

Clean Air Force Campaign 1989–1990: Programs, Attitudes, and Commute Behavior Changes

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This was the fourth year of the Clean Air Force's "Don't Drive 1-in-5" campaign, a voluntary no-drive day program in Phoenix, Arizona. The campaign maintains a high level of awareness of 95 percent. Opinions are positive, with 89 percent indicating a favorable rating and 59 percent saying the campaign is likely to lower pollution levels. Half of the commuters indicated that it would be possible for them to rideshare at least once a week. Research also indicates a substantial increase in the number of people participating in alternative modes. This year, 36 percent of commuters used alternatives to driving alone (21 percent car-pool; 15 percent bus, bike, and walk combined), up 80 percent from a year ago when only 20 percent of commuters used alternatives. The number of trips made by alternatives is also increasing, from about 18 percent of trips last year to this year's 22 percent. Commuter behavior changes are not expected to take place overnight, especially with the external factors working against them, including a decline in the price of gasoline from 1973 (inflation-adjusted), lack of density in residence and work locations, and lack of valley-wide bus service and bikeways systems. Over the past 2 years, an increase in bus ridership of 36.5 percent has been achieved, including a 13.3 percent increase this past year. The average number of riders has increased from 76,470 two years ago to 104,400 this year, an increase of 27,930 riders each weekday. Transit systems that enjoy ridership increases at all are achieving 2 to 5 percent boosts. All-day traffic counts did not exhibit statistically significant changes this year; however, an estimated reduction in peak period traffic of 2 to 3 percent occurred, equivalent to all-day reductions of 405,000 mi traveled and 5 tons of carbon monoxide emitted. Employers more than doubled their participation in the "challenges," the 1-week competition for the highest participation rates. Almost 100,000 employees from 81 employers participated. Community-wide events were aimed at getting people to try an alternative. Free bus day was a success with a 33 percent increase in ridership. Bike-to-work day and blue ribbon day, 1-day community-wide challenges, were also successful. The media task force played a major role in the success of the campaign and donated 1,803 radio and 1,935 TV public service announcements valued at over \$750,000. Some 150 campaign volunteers helped expand the level of participation and in-kind services; donations totaled more than \$202,000.

The year 1989–1990 marked the fourth year of the Clean Air Force Campaign. This campaign was designed to help solve the problem of carbon monoxide pollution in Phoenix, Arizona. The mission of the campaign was to decrease air pollution by asking drivers to reduce their vehicle-miles by not driving their car 1 day per week.

Regional Public Transportation Authority, 505 North Second Street, Suite 365, Phoenix, Ariz. 85005.

The goals of the campaign were to educate the public that automobile usage is the major contributor to carbon monoxide pollution, which causes certain harmful health effects; and to increase employer and employee participation in the program.

The specific objective was to reduce the average daily weekday trips by 4.0 percent, 2.1 of the 52.5 million miles driven daily, thereby reducing 40.5 tons of carbon monoxide.

The campaign consisted of sponsors, an advisory council, five task forces, a working group, and many community volunteers and professional staff. (See Figure 1 for the organization chart.) The sponsors, who are responsible for developing the overall policies, guidelines, and goals of the campaign, include the Arizona Department of Environmental Quality, the Arizona Energy Office, Maricopa County, the Phoenix Chamber of Commerce, and the Regional Public Transportation Authority (RPTA).

The campaign was organized into five task forces, each with a specific function, including media, government, business, health and education, and promotion. The task forces met frequently to help plan the campaign. They were responsible for planning and implementing the major elements of the campaign. The working group consisted of representatives from the major sponsors and staff members from each of the committees. This group met biweekly, thus providing the forum to discuss issues, exchange information, work out problems, keep the program on schedule, and provide overall direction.

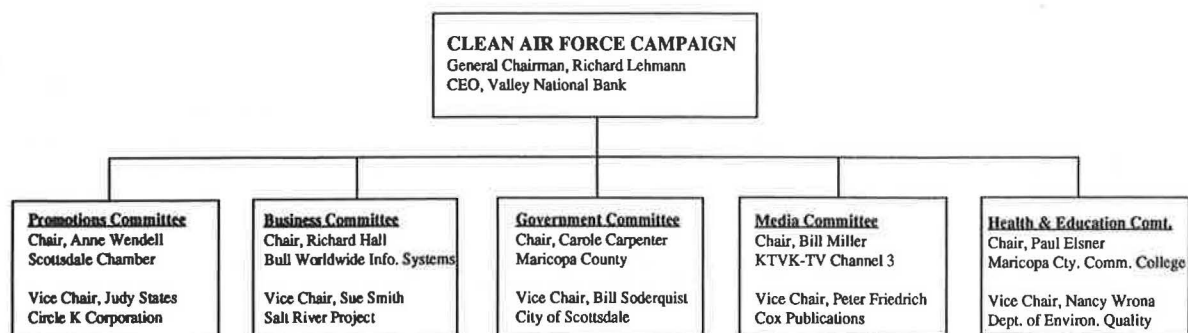
GOVERNMENT TASK FORCE

Goal and Objectives

The goal of the government task force was to generate active involvement from the government sector.

The objectives included the following:

- Increase public employer participation in campaign from previous year,
- Increase participation levels in the challenge competition by exceeding last year's rate of 18.3 percent,
- Coordinate activities with the mandatory travel reduction program, and
- Integrate the high pollution advisory program into the public employer outreach program to maximize effectiveness.



SPONSORS

The Clean Air Force is sponsored by the Regional Public Transportation Authority, Phoenix Chamber of Commerce, Department of Environmental Quality, Maricopa County, and the Arizona Department of Commerce Energy Office.

FIGURE 1 Organization chart for the Clean Air Force Campaign.

Summary

Government jurisdictions throughout Maricopa County were active in the Clean Air Force campaign this year. During the course of the campaign, 23 jurisdictions and federal agencies were involved in promotion of the campaign effort.

Government jurisdictions sent representatives to all of the main campaign events including the campaign kick-off, free bus day, all challenge activities, blue ribbon day, and bike to work day. In particular, elected officials were active and visible participants in media activities.

Government jurisdictions have played an integral role in the success of the Clean Air Force Campaign and have contributed in a multitude of ways. Many of the larger jurisdictions are completing their fourth year in the campaign and these veteran participants have been an influential factor in the overall development of the entire program.

Government Challenge Week

During the week-long challenge event, 19 jurisdictions participated, an increase of 9 jurisdictions over last year. These jurisdictions represented over 43,000 employees; the overall rate of participation (percentage of employees using alternative modes) increased to 19.6 percent this year from 18.3 percent last year.

The challenge winners by flight (employee size) and participation rate were as follows:

Flight	Participation Rate (%)
City of Phoenix (over 10,000 employees):	25
City of Glendale (1,000 to 9,999 employees):	54.5
U.S. Housing and Urban Development (150 to 1,000 employees):	44.4
City of Avondale (50 to 149 employees):	32.3
Town of Cave Creek (under 50 employees):	100

Bike To Work Day Planning

Another major area in which the local governments had a great deal of input into the campaign was in the preparation of the bike to work day on February 28th.

Before this time, there had been no organized integration of bikeways between jurisdictions in Maricopa County. In the 7 months of planning this event, RPTA staff brought together bicycle and transportation planners from all the metro jurisdictions to develop a series of contiguous routes for the bike to work event. In addition to designing the map, the city of Phoenix coned off a route from Metro Center to downtown and many of the cities sponsored park and pedal events on February 28th. The long-term goal was to continue cooperation between the cities not only to incorporate bikeways into their transportation plans but also to emphasize the need for interconnecting bikeways.

Traffic Monitoring

Another area in which the government representatives were instrumental was providing assistance in traffic monitoring during the campaign. Under the direction of the Maricopa Association of Governments Transportation and Planning Office (MPO), the metro jurisdictions worked together to establish a comprehensive traffic monitoring program that was used throughout the course of the campaign. This work was all done on a voluntary basis and meant dozens of hours of time donated to the Clean Air Force Campaign by these traffic engineers from the cities of Phoenix, Mesa, Scottsdale, Tempe, and Glendale; and from Maricopa County and the Arizona Department of Transportation (ADOT).

BUSINESS TASK FORCE

Goal and Objectives

The goal of the business task force was to generate active involvement from the business community. The objectives were

- Increasing the number of employer commitments to participate in the overall campaign by more than 100 employers,
- Increasing participation rates and the number of firms in the 1-week business challenge competition by exceeding last year's rate of 8.2 percent and having over 25 employers participate,
- Coordinating the business outreach activities and promotions with the travel reduction program, and
- Integrating the high-pollution advisory program into the employer outreach program.

Summary

The business task force had a banner year in the recruitment and participation of the private sector. Under the chairmanship of Richard Hall, communications and public affairs manager at Bull Worldwide Information Systems, the committee has surpassed each of the previous 3 years, objectives in obtaining corporate support, commitment, and participation in the campaign.

General Workshops

The business task force was responsible for sponsoring four general campaign workshops that provided vital information on how to promote and participate in the campaign to over 88 valley organizations. The committee also held four challenge workshops to help explain the challenge week, promotional materials, and suggested and planned events.

Challenges

The overwhelming support of the clean air challenge was evidenced this year as 52 firms representing 56,000 employees formally participated in the challenge. This number was an increase from the 25 firms who participated the previous year and the 6 firms the first year. The committee also devised flights for different-sized companies so that each organization could compete against another of relatively the same size. These flights facilitated greater competition between firms and greater participation resulted. Law firms continued to have their own separate minichallenge as Meyer, Hendricks, et al. won the law firm minichallenge and Streich, Lang, et al. won the flighted minichallenge. AAA once again won in the micromini challenge. A complete listing of the challenge results is provided later. The overall participation rate of all 52 firms was 7.9 percent and a CEO bet for each firm was initiated as a motivating force to win in each challenge flight.

Events

The business task force was instrumental in ensuring the success of other campaign events. Free bus day realized a 33 percent increase in ridership even though there was much less publicity than last year because the San Francisco earthquake occurred the night before the event. More than 6,000 coupons were returned to the campaign for the blue ribbon day drawing and more than 1,500 coupons were returned for bike to work day. All these events illustrate the commitment and participation of private businesses in the campaign for both the benefit of their employees and as strategies to include in their travel reduction program plans.

Donations

Finally, the committee also secured donations to help defray many campaign costs. The following donated \$2,700 for the final awards luncheon: Bull HN Information Systems; Streich, Lang, Weeks, and Cardon; U.S. West Communications; the Arizona Broadcasters Association; and Sundstrand. Valley National Bank sponsored a cocktail party for volunteers and the Phoenix and Scottsdale Chambers donated their time and support in soliciting the more than 300 prizes donated to the campaign. Allstate donated bus shelter advertising valued at more than \$35,000 this year, the largest dollar donation of the campaign.

PROMOTIONS TASK FORCE REPORT

Goal

The primary goal of the promotions task force was to promote the campaign throughout the community and educate the public about the air pollution problem and its various solutions.

Objectives

- Creating widespread awareness and acceptance of the campaign throughout the community.
- Securing commitments to receive free advertising for the campaign through retailers, civic groups, and other organizations.
- Securing prizes for the clean air challenges.
- Conducting a poster contest for elementary school age children.
- Securing commitments to carry messages in organizational newsletters, promotional literature, grocery bags, mar-quees, cash register receipts, and other advertising media.

Summary

The promotions committee was busy this year under the leadership of Anne Wendell of the Scottsdale Chamber of Commerce. The primary objectives of the promotions task force were to secure in-kind gift donations for the challenges, to

coordinate the awards presentation, and to promote the campaign in a variety of different ways.

Prizes

More than 300 prizes were received this year for the participants in the clean air events. This number represented an increase of 237 percent from last year. The estimated value of the prizes was \$15,000, an excellent response from valley retailers. The increase was caused by the special letters sent from the Phoenix and Scottsdale chambers of commerce.

Newsletters

A newsletter article with a schedule of events was sent to more than 1,000 community organizations with a request to run the article in their newsletters.

Marquee

The clean-air message ran on the coliseum message center for free bus day and blue ribbon day.

Library: Read a Book on the Bus Promotion

The Maricopa County Library District and Phoenix Transit created two posters for the read a book on the bus campaign. These posters were given to every library and put inside all buses. The county also produced a 30-sec public service announcement (PSA) with supervisor James Bruner.

Malls: Shop with a Friend Promotion

The shop with a friend reindeer crusade was kicked off with a press conference with Rudolf and scheduled visits with radio stations. Three key malls in the valley promoted the program by conducting drawings for prizes that they donated.

Driver Education Courses

Four informational fact sheets were sent to all the driver education teachers in the valley. Many teachers requested the clean air video.

Movie Slides

The only theaters in the Valley that ran clean-air PSAs were the Harkins Theaters. They ran clean air slides from October through February.

Bike-To-Work Day

There was cooperation from eight cities in developing the routes, which in some cases were especially set up just for

this event. The event was publicized in all the Circle K stores, all 70 bicycle shops, 560 employers, all libraries, 1,500 Arizona Youth Hostel members, Multiple Sclerosis Society, Cystic Fibrosis Foundation, and the Tour de Tucson newsletter.

Arizona Hospital Association

The high-pollution advisory program and clean air campaign information was sent to all hospitals through the association.

Water Bills

Three clean-air articles were sent out to all valley residents through various water bill newsletters concerning the general campaign, blue ribbon day, and bike to work day. The city of Phoenix alone reached more than 200,000 households.

Emissions Testing

Hamilton Testing Systems incorporated an article into their booklet. This was handed out to 90,000 people per month.

Grocers Association

Posters were distributed to all grocery stores in October-November through the Association. In January, the major chains received logo artwork to print on the bags or in advertising. Fry's used the logo in its print advertising.

Unions

The Central Arizona Labor Council distributed 5,000 pieces of literature in conjunction with the flu shot program and printed articles in their newsletter.

Daycare and Senior Centers

Four major daycare centers including Children's World, Kindercare, Palo Alto Preschools, and Sunrise Preschools, with a total of 44 sites, received posters and brochures. All senior centers were sent a packet of information with ideas on how they could participate.

Poster Contest

The second annual clean-air poster contest was held. More than 5,000 grade school children participated representing 24 schools in 11 valley cities.

Bicycle Festival

The Clean Air Force Campaign sponsored a booth at the Ghouzette Ride, which 3,000 people attended.

HEALTH AND EDUCATION TASK FORCE REPORT

Goal

The primary goal of the health and education task force was to educate the public on the health effects of air pollution.

Objectives

- Increase the level of understanding about the carbon monoxide problem;
- Increase the level of understanding of other harmful pollutants, their short- and long-term health effects, sources, and relationship to automobile emissions;
- Educate the elementary school age children about the pollution problem and transportation-related solutions; and
- Increase public awareness about the high-pollution advisory program.

Summary

The Health and Education Committee, as the newest committee of the Clean Air Force Campaign, has had two main goals this year. The two programs that the committee has been working on are (a) a high-pollution advisory media workshop, and (b) a curriculum on air quality for elementary age students.

Media Workshop

In September, the committee sponsored a high-pollution advisory media workshop for TV and radio personnel throughout the valley. More than 20 members of the media turned out for the workshop. A media briefing book was prepared that included information on the campaign, health effects, and pollution and provided a list of contacts. The workshop was videotaped for those who were unable to attend. The videotape was edited by the county down to 23 min and is available for any interested party to borrow and view.

Air Quality Bibliography

The committee has also produced a bibliography of resources on air quality for teachers that lists available curricula (both local and from other states), as well as field trips, videos, and a list of speakers.

Air Quality Curriculum

The committee has solicited and received two curricula from other states with air quality programs. It has received permission from both of these state agencies to edit and use any portion of the curricula without cost. The goal for the next year was to combine the best portions of these curriculums,

add extension activities, and produce an accompanying teacher's guide, as well as provide in-service training for teachers who are using the curriculum. Private sponsors will be solicited to help defray promoting costs.

CLEAN-AIR MEDIA TASK FORCE

Goal

The primary goal is to help develop, implement, and monitor the public relations and advertising plans and strategies that result in increased participation in the campaign.

Objectives

- Increase the level of understanding about the problem and effects of air pollution,
- Increase the favorable attitude about the campaign,
- Increase the belief by the public that the campaign will have a positive impact on the problem,
- Inform the commuting and noncommuting public of the various alternatives, and
- Assist in helping to increase the level of participation.

Summary

This year, the media task force participation included solid representation from radio and television, but also outstanding print representation and special media including Skyview Traffic Watch and Gannett Outdoor Advertising. For the first time, advertisements for Spanish station KTVW TV 33 were produced and aired.

Broadcasting Reports for Radio and Television

Although the number of PSAs was down slightly from last year's campaign, live mentions on radio and TV were up significantly. In addition, special promotions and the overall level of participation from the broadcast media have increased. The total value was \$750,635 (see Table 1).

Print Representation

The media task force was well represented by major newspapers and those in the valley communities. The larger newspapers were strongest in editorial coverage and the smaller dailies achieved a solid balance between editorial and PSA advertisement coverage.

Creative Contributions and Production

Evaluating the campaign's advertising and public relations elements were important functions of the media task force. The group recommended the advertisement concepts that were adopted by the campaign sponsors. The goal of the task force

TABLE 1 VALUES OF PSAs OVER RADIO AND TELEVISION

Radio				
	<u>PSA#</u>	<u>Value</u>	<u>Other Value</u>	<u>Sub Total</u>
Oct.\Nov.	243	\$13,376	\$3,601	\$16,977
Dec.	338	\$15,370	\$6,380	\$21,750
Jan.	399	\$29,450	\$5,336	\$34,786
Feb.	473	\$41,047	\$9,452	\$60,499
Mar.	350	\$25,041	\$5,354	\$30,395
	<u>1803</u>	<u>\$134,284</u>	<u>\$30,123</u>	<u>\$164,407</u>
TV				
	<u>PSA#</u>	<u>Value</u>	<u>Other Value</u>	<u>Sub Total</u>
Oct.\Nov.	552	\$126,081	\$12,000	\$138,081
Dec.	582	\$148,239	\$12,000	\$160,239
Jan.	412	\$154,163	\$26,523	\$180,686
Feb.	230	\$ 62,352	0	\$ 62,352
Mar.	159	\$ 44,870	0	\$ 44,870
	<u>1935</u>	<u>\$422,224</u>	<u>\$50,523</u>	<u>\$586,228</u>
Totals TV & Radio				
	<u>PSA\Mentions</u>	<u>Value</u>		
Oct.\Nov.	795	\$155,066		
Dec.	920	\$188,981		
Jan.	811	\$215,472		
Feb.	703	\$122,851		
Mar.	509	\$ 75,265		
GRAND TOTAL	<u>3738+</u>	<u>\$750,635</u>		

was to select effective advertisement concepts while achieving consistency in both sound and appearance.

Members of the Arizona broadcasters produced, edited, mixed, dubbed, distributed, and provided voice talent and video footage for the campaign's PSAs, as part of an agreement with the campaign, for \$55,000.

High Pollution Advisories

In addition, the task force sponsored a design competition for the pollution advisory logo that the media used when alerting the public of a high-pollution advisory.

Clean-Air Buses

This year the campaign enjoyed a second year with KTSP TV-10 sponsoring the Challenge 10 clean-air bus. Channel 10 again subsidized one free trip, which they advertised 6 days per week on all four daily newscasts. Their news personalities also made weekly rides on the bus.

KOY FM (Y95) sponsored the Y95 clean-air bus this year for the first time and promoted bus ridership on the daily drive-time morning zoo.

PUBLIC RELATIONS AND ADVERTISING SUMMARY

The 1989-1990 Clean Air Force Campaign received an enviable amount of publicity and public service advertising as always. It was clearly one of the most successful public service campaigns in the valley, because in large part of the excellent constituency building that had been done over the previous 4 years. Changing the public's behavior is a slow process of education. It involves consciousness raising much like that for seat belt usage and fitness. Often, it is the news media that help raise awareness. This campaign has their continued support.

The public relations program began in late July 1989 by Phillips-Ramsey who was selected to conduct public relations and provide creative services for the campaign. The plan was designed to generate community awareness and involvement in the campaign through publicity and special events. The join the clean air team theme provided a good overall rallying cry. The events included the following:

- Clean air pep rally (kick-off), October 11;
- Free bus day, October 18;
- All-star challenge (1-week employer competition), November 9;

- Shop with a friend (mall promotion), December 5–9;
- Reindeer crusade (radio promotion), December 1–7;
- Blue ribbon day (1-day rideshare promotion), January 24; and
- Bike to work day (1-day bike promotion), February 28.

Publicity-Media Relations

Personal visits were made to news directors and key radio promotions directors, reports were made regularly to the media committee, and personal thank you messages were sent to media who had been especially helpful on an event. Media coverage of the events was excellent. Considerable prepublicity was generated for events requiring public participation like free bus day, blue ribbon day, and bike to work day. The media were both receptive and supportive.

Broadcast coverage was the primary goal because most people answering last year's postsurvey said they had heard about the campaign over television. Radio was emphasized because this medium was underutilized in the past. Radio remotes, on-air personalities, talk shows, traffic reporters, and weather reporters added substantially to the event coverage. Print coverage in the dailies was often skeptical or negative about the program as a whole. The reporters often focused on the lack of viable alternatives for commuters to use. Although this policy was short sighted, it was also probably a fair assessment of the valley's current transportation. Also, the information provided throughout the campaign did not offer enough hard news angles for the print media. More attention should have been given to developing sources and angles related to the environment, health, and so forth. This low-key information would have provided a serious counterpoint to the excessive publicity generated by the events.

Special Events

The special events were fun for everyone. They provided opportunities for companies and volunteers to get involved. The news media seemed to support them with coverage and personality involvement. Major public events like free bus day, blue ribbon day, and bike to work day should be expanded in the future.

The shop with a friend event never really got off the ground because of lack of support from area retailers. It might be better to create a winter event that is easier to lead from the staff side.

Using mayors, governor, and county supervisors is always a good media draw. Although getting commitments from them is difficult, they provide focal points for the media.

Advertising

Relying solely on public service advertising time and space is limiting, especially at the kick-off of the campaign. It would be better if the media could coordinate public service advertisements with the kick-off of the campaign or if some paid advertising were used. Because advertising lagged well behind

the kick-off, the early impact of a coordinated advertising and public relations campaign was lost.

Even printed advertisements would be helpful if there were some guarantee they would run. This might be more certain if various sizes of the same advertisements were available. Perhaps one generic campaign advertisement and three event advertisements would be more useful. Because most radio stations do not use taped PSAs but provide considerable live announcer coverage, the cost of producing radio spots could go to more printed advertisements. Regular written PSAs could be sent to the radio stations. The total value of the broadcast media spots donated was over \$750,000.00. The advertising produced for the campaign included three newspaper advertisements, billboards, seven television commercials, exterior bus posters, and nine radio commercials.

Collateral

The collateral materials were important to the campaign, especially those for the employees. The materials produced by the agency included employee brochure, four general posters, campaign coordinator books, video, three clip art pages, press kit folders, post-it notes, buttons, bags, water bottles, free bus day stickers, counter card holders, grocery bag logos, challenge poster and flyers, free bus day flyers, blue ribbon day posters and flyers, and bike to work posters and flyers.

Donated Services

The public relations support for this campaign is time consuming. With six major special events, many collateral pieces like brochures and flyers to write, public service announcements, news releases, media alerts, talk show bookings, radio station promotions, and committee and staff meetings, many more hours were spent on the project than were covered by the retainer fees. The current estimate is that Phillips-Ramsey donated approximately 750 hr in agency public relations time as community service.

Estimated donated time was 500 hr for creative services and 430 hr for accounting services. The resources donated by the media committee and production and talent companies were invaluable at keeping out-of-pocket costs within budget.

In-kind gifts supplemented the public relations and creative budgets as follows:

- Public relations, \$100,000;
- Photography for events, \$1,000;
- Talent for events (Sparky, etc.), \$2,000;
- Refreshments (Kalil, etc.), \$1,000;
- Flyers, ribbons (Circle K, etc.), \$3,500;
- Hanging banner (Phx), \$400;
- Video, radio, and TV talent, \$42,000;
- Allstate-Transit shelters, \$35,000; and
- Awards luncheon, \$2,700.

The total for donated services was approximately \$187,600.

TABLE 2 NUMBER OF PEOPLE BY MODE OF TRAVEL TO WORK FOR PERSONS EMPLOYED OUTSIDE THEIR HOMES

TRAVEL MODE	Pre'88-89 (%) (Mean)		Post'88-89 (%) (Mean)		Pre'88-90 (%) (Mean)		Post '89-90 (%) (Mean)	
Single Occupant Vehicle								
Drive Alone	82%	4.9	89%	4.8	85%	4.7	87%	4.5
Motorcycle	2	4.7	*	1.0	3	3.2	2	2.4
Alternate Mode								
Car-pool	17	4.2	12	3.8	22	3.6	21	3.4
Ride a Bike	2	4.2	2	3.7	5	2.9	7	2.2
Take the Bus	1	4.0	3	2.9	3	2.6	4	2.7
Walk to Work	*	5.0	3	2.8	3	3.0	4	3.8
ALTERNATE MODE TOTALS								
	20%		20%		33%		36%	

Use caution when comparing time series data due to differences in sample size and the associated sampling error. Column totals exceed 100% due to multiple modes of transportation used in a typical week. * = Less than half of one percent.

CAMPAIGN RESULTS

Market Research

This report presents the results from a survey conducted for the RTPA by O'Neil Associates, Inc. The report is based on an analysis of 701 telephone interviews conducted with licensed drivers living in Maricopa County who own or lease at least one motor vehicle. The survey was conducted from February 24 to March 1 1990. This study represents a research plan analyzing drivers' attitudes and behavior before and after the campaign, and compared to the previous year's research.

Current Travel Behavior

Approximately 36 percent of commuters either carpooled, rode their bicycles, took the bus, or walked to work at least once a week in 1989-1990 compared with approximately 20 percent in 1988-1989. Driving alone, however, continues to be the predominant means of travel to and from work (see Table 2).

The percentage of total trips to and from work using one or more of the alternate modes of transportation has also increased, but by a smaller margin, from 18 to 22 percent. The reason for a greater increase in the number of persons using alternative modes for commuting and the proportion of trips made using alternative modes may indicate that more people are trying alternative modes on an infrequent basis (see Table 3).

The concept of carpooling continues to be appealing for shopping and recreational trips. Although driving alone remains the primary means of transportation on shopping trips, carpooling is much more popular for shopping than it is for work travel. Recreational travel is generally in the form of a carpool, though some drive alone in these instances as well.

Use of Alternate Modes of Transportation

When asked how they would get to work if they did not have a car, 26 percent of employed respondents indicated they would ride with someone else (carpool), 17 percent would take the bus, 6 percent would walk, and 14 percent would use some other means to get to work. Only 32 percent refused to respond, insisting that they absolutely needed to have a car to get to work. The primary reasons given for needing to drive alone were irregular work hours (23 percent), needing a car for business purposes (22 percent), and not knowing anyone with whom to carpool (20 percent). Half of these respondents, however, indicated it would be possible for them to get to work some other way than driving alone at least once a week. Younger respondents are more likely to indicate they could get to work by an alternate means.

When nonemployed respondents were asked how willing they would be to take specific steps to preserve air quality in Maricopa County, combining or reducing automobile trips appear to be the most acceptable alternatives followed by carpooling more often. Options that required leaving the au-

TABLE 3 PERCENTAGE OF TOTAL TRIPS TO AND FROM WORK

TRAVEL MODE	Pre-88-89	Post-88-89	Pre-89-90	Post-89-90
Single Occupant Vehicle				
Drive Alone	80%	86%	77%	77%
Motorcycle	2	*	2	1
Alternate Mode				
Carpool	15	9	15	14
Take the Bus	1	2	1	2
Ride a Bike	2	1	3	3
Walk to Work	*	2	2	3
Alternate Mode Totals	18%	14%	21%	22%
Total Trips:	1,340	1,342	2,948	2,218

Use caution when comparing time series data due to differences in sample size and the associated sampling error. Column totals exceed 100% due to multiple modes of transportation used in a typical week. * = Less than half of one percent.

tomobile (i.e., taking the bus, calling Dial-A-Ride, or riding a bicycle) were less acceptable.

Awareness and Perceptions

The Don't Drive 1 in 5 campaign continues to have high awareness among Maricopa County residents. More than 19 in 20 residents (95 percent) are aware of the campaign. This number is up slightly from the precampaign level of 93 percent, but is down slightly (yet nonsignificantly) from awareness levels experienced directly after last year's campaign concluded (97 percent).

Television and radio are the sources of information cited most frequently by respondents aware of the Clean Air Force campaign. Awareness based on information from all sources either remained the same or increased in comparison to percentages recorded postcampaign 1988–1989. The sources exhibiting the most noticeable increases in effectiveness this year are radio commercials, billboards, and the clean-air bus.

Overall, attitudes toward the Don't Drive 1 in 5 campaign are positive, with 89 percent indicating a favorable attitude toward the campaign. This figure is down insignificantly from last year's postcampaign level of 90 percent and up from this year's precampaign level of 84 percent. There has, however, been a drop in the proportion rating the campaign very favorable, from 55 percent in each of last year's surveys to 35 percent in this year's precampaign survey to 44 percent in the current survey. The reason may be found in continuing recognition of the severity of the problem (hence, overall favorability) coupled with concern over the absence of dramatic measurable effects (hence a diminished enthusiasm). If this interpretation proves correct, it indicates the potential for diminished support for the program in future years if demonstrable results cannot be communicated to the public.

Approximately three-fifths of respondents believe the campaign will lower pollution levels, a figure that has been fairly constant for the last 2 years. However, there has been a slight increase in the proportion who do not feel the campaign will lower pollution levels, from 29 percent in last year's postcampaign survey to 38 percent in the current survey. Most of the increase came from a decrease in don't knows. Although the feelings are still positive, this trend means attention should be paid to the need to maintain a high level of public support in future campaigns. This support may be more difficult to maintain in the future than it has been in the past.

High-Pollution Advisory Program

Three-fourths of the respondents are aware of the high-pollution advisory program, representing a slight increase in awareness from the precampaign survey and from the level of awareness a year ago. The percentage of respondents willing to alter their behavior on a high-pollution day by driving less or consolidating their trips continues to be up from postcampaign levels found in 1988–1989. Thirty-one percent of respondents indicated they would be very likely to make an extra effort not to drive their car on high-pollution days. This compares with only 17 percent in the postcampaign survey in 1988–1989 and 26 percent in the 1989–1990 precampaign

survey. The percentage of those who claim they would not be likely to make an extra effort (37 percent) decreased substantially from the 52 percent reported in the 1988–1989 postcampaign survey.

Assessment of the Air Quality Program

The public's concern about air quality has not changed since the 1989–1990 clean-air precampaign survey. Air quality in Maricopa County remains a serious problem in the minds of most residents and two-thirds perceive the current level of air quality to be a major problem. Most residents also foresee air quality worsening in the future just as they did in the 1989–1990 precampaign survey. Air quality in Maricopa County also is considered to be a year-round problem not just a part-year problem.

The belief that oxygenated fuel is not enough to improve air quality and that automobile use must be limited as well has grown by more than 10 percent since the 1989–1990 precampaign survey, from 61 percent precampaign to 73 percent postcampaign.

Payment for Mass Transit Alternatives

Nearly two out of every three respondents (63 percent) would be willing to pay increased taxes for increased bus service. Approximately half would pay more taxes for more bicycle lanes or rail-based mass transit and two-fifths would support increased taxes for more carpool or bus lanes. When asked if they would take the bus if its service were made more convenient (i.e., stops within ½ mi of home and frequent routes), almost two-thirds report a likelihood of using the bus.

Employer Incentives

The majority of respondents (70 percent) agree that the government should provide tax incentives for employers who subsidize employees who carpool or ride the bus. More than two-thirds (69 percent) of respondents indicate that their employers have encouraged them to use some other means than driving alone to work.

Methods that provide the employee a means of meeting emergency or business needs or which subsidize desired activities have the greatest potential for changing travel behavior. The strongest incentive for carpooling among employed respondents is providing transportation home in the event of an emergency followed by subsidizing bus tickets or gas for carpools and providing a company car for business. Less effective were mandatory fees for parking at work, providing information about bus routes and service to employees, and the sale of bus tickets at work.

Traffic Count Analysis

An extensive program of traffic counting was designed and conducted to provide an indication of the effectiveness of the

1989–1990 voluntary no drive days program. Traffic counts taken during the campaign were compared with counts taken just before the campaign to determine whether or not any change was evident. All counts were adjusted to remove bias caused by seasonal variation and population growth. The results indicate that morning commuter traffic was down by approximately 2 percent during the 1989–1990 campaign, whereas all-day traffic counts were virtually unchanged (see Table 4).

An important limitation of traffic counting results is that they do not necessarily demonstrate cause and effect. The voluntary no drive days program was just one of many factors that may have affected daily traffic variation on any given street. Weather conditions, gasoline prices, traffic accidents, fluctuations in tourism, and numerous other socioeconomic factors may have influenced the outcome. Additional uncertainty in the final result may be caused by the limited precision of the seasonal adjustment factors, as well as to accuracy limitation of the mechanical counting equipment.

Jurisdictional Responsibilities

The actual collection of traffic counts was conducted (gratis) by five area cities, the county, and the ADOT. Analysis of the traffic counts was conducted by the local MPO.

Selection of Sites

To minimize the influence of random variability, traffic counts were taken at 43 sites around the metropolitan area. Thirty-four arterial sites were selected using random selection procedures. Nine freeway sites were selected in a nonrandom manner, because site availability was limited by construction. Data collection was attempted at the same set of sites for each of six traffic counting periods during the 1989–1990 campaign.

Schedule

In order to assess traffic levels before the program began, counts were taken during September 12–14 and October 3–6. During each counting period, 24-hr counts were taken

on Tuesday, Wednesday, and Thursday to reflect average weekday traffic.

The same approach was used to measure traffic during the campaign. Care was taken to avoid scheduling counts for any week that would include a legal holiday. The first set of counts during the campaign was taken October 17–19. Further counts were taken at least one time each month from November through February.

Adjustment for Seasonal Variation and Population Growth

Some of the observed fluctuation in traffic counts from month to month would have occurred even in the absence of the voluntary no drive days program, because of other factors. One of these factors is seasonal variation, reflecting annual patterns such as winter tourism and school activities. Another important factor is population growth. In the absence of seasonal variation, regional traffic would be expected to increase every month because of population growth.

Weekday traffic counts taken over a 4-year period were used to derive monthly factors reflecting seasonal variations in traffic. The factors were calculated on a fiscal year basis, using ADOT data from July 1983 through June 1987. Regional population estimates from Mountain West Research provided a basis for adjusting factors to isolate normal seasonal variation. The adjustment factors finally applied to the results for the voluntary no drive days program are the multiplicative combination of the seasonal variation factors, and the estimated regional population increases.

Analytical Approach

The traffic counting results for September and October were seasonally adjusted and then averaged together to represent a preprogram base level of traffic. Traffic changes were calculated using both 24-hr counts and 3-hr counts from the morning commuter period (6:00 to 9:00 a.m.). All subsequent monthly counts were also adjusted for seasonal variation and population growth, for comparison to the preprogram base.

Traffic counts were not successfully retrieved each month at all of the sites, so the actual sample size varied from month to month. For each site where a matched pair of observations

TABLE 4 PERCENT TRAFFIC CHANGE FROM PREPROGRAM BASE (NEGATIVE NUMBERS INDICATE REDUCTION COMPARED WITH EXPECTED TRAFFIC LEVELS)

MONTH	MORNING PEAK PERIOD TRAFFIC COUNTS	ALL DAY TRAFFIC COUNTS
October	-1.11	+1.86
November	-2.42	-1.54
December	-0.63	+2.51
January	-2.55	+0.44
February	-6.82	-2.46
OVERALL RESULT	-2.88	-0.03
OVERALL EXCLUDING FEB.	-1.76	+0.67

TABLE 5 AVERAGE WEEKDAY BUS RIDERSHIP

	1987-88	1988-89	'87/'88- '88/'89 change	1989-90	'88/'89- '89/'90 change	'87/'88- '89-'90 change
OCT.	81,061	90,411	11.5%	107,008	18.4%	32.0%
NOV.	75,567	92,291	22.1%	105,197	14.0%	39.2%
DEC.	67,225	88,422	31.5%	98,474	11.4%	46.5%
JAN.	78,785	91,944	16.7%	103,114	12.1%	30.9%
FEB.	79,711	97,635	22.5%	108,206	10.8%	35.7%
TOTALS	382,349	460,703	N/A	521,999	N/A	N/A
AVERAGES	76,470	92,141	20.5%	104,400	13.3%	36.5%
Post campaign statistics:						
MAR.	85,039	96,747	13.8%	108,196	11.8%	27.2%
APR.	90,239	100,613	11.5%	109,701	9.0%	21.6%

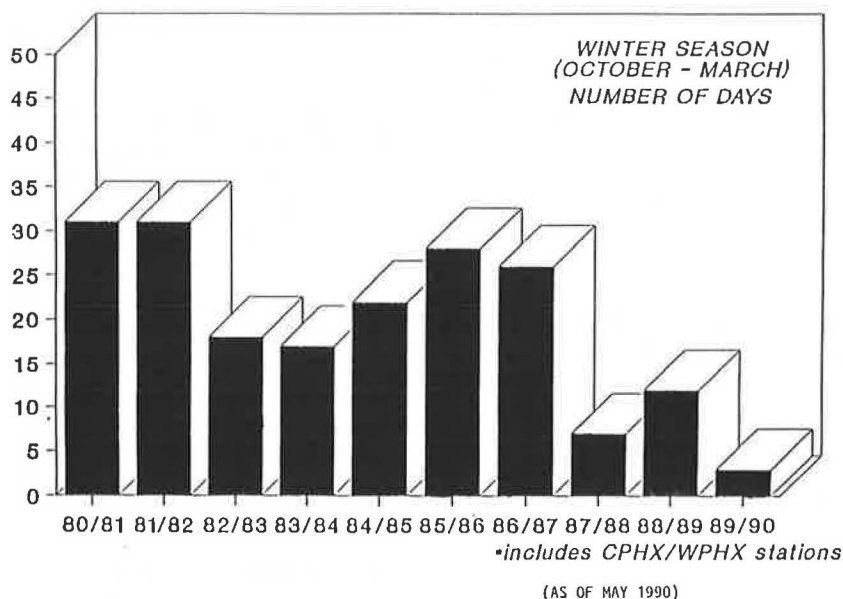


FIGURE 2 Days federal carbon monoxide standard was exceeded.

was available, the traffic change was calculated. The sum of these individual changes was divided by the sum of the corresponding counts in the preprogram base to yield the percentage change for the sample. This calculation was done separately for arterial streets and freeways to facilitate the computation of a weighted average.

The computation of a weighted average was necessary because freeway traffic was proportionally overrepresented in the sample. If all of the arterial streets and freeways in the region were included in the sample, freeway traffic would account for only 17 percent of the total, based on simulation results from regional traffic modeling. Therefore, the weighted average results assign the freeway counts a weight of 17 percent, and arterial counts are assigned a weight of 83 percent.

Statistical Significance

The traffic counting program described earlier involves the use of a sample to estimate overall regional behavior. Principles of statistical inference can be used to quantify the amount of uncertainty surrounding the use of such a sample. The key elements in the statistical calculations are the sample size (i.e., the number of sites used) and the amount of variance observed in the sample data. Based on the size and variance of the sample, the traffic count results are subject to a margin of uncertainty of ± 3 percent.

Bus Ridership Analysis

Bus ridership throughout the campaign was high. The increase in average weekday ridership during campaign months increased 36.5 percent from 2 years ago, including a 13.3 percent increase over the past year. (Table 5 presents statistics from 1987 through 1989–1990.) These ridership increases were also noteworthy in that bus service was not increased significantly during this 2-year period.

Since the campaign, average weekday ridership continued to increase. The average for April for 1990 of 109,701 riders increased over 5,000 riders from the average during the 1989 campaign.

On free bus day, there were 142,182 riders, an increase of 35,174 riders (33 percent) over the daily average for the month of 107,008. This increase is especially significant when the preevent television publicity was overshadowed by the San Francisco earthquake the evening before. This increase in ridership represents a decrease of 3.5 tons of total pollutants and 2.7 tons of carbon monoxide.

HIGH-POLLUTION ADVISORY

The goal of the high-pollution advisory program was to prevent potential exceedances of carbon monoxide levels by encouraging citizens to limit their driving on the day following the announcement. High-pollution advisories are issued by the county when the next-day forecast is for unhealthy concentrations of carbon monoxide. These advisories are issued between 9:00 a.m. and 3:00 p.m. by contacting Associated Press and UPI, which in turn issue a standardized HIGH POLLUTION ADVISORY statement provided by the Clean Air Force Campaign to the media. Figure 2 shows the number of days carbon monoxide standards were exceeded during winter seasons from 1980–1981 to 1989–1990.

Since the Clean Air Force Campaign began in 1986, the numbers of days exceeding the clean air standard have been as follows:

Year	Number of Exceedance Days
1986–1987	26
1987–1988	7
1988–1989	12
1989–1990	3