (19%) responses last year, and is the lowest percentage recorded since 2018 (13%). Those who work outside the home (83%) primarily work for another company exclusively (76%), rather than work for both another company and a home-based business (7%). Home-based businesses are somewhat more common in the Central or East zip codes.

Among full-time employees in the 2021 survey, 72% say they work a “standard” schedule (8 hour days five days a week). This is up slightly from pre-COVID 2020 levels (69%), and just slightly less than the record-high of 75% recorded in 2019. Fewer report working 10 hour days, 4 days a week (from 9% pre-COVID to 6% now), while a few more work a 12-hour day, 3 or 4 days a week (from 3% to 5%). Consistent with prior studies, 3% say they are working 80 hours over 9 days with the 10th day off. Down slightly from pre-COVID 2020 (17%), 14% now say their workweek varies. South area residents are more apt to have utilized some type of compressed workweek.

Up slightly from 2020 COVID numbers (61%), but down from pre-COVID usage (71%), 64% use **single passenger commuting to work or school**. The average frequency of single passenger commute is 4.2 days, up from 2020 COVID levels (3.8 days). One of four indicate they **work at home instead of driving to work** at least one day per week. This is up from the 2020 pre-COVID reporting of 18%, and average frequency of usage has increased (from 3.0 to 3.7 days). Nearly identical to 2020 COVID findings, 15% report **attending classes at home instead of going to school**. As students return to the classroom in 2021, average days of at-home class has declined from 4.4 to 3.7. Identical to pre-COVID 2020 levels, 23% say they **walk to work or school**, although there is a decline in average days (from 2.8 to 2.5 days). Highly consistent with the 2020 pre-COVID total (21%), 22% report **carpooling or vanpooling** at least one day per week. However, average frequency has dipped from 3.2 to 2.8 days.

Most Used Mode of Transportation for Work/School Amidst Current COVID-19 Conditions – Down from 2020 pre-COVID levels (59%), one-half of 2021 commuters (49%) utilize **single-passenger vehicle commuting** as their *most-used* method of transportation.

Another 16% primarily **telecommute**. These findings are more than double 2018 to pre-COVID 2020 levels (7% each), but lower than 27% peak COVID 2020 usage. Another one of ten **attend classes from home instead of going to school** as their most-used commuting method. Down slightly from 2020 pre-COVID (11%) findings, 8% are primarily **carpooling** for their commute. Representing a slight increase from last year’s pre-COVID response (5%), 7% say **walking** is their most used mode of commute transportation. Down slightly from 2020 pre-COVID findings (8%), 6% indicate that **taking the bus** is their most used method of transportation. Identical to pre-COVID 2020, 4% are **riding a bike** as their primary mode of transportation to work or school.

Miles Traveled to Work or School Amidst Current COVID-19 Conditions – Up from 2020 findings (26% for both pre-COVID and COVID), 31% say they have a school or work commute of 5 miles or less. Another three of ten commute between 6 and 10 miles (down from 33% 2020 pre-COVID), while 9% say their commute is between 11 and 14 miles. In line with recent years, the remaining 29% travel 15 miles or more. In terms of geography, South area residents are most likely to report commutes of 15+ miles (40%). On the other hand, 78% of Central residents have a commute of 10 miles or less.

Telecommuting Amidst Current COVID-19 Conditions – Among those who work outside the home (35% of the total sample), 37% indicate that they telecommute. This is down from 2020 COVID levels (49%), but much higher than the pre-COVID total (20%). Teleworkers are more apt to be Northwest or Central area residents. In line with 2020 pre-pandemic levels, 71% of 2021 telecommuters indicate they do so more than once a week. This reflects an increase in the percentage who telework 5 days a week or more (from 30% to 39% now). During the height of the 2020 pandemic, fully 90% of teleworkers said they telecommuted at least once a week (with 48% who did so 5+ days each week).

Daily Commuter Miles Saved Through Alternate Modes – Based on the combination of results related to the modes of commuter travel and distances traveled with April 2021 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 3,846,406 vehicle miles per day amidst current COVID-19 conditions – or 43% of total miles driven/not driven.** The 2021 percentage of miles saved (43%) is higher than 2020 pre-COVID-19 findings (38%), but well short of COVID-era savings (55%). These positive 2021 miles saved findings (as compared to 2020 pre-COVID) are primarily related to lower levels of single-passenger travel (64% versus 71%, respectively), as well as an increase in the participation rate and/or frequency of use of several alternate modes (particularly telecommuting).

2021 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	64%	376,667	12.3	4,633,004	4,633,004	-0-
Motorcycle	2%	2,776	6.5	18,044	18,044	-0-
Carpool	22%	85,505	11.6	991,858	381,484	610,374
Bus	10%	46,084	9.8	451,623	12,904	438,719
Bicycle	11%	30,995	7.9	244,861	-0-	244,861
Walk	23%	80,133	3.5	280,466	-0-	280,466
Streetcar	5%	13,117	4.8	62,962	-0-	62,962
Telecommute	25%	130,131	10.4	1,353,362	-0-	1,353,362
School from home	15%	76,621	8.2	628,292	-0-	628,292
Compressed workweek	10%	14,575	15.6	227,370	-0-	227,370
TOTALS:	--	856,604	--	8,891,842	5,045,436	3,846,406

- (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 – Combining trip frequency/length estimates provided by Pima Association of Governments with the “most used” methods of pre-pandemic transportation (Tables 18/19 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 for **shopping** saves 499,825 vehicle miles per day, or 26% of total miles driven/not driven (down slightly from 27% in 2020 pre-pandemic savings). The number of **leisure** travel miles saved daily is 3,028,492 – 35% of total miles driven/not driven (up from 33% 2020 pre-pandemic savings). These compare to a savings of 3,846,406 vehicle miles per day in 2021 **travel to work or school** (or 43% of total miles driven/not driven).

2021 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	64.2%	398,487	5.00	1,279,143	1,279,143	0
Motorcycle	0.2%	398,487	5.00	3,985	3,985	0
Carpool/Vanpool	21.2%	398,487	5.00	422,396	162,460	259,936
Bus	5.6%	398,487	5.00	111,576	3,188	108,388
Walk	4.4%	398,487	5.00	87,667	0	87,667
Bicycle	1.8%	398,487	5.00	35,864	0	35,864
Streetcar	0.4%	398,487	5.00	7,970	0	7,970
TOTALS:	--	--	--	1,948,601	1,448,776	499,825

- (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 32b). Bus: based on average of 35 riders/bus. Walk/bicycle/streetcar: no polluting vehicles used.

2021 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	49.0%	1,518,736	5.78	4,301,364	4,301,364	0
Motorcycle	0.2%	1,518,736	5.78	17,557	17,557	0
Carpool/Vanpool	36.2%	1,518,736	5.78	3,177,742	1,222,208	1,955,534
Bus	6.2%	1,518,736	5.78	544,254	15,550	528,704
Walk	3.2%	1,518,736	5.78	280,905	0	280,905
Bicycle	2.4%	1,518,736	5.78	210,679	0	210,679
Streetcar	0.6%	1,518,736	5.78	52,670	0	52,670
TOTALS:	--	--	--	8,585,171	5,556,679	3,028,492

- (A) From Table 19.
- (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 32b). Bus: based on average of 35 riders/bus. Walk/bicycle/streetcar: no polluting vehicles used

Final Air Quality Campaign Observations

While there has been little change in awareness of the Pima County “Clean Air” Program (41% versus 42% in 2020), fewer overall are familiar with at least one “Clean Air” event (75% versus 82% in 2020). Still, there continues to be a significant difference in key attitudes and behaviors related to air quality among those familiar of the “Clean Air” Program (41%) and those who are not (44%). This relationship is once 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> (41%)	<u>Unaware</u> (44%)
<i>Air Quality Event Awareness</i>			
• <u>Travel Reduction Program</u>			
2021	+720%	41%	5%
2020	+133%	42%	18%
• <u>Healthy Air Is in Our Hands</u>			
<u>Drive-Less Pledge</u>			
2021	+720%	41%	5%
• <u>This Is Clean Air Challenge</u>			
2021	+671%	54%	7%
• <u>Cyclovia</u>			
2021	+325%	34%	8%
2020	+81%	38%	21%
• <u>Bike Fest</u>			
2021	+217%	57%	18%
2020	+77%	55%	31%
• <u>Walk and Bike to School Day</u>			
2021	+158%	62%	24%
2020	+100%	58%	29%
• <u>Bike to Work Day</u>			
2021	+141%	65%	27%
2020	+80%	74%	41%
• <u>Earth Day Festival</u>			
2021	+94%	66%	34%
2020	+59%	73%	46%
• <u>Participation in a “Clean Air” event</u>			
2021	+850%	19%	2%
2020	+278%	34%	9%

✓ **On average, there is a 433% higher awareness and/or participation in “Clean Air” events or programs among those familiar with the “Clean Air” Program (compared to 115% in 2020).**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Air” Program</u>	
		<u>Aware</u> (41%)	<u>Unaware</u> (44%)
<i>PDEQ and Sun Rideshare Awareness</i>			
• <u>Aware of PDEQ</u>			
2021	+200%	78%	26%
2020	+124%	83%	37%
• <u>Aware of Sun Rideshare services</u>			
2021	+94%	68%	35%
2020	+54%	60%	39%
✓ On average, there is a 147% greater awareness of PDEQ and Sun Rideshare services among those aware of the “Clean Air” Program (compared to 89% in 2020).			

PDEQ Activity Understanding

• <u>Seen or heard information that vehicle engine idling causes air pollution</u>			
2021	+38%	83%	60%
2020	+25%	80%	64%
• <u>Seen or heard information regarding clean air or air pollution</u>			
2021	+30%	90%	69%
2020	+21%	81%	67%
• <u>Seen or heard information about the importance of keeping tires properly inflated</u>			
2021	+26%	91%	72%
2020	+9%	81%	74%
• <u>Aware that majority of air pollution comes from motor vehicle use</u>			
2021	+17%	83%	71%
2020	+10%	79%	72%
✓ On average, there is a 28% higher understanding of PDEQ activities among those aware of the “Clean Air” Program (compared to 16% in 2020).			

Based on these survey findings and tracking results, we again conclude that the “Clean Air” Program increases awareness, belief and actions related to improving air quality. Consequently, targeting those *unfamiliar* with the program continues to be a key recommendation of this project.

Those unfamiliar with (or unsure of) the “Clean Air” Program are more apt to live in the South region, and tend to be younger (16 to 25), Hispanics and newer Pima County residents (for five years or less).

As result, promotional, communication and awareness-building efforts should be targeted towards these groups. We continue to recommend increased development and usage of social media to help reach younger and newer residents. This could be supplemented (as the budget allows) with traditional media (such as television, print and/or radio, especially those specific to the South region) to reach the defined target.

Tire Inflation Education Campaign – More than eight of ten (81%) indicate that they “have seen or heard information about the importance of keeping your tires properly inflated” (up from 76% in 2020). Three of ten say they are keeping their tires properly inflated to help reduce air pollution in the Tucson. This is down from a record 42% mention last year, no doubt influenced (to a degree) by the pandemic and reduced levels of driving.

What is the direct impact of this action taken to keep tires properly inflated? There are an estimated 697,651 working vehicles (automobiles, vans and trucks of one-ton capacity or less for household use) in Pima County (source: 2019 American Community Survey). According to PDEQ, a vehicle will save 144 gallons of gasoline per year with properly inflated tires.

If 29% are keeping their tires properly inflated, this yields an annual reduction of 29,133,906 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 –

Similar to past surveys, respondents were informed that “some streets in the Tucson area are equipped with storm drains.” Immediately afterwards, respondents were asked to identify where (to the best of their knowledge) water that flows into these storm drains ends up. Allowing for multiple responses, ranked perceptions include:

- **River or wash** (46%, down from one-half in the last two surveys. These tend to be Northwest or Central zip code residents.)
- **Groundwater** (14%, down slightly from last year [17%] – but in line with 2018-2019 findings [15%]. This perception is lower only in the Northwest zips [8% versus 16%-17% elsewhere].)
- **Water treatment plants** (13%, consistent with the last two years [12%-14%]. East zip residents are more likely to think that stormwater flows into water treatment plants.)
- **Sewage plants** (11%, down slightly from last year [13%], but identical to 2019 results. There are few differences based on geography.)
- **Canals** (5%, down from 9% last year. Slightly higher in the Central zips.)

In line with recent years, one of four say they **do not know** where water that flows into storm drains ends up. These are more likely to be South region residents.

Green Infrastructures Implemented/Installed at Home or Business – Once again, **landscaping with native plants** is the most often implemented Green Infrastructure (52% – basically unchanged since last year at 53%). Native plants are used regardless of geography (particularly in the Northwest zips). Usage is higher among residents who perceive a progressively more “serious” stormwater pollution problem.

Two of ten report that these two Green Infrastructures have been installed or implemented at their home or business:

- **Porous pavements or bricks** (22%, down just slightly from last year [24%]. Usage is generally consistent across geography.)
- **Connecting runoff from a roof or paved surface to a basin to water plants** (19%, down from 26% last year. Runoff collection is elevated among Central zip residents.)

Additional Green Infrastructure installed at home or business include:

- **Landscaped depressions that collect stormwater** (15%, down from 27% last year. Central or South region residents are more likely to implement this Green Infrastructure.)

- **Natural areas protected from clearing and grading** (13%, down from 16% last year. Implementation is lower only in the Central zips [8% versus 14%-17% elsewhere].)
- **Water harvesting using rain barrels or cisterns** (13%, down from 16% last year. Usage is higher in the South zip codes.)
- **A trench that is filled with gravel to collect stormwater** (11%, down from 19% last year.)

Awareness of the “Clean Water Starts With Me” Campaign – Similar to the last two surveys, four of ten say they are familiar with the “Clean Water Starts With Me” campaign. Awareness is higher in the Central zips and among residents who perceive a “serious” or “moderate” stormwater pollution problem.

Perceived Seriousness of Stormwater Pollution Problem in the Tucson Area – Similar to 2020 findings, fully 86% of respondents perceive that there is at least a “moderate” problem in the Tucson area “with polluting materials entering storm drains.” However, over the past three years, there has been a progressive decline in the percentage who indicate a “serious problem.” In 2019, a record 44% perceived a “serious problem” – compared to 33% last year and 27% now. Still, as in recent studies, only 14% think stormwater pollution is “not a problem.” This yields a 5.4 average score on the “1-to-9” rating scale (down from 5.7 in 2020). Geographically, average scores are somewhat lower only in the East region (4.9 versus 5.4-5.5 elsewhere).

Methods Used to Dispose of Various Types of Household Hazardous Wastes – Consistent with last year, 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** (43% usage, down from 49% last year. East zip code residents are more likely to dispose of household wastes at a hazardous waste collection site.)
- **Auto parts store** (31% usage, down from 39% last year. There are few differences based on geography.)
- **Put in the garbage** (27% usage, down from 34% last year. These are more apt to be younger residents [16 to 35].)
- **Service station** (18% usage, down from 24% last year. These tend to be South residents.)
- **Landfill** (12%, down from 17% last year. Landfill users tend to be Northwest or East residents.)

Down from 16% last year, 12% indicate that they get rid of household hazardous wastes by **pouring them in the sink or down the drain**. These tend to be younger (16 to 35) respondents, with relatively few differences based on geography.

Up from 14% last year, 18% indicate they **do not use** items such as household chemicals, automotive fluids or lawn & garden chemicals (or finishing them up when they do). In line with past years, 8% are not sure how they dispose of household hazardous wastes.

Rating of Various Contributors to Stormwater Pollution Problem – As in past years, survey participants were asked to rate the perceived severity of eight contributors to the problem of stormwater pollution in Tucson. The same “1-to-9” rating scale was used, where “1” means “not a problem” and “9” means a “serious problem.”

Compared to last year, average contribution scores trend lower – although the ordinal rankings of these contributors remain about the same. In general, this is related to each item being perceived to be a more “moderate” (and less “serious”) contributor to stormwater pollution. Still, as in recent surveys, there continues to be a direct relationship between the severity of the stormwater pollution problem in Tucson and the degree to which each of these factors is perceived to contribute to the problem.

The eight stormwater pollution problem contributors evaluated include:

- **Chemicals and materials from industrial facilities** (77% contributor to stormwater pollution [compared to 80% in 2020], 26% “serious” [down from 38%] – resulting in a 5.1 average score on the “1-to-5” scale [compared to 5.5 last year]. Perceived causation is higher in the Northwest zip codes.)
- **Automotive fluids such as oil, gasoline and brake fluid** (76% contributor to stormwater pollution [compared to 81% in 2020], 24% “serious” [down from 36%] – resulting in a 5.0 average score [compared to 5.4 last year]. These tend to be South or Northwest residents.)
- **Pesticides, fertilizers and debris from lawns and gardens** (75% contributor to stormwater pollution [compared to 79% in 2020], 26% “serious” [down from 35%] – resulting in a 5.0 average score [compared to 5.4 last year]. There are few differences based on geography.)
- **Chemicals and materials from construction sites** (76% contributor to stormwater pollution [compared to 80% in 2020], 25% “serious” [down from 35%] – resulting in a 5.0 average score [compared to 5.4 last year]. Northwest or South residents are more apt to say that chemicals/materials from construction sites contribute to stormwater pollution.)

- **Household trash and bulky items like mattresses, sofas and tires** (74% contributor to stormwater pollution [compared to 77% in 2020], 24% “serious” [down from 36%] – resulting in a 4.9 average score [compared to 5.3 last year]. These tend to be Northwest residents.)
- **Household products such as cleaning fluids, detergents, paints, degreasers and bleaches** (71% contributor to stormwater pollution [compared to 75% in 2020], 23% “serious” [down from 34%] – resulting in a 4.9 average score [compared to 5.2 last year].)
- **Animal waste from household pets** (61% contributor to stormwater pollution [unchanged since 2020], 13% “serious” [down from 22%] – resulting in a 4.1 average score [compared to 4.4 last year]. These tend to be South or Northwest residents. Similar to recent years, four of ten overall consider pet waste to be “not a problem.”)
- **Copper from brake pads made with copper** (59% contributor to stormwater pollution [compared to 61% in 2020], 12% “serious” [down from 18%] – resulting in a 4.1 average score [compared to 4.2 last year].)

Government Entity to Call If Witness to Someone Dumping Trash or Chemicals in a Storm Drain – Nearly three of ten (28%) indicate that they are **unsure** who they would contact if they saw someone dumping trash or chemicals in a storm drain. This is up slightly from one of four last year.

One-third (34%) say they would contact **911/Police department** to report someone dumping trash or chemicals in a storm drain. This is down slightly from 37%-38% in the last two surveys.

Others indicate they would contact these government-related agencies or departments to report storm drain dumping:

- **City government** (13%, down from 18% last year. These tend to be Central or East zip code residents.)
- **County government** (13%, down from 16% last year. South region residents are among those more apt to say they would contact county government.)
- **Water department** (10%, down from 15% last year.)
- **Sanitation department** (9%, down from 12% last year. South or Northwest residents are more apt to say they would speak to the sanitation department.)
- **Health department** (8%, down from 12% last year. These are more likely to be Northwest residents.)
- **Flood control district** (3%, basically unchanged since last year [4%.])

In line with recent years, very few (3%) say they would **not report** storm drain dumping.

Typical Methods of Handling Pet and Animal Waste – A majority (55%) indicate they typically handle pet and animal waste by **placing it in the garbage for disposal**. This is the case regardless of geography (particularly in the East zips). Among the rest, and allowing for more than one response, about one of ten overall:

- **Leave waste to decompose on grass or soil** (12%, more often South residents.)
- **Flush down the toilet** (9%, typically South or East residents.)

Likelihood of Taking Part in Various Activities to Help Keep Stormwater Clean – In line previous years, most survey respondents remain “very likely” to take part in these two activities to help keep stormwater clean:

- **If you have a dog, using a doggie bag to clean up after them** (69% “very likely,” up slightly from 67% last year. Northwest or East residents are most likely to be “very likely” to use a doggie bag.)
- **Safely dispose of chemicals** (63% “very likely,” down slightly from two-thirds last year. These are more apt to be Central or East residents.)

Nearly one-half (48%) are “very likely” to say they would **report a spill**, down from 54% last year. This is especially true in the Northwest zip codes.

While fewer are “very likely” to indicate they would **replace a toxic compound with a non-toxic compound** (from 52% to 42%), just 9% say are “not at all likely” to take this action. Instead, more are “somewhat likely” (from 28% to 35%). Northwest region residents indicate the strongest likelihood of replacing a toxic compound.

Overall, 37% report that they would be “very likely” to **gather stormwater to use for watering plants** (down slightly from 39% last year). These tend to be Northwest or Central residents.

As we found last year, six of ten indicate they would be likely (to some degree) to **install Green Infrastructure** – including 23% who are “very likely” (down just slightly from 24% in 2020). Fewer are “not at all likely” (21%, down from 26%).

Final Clean Water Program Campaign Observations

For the third consecutive year, four of ten survey participants indicate awareness of the “Clean Water Starts With Me” campaign. In line with our previous findings, there continues to be significant positive perception, attitudinal and behavior differences with respect to stormwater between those aware of the “Clean Water Starts With Me” campaign (40%) and those who are not (60%).

Regardless of campaign awareness, the majority think that Tucson has a “moderate” stormwater pollution problem (59% overall). However, residents familiar with “Clean Water Starts With Me” remain more likely to perceive a “serious problem” (29% versus 26% of those unfamiliar).

In terms of where stormwater that flows into Tucson storm drains end up, there are few differences (again) in the ordinal ranking of resident perceptions. The highest percentage (regardless of campaign awareness) continue to say that stormwater flows in a river or wash (46% overall). However, 29% unaware of the “Clean Water Starts With Me” campaign indicate that they “don’t know” where stormwater ends up. This compares to 22% of residents aware of the campaign.

As indicated in the displays below, there are key differences related to the perceived factors that contribute to the stormwater pollution problem, the implementation/ installation of Green Infrastructures at home or business and willingness to take 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> (40%)	<u>Unaware</u> (60%)
“Serious” Contributors to Stormwater Pollution			
<u>Copper from copper brake pads</u>			
2021	+60%	16%	10%
2020	+53%	23%	15%
<u>Animal waste from household pets</u>			
2021	+45%	16%	11%
2020	+14%	24%	21%
<u>Household trash and bulky items</u>			
2021	+40%	28%	20%
2020	+41%	45%	32%
<u>Household products such as cleaning fluids, detergents, paints, etc.</u>			
2021	+35%	27%	20%
2020	+6%	35%	33%
<u>Pesticides, fertilizers and debris from lawns and gardens</u>			
2021	+21%	29%	24%
2020	+3%	36%	35%
<u>Construction site chemicals/materials</u>			
2021	+12%	27%	24%
2020	+25%	40%	32%
<u>Industrial facility chemicals/materials</u>			
2021	+12%	28%	25%
2020	+20%	42%	35%

- ✓ 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 (up from 28% last year). Regardless of campaign awareness, about one of four think that automobile fluids (such as oil, gasoline and brake fluid) are a “serious” contributor to stormwater pollution.

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Water Starts With Me”</u>	
		<u>Aware</u> (40%)	<u>Unaware</u> (60%)
<i>Green Infrastructures Implemented/ Installed at Home or Business</i>			
<u>Water harvesting using rain barrels or cisterns</u>			
2021	+100%	18%	9%
2020	+62%	21%	13%
<u>Connecting runoff from a roof or paved surface</u>			
2021	+86%	26%	14%
2020	+62%	34%	21%
<u>Natural areas protected from clearing and grading</u>			
2021	+45%	16%	11%
2020	+62%	21%	13%
<u>Trench filled with gravel to collect stormwater</u>			
2021	+30%	13%	10%
2020	0%	19%	19%

- ✓ **There is a 65% higher incidence of Green Infrastructures implemented or installed at home of business among those aware of the “Clean Water Starts With Me” campaign (up from 45% last year). Regardless of campaign awareness, about one-half report that they are landscaping with native plants (52% overall) – while two of ten say they have utilized porous pavements or bricks. Another 15% have landscaped depressions that collect stormwater.**

<u>Some key differences:</u>	<u>Difference</u>	<u>“Clean Water Starts With Me”</u>	
		<u>Aware</u> (40%)	<u>Unaware</u> (60%)
“Very Likely” to Take Actions to Help Keep Stormwater Clean			
<u>Install Green Infrastructures</u>			
2021	+76%	30%	17%
2020	+55%	31%	20%
<u>Gathering stormwater to use for watering plants</u>			
2021	+66%	48%	29%
2020	+22%	44%	36%
<u>Replacing a toxic compound with a non-toxic compound</u>			
2021	+32%	49%	37%
2020	+21%	58%	48%
<u>Report a spill</u>			
2021	+26%	54%	43%
2020	+12%	58%	52%

- ✓ **There is a 50% higher strong likelihood of taking specific actions to help keep stormwater clean among those aware of the “Clean Water Starts With Me” campaign (up from 28% last year). Similar to 2020 findings, and regardless of campaign awareness, the vast majority remain “very likely” to use a doggie bag to clean up after a pet (69%) and safely dispose of chemicals (63%). Among pet owners (and regardless of campaign awareness), most say they dispose of animal waste by placing in the garbage.**

These survey findings 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 recommend targeting future stormwater outreach/education efforts towards Pima County residents who are less familiar with the “Clean Water Starts With Me” campaign. These include South or East region residents, 56 to 65 year-olds, those with some college or less and newer Pima County residents (for five years or less).

A secondary audience for outreach might be residents unsure who they would call to report someone dumping trash or chemicals into a storm drain or wash. These tend to be the oldest residents (66+) and non-Hispanic minorities. Furthermore, household waste disposal education efforts might be focused on the youngest residents (16 to 25) – who are most likely to indicate they dispose of household hazardous waste by pouring in the sink or placing in the garbage.