



TRAVEL REDUCTION PROGRAM

Annual Report

2016

Maricopa County Air Quality Department

Travel Reduction Program

July 1, 2015 – June 30, 2016

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**CLEAN AIR
MAKE
MORE**

DRIVE HYBRIDS MORE CONSOLIDATE ERRANDS MORE RIDE PUBLIC TRANSPORTATION MORE USE ENERGY EFFICIENT APPLIANCES MORE
CARRY REUSABLE TOTE BAGS MORE CONSIDER SOLAR MORE RUN COLD WATER CYCLES MORE USE REUSABLE CONTAINERS MORE CONSERVE
ELECTRICITY MORE REDUCE WOODBURNING MORE RECYCLE MORE USE ELECTRIC LAWN AND GARDEN EQUIPMENT MORE REFUEL AFTER DARK MORE

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ACKNOWLEDGMENTS

Maricopa County Travel Reduction Program staff with the input and assistance of many individuals, organizations and agencies has prepared this report. We would like to thank them for their time and expertise.

Special thanks to:

- Arizona Department of Environment Quality
- Maricopa Association of Governments
- Maricopa County Travel Reduction Task Force
- Regional Public Transportation Authority

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Maricopa County

Air Quality Department

SUBJECT: Travel Reduction Program – Fiscal Year 2016 Annual Report

DATES: July 1, 2015 – June 30, 2016
ADEQ Contract No. - EV11-00065, Amendment 6

EXECUTIVE SUMMARY

During the Fiscal Year 2015-2016 (FY16) grant year, Maricopa County continued the Travel Reduction Program (TRP) and outreach efforts in support of the voluntary “Clean Air Campaign”. Results were gathered from detailed statistical summary reports from each employee and student site participating in the program. During FY16, there were 2,903 sites in the TRP representing 1,141 companies. This year, the survey was administered to over 792,000 commuters. In addition, the TRP Regional Task Force, along with the TRP staff, reviewed and approved 1,009 travel reduction plans. The following report tracks and analyzes the commuting habits of employees and students in Maricopa County.

The TRP is continually identifying new sites required to participate in the program. This ongoing effort has resulted in 134 new employee and student sites incorporated into the TRP and completing their baseline year during FY16. While companies phased in and out of the TRP, the number of active sites remained approximately 3,000 throughout the year.

An aggregate analysis of the sites processed during FY16, for both employee and student participants, produced the following statistical results: 1) commuters in the TRP prevented 8,294 tons of pollution by using an alternative mode of transportation; and 2) the TRP’s e-survey was used by more companies than ever before, an increase of 5.1% year over year.

The TRP has two forms of its online e-survey. Employers can choose either the Intranet or Internet version. Overall, 429 companies had their employees/students utilize the e-survey this year. Thirteen companies programmed the intranet version onto their systems for their employees to use and 416 companies had their employees access the Maricopa County web-site for the Internet form. Some of the larger companies used the Intranet version, accounting for nearly one-tenth of all TRP employees using the e-survey format.

Companies that used the e-survey saved the TRP from providing over 451,000 paper forms. When the TRP first started administering the e-survey, its goal was to have a 35% usage by all employees. This year, 57% of all TRP participants utilized the e-survey to complete their survey. In addition, student sites had 62% of the student population use the e-survey form.

MARICOPA COUNTY REGIONAL TRAVEL REDUCTION PROGRAM 2016 Annual Report

INTRODUCTION

During Fiscal Year 2016, 2,903 employer sites were processed by the Travel Reduction Program (TRP). Of all the sites, 134 were baseline sites (first year sites). The TRP produces a detailed statistical summary report for each employer and student site. This year, the program administered the survey to over 792,000 employees and students. In addition, the TRP Regional Task Force, along with the TRP staff, reviewed and approved 1,009 Travel Reduction plans. The following report tracks and analyzes the commuting habits of employees and driving age students in Maricopa County.

The 1988 Omnibus Clean Air Legislation laid the foundation for the Maricopa County TRP. Employers with 100 or more employees were required to (1) reduce the single occupancy vehicle rate (SOV) by 5% annually, (2) name a transportation coordinator, (3) provide travel reduction information to all employees and/or students, (4) conduct an annual travel reduction survey and (5) submit an annual travel reduction plan.

The Maricopa County Ordinance No. P-7, adopted by the Board of Supervisors in September 1992 became effective January 1, 1993. This ordinance expanded the TRP by requiring employers with 75 to 99 employees to participate. The 1993 ordinance also established a SOV floor of 60%, and it improved SOV rate and SOV target calculations.

The Ordinance was amended May 26, 1994 with the following changes effective July 1, 1994; (1) employer SOV reduction goals were increased from 5% for the first five target years to 10% (employers in their sixth and subsequent target years have a SOV target of 5% annually), (2) employers with 50 to 74 employees were incorporated into the program and (3) employers were given credit towards SOV reduction goals for using Reduced Emission Vehicles (REV).

In May 1996, the Ordinance was amended and ten Equivalent Emission Reduction (EER) measures were implemented. The EER ordinance measures allow for credit to be given to companies toward meeting their travel reduction goals by implementing alternative air pollution reduction strategies. These strategies are listed on a separate form and submitted with their travel reduction surveys on an annual basis.

In the first program year of the TRP, approximately 500 employers and 800 employer sites were affected by the TRP. The implementation of the 1993 Ordinance added 300 employers and 700 sites to the program. With the implementation of the 1994 Ordinance, there are currently over 1,100 employers and 3,000 sites participating in the TRP.

PROGRAM OVERVIEW

The TRP's operational functions are divided into two sections: Operations/Research Data Analysis and Plan Review/Monitoring.

Operations / Research Data Analysis

Operations section's primary responsibilities are: 1) coordinating survey delivery and processing data; 2) monitoring new employers for incorporation into the TRP; 3) tracking effected employers to ensure that questionnaires and other requirements are submitted on schedule; and 4) developing policies and procedures.

The Research Data Analysis section is responsible for 1) analyzing survey data and generating summary analysis reports for each site; 2) analyzing and measuring the overall impact of the TRP on reducing single occupant commutes; and 3) producing quarterly, annual and special reports for internal and external requests. In FY16, the Research Data Analysis section sent out 3,067 summary analyses for employers and schools. In addition, they completed reports and supplied statistical data results for employers, researchers, city planners, news affiliates and individuals.

Plan Review/Monitoring

The Plan Review/Monitoring section reviews and evaluates all submitted TRP plans to determine if proposed strategies and/or incentives are adequate to achieve targeted SOV reductions. There were 1,009 TRP plans that were reviewed and approved by the Task Force and staff during FY16.

The Plan Review staff also monitors employers to ensure that travel reduction plans are implemented accordingly. Monitoring activities include on-site visits and phone calls to employers. This year there were 465 monitoring phone calls and 783 site visits completed. Employers not in compliance with TRP's policies and procedures can receive a Notice of Violation (NOV). During FY16, 114 NOV's were issued to employers who did not meet the statutory requirements. Of those referred to the TRP Regional Task Force for enforcement, 97% were withdrawn because of compliance. The remaining 3% were sent to the Maricopa County Board of Supervisors (BOS) for action and came into compliance.

Valley Metro/ RPTA

Both the Maricopa County TRP and the Valley Metro/Regional Public Transportation Authority (RPTA) provide staff to coordinate the benefits of both the TRP and the Clean Air Campaign. The RPTA is a sub-contracted organization that provides training, technical assistance and promotional material to all affected organizations. During the past year, five "Introduction to the Travel Reduction Program" training classes were conducted with a total of 52 attendees. There were nine workshops held with 56 attendees; 12 TCA webinars were conducted with a total of 784 in attendance. Now in its twenty-ninth year, awareness of the Clean Air Campaign continues to grow with the public.

ANNUAL REPORT METHODOLOGY

The Maricopa County Regional Travel Reduction Program's method for measuring employers' compliance with the program is based on an employer's current site year. This methodology allows for the aggregation of data by the current TRP program year. New sites are added on a continual basis. The total number of employees'/students' commuting patterns is measured to determine TRP's overall effectiveness on reducing single occupant vehicle trips and miles.

This year, aggregate data is only shown for the first program year (FY 1991) and the last five fiscal years. This is done to show how the TRP compares to the inaugural year and reflect the most recent trend of data. For purposes of maintaining consistency and tracking a company's historical data from one year to the next, data gathered for a company are based upon the company's anniversary date.

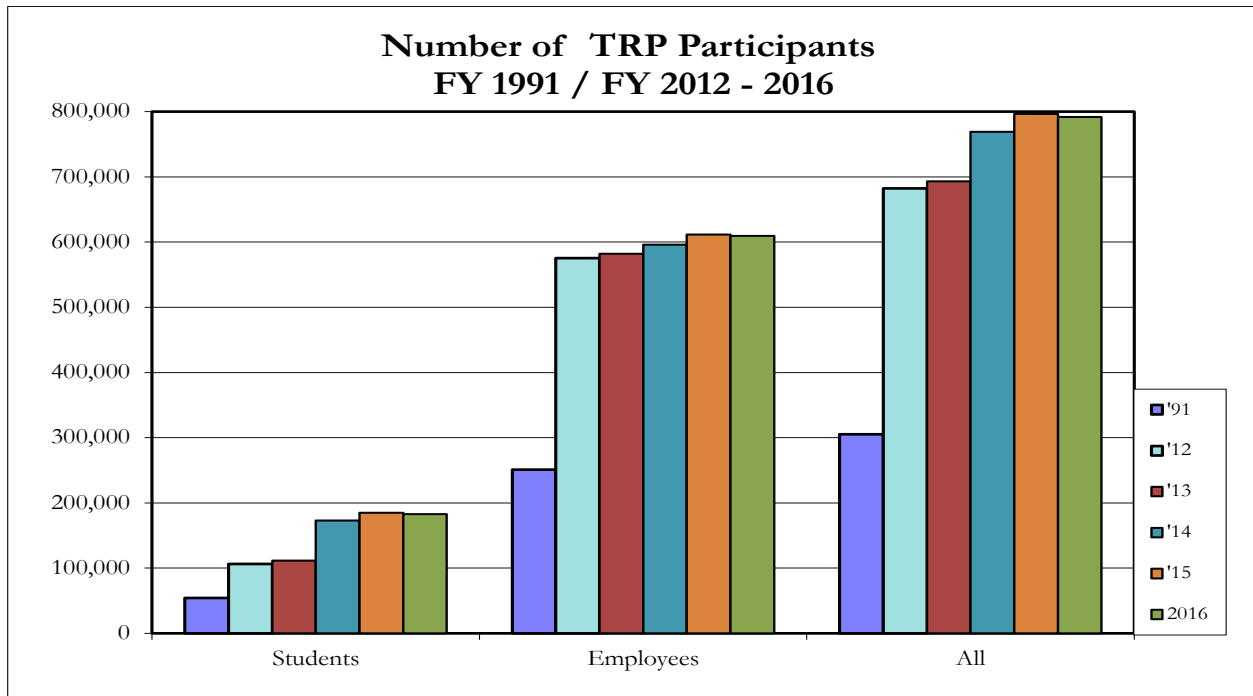
The regional calculation for the number of miles needed to generate one-pound of pollution, for an average vehicle, was 73.5 for the first and second quarters and 80.1 miles for third and fourth quarters of the fiscal year. This factor was used to calculate the amount of pollution saved annually in the program. The Maricopa Association of Governments (MAG) has provided the data, citing EPA's MOVES2014 for the first and second quarters and MOVE2014a for the third and fourth quarters as its source.

The FY16 Travel Reduction Program Final Report is highlighted with samples of program material, aggregate results of the annual survey and the calculation methodology. Questions or comments should be addressed to the Maricopa County Air Quality Department, Travel Reduction Program, 1001 N. Central Ave. #550, Phoenix, AZ 85004.

NUMBER OF TRP PARTICIPANTS

The Maricopa County region affected by the Travel Reduction Program (TRP) has recorded continual growth since the inception of the program in 1989. TRP's overall participation has increased 159% since the first program year.

Based on current DES estimates for the Greater Phoenix-Glendale-Mesa Metropolitan Area non-farm workforce, there are approximately 1,934,200 employees. TRP employees account for over 31.5% of those Maricopa County residents. In addition, 'Student' sites contribute another 182,685 participants to the overall population tracked by the TRP.



The number of all TRP participants has steadily increased each year of the program. When compared to DES estimates for non-farm workforce, TRP employees decreased by 0.3%, while the DES workforce showed an increase of 3.7% from the previous year. The student count showed a slight decrease of 1.1% from last fiscal year.

Number of Participants

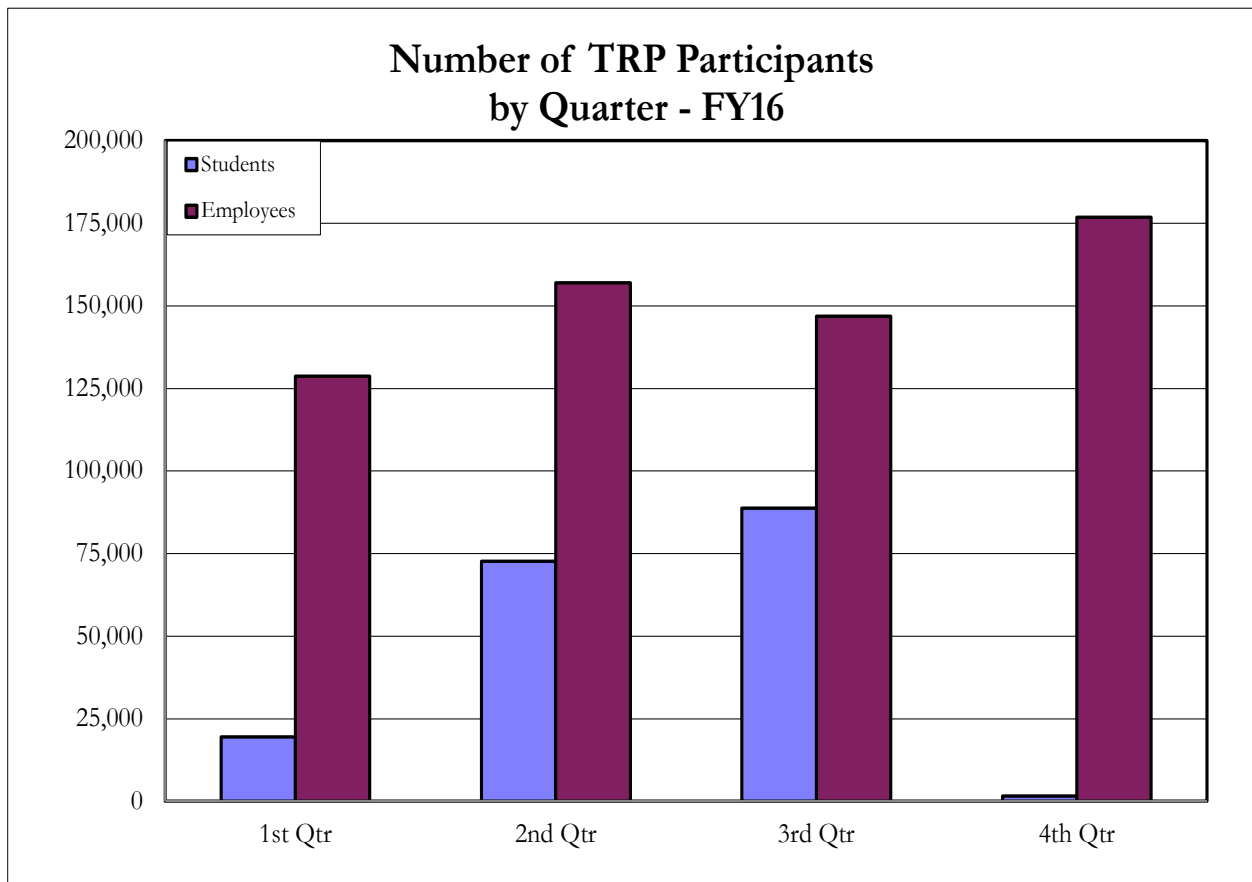
Site Type	FY 91	FY 12	FY 13	FY 14	FY 15	FY 2016
Students*	53,943	106,081	111,224	172,889	184,761	182,685
Employees	251,112	577,432	582,172	596,153	611,527	609,419
All	305,055	683,513	693,396	769,042	796,288	792,104

*Student population includes high school juniors and seniors, colleges, universities and vocational institutions.

TRP Participation by Quarter for FY 2016

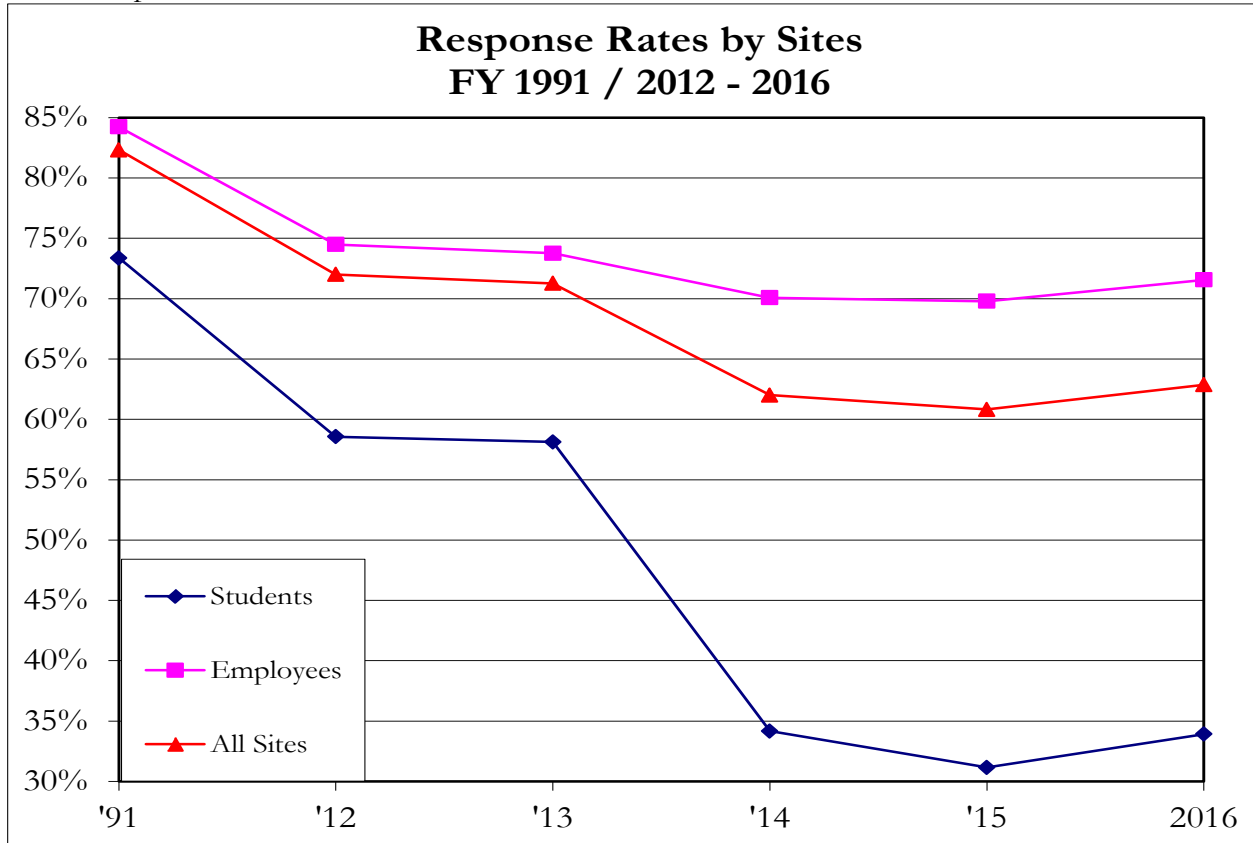
During the third quarter, the TRP surveyed many of the larger companies and high schools. Most secondary schools, which make up 39% of the student population, surveyed in the second and third quarters. This ensures that high schools, universities and colleges will receive their survey results before the end of the school year and have time to implement their TRP plan before the end of the current school year. For employees, the least amount of surveys administered was during the first quarter, which is traditionally lower because employees are taking time off during the summer vacation season and this does not allow for employers to survey their employees easily.

Site Type	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total Year
Students	19,569	72,728	88,739	1,649	182,685
Employees	128,737	157,014	146,864	176,804	609,419
All	148,306	229,742	235,603	178,453	792,104



TRP RESPONSE RATES

During FY16, 2,903 sites were analyzed. This included 2,777 ‘Employee’ sites and 126 ‘Student’ sites. The TRP questionnaire was administered to 792,104 employees and students this year with an overall response rate of 62.87%.



The response rate is calculated by dividing the number of questionnaires completed by the number of the employees at the site. If the response rate for an employer is less than the required 60%, a company is directed to resurvey that site. The data collected by the TRP is very comprehensive, and is requested by numerous outside agencies and organizations for detailed analysis and reports.

The response rate for ‘All’ site types increased for this year. The student response rate was lower than the employee response rate, 33.92% and 71.55% respectively. The increase in the ‘Employee’ response rate is the first increase in four years, an indication that the efforts put forward by the TRP staff to encourage employers to return 60% of surveys has brought many employers into compliance with TRP requirements.

Response Rates

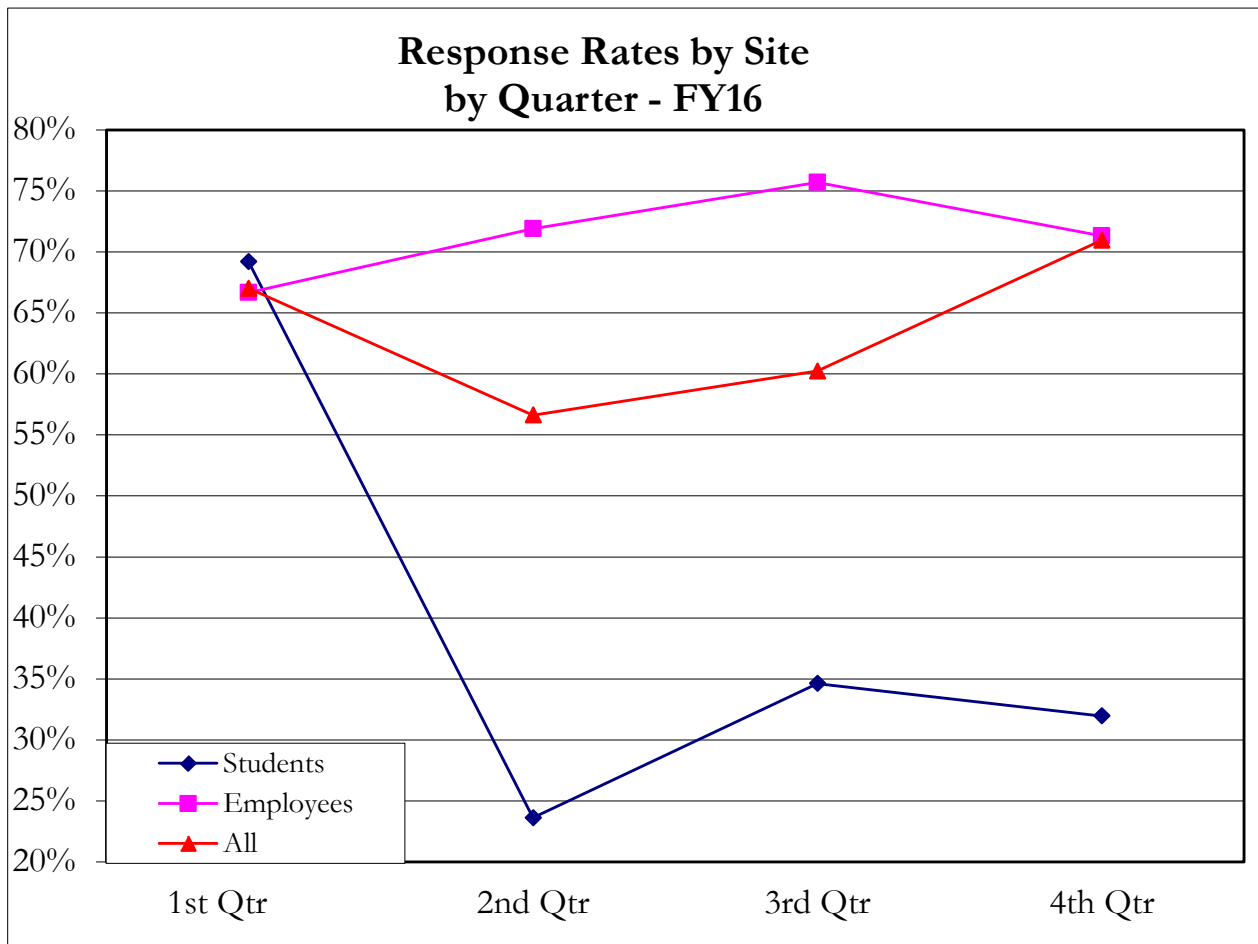
Site Type	FY 91	FY 12	FY 13	FY 14	FY 15	FY 2016
Students*	73.36%	58.56%	58.13%	34.17%	31.15%	33.92%
Employees	84.24%	74.53%	73.77%	70.08%	69.79%	71.55%
All	82.32%	72.05%	71.26%	62.01%	60.82%	62.87%

*Student population includes high school juniors and seniors, colleges, universities and vocational institutions.

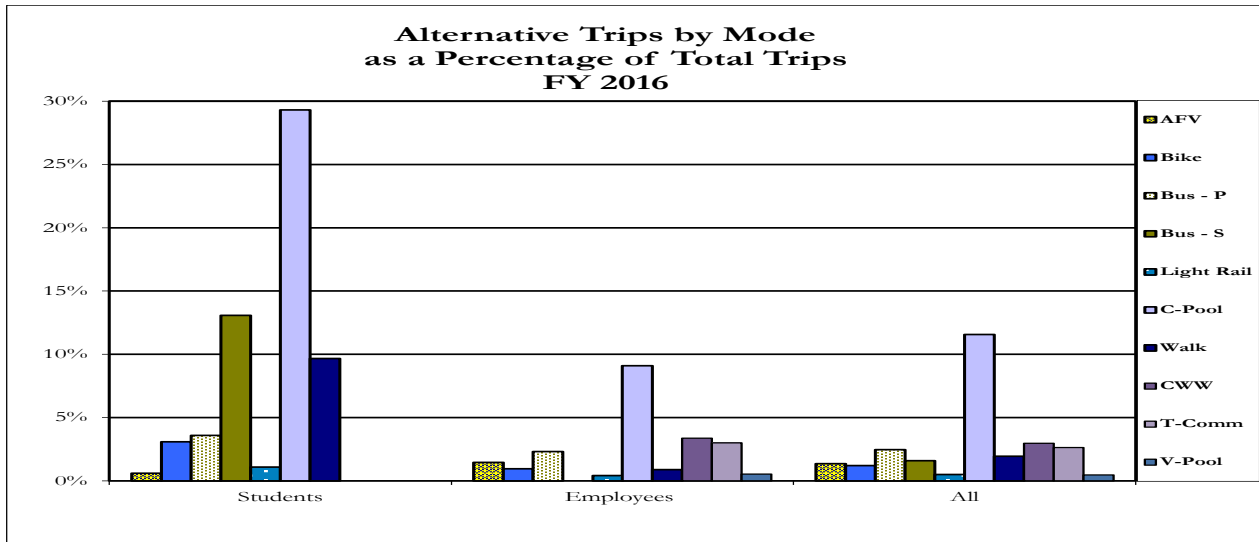
TRP Response Rates by Quarter for FY 2016

In FY16, the response rates fluctuated each quarter. Although there is no distinguishable pattern throughout the year, the fourth quarter had the highest response rates for ‘All’ sites. For ‘Employee’ sites, the third quarter had the highest response rates. ‘Student’ responses were their lowest during the second quarter, Arizona State University surveyed during this period and the overall numbers for students can change dramatically each academic year.

Site Type	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Current Year Average
Students	69.19%	23.62%	34.63%	31.96%	33.92%
Employees	66.98%	71.91%	75.71%	71.32%	71.55%
All	67.01%	56.62%	60.24%	70.95%	62.87%

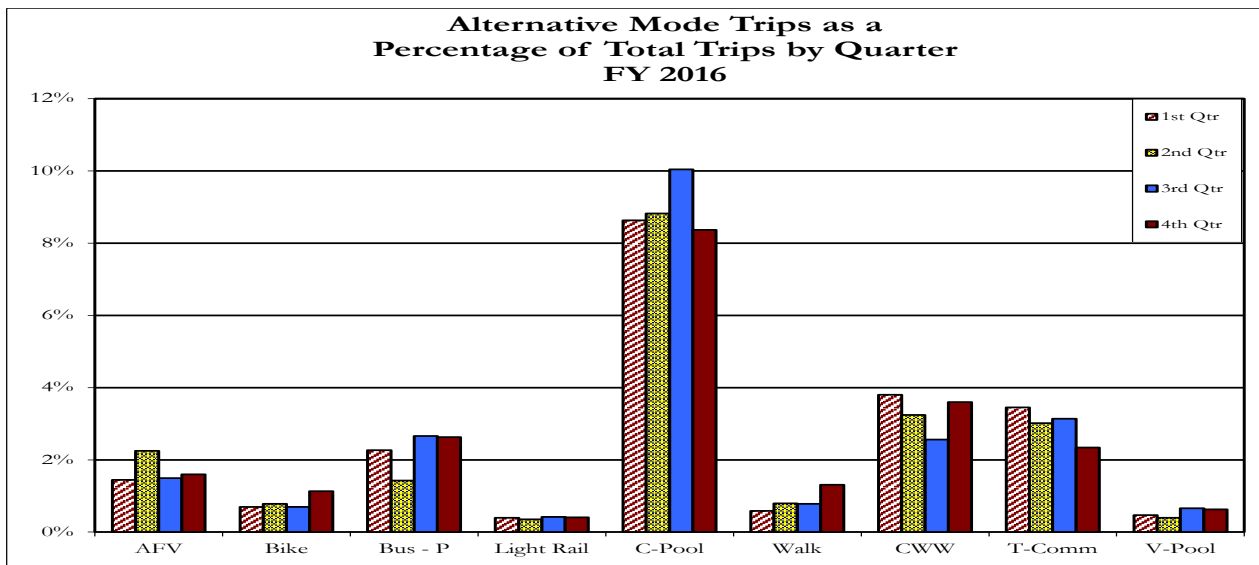


ALTERNATIVE MODE TRIPS



TRP participants continue to use alternative modes with more frequency each year. During this year, carpool usage continued to be the highest type of alternative mode used for ‘All’ site types. ‘Student’ and ‘Employee’ sites used carpooling as their primary alternative mode.

Students used carpooling for 29.3% of all their commuting trips. Other alternative modes used mainly by students were taking the bus (16.7%) and walking (9.7%). These three modes account for over 55% of commuting habits by students. Employees carpoled 9.1% of the time, while compressed work week (CWW) accounted for 3.4% of alternative trips and using telecommuting resulted in 3.0%.



Carpooling continues to be the highest percentage of trips taken by alternative mode users. The second and third quarters showed the largest use of carpooling. The two other alternative modes mostly used by commuters (CWW and telecommuting) were used in the first quarter.

POUNDS OF POLLUTION

TRP participants continue to use alternative modes of transportation for 32.3% of their commuting miles. In FY16, for 'All' sites, pounds of pollution prevented daily totaled 63,804 pounds.

There were multiple circumstances that affected the results of the amount of pollution prevented by the program: 1) because of newer and environmentally cleaner vehicles on the road, the pounds of pollution factor was recalculated mid-way through the year from 73.5 to 80.1 miles per one-pound of pollution, this 8.9% increase attributed largely to the decrease of pounds of pollution prevented by alternative mode users; and 2) the number of completed surveys returned by employers cause fluctuations in the aggregated results year over year.

Pounds of Pollution Prevented by Mode

MODE	STUDENT SITES		EMPLOYEE SITES		ALL SITES	
	Miles Daily (Both - Ways)	Pounds of Pollution Prevented Daily ¹	Miles Daily (Both - Ways)	Pounds of Pollution Prevented Daily ¹	Miles Daily (Both - Ways)	Pounds of Pollution Prevented Daily ¹
Generated SOV	370,256		9,956,652		10,326,908	
Prevented						
AFV	5,046	66	228,418	2,971	233,464	3,037
Bike	11,005	140	40,714	525	51,719	665
Bus (Public)	28,610	375	308,032	3,955	336,642	4,330
Bus (School)	100,138	1,312			100,138	1,312
Carpool	293,694	3,821	1,671,389	21,654	1,965,083	25,475
Light Rail	14,458	182	44,018	566	58,476	748
CWW*			479,490	6,247	479,490	6,247
TeleComm*			482,967	6,262	482,967	6,262
Vanpool			1,177,678	15,208	1,177,678	15,208
Walk	26,451	338	14,259	182	40,710	520
Alternative Mode Total	479,402	6,234	4,446,965	57,570	4,926,367	63,804
Total Miles	849,658		14,403,617		15,253,275	

* Miles not driven

¹ To calculate the pounds of pollution prevented daily, the "Miles Daily" was divided by 73.5 for the first and second quarters and 80.1 for the third and fourth quarters. Using the third and fourth quarters as an example, 80.1 is the number of miles driven needed to generate one pound of pollution using the most recent standards.

POLLUTION PREVENTED

TRP participants continue to contribute in the prevention of pollution each year. This year alone, the amount of pollution prevented by the 792,104 employees/students surveyed is estimated at 12,849 tons. This was a decrease of 28% from last year. A large contribution to this decrease is due to the increase in the number of miles driven to generate one-pound of pollution, an increase of 8.9% over last year.

Total Pounds of Pollution Prevented

Site Type	Pounds of Pollution Prevented Daily	Tons of Pollution Prevented Weekly ²	Tons of Pollution Prevented Annually ³	Tons of Pollution Prevented by TRP Annually ⁴
Students	6,234	15.6	810	2,389
Employees	57,570	143.9	7,484	10,460
All ⁵	63,804	159.5	8,294	12,849

Pounds of pollution prevented are calculated by dividing the miles that were not driven by commuters using an alternative mode of travel by 80.1. Eighty and one-tenth is the number of miles that is calculated to be driven in order to produce one pound of pollution.

Below is the equation to calculate one pound of pollution:

$$\begin{array}{ccccccc} \text{VOC} & + & \text{NO}_x & + & \text{CO} & + & \text{PM} & = & 1 \text{ lb. of pollution} * \\ 7.40\% & & 8.47\% & & 83.99\% & & 0.14\% & & \end{array}$$

The on-road emissions model used to calculate miles per pound for Light Duty Gasoline Vehicles (LDGV) was updated this reporting period by the EPA. The EPA officially replaced the previous emissions model, Motor Vehicle Emission Simulator (MOVES2014), with the MOVES2014a model. The new model continues to calculate how many miles driven it takes to generate one-pound of pollution for a standard on-road vehicle.

For this reporting period the TRP conversion rate for Natural Gas Vehicles (NGV) is derived from the MOBILE6.2 model. The natural gas LD NGV calculation is used to measure the credit amount given for commuters who select Alternative Fuel Vehicles (AFV) as their mode use. For this year the amount of credit given for AFV use of NGV is .453.

² “Tons of Pollution Prevented Weekly” is calculated by dividing the “Pounds of Pollution Prevented Daily” by 2000, and then multiplying the result by the number of trips taken weekly by an average commuter, which is set to be five by the TRP, i.e. for students, (6,234/2000)* 5 = 15.6 tons.

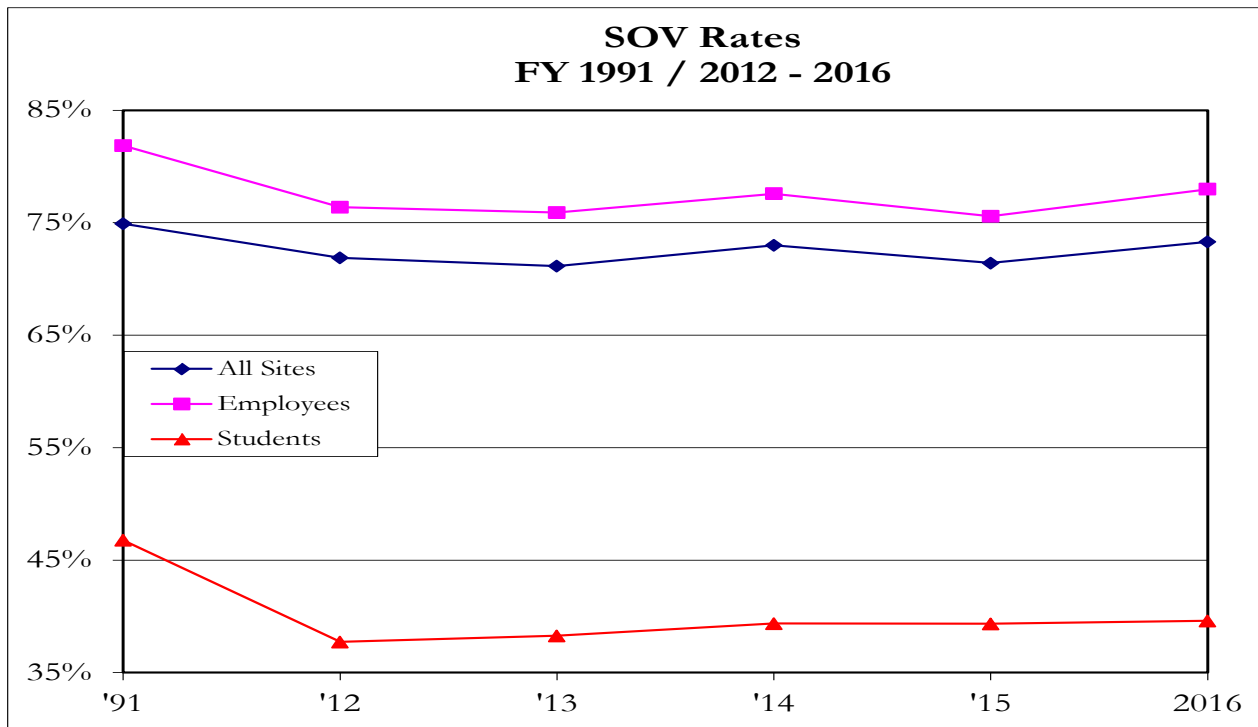
³ Weekly tons are then multiplied by 52 to calculate “Tons of Pollution Prevented Annually”, 15.6 * 52 = 810 tons.

⁴ “Tons of Pollution Prevented by TRP Annually” is calculated by extrapolating out to the number of TRP participants who had the survey administered to them. The “Tons of Pollution Prevented Annually” is divided by the response rate, i.e. 61,969 students answered the survey for a response rate of 33.92% (.3392); 810/.3392 = 2,389. All 182,685 TRP students prevented 2,389 tons of pollution in FY16.

⁵ The numbers for ‘All’ site types is calculated by adding the totals from the ‘Student’ site and ‘Employee’ site rows.

SOV TRIP RATES

The Single Occupant Vehicle (SOV) trip and Single Occupant Vehicle Miles Traveled (SOVMT) rates indicate how well a company is doing at reducing employee/student trips and miles. In order for a company to achieve their reduction goal for the year it must meet or exceed either one of these target rates. In order for an employer to meet this goal, they must have their site(s) reach either the targeted goal or 60%.



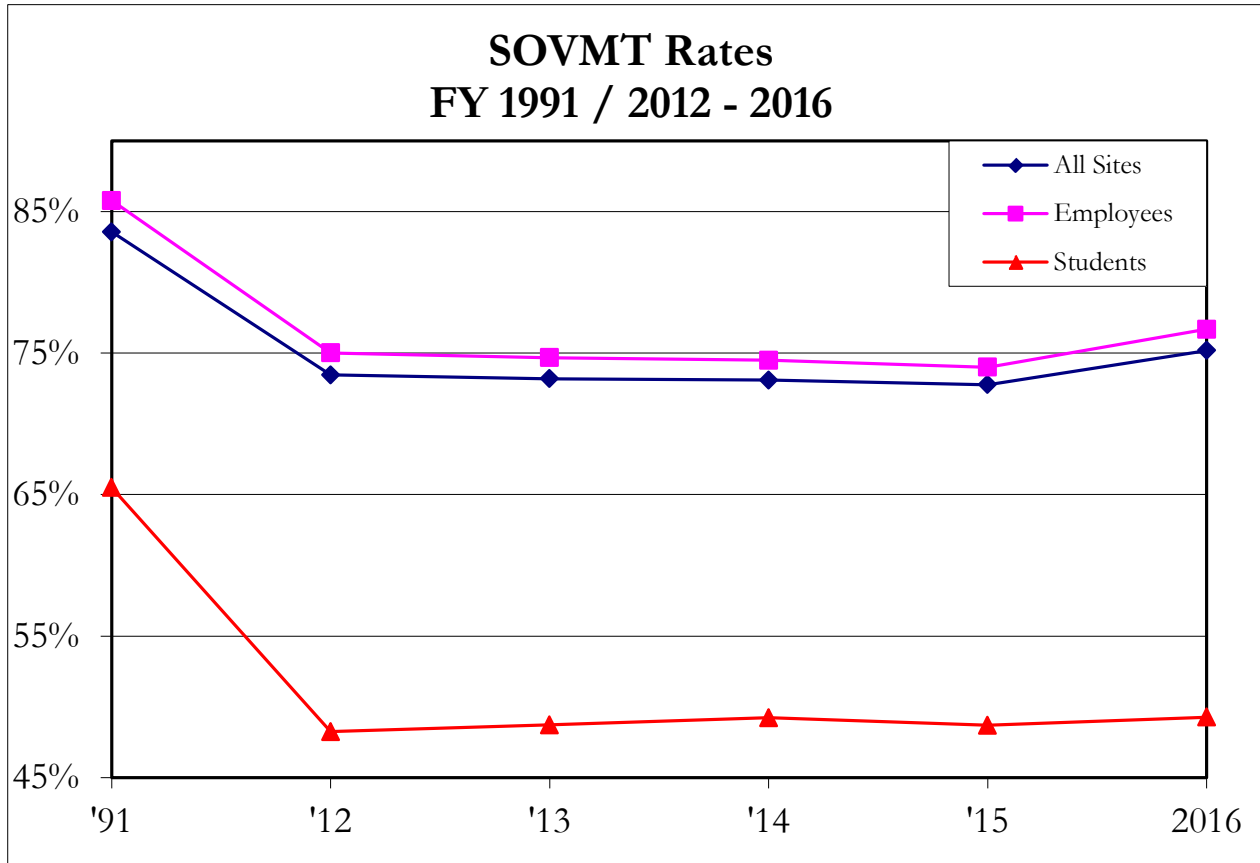
The SOV trip rate is calculated by dividing the number of SOV trips by the total trips taken for all commuters. This is also done separately for 'Employee' sites and 'Student' sites in order to compare their rate of change. For FY16 the SOV rate showed an increase of 2.64% for 'All' sites when compared to last fiscal year. 'Student' and 'Employee' sites showed the following rate changes, 0.66% and 3.18% respectively.

SOV Trip Rate

	Students		Employees		All	
		Change from Previous Year		Change from Previous Year		Change from Previous Year
FY 91	46.78%		81.86%		74.92%	
FY 12	37.73%		76.38%		71.89%	
FY 13	38.28%	1.45%	75.90%	-0.62%	71.15%	-1.02%
FY 14	39.37%	2.84%	77.58%	2.21%	73.00%	2.60%
FY 15	39.34%	-0.01%	75.57%	-2.59%	71.42%	-2.16%
FY 16	39.60%	0.66%	77.98%	3.18%	73.31%	2.64%

SOVMT RATES

This year the SOVMT showed an increase of 3.31% for 'All' sites when compared to last fiscal year. 'Student' and 'Employee' sites showed the following rate changes, 1.19% and 3.62% respectively.

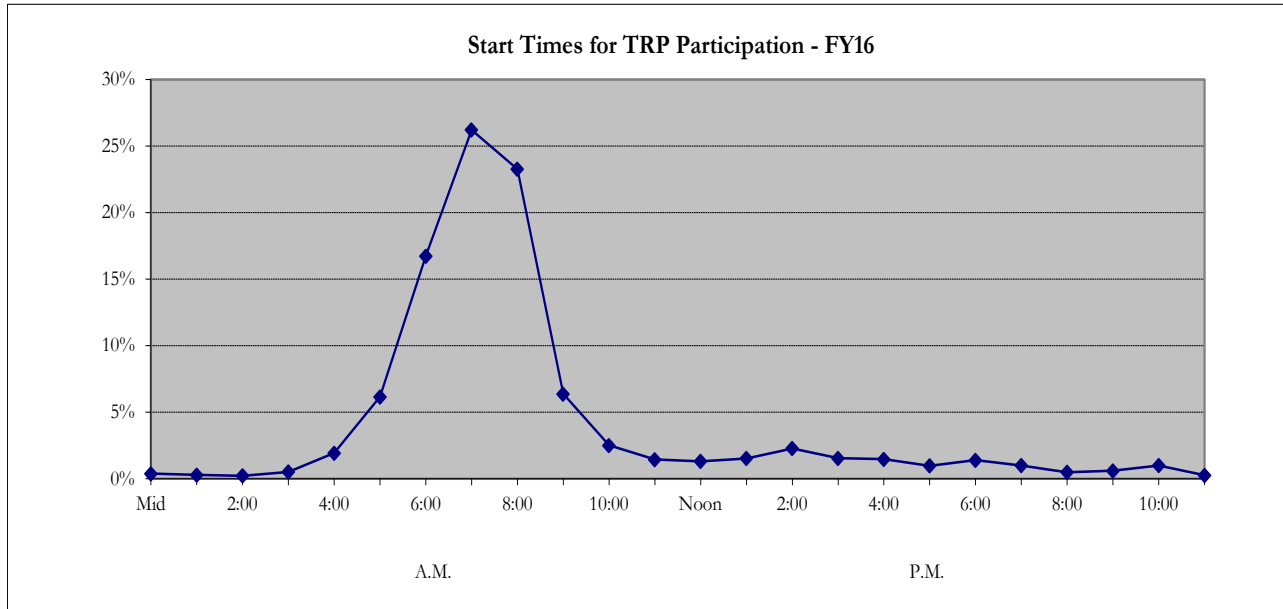


The SOVMT rate is calculated by dividing the number of SOV miles traveled by the total number of miles driven by all commuters. This is also done separately for 'Employee' sites and 'Student' sites in order to compare their rate of change.

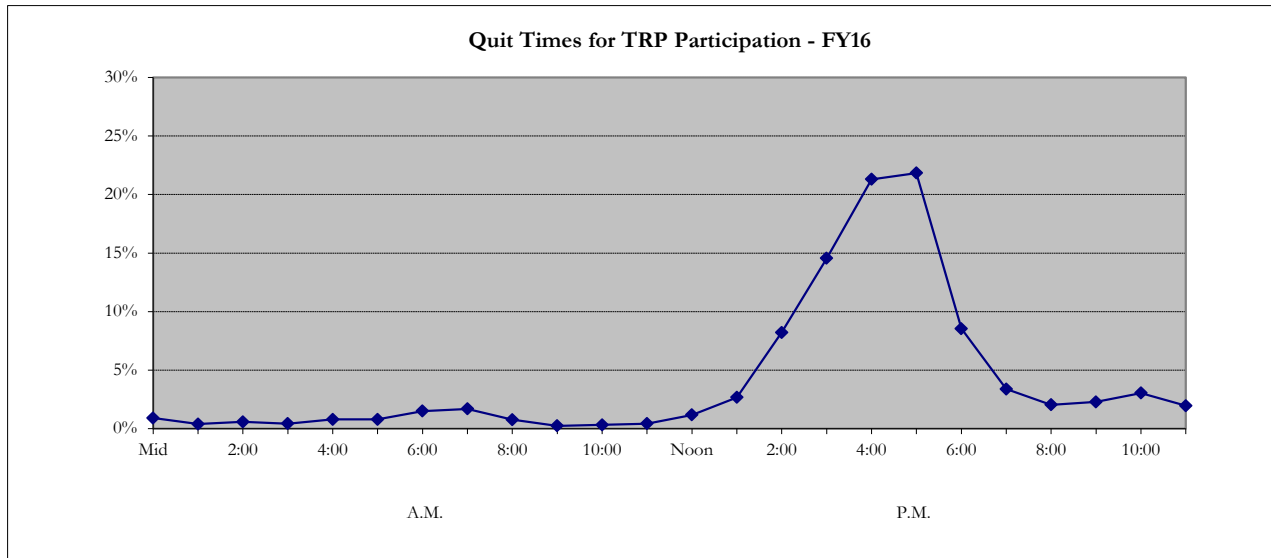
SOVMT Rate

	Students	Change from Previous Year	Employees	Change from Previous Year	All	Change from Previous Year
FY 91	65.49%		85.78%		83.57%	
FY 12	48.24%		75.01%		73.46%	
FY 13	48.72%	0.99%	74.68%	-0.43%	73.19%	-0.36%
FY 14	49.23%	1.04%	74.50%	-0.24%	73.09%	-0.13%
FY 15	48.69%	-0.11%	74.00%	-0.07%	72.77%	-0.04%
FY 16	49.27%	1.19%	76.68%	3.62%	75.18%	3.31%

COMMUTING TO WORK

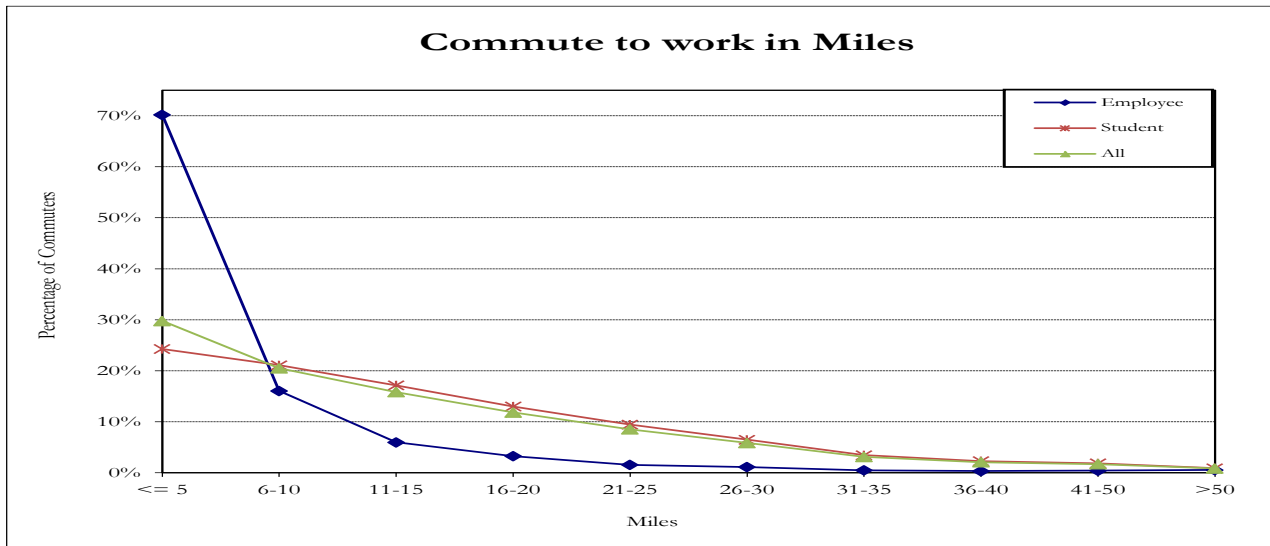


The peak hours for Maricopa County commuters traveling to work are between 5:00 a.m. and 9:00 a.m.; 72% of all commuters are on the road during this time. During the morning rush, the time between 7:00 a.m. and 8:30 a.m. is the most heavily traveled. There is also a second shift peak between 2:00 p.m. and 4:00 p.m. when commuters make their way to work.

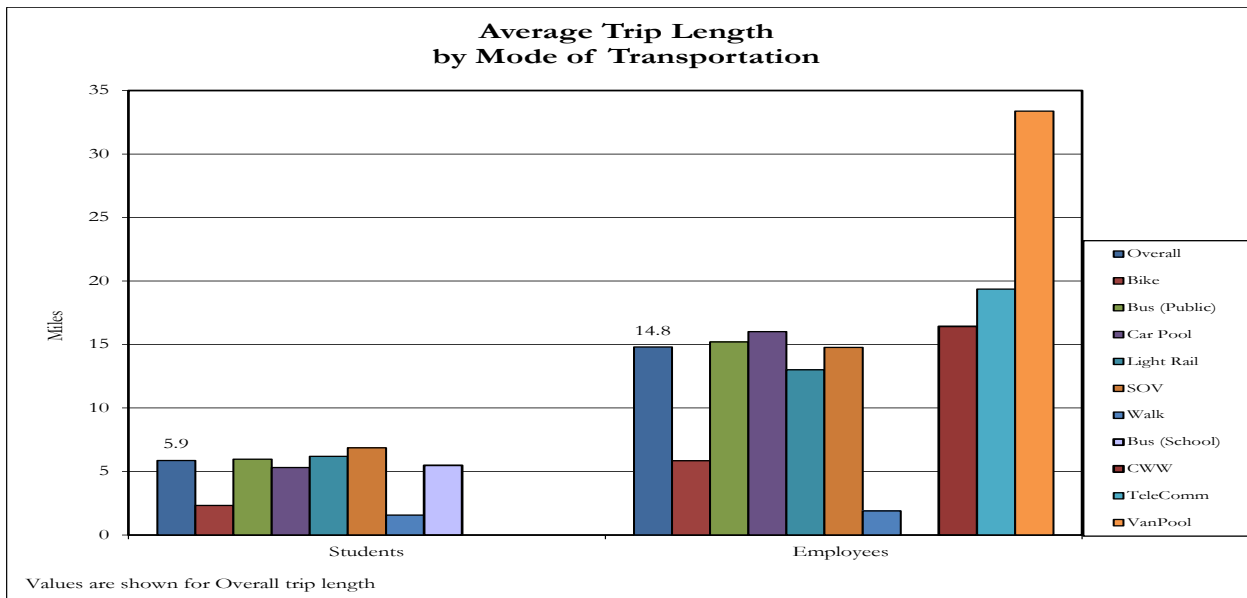


Conversely, quit times for commuters peak between 2:00 p.m. and 6:00 p.m.. Over 66% of all commuters are leaving the workplace during this time. However, the peak for departing workers is not as great as that of arrival times. This is caused by workers who complete their eight-hour shifts prior to the afternoon rush or those who put in extended hours. The time between 5:00 p.m. and 6:00 p.m. showed the largest numbers of commuters leaving from work.

HOW FAR IS THE COMMUTE?

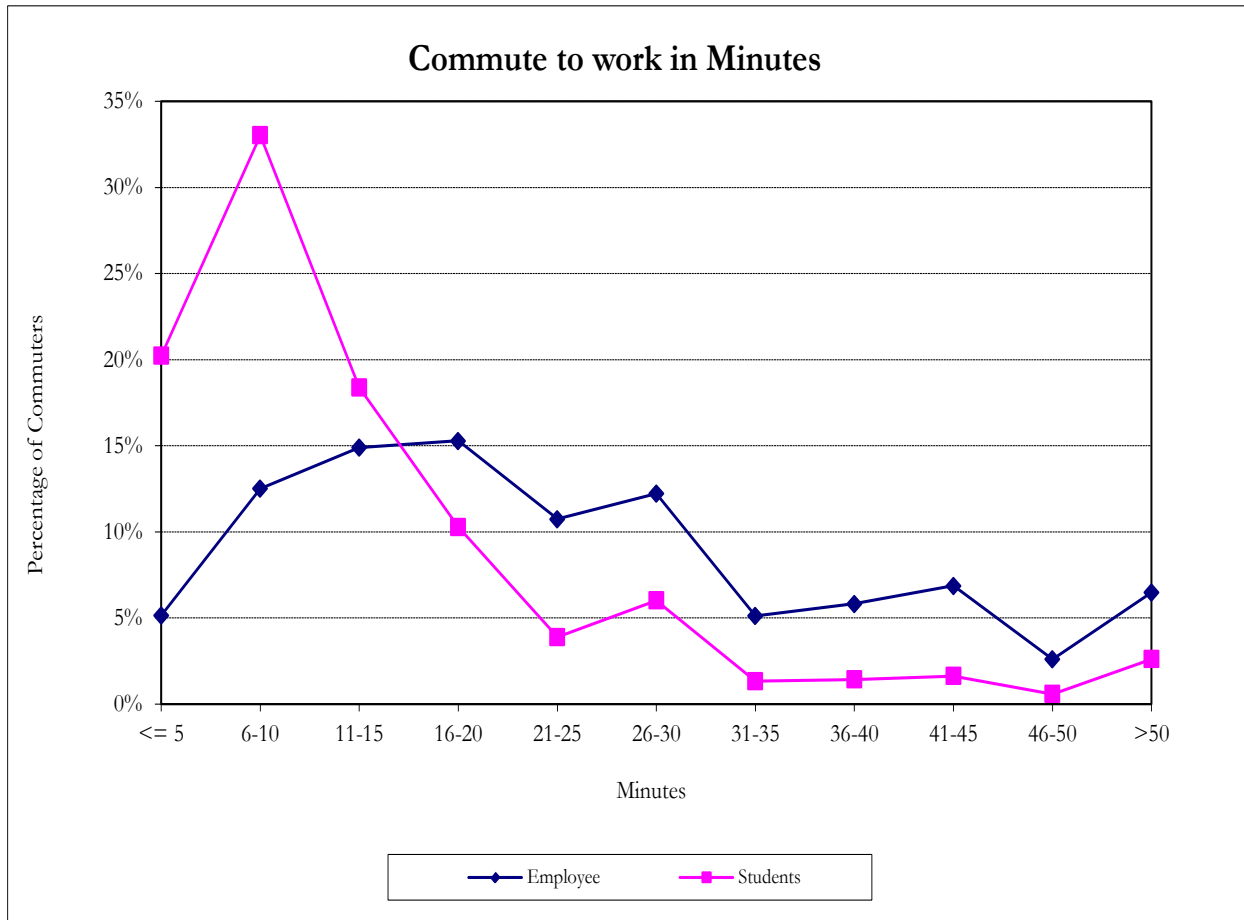


In FY16, the typical TRP commuter (employee or student) could have expected to drive, on the average, 13.8 miles one-way to work or school. While the average drive for an employee was 14.8 miles to work, students drove an average of 5.9 miles one-way to school. Overall, 29.8% of all TRP participants drive less than five miles to work/school. Another 42.0% of the commuters live between 11 and 30 miles from work. Over 7.7% of all commuters have a drive of over 30 miles.



The average trip length by mode split shows that employee trips on all accounts are longer than student trips. However, employees' longest commuting trips are taken using an alternative mode, not SOVs. The longest of these trips using alternative modes are vanpools (33.4 miles) and trips not taken (CWWs – 16.4 miles, and Telecommuting – 19.3 miles). This suggests that those commuters who live farthest from work are more likely to reduce the number days they drive into their worksite by using one of these alternative mode types as their commuting method.

HOW LONG DOES THE COMMUTE TAKE?

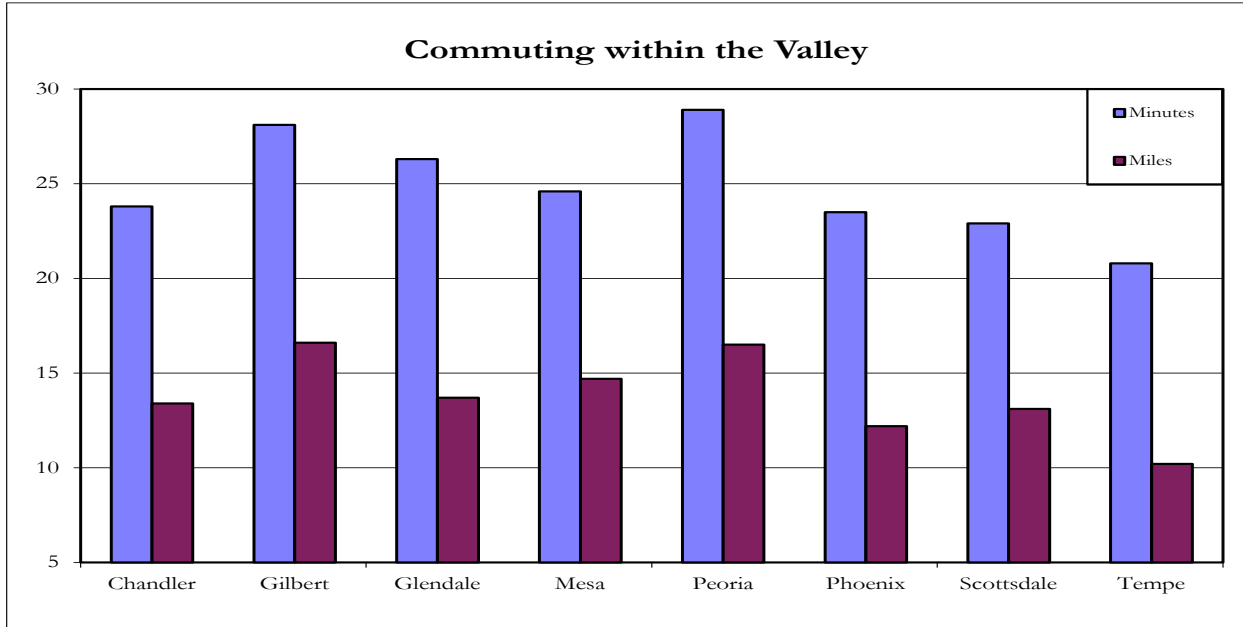


Typically, TRP participants can expect to spend an average of 24.9 minutes commuting to work or school. Students take an average of 14.4 minutes to get to school, while employees average 26.3 minutes to get to their worksite.

Approximately 52.1% of all commuters take 20 minutes or less to arrive at work/school. The largest group of all respondents is represented by those who take between 11 and 15 minutes to commute, while 24.5% of commuters take over 30 minutes or more to get to their worksite.

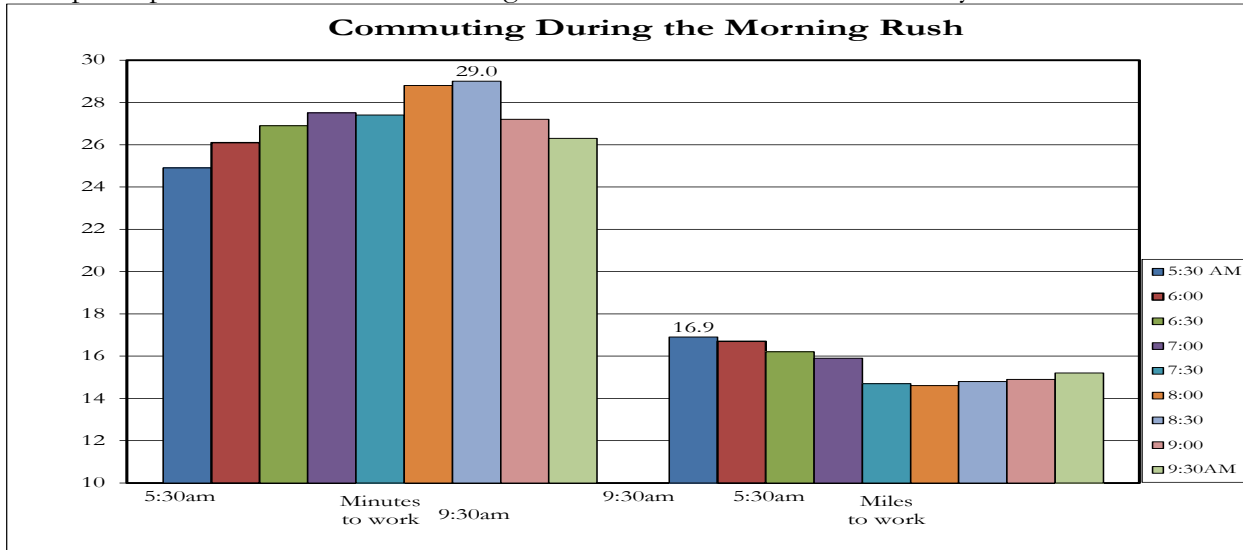
Nearly, 26.9% of all employees take more than 30 minutes to arrive at their workplace. For students, 71.7% commute to school in 15 minutes or less.

VALLEY COMMUTING PATTERNS



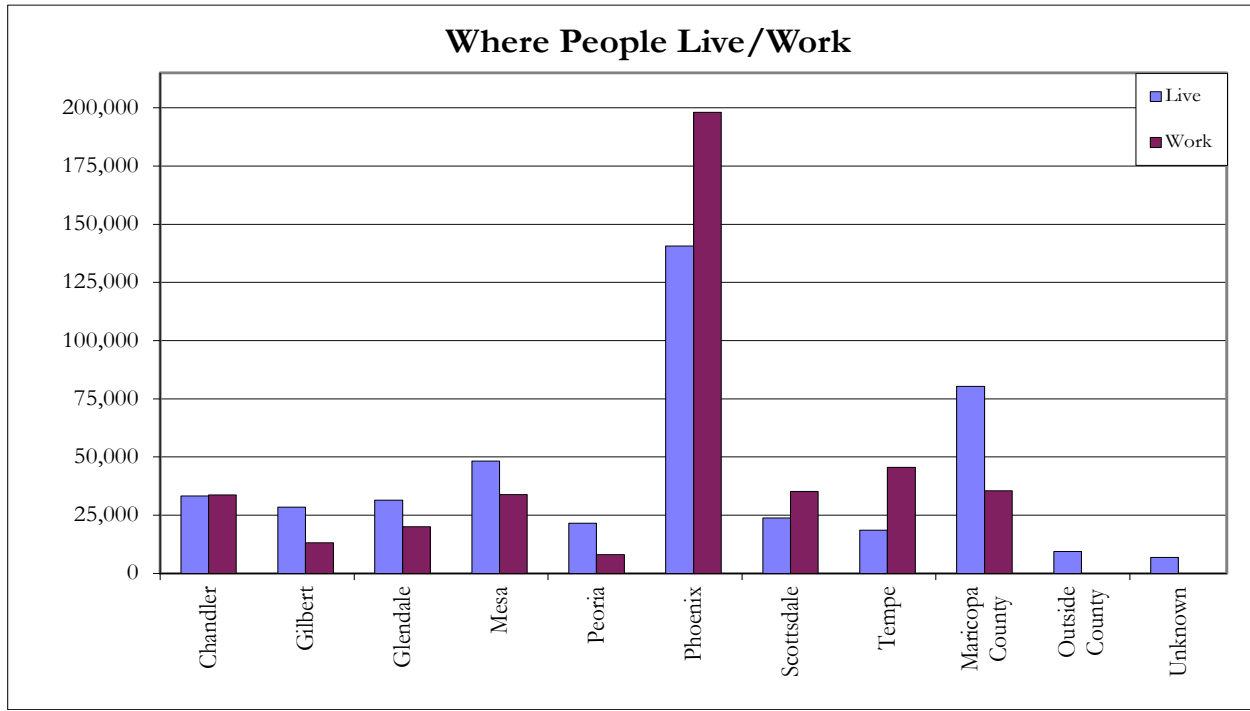
Of the eight largest municipalities in the Valley, the time and distance spent commuting to work can vary depending upon where one lives. For all communities, the time spent commuting correlates to the distance traveled to work.

The two Valley communities that have the longest commute in minutes and miles are Peoria and Gilbert. This may be that these commuters must travel outside of their area of residence to get to their worksite. With the exception of the City of Chandler, all these major cities found that their TRP participants distance traveled during their commute increased from last year.



For Valley commuters, the morning rush is worse during the later portion of the commute. The average morning commute takes about 27.5 minutes and is 15.5 miles long, both increased from last year. A TRP commuter may experience nearly a 29-minute drive if they begin work at 8:30 a.m., even though it is one of the shorter commute trips. It is also noted that those who have a longer distance to commute, depart for work earlier in the morning.

WHERE TRP EMPLOYEES LIVE COMPARED TO WHERE THEY WORK



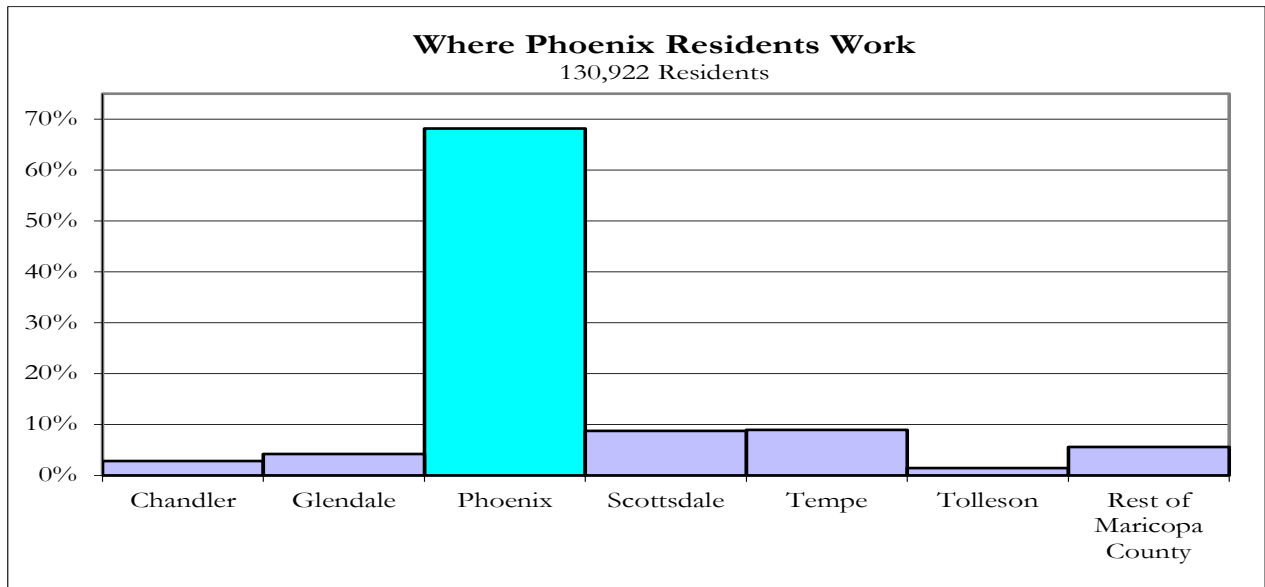
During FY16, 423,227 employees responded to the survey indicating their city of residence. For the purposes of this report, only those cities whose residents total 18,000 or more employees in the TRP for the year are listed.

As expected, the City of Phoenix is the largest contributor in both residents and number of employees in the workforce. While 140,694 residents live in Phoenix, 198,000 work within the city limits. Other cities that have a positive employee/resident ratio (more employees working in an area than live in that area) are Scottsdale, Tempe and Chandler. This trend indicates that these cities have to accommodate more commuters coming into their communities during the rush hours. Additional use of alternative modes of transportation will be needed in order to reduce traffic congestion associated with commuters getting to their worksite.

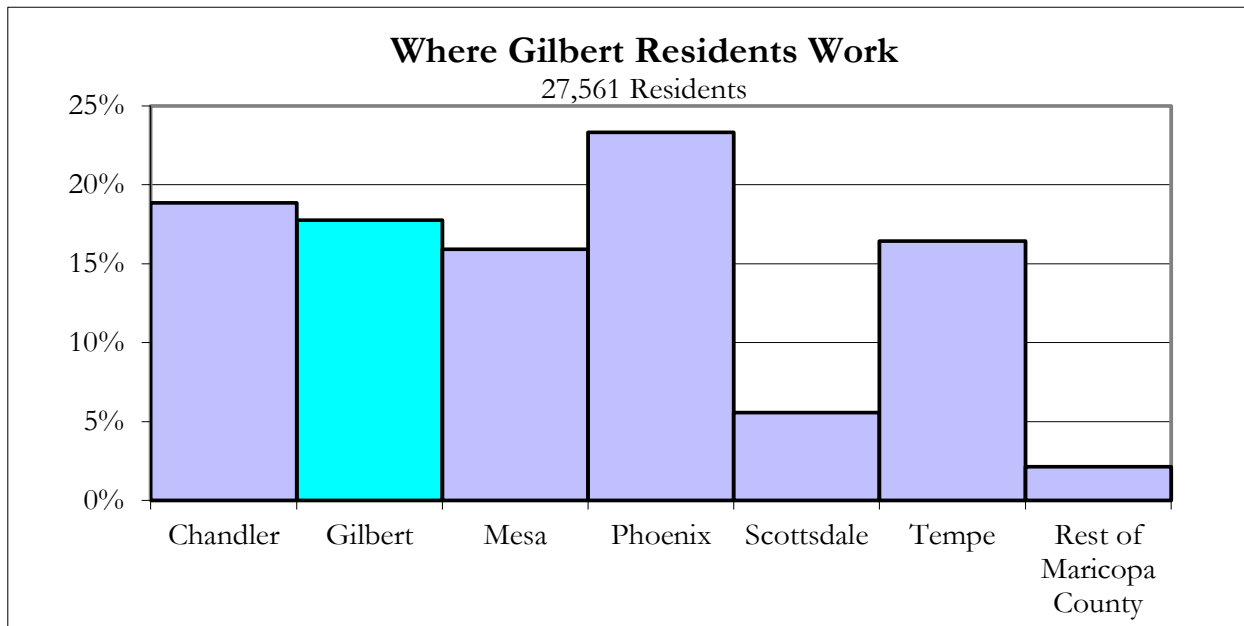
Conversely, all other major cities in the area have a negative employee/resident ratio (more residents live within the city, than work in that area). These communities also face the task of commuters returning to their residences. The Town of Gilbert shows true characteristics of a 'bedroom community'; while there are 28,417 residents in Gilbert who participate in the TRP, only 13,240 TRP participants work in Gilbert.

The following charts show two completely different examples of demographic trends here in the Valley. The City of Phoenix represents the typically large metropolitan area with major employers within the city limits, while the Town of Gilbert shows signs of being the suburban enclave where commuters live, but work in surrounding cities.

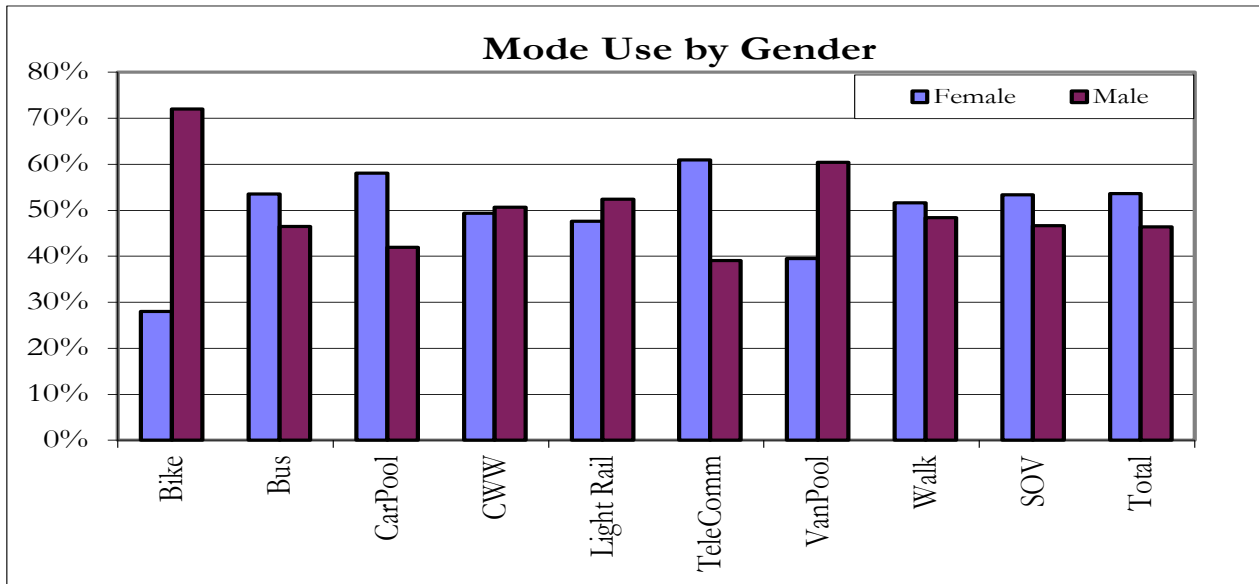
Of all Phoenix residents in the TRP, 68.2% (89,263) live and work within the city limits. Approximately 26.2% of all other Phoenicians work in adjoining major cities. While the rest of the city's residents work throughout the County, representing only 5.6% of Phoenix TRP residents.



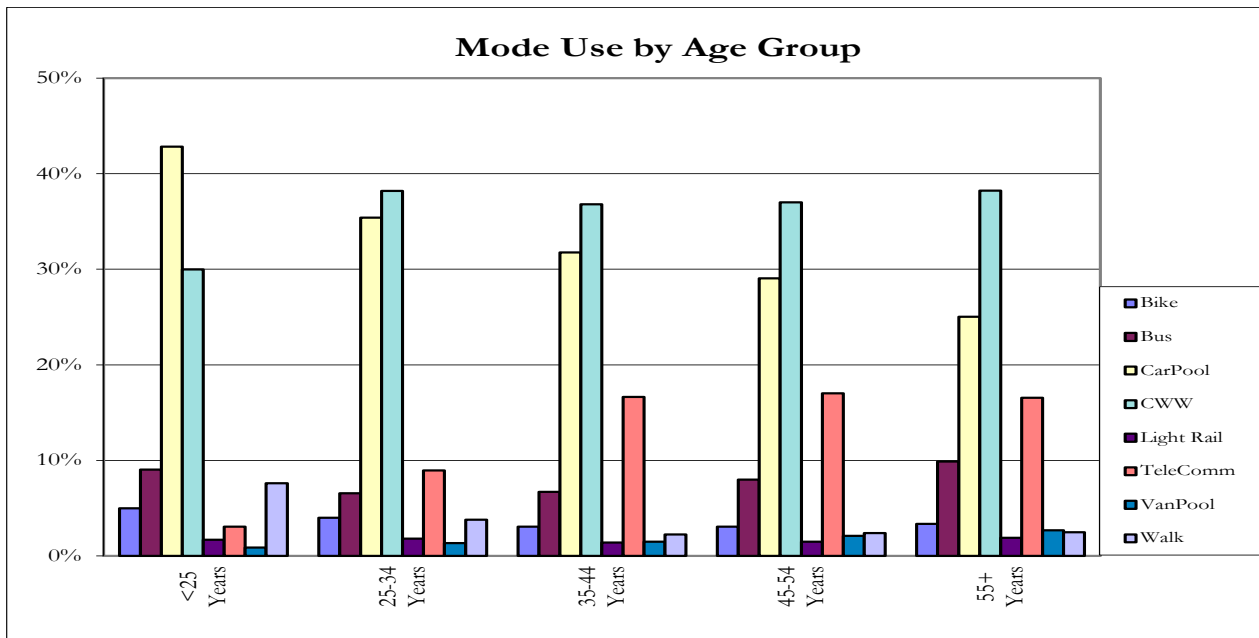
Representing the other side of commuter travel, the majority of the Town of Gilbert residents work in other cities in the Valley; over 82% work outside of Gilbert. Only 17.8% of the TRP participants (4,894) who live in Gilbert also work within the city limits. This indicates that Gilbert residents who participate in the TRP continue to seek work outside of the town, resulting in a true bedroom community. Comparatively, for the other major cities in Maricopa County, the average percentage of residents who live and work in the same city is approximately 34% for TRP participants. The Town of Gilbert is substantially below the average for other major cities in Maricopa County.



DEMOGRAPHIC DATA



For this year, over 403,000 TRP participants answered the optional question on gender. Females account for 53.6% of the total responses. While women show a higher percentage than men do of carpooling and telecommuting, men are more likely to use bike and vanpool in larger numbers. The greatest disparity is represented by bicyclists. Men are more likely to bike to work than women, by a 3:1 ratio.



For those who responded to the optional question on age, the older the age group in TRP, the more likely the commuter will use vanpooling and compressed work week (CWW) as their alternative mode to get to their worksite. The younger age groups are more apt to use biking and walking when traveling to work. Those younger than 25 years old are more likely to use a bike, carpool, walk or bus than any other group and are the least likely to use telecommuting as an alternative mode by a greater disparity. The 45-54 year old group telecommutes more often than other groups. Those 55 years and older, typically use CWW or vanpools more than any other group.

WORK ACTIVITY FOR TRP PARTICIPANTS

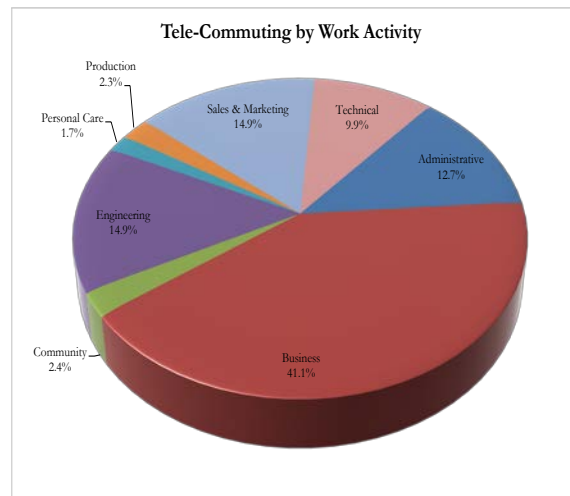
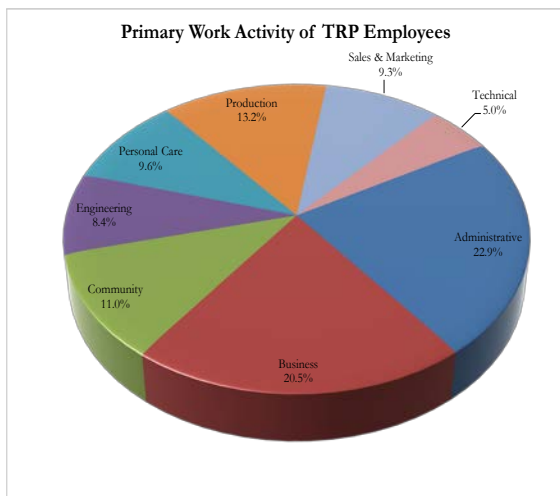
In recent years the TRP has monitored the work activity of employees by adding the following question. “What best describes your primary work activity on a regular basis?” The categories for work activity were chosen based upon demographic modeling tracked by the Maricopa Association of Governments (MAG), with a more detailed listing of each group described below. For brevity’s sake, all work activities are abbreviated on the pie charts.

Administrative	Administrative/Clerical/Retail
Business	Business/Financial/Professional
Community	Community Support/Teaching
Engineering	Engineering/Research/Design
Personal Care	Personal Care & Services
Production	Production/Construction/Transport
Sales & Marketing	Sales & Marketing
Technical	Technical Support

For an overall analysis of work activities by TRP employees, the chart on the left shows how commuters identify themselves in their jobs. Generally speaking, ‘Production’ and ‘Personal Care’ are job functions that require an employee to work onsite. For all participants they make up 13.2% and 9.6% of the TRP work force, respectively.

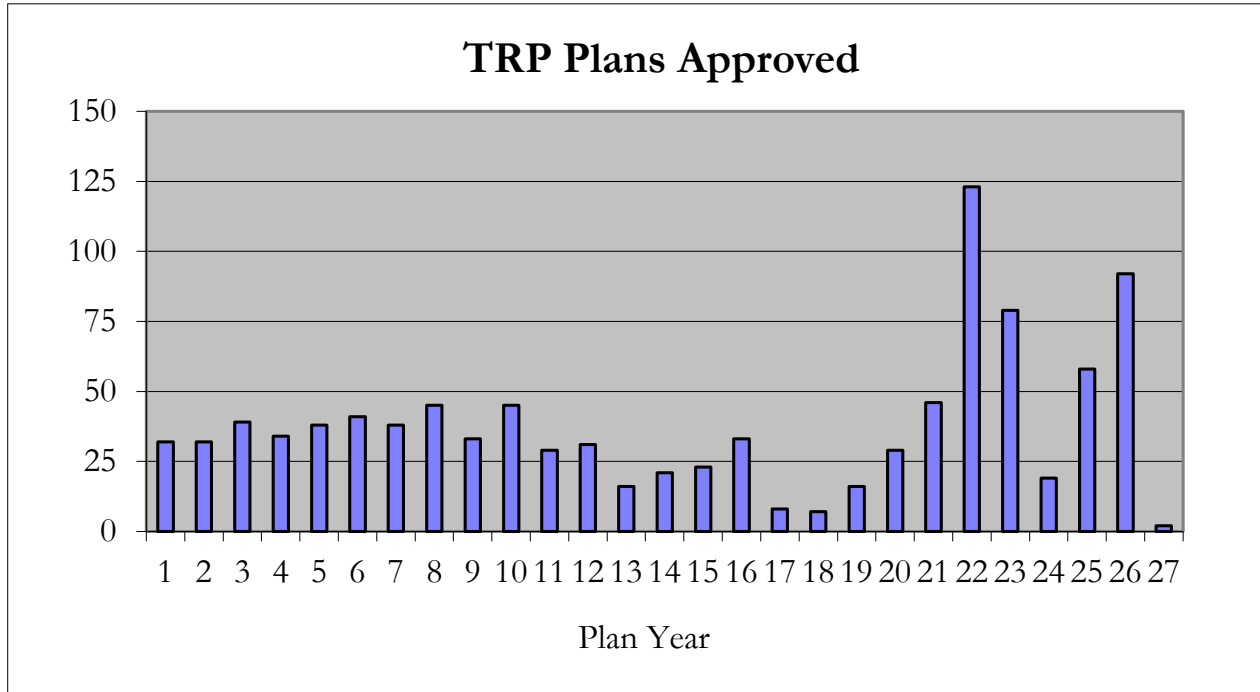
In order to provide a contrast of what type of work activity the employee does and what type of alternative mode they may use, a side by side comparison is shown below. To limit charts and graphs, only one example of an alternative mode is shown, telecommuting. Comparatively, ‘Production’ and ‘Personal Care’ represent 2.3% and 1.7% of all telecommuters, respectively.

This comparison makes perfect sense. Those in ‘Production’ and ‘Personal Care’ are less likely to have the opportunity to telecommute, because their type of job does not allow for them to work from home.



TRAVEL REDUCTION PLANS

During Fiscal Year 2016, the County received 1,075 plans and presented 1,009 plans to the Task Force for review and approval. Of those approved by the Task Force, 32 of them were first year plans.



Monitoring

TRP staff will follow-up with employer to confirm their approved plan has been implemented/documented. A substantial amount of monitoring occurs through written and verbal channels, with the balance accomplished by staff visiting the employer sites. During this year, 465 monitoring calls were made and 783 site visits were conducted. When an employer fails to implement or document one or more approved measure(s), staff will issue a 'Request for Documentation' (RFD) to resolve the matter. During this year, staff issued 499 RFDs.

Enforcement

Enforcement is initiated when an employer fails to respond to staff's outreach regarding a pending delinquency. Enforcement activities occurring during FY16 are as follows:

- One hundred-fourteen (114) Notices of Violation (NOV) were issued for failure to submit a plan, supply documentation or appoint a Transportation Coordinator.
- Civil penalties were assessed and collected from three employers receiving Orders of Abatement by Consent (OAC) in FY16, totaling \$5,140.

CONCLUSION

In FY16, the TRP is currently in its twenty-seventh year of operations. Analysis of the TRP data show that the employees/students participating in the TRP continue to be strong supporters of using alternative modes of transportation in order to get to work or school.

A number of changes in methodology used to collect and calculate commuter miles, trips, modes and pollution prevented impact this reporting period. The reporting outcome was affected by one or more of the following reasons: 1) credits for Alternative Fuel Vehicle (AFV) use were calculated for trips or miles driven. Full or partial credit was given to electric and hybrid vehicles; 2) other external factors impacted commuter driving patterns, such as: the calculation factors used to determine how many miles are driven to produce one-pound of pollution. The regional miles/pound factor increased from 73.5 to 80.1, an 8.9% increase; and 3) the number of completed surveys returned by employers cause fluctuations in the aggregated results year over year.

Alternative mode users in the TRP continue to support the program by showing a substantial amount of miles driven weekly in order to reduce Valley pollution. The total amount prevented this year was 24.6 million miles weekly for alternative mode commuters. Carpool and vanpool miles accounted for 63.8% of all miles saved. The miles saved by TRP commuters resulted in 8,294 tons of pollution not being produced. Even though commuting distances and time traveled to the worksite have decreased this year, TRP participants continue to make environmentally sound decisions by choosing to use an alternative mode in order to lessen their SOV trips.

The employees who participate in the program continue their support of the TRP as shown by a high survey response rate, 71.55%. Employee's contribution to the amount of pollution prevented annually accounted for 91.3% in the TRP. The e-survey continued to be a successful format for TRP employers to survey their employees. The number of companies using the e-survey this year increased from 408 to 429, 55.5% of all employees used the e-survey this year.

The miles saved by alternative mode use for students resulted in 810 tons of pollution prevented this fiscal year. The number of students filling out the web-based survey was 62.7% of all students. Since new high school driving-age students enter the TRP annually, efforts to educate students on the program's environmental benefits represent an ongoing training opportunity. Educating students on the use of alternative modes to commute will only increase the probability that once the students are out in the workplace they will continue with their learned environmental commuting practices.

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SURVEY FORM METHODOLOGY

Maricopa County Regional Travel Reduction Program
Fiscal Year 2015 - 2016

Introduction:

The Maricopa County Regional Travel Reduction Program (TRP) has completed its twenty-seventh program year. During FY16, the TRP modified its methodology for the amount of credit assigned to Alternative Fuel Vehicles (AFV). Each program year, new methodologies, procedures and definitions are implemented to improve the overall quality of TRP data.

Response Rate:

Employers and schools affected by the TRP conduct a travel reduction survey annually and are required to achieve a minimum response rate of 60% per site. The response rate is calculated based on the number of questionnaires returned to the TRP divided by the number of surveys requested. An employee site not achieving the minimum response rate is required to re-survey. If that site does not achieve the minimum response rate on the re-survey, the non-respondents are counted as single occupant commuters. Student sites do not have to re-survey if they do not achieve the minimum response rate, nor do they incur a statistical penalty for non-respondents.

Program Year:

The TRP's method for measuring employers' participation is based on the employer's site program year. This methodology permits the aggregation of employment sites based on program year.

For purposes of maintaining consistency and tracking a company's historical data from one year to the next, data gathered for a company is based upon the company's anniversary date. The anniversary date is less likely to fluctuate for a company than the summary analysis sent date. This allows TRP the capability to track the same companies and their results for any given time period with greater accuracy.

Valid Surveys:

Three questions from the TRP survey are necessary to constitute a valid questionnaire. A valid response to question #1 is used to verify that an employee reports to the worksite three or more days per week; question #3 validates the mode used by the commuter and calculates the Single Occupant Vehicle (SOV) rate; and question #6 is needed to calculate the Single Occupant Vehicles Miles Traveled (SOVMT) rate. Currently, the maximum one-way distances that exclude questionnaires from statistical analysis are:

Mode of Transportation

Maximum One-way Distance (Miles)

	Employees Site	Student Sites
Drive alone (SOV)	150	75
Carpool	150	n/a
Vanpool	150	n/a
AFV	150	75
Bus (Public)	75	25
Bus (School)	n/a	25
Light Rail	35	25
Bike	50	10
Walk	10	6

Establishing SOV Targets:

SOV trip and mile targets are established to give employers their SOV reduction goals for the following year and in subsequent years. Effective July 1, 1994, employer’s annual SOV reduction goals increased from 5% to 10% for the first five target years. SOV targets for the sixth year and subsequent program years are 5% annually.

Site Analysis:

Two indexes, the SOV trip and SOVMT rates, are used to measure the amount of SOV reductions per employment/student site. SOV trips are calculated from question #1 and #3 on the TRP questionnaire. The formula for this calculation is:

SOV Trip Rates:

SOV Trips = Drive alone trips + Penalty trips

Total Trips = SOV trips + AFV trips + Carpool trips + Bus trips + Bike trips + Light Rail trips + Walk trips + Vanpool trips + Telecommuting trips + CWW trips

SOV Trip Rate = $\frac{\text{SOV trips}}{\text{Total trips}}$

Assumptions used in measuring the SOV trip rate are: 1) calculating SOV trip rate allows for changes (increase or decrease) in the work force population, 2) motorcycles are considered SOV trips since their emission standards are higher than automobiles and 3) factoring carpool and vanpool trips by the average vehicle occupancy (AVO) would adversely impact small companies.

1 Penalty trips are non-respondents on a re-survey that are counted as single occupant commutes.

The other index, the SOVMT rate is obtained by multiplying the number of one-way miles traveled to the worksite (question #6) by the modes of transportation (question #1 and #3). The total number of carpool or vanpool miles traveled weekly per site is factored by the AVO. The AVO is calculated from question #5 on the TRP questionnaire. The formula for computing the SOVMT rate is:

SOVMT Rate:

SOVMT = Drive alone miles + Penalty miles

Total VMT = SOVMT + AFV miles + (Carpool miles/AVO) + Bus miles + Bike miles + Light Rail miles + Walk miles + (Vanpool miles/AVO) + Telecommuting miles + CWW miles

SOVMT Rate = $\frac{\text{SOVMT}}{\text{Total VMT}}$

The assumptions used in calculating the SOVMT rate are: 1) SOVMT rate allows for changes in the work force population, 2) the SOVMT rate controls for changes in the location of employment sites and/or employee residence, 3) the SOVMT rate accounts for employees/students changing from an SOV mode of transportation to one of the main alternative modes of transportation (carpool, vanpool or bus), as well as employees/students changing to bike or walk modes of transportation and 4) factoring by AVO more accurately measures the amount of miles traveled in carpools and vanpools to the worksite.

Accounting for Telecommuting and Compressed Work Week Schedules:

Telecommuting trips measure the number of days per week a respondent works at home instead of traveling to the work site. Compressed work week schedules (CWW) measure the number of respondents working a 4-day week (10-hour work days), 3-day week (12 hour work days), alternating 3-day/4-day workweeks (36 hours one week, 48 hours the next week) and 80 hours in nine (9) days (9/80).

The assumptions used in accounting for CWW and telecommuting work schedules are 1) telecommuters and CWW employees are SOV commuters; and 2) CWW work schedules and telecommute trips are considered trips not taken; and 3) a commuter cannot live greater than 150 miles from their work site to be considered one of these types of alternative mode users.

1 Penalty miles are non-respondents that are counted as single occupant commutes.

Accounting for AFV trips and miles:

Alternative Fuel Vehicles are given credit for trips and miles when a respondent selects a fuel type from question #4 on the survey. Credit criteria were initially calibrated with the assistance of Maricopa Association of Governments (MAG) and the Environmental Protection Agency (EPA). Credit for AFV types will be adjusted as criteria for the fuel type will be recalibrated each year.

The assumptions used in accounting for AFV trips and miles are: 1) AFV users are SOV commuters and 2) if another alternative mode was marked on the survey, credit is given to that mode.

Below is a current list of AFVs for this year that TRP gives credit for trips and miles to employers.

<u>Alternative Mode</u>	<u>Calculated Credit</u>
	<u>Jul 2015 – Jun 2016</u>
Electric	1.0
Hybrid (gas/electric)	0.453

The on-road emissions model used to calculate miles per pound for Light Duty Gasoline Vehicles (LDGV) was updated this reporting period by the EPA. It officially replaced the previous emissions model with the Motor Vehicle Emission Simulator 2014 (MOVES2014) with the MOVES2014a model, beginning January 2016. The new model continues to calculate how many miles driven it takes to generate one-pound of pollution for a standard on-road vehicle.

For this reporting period the TRP conversion rate for Natural Gas vehicles is derived from the MOBILE6.2 model. The EPA is still making adjustments to their model to calculate emission rates for Light Duty CNG Vehicles (LD NGV). The natural gas LD NGV calculation is used to measure the credit amount given for commuters who select AFV as their mode use. For this year the amount of credit given for AFV use of Natural Gas vehicles is .453.

Comparing Change in SOV Rates:

The SOV trip and SOVMT rates obtained in the current year are compared with the SOV rates obtained in the previous year for each employment/student site. Each employer and site is given an employer code and a site number that make it possible to compare sites from year to year. The SOV trip and SOVMT rates are compared annually by using the following formula:

$$\frac{\text{SOV Rate Current Year} - \text{SOV Rate Previous Year}}{\text{SOV Rate Previous Year}}$$

Aggregate Analysis:

Aggregate models used to measure the overall impact of the TRP on reducing SOV trips or SOV miles are very similar to the models used to measure employment sites. Aggregate analyses are performed for quarterly reports, year-end reports and special studies. The guidelines for including employee and student sites into aggregate analyses are: 1) an employee/student site must be available for all years under investigation and 2) affected sites are analyzed separately for employee and student populations.

Aggregate Models for SOV Rates:

SOV Trip Rate:

$$\text{SOV Trips} = \text{Drive alone trips} + \text{Penalty trips}$$

$$\text{Total Trips} = \text{SOV trips} + \text{AFV trips} + \text{Carpool trips} + \text{Bus trips} + \text{Bike trips} + \text{Light Rail trips} + \text{Walk trips} + \text{Vanpool trips} + \text{Telecommute trips} + \text{CWW trips}$$

$$\text{SOV Trip Rate} = \frac{\text{SOV Trips}}{\text{Total Trips}}$$

SOVMT Rate:

$$\text{SOVMT} = \text{Drive alone miles} + \text{Penalty miles}$$

$$\text{Total VMT} = \text{SOVMT} + \text{AFV miles} + (\text{Carpool miles/AVO}) + \text{Bus miles} + \text{Bike miles} + \text{Light Rail miles} + \text{Walk miles} + (\text{Vanpool miles/AVO}) + \text{Telecommute miles} + \text{CWW miles}$$

$$\text{SOVMT Rate} = \frac{\text{SOVMT}}{\text{Total VMT}}$$

Definitions:

Alternative Fuel Vehicle (AFV) - a motor vehicle that is a hybrid, electric, uses biodiesel, compressed natural gas (CNG) or propane (LPG) instead of conventional or diesel fuel.

Carpool - Rides shared in private automobiles by two or more people, on a continual basis, regardless of their relationship to each other or cost-sharing agreements. Vehicle can include, but not limited to, sedan-like vehicle, SUV or mini-van.

Commute Alternatives - Carpooling, vanpooling, making use of the public transit system, bicycling or walking as commute modes for traveling to and from work.

Compressed Work Week (CWW) - Management reschedules the normal five-day, forty-hour week to longer hours per day but fewer days per week.

High Occupancy Vehicle (HOV) - A motor vehicle occupied by two or more people.

Single Occupant Vehicle (SOV) - A motor vehicle occupied by one person commuting to work/school. This definition also includes commuting to work on a motorcycle.

Single Occupant Vehicle Miles Traveled (SOVMT) - The total one-way distance traveled, in miles, by a commuter to the worksite/school. This includes trips not taken by a commuter for telecommuting or CWW schedule.

Telecommuting - The use of telecommunications technology to transport information rather than people to the work place. Generally speaking, telecommuting is simply working at the home instead of going to the work site.

Vanpool - The prearranged membership of a group whose members are picked up by a van at specific points and are taken to common or nearby employment sites, then returned to the pick-up point(s) after the end of the workday, usually for a monthly fare.