

UNDERSTANDING AIR QUALITY ISSUES IN TEXAS: PUBLIC ATTITUDES AND EXPERT OPINION

Prepared for
Texas Transportation Institute
Texas Department of Transportation
Texas Natural Resource Conservation Commission

Prepared by
Institute for Science, Technology and Public Policy
The George Bush School of Government and Public Service
Texas A&M University

October 2001



DR. ARNOLD VEDLITZ, DIRECTOR & BOB BULLOCK CHAIR IN GOVERNMENT AND PUBLIC POLICY

INSTITUTE FOR SCIENCE, TECHNOLOGY AND PUBLIC POLICY

George Bush School of Government and Public Service • Texas A&M University • College Station TX 77843-4350

Phone: 979.845.2929

fax: 979.862.8856

avedlitz@bushschool.tamu.edu

INSTITUTE FOR SCIENCE, TECHNOLOGY AND PUBLIC POLICY

A nonpartisan, interdisciplinary public policy research institute.

ISTPP RESEARCHERS

Arnold Vedlitz, Ph.D. • Director

Letitia T. Alston, Ph.D. • Associate Director

B. Mitchell Peck • Research Scientist

ISTPP RESEARCH ASSOCIATES

Nandita Chaudhuri • Program Assistant, Research Development

Monica Holder • Program Coordinator, Research Development

Eric Lindquist • Research Scientist

Nell Frazer Lindquist • Program Coordinator, Research Development

Meg Patterson Rogers • Assistant Director, Research Development

ISTPP GRADUATE STUDENTS

Stacey A. Allison • Wildlife and Fisheries Sciences

Charles R. Hemmeline • George Bush School of Government and Public Service

Kami L. Jones • George Bush School of Government and Public Service

DR. ARNOLD VEDLITZ, DIRECTOR & BOB BULLOCK CHAIR IN GOVERNMENT AND PUBLIC POLICY

INSTITUTE FOR SCIENCE, TECHNOLOGY AND PUBLIC POLICY

George Bush School of Government and Public Service • Texas A&M University • College Station TX 77843-4350

Phone: 979.845.2929

fax: 979.862.8856

avedlitz@bushschool.tamu.edu

INSTITUTE FOR SCIENCE, TECHNOLOGY AND PUBLIC POLICY

A nonpartisan, interdisciplinary public policy research institute.

ACKNOWLEDGEMENTS

This research was supported by the Texas Department of Transportation and the Texas Commission on Environment Quality and was a joint project of Texas A&M University's Institute for Science, Technology and Public Policy in the George Bush School of Government and Public Service and the Texas Transportation Institute.

This work may not be reproduced in its entirety, nor in part, without the knowledge and permission of its authors.

The authors would like to thank the following individuals for their assistance in this research: Nandita Chaudhuri, Monica Holder, Eric Lindquist, Nell Frazer Lindquist, Meg Patterson Rogers, Stacey A. Allison, Charles R. Hemmeline, and Kami L. Jones.

CITATION FORMAT

Arnold Vedlitz, Letitia T. Alston, and B. Mitchell Peck. *Understanding Air Quality Issues in Texas: Public Attitudes and Expert Opinion*. (October 2001) An unpublished report by the Institute for Science, Technology and Public Policy in the George Bush School of Government and Public Service prepared for the Texas Transportation Institute, the Texas Department of Transportation, and the Texas Natural Resource Conservation Commission.

TABLE OF CONTENTS

PROJECT SUMMARY	6
INTRODUCTION	7
DATA COLLECTION AND ANALYSIS	7
General Public Survey	7
Stakeholder Interviews	7
Methods of Analysis	8
FINDINGS FROM THE PUBLIC SURVEY	8
The Environment and Air Quality in Texas	10
<i>Where the Environment Ranks</i>	10
<i>Focus on the Environment</i>	10
<i>Assessment of Local Air Quality</i>	10
<i>Local Sources of Air Pollution</i>	11
<i>Perceived Risks of Air Pollution</i>	11
Current Driving Patterns of Texans	12
<i>General Driving Patterns</i>	12
<i>Public Transportation, Automobile Use, and Carpooling</i>	12
<i>Future Driving Expectations of Texans</i>	14
Public Responses to Recommendations for Improving Air Quality	14
<i>Willingness to Change Driving Behavior</i>	14
<i>Public Support for Policy Solutions</i>	15
<i>Public Willingness to Participate in Air Quality Improvement Measures</i>	16
<i>Public Perception of Effectiveness of Air Quality Improvement Measures</i>	17
<i>Public Support for Investing Money to Improve Air Quality</i>	18
Assessment of and Preference for Information Sources on Air Quality	18
<i>Believability of Information Sources</i>	18
<i>Competence of Information Sources</i>	19
<i>Reliability of Information Sources</i>	20
<i>Preferred Information Media</i>	21
Cluster Analysis Results	21
FINDINGS FROM THE STAKEHOLDER INTERVIEWS	24
Current Air Quality Programs	25
<i>Air Quality Programs: Near Non-Attainment Cities</i>	25
Austin	25

Corpus Christi	25
Tyler-Longview	25
San Antonio	25
Victoria	26
<i>Air Quality Programs: Non-attainment Cities</i>	26
Beaumont/Port Arthur	26
Dallas / Fort Worth	26
El Paso	27
Houston/Galveston	27
Incentives For Change: Stakeholder-Suggested Incentives to Motivate Individuals, Businesses, and Local Governments to Clean the Air in Texas	28
<i>Individual Incentives for Change</i>	28
<i>Business Incentives for Change</i>	29
<i>Government Incentives for Change</i>	29
Specific Solutions: Stakeholder Suggestions for Cleaning the Air in Texas	30
<i>Increasing Public Awareness</i>	30
<i>Enabling Change</i>	30
<i>Reducing Urban Sprawl</i>	30
<i>Increasing the Costs of Polluting</i>	30
<i>Leadership</i>	31
Different Cities, Different Issues: City Summaries	31
<i>Near Non-Attainment City Summaries from Air Quality Stakeholder Interviews</i>	31
Austin	31
Corpus Christi	31
Longview	32
San Antonio	32
Tyler	33
Victoria	33
<i>Non-Attainment City Summaries from Air Quality Stakeholder Interviews</i>	33
Beaumont-Port Arthur	33
Dallas/Fort Worth	34
El Paso	34
Houston/Galveston	34

PROJECT SUMMARY

In an effort to better target a statewide campaign to raise public awareness of air quality issues, information was gathered from (1) a random sample of Texas citizens and (2) a selected sample of stakeholders in non-attainment and near non-attainment cities. A sample of 870 Texas citizens was interviewed to assess public attitudes toward air quality issues, perceived risks of air pollution, and acceptance of and willingness to act on proposed policies. A sample of 102 stakeholders was interviewed to gather in-depth information on local conditions and awareness of air quality, incentives to change existing patterns of behavior to improve air quality, specific solutions to the air quality problem in Texas cities, and assessment of existing programs addressing the air quality issue. The results are summarized below.

- The environment ranks low as a problem in Texas. The environment ranked 8th out of a list of 10 problems—ahead of only social security and the national debt.
- When forced to focus only on environmental issues, Texans view air pollution as a more serious problem than water pollution or ground/soil pollution.
- Only 14% of Texans report using public transportation.
- 94% of the public uses an automobile to get to work.
- 89% of the public rides alone to and from work.
- Reported willingness to change driving behavior is slightly positive. Those least willing to change driving behavior are white males, college-educated, over 26 years of age, and residents of attainment areas.
- Policies that limit personal freedom or result in higher costs to individuals received the least public support.
- The public viewed required emissions inspections and regular vehicle maintenance as the most effective measure to improve air quality.
- The most believable, competent, and reliable sources of information about air quality issues were those perceived to be independent and unable to profit from the information—university scientists ranked highest on each dimension.
- The public preferred information from PSA's on television and the internet. The internet was particularly popular with the college-educated and those under 50 years of age.

INTRODUCTION

In a collaborative effort to assist Texas cities to achieve EPA air quality standards, The Texas Department of Transportation (TxDOT) and The Texas Natural Resource Conservation Commission (TNRCC) are sponsoring the development of a public awareness campaign to increase public awareness of air quality issues in Texas. The Texas Transportation Institute (TTI), on the Texas A&M University campus, is overseeing and coordinating the different elements that go into the development of such a campaign. In an effort to focus the campaign most effectively, The Texas Transportation Institute contracted with The Institute for Science, Technology and Public Policy (ISTPP) at the George Bush School of Government and Public Service, Texas A&M University to provide information on what Texans know, think, and feel about air quality issues. To that end, The Institute for Science, Technology and Public Policy (ISTPP) collected data from a large sample of the general public across the state and a smaller sample of stakeholders in Texas non-attainment and near non-attainment cities.

DATA COLLECTION AND ANALYSIS

GENERAL PUBLIC SURVEY

The survey of the general public was conducted with a random sample of all Texas residents over 18 years old. A sampling frame was purchased from Survey Sampling Inc. to insure adequate coverage of the state. Interviewers were able to conduct surveys in either Spanish or English. The survey, conducted from August 3 to August 30, 2001, was designed to gather information on public attitudes toward air quality, the perceived risks of not meeting air quality standards, awareness and acceptance of current and proposed policy solutions, and willingness to change behaviors to meet air quality standards, as well as demographic information. The Public Policy Institute (PPI) at the University of New Mexico conducted the survey via telephone interviews. The interviews lasted, on average, 28 minutes. A total of 870 citizens from across Texas completed the interview. The sample was 55 percent female; the average age was 43; most respondents had at least a high school education; 69 percent were white. A more complete description of the sample is presented in Table 1 of findings section.

STAKEHOLDER INTERVIEWS

Stakeholders in the air quality issue were interviewed to gather in-depth information on local conditions and awareness, recommendations for incentives to change driving and other behaviors that affect air quality, recommendations for specific solutions to the air quality problem, and information on existing programs in place to address the air quality issue. Some of the questions asked on the public survey were also repeated in stakeholder interviews as a check for consistency between the two samples. Telephone interviews were conducted with a selective sample of stakeholders in non-attainment and near non-attainment cities across Texas. The interviews took a minimum of 20 minutes to complete and averaged about 45 minutes. The non-attainment cities included Houston-Galveston, Dallas-Fort Worth, Beaumont-Port Arthur, and El Paso. The near non-attainment cities included: Austin, Tyler-Longview, Victoria, San Antonio, and Corpus Christi. Stakeholders were chosen from among many groups of community leaders, decision-makers, and others with a stake in the air quality issue. Within each city we targeted representatives from local government, top businesses, educational institutions, transportation institutions, and special interest groups, among others, to participate in the interview. The plan was to interview a maximum of 200 stakeholders or until interviews yielded no new information. Repetition of themes was achieved fairly early in the interview process. Nevertheless, a total of 102 stakeholder interviews were completed. Those interviewed were from backgrounds in health (6%), environment (13%), government (22%), business (36%), transportation (18%), and public interest groups and education (5%).

Findings from stakeholder interviews are reported in a separate section. For the questions shared by both the public survey and stakeholder interviews, the responses were so similar that stakeholder results are not

reported with results from the public survey. Information unique to the stakeholder interview is reported in a separate section titled, Findings From the Stakeholder Interviews.

METHODS OF ANALYSIS

Most of the analyses consist of univariate descriptive statistics, frequency counts and percentages. The bulk of the conclusions drawn are from these frequency counts and percentages. In addition to univariate descriptive statistics, we present bivariate analyses that examine the relationships by demographic characteristics, respondent's city of residence, and attainment status of that city. For those variables of interest that are measured on a categorical scale, we present cross tabulations of the variable with the demographic variables and residence variables. For those variables of interest that are measured on a continuous scale, we present mean values for the sample and by demographic characteristics and the residence variables. Most of these variables were measured on a scale from 1 to 7 or from 0 to 10. In each case, the higher number represents a more positive or more favorable response. For example, a series of questions asks about the likelihood of participating in various air quality improvement measures, such as carpooling. A higher number represents a higher likelihood of participation. Similarly, a series of questions asks about support for policies to improve air quality, such as vehicle emissions testing—the higher the number, the higher the support.

In addition to the descriptive analyses and bivariate analyses, we present a multivariate cluster analysis. This analysis clustered respondents on perception of risk to health, environment, economy, and overall image of the community. These distinct clusters were then used as categories to examine two dependent variables: (1) the willingness of citizens to participate in recommended measures to improve air quality, such as carpooling, using public transportation, and so forth; and (2) public support for policy recommendations to improve air quality, such as limiting hours in which people can use lawn mowers, requiring vehicle emissions testing, and so forth. The analysis yielded 5 clusters of respondents with each cluster's members having similar responses to the perceived risks of air pollution. The clusters may be characterized as (1) those most sensitive to all risks, (2) those least sensitive to all the risks, (3) those more sensitive to health risks and less to economic risks, (4) those more sensitive to economic risks than health risks, and (5) those unaffected by economic risks, but somewhat sensitive to health and environmental risks. The clusters are characterized by demographic characteristics, gender, age, education, race/ethnicity, and attainment status of city of residence. The cluster analysis provides a snapshot view of who—in terms of these demographic characteristics—is most sensitive to perceived risks of air pollution and who is most willing to act on recommendations and support policies to improve air quality.

Throughout the report we refer to race/ethnicity categories and often use the terms white or non-white. White refers to respondents who self-reported themselves as White, non-Hispanic. Non-white refers to respondents who self-reported themselves as Black, Hispanic, or something else.

Not all relationships are presented in tabular form in the main body of the report. For more information on a particular topic area, contact Dr. Letitia T. Alston at 979.845.4114 or lalston@bushschool.tamu.edu.

FINDINGS FROM THE PUBLIC SURVEY

The findings are summarized by four major topic areas: the environment and air quality as a problem in Texas, current driving patterns of Texans, public responses to recommendations to improve air quality in Texas, and assessment of and preference for specific air quality information sources. Each of these topic areas was examined by demographic characteristics (gender, age, education, race/ethnicity) and location of residence (attainment status and city/region). Significant findings from these analyses are reported here. Findings from the cluster analysis of dimensions of risks of air pollution are presented as well. Table 1 lists the frequencies and percentages for the demographic characteristics and residence variables of the public survey sample used throughout the analyses.

Table 1. Frequency distributions of Demographic Characteristics and Residence Characteristics.		
	Frequency	Percent
<i>Gender</i>		
Female	476	54.9
Male	391	45.1
Total	867	100.0
<i>Age</i>		
<26	135	15.7
26-50	457	53.2
51+	267	31.1
Total	859	100.0
<i>Education</i>		
< High School	64	7.4
High School Grad	502	58.0
College Grad	299	34.6
Total	865	100.0
<i>Race/Ethnicity</i>		
White	504	68.7
Black	48	6.5
Hispanic	123	16.8
Other	59	8.0
Total	734	100.0
<i>Attainment Status</i>		
Attainment	331	38.0
Non-Attainment	391	44.9
Near non-attainment	148	17.0
Total	870	100.0
<i>Residence</i>		
Attainment Cities	331	38.0
Austin	48	5.5
Tyler-Longview	19	2.2
San Antonio	61	7.0
Victoria	3	.3
Corpus Christi	17	2.0
Dallas-Ft Worth	171	19.7
Houston-Galveston	173	19.9
El Paso	24	2.8
Beaumont-Port Arthur	23	2.6
Total	870	100.0

THE ENVIRONMENT AND AIR QUALITY IN TEXAS

Where the Environment Ranks

Overall, Texans do not view the environment as a major problem. When asked what they thought was the biggest problem facing people in Texas today, respondents ranked 7 problems higher than the environment. Respondents viewed the economy, crime, education, drugs, health care, moral decline, and taxes as more pressing concerns in Texas than the environment. The environment ranked ahead in importance of only the national debt and social security. Residents of non-attainment cities, however, do view environmental issues as relatively more serious than residents of attainment and near non-attainment cities. Table 2 shows how the public in different attainment status areas views problems facing Texas.

What would you say is the single, biggest problem facing people in Texas today?	Attainment Status			
	Attainment	Non Attainment	Near non-attainment	Total
Economy	9.4%	13.6%	11.2%	11.6%
Crime	9.7%	10.7%	7.0%	9.7%
Education	14.9%	17.9%	22.4%	17.6%
Drug abuse	16.6%	9.9%	10.5%	12.5%
Environment	3.9%	9.1%	6.3%	6.7%
Health care	13.0%	10.7%	16.1%	12.5%
Moral decline	19.5%	15.5%	16.8%	17.2%
Taxes	8.1%	7.2%	5.6%	7.3%
National debt	.6%	1.6%		1.0%
Social security	4.2%	4.0%	4.2%	4.1%
Total	100.0%	100.0%	100.0%	100.0%

Although the general level is low, a relatively higher percent of residents in non-attainment cities views the environment as the most pressing concern in Texas (3.9%, 6.3%, and 9.1% for attainment, near non-attainment, and non-attainment, respectively).

Focus on the Environment

When forced to think only about environmental issues, the public views air pollution as a more serious problem than either water pollution or ground/soil pollution. Almost 60 percent of the public (57.9%) reported air pollution as the most serious environmental problem facing Texas today. Air pollution was the most serious environmental problem named by all groups, regardless of gender, age, education, race. A higher percentage of residents of non-attainment cities viewed air pollution as the most pressing concern. A distant second was the problem of water pollution. Twenty-five percent of the public reported water pollution as the most pressing environmental concern.

Assessment of Local Air Quality

Respondents were asked to rate the quality of air in their local communities on a scale from 1 to 7, with 1 representing very bad quality air and 7 representing very good quality. In general, the public's assessment of air quality in their local communities is consistent with scientific evidence: residents of non-attainment cities rated their air quality lower than residents of both attainment and near non-attainment cities. The overall average rating of air quality in local areas was 4.9 out of a maximum rating of 7.0.

Local Sources of Air Pollution

The public perceives vehicles to be the major source of air pollution. In some areas, however, manufacturing and other sources were seen as important sources of pollution. In addition, a significantly higher percentage of people with less than a high school education attributed air pollution to industry and manufacturing. Table 3 shows the major sources thought to cause air pollution grouped by city of residence.

Which of the following is the greatest source of air pollution in your community?	Air emissions from oil refineries	Air emissions from manufacturing plants	Exhaust from cars, trucks and buses	Dust from construction	Dust and other emissions from farming and ranching	Other
Attainment Cities	5.5%	11.6%	50.9%	6.1%	22.9%	3.1%
Austin			88.4%	9.3%	2.3%	
Tyler-Longview		16.7%	66.7%			16.7%
San Antonio	1.8%	3.6%	83.9%	5.4%	5.4%	
Victoria		33.3%	33.3%		33.3%	
Corpus Christi	41.2%	5.9%	35.3%	5.9%	5.9%	5.9%
Dallas-Ft Worth	3.1%	8.1%	76.9%	8.8%	1.9%	1.3%
Houston-Galveston	26.6%	12.7%	50.6%	5.1%	2.5%	2.5%
El Paso	5.0%	15.0%	70.0%	5.0%		5.0%
Beaumont-Port Arthur	70.0%	5.0%	15.0%		10.0%	
Total	10.9%	9.9%	60.0%	6.2%	10.4%	2.5%

Perceived Risks of Air Pollution

In general, the public's perceptions of risks from air pollution are not extremely high, but of risks to the economy, the environment, health, and overall community image, health ranks as the most important concern. However, residents of non-attainment cities viewed risks to health, the environment, overall image of the community, and the economy of the community as more serious than residents of either attainment or near non-attainment cities. Table 4 shows the relationships between perceived risks and gender, age, and attainment status.

How much of a risk does air pollution pose to...	The health of people in your community?	The environment in your community?	Your community's ability to attract tourism and new business?	The overall image of your community?
<i>Gender</i>				
Female	5.69	5.44	3.72	4.12
Male	4.66	4.42	3.16	3.67

How much of a risk does air pollution pose to...	The health of people in your community?	The environment in your community?	Your community's ability to attract tourism and new business?	The overall image of your community?
<i>Age</i>				
<26	5.24	5.45	3.65	4.23
26-50	5.52	5.30	3.66	4.10
51+	4.66	4.17	3.00	3.40
<i>Attainment Status</i>				
Attainment	4.07	4.00	2.74	2.81
Non-Attainment	6.19	5.80	4.13	4.97
Near non-attainment	5.26	4.98	3.33	3.60
Total	5.22	4.97	3.46	3.91

CURRENT DRIVING PATTERNS OF TEXANS

General Driving Patterns

Driving patterns are remarkably similar across all groups of Texans. The average number of miles driven each week, the primary mode of transportation used to get to and from work, sharing rides to work, and use of public transportation are all similar regardless of gender, age, race, or attainment status of city of residence. Residents of non-attainment cities, however, do drive more minutes to work on average than residents of attainment or near non-attainment cities. Residents of non-attainment cities report a driving time to work 20 percent longer than residents of other cities—25 minutes versus 20.5 minutes, respectively.

Public Transportation, Automobile Use, and Carpooling

While the differences in driving patterns among groups of Texans are not remarkable, the overall patterns and their implications for air quality are quite remarkable. For example, only 14 percent of the population reported using public transportation of one or more days a week. Table 5 shows public transportation use in Texas.

On average, how many days a week do you use public transportation?	Frequency	Percent
0	298	85.6
1	11	3.2
2	8	2.3
3	7	2.0
4	1	.3

On average, how many days a week do you use public transportation?	Frequency	Percent
5	17	4.9
6	1	.3
7	5	1.4
Total	348	100.0

Congruent with public transportation use, Texans report using automobiles as their primary means of transportation to and from work. A full 94 percent of Texans report using an automobile or truck to get to work. Consistent with the previous findings, only about 1 percent of the public reports using a bus as their primary means of transportation to work. Table 6 shows the breakdown of means of transportation used to get to and from work.

	Frequency	Percent
Auto or truck	522	94.2
Motorcycle	4	.7
Bus	8	1.4
Bicycle	3	.5
Walk	10	1.8
Other	7	1.3
Total	554	100.0

Not only do Texans primarily use automobiles and trucks to get to work, very few report sharing a ride with others. Only 11 percent of the public reported that they share a ride with one or more persons to work. Table 7 shows how few Texans currently carpool to and from work.

To get to work do you usually drive alone, or share a ride with at least 1 other person?	Frequency	Percent
Alone	457	88.9
Share with other person(s)	57	11.1
Total	514	100.0

Future Driving Expectations of Texans

In general, most Texans do not expect their driving patterns to change in the next year. Better than two-thirds (68%) of the public reported they expected their driving patterns in the next year to be about the same as the previous year. There were three exceptions: younger Texans (age 25 and under), ethnic minorities and those with lower educational levels. Among the young, 37 percent reported expectations of driving more in the next year. Ethnic minorities and those with lower educational levels reported more varied expectations of future driving patterns; they were above the average on both driving less and driving more in the future. Table 8 summarizes the expectations of future driving patterns.

Table 8. Expectations of Future Driving Patterns.			
In 1 year do you think you will be driving more, less or about the same?			
	Less	About the same	More
<i>Age</i>			
<26	16.5%	46.5%	37.0%
26-50	11.9%	69.1%	19.1%
51+	17.1%	75.1%	7.8%
<i>Education</i>			
< High School	27.6%	51.7%	20.7%
High School Grad	13.9%	64.3%	21.8%
College Grad	12.2%	75.7%	12.2%
<i>Race/Ethnicity</i>			
White	13.6%	75.6%	10.8%
Black	12.8%	51.1%	36.2%
Hispanic	17.9%	52.0%	30.1%
Other	11.9%	57.6%	30.5%
Total	14.1%	68.5%	17.3%

PUBLIC RESPONSES TO RECOMMENDATIONS FOR IMPROVING AIR QUALITY

In this section, we examine public responses to various recommendations for improving air quality in Texas. We examine the public's willingness to change driving behavior, support for policy solutions, willingness to participate in individual level solutions, the perceived effectiveness of proposed policy solutions, and levels of public support for investing money in measures to reduce air pollution. In general, public responses to improve air quality in Texas are moderately strong, at best.

Willingness to Change Driving Behavior

Respondents were asked specifically about the likelihood of changing their driving habits after receiving information encouraging them to reduce driving. On average, respondents reported relatively low willingness to change their driving behavior. The average score was 4.46 on a scale from 0 to 10, where 0 represents no willingness to change and 10 represents a high degree of willingness to change. Males reported lower likelihood of changing their driving behavior, as did whites and those with a college education. Table 9 reports the likelihood of changing one's driving behavior by demographic characteristics.

Table 9. Likelihood of Changing Driving Behavior by Demographic Characteristics. (0 to 10 scale, where 0 is extremely unlikely)	
<i>Gender</i>	
Female	4.85
Male	4.01
<i>Education</i>	
< High School	5.88
High School Grad	4.47
College Grad	4.19
<i>Race/Ethnicity</i>	
White	3.97
Black	5.44
Hispanic	6.04
Other	4.44
Total	4.46

Public Support for Policy Solutions

The support for policy options reported by the public is generally moderately positive, similar to the pattern reported for willingness to change driving behavior. Significantly, Texans reported less support for policies that limit individual freedoms or result in higher costs to individuals. Those policies receiving relatively higher support were policies that focused on economic incentives or the regulation of companies. Policies requiring companies and local governments to replace vehicles that do not have clean burning engines, giving tax-breaks to companies for reducing the amount of pollution they produce, and giving tax-breaks to individuals who buy more efficient vehicles were above the midpoint in terms of reported support. Table 10 shows the public support for potential policy options to improve air quality.

Table 10. Public Support for Potential Policy Options to Improve Air Quality in Texas. (1 to 7 scale, where 1 is strongly oppose)	
Do you oppose or favor policies limiting the hours in which citizens could use their lawnmowers?	3.34
Do you oppose or favor policies requiring companies to replace vehicles that don't have clean burning engines?	5.10
Do you oppose or favor policies requiring local governments to replace vehicles that don't have clean burning engines?	4.95
Do you oppose or favor policies providing tax incentives to companies that reduce pollution output?	5.34
Do you oppose or favor policies providing tax incentives to households for using energy efficient autos?	5.31
Do you oppose or favor policies requiring zero or very low emissions vehicles?	4.62

Do you oppose or favor policies requiring the use of gasoline that costs more but which reduces emissions?	4.53
Do you oppose or favor policies limiting the time that a vehicle is allowed to idle at drive-throughs?	3.46
Do you oppose or favor policies requiring varied work schedules to reduce driving at peak times?	4.37
Do you oppose or favor policies providing tax incentives to households for scrapping older vehicles?	4.76

Public Willingness to Participate in Air Quality Improvement Measures

Consistent with other public responses to recommendations concerning air quality, the public's willingness to participate in air quality improvement measures is generally not very strong. These measures include carpooling, using public transportation, telecommuting, performing emissions inspections, and reducing speed on the highways. Women report more willingness than men to participate in improvement measures. Additionally, there are small but consistent differences between residents of non-attainment and other cities in their willingness to participate in potential solutions. The pattern of responses of residents of non-attainment cities is similar to the pattern of residents of other cities, but the non-attainment city respondents report somewhat higher levels of willingness to participate.

Table 11 summarizes the public's willingness to participate in these solutions. It is noteworthy that the public reports substantially more willingness to participate in regular emissions inspections than to engage in other behaviors. This is a solution that does not interfere with daily routines and can be scheduled at the driver's convenience.

	How likely are you to				
	Car or van pool	Use public transportation	Tele-commute or telework	Perform regular emissions inspections	Reduce your speed
<i>Gender</i>					
Female	5.79	5.14	5.92	7.94	6.14
Male	4.73	4.37	5.32	6.99	4.47
<i>Age</i>					
<26	5.89	5.24	5.44	7.25	4.97
26-50	5.36	4.84	6.12	7.81	5.22
51+	4.92	4.40	4.80	7.16	5.87

Table 11. Public Willingness to Participate in Proposed Solutions to Improve Air Quality in Texas. (0 to 10 scale, where 0 is very unlikely)					
	How likely are you to				
	Car or van pool	Use public transportation	Tele-commute or telework	Perform regular emissions inspections	Reduce your speed
<i>Education</i>					
< High School	6.97	6.00	5.00	6.64	6.78
High School Grad	5.30	4.92	5.74	7.48	5.36
College Grad	5.02	4.37	5.60	7.72	5.16
<i>Race/Ethnicity</i>					
White	4.90	4.32	5.45	7.49	5.18
Black	6.89	5.52	6.76	8.20	6.17
Hispanic	6.06	5.80	5.75	7.45	6.21
Other	5.29	5.23	6.07	7.82	5.01
<i>Attainment Status</i>					
Attainment	5.02	4.33	5.26	7.15	5.40
Non-Attainment	5.61	5.29	6.02	7.78	5.42
Near non-attainment	5.05	4.46	5.50	7.56	5.13
Total	5.29	4.78	5.64	7.50	5.36

Public Perception of Effectiveness of Air Quality Improvement Measures

Public perception of the effectiveness of measures to improve air quality is mixed. Alternate modes of transportation such as carpooling and public transportation, telecommuting, and requiring regular emissions inspections are all perceived as being relatively effective for improving air quality. In contrast, the perceived effectiveness of reducing driving speed is the lowest of all the measures. Residents of non-attainment cities, those cities most negatively affected by air quality issues, are somewhat more positive about the effectiveness of the measures to improve air quality. Table 12 summarizes the public's perception of effectiveness for the various measures by attainment status.

Table 12. Public Perception of Effectiveness of Air Quality Improvement Measures by Attainment Status. (0 to 10 scale, where 0 is not at all effective)				
For improving air quality, how effective is	Attainment Status			
	Attainment	Non Attainment	Near non-attainment	Total
Car or van pooling	6.20	6.79	6.21	6.47
Using public transportation	6.09	6.66	5.96	6.32
Telecommuting or teleworking	6.19	6.79	6.38	6.49
Emissions inspections	6.62	6.76	6.66	6.69
Reducing speed limit to 55mph	3.86	4.28	3.75	4.02

Public Support for Investing Money to Improve Air Quality

In general, the public approves of investing more money in transportation improvements to improve air quality. Residents of non-attainment cities are especially interested in reducing the number of vehicles on the road as evidenced by their greater support for investing in public transportation. Residents in near non-attainment cities, on the other hand, are relatively more concerned about reducing traffic congestion, or facilitating traffic flow. People in these cities report relatively more support for investing in road construction and HOV and other special use lanes. Table 13 summarizes public support for investing in potential air quality improvement measures.

		Attainment Status			
		Attainment	Non Attainment	Near non-attainment	Total
Auto emissions inspection and maintenance programs?	Invest less	7.8%	14.2%	7.5%	10.6%
	About right	62.2%	51.5%	49.3%	55.1%
	Invest more	30.1%	34.3%	43.3%	34.2%
Road construction?	Invest less	9.0%	11.0%	10.6%	10.2%
	About right	32.6%	41.0%	28.9%	35.8%
	Invest more	58.4%	48.0%	60.6%	54.1%
HOV or other special use lanes?	Invest less	25.2%	18.1%	17.6%	20.4%
	About right	47.9%	44.0%	32.8%	43.4%
	Invest more	26.9%	37.9%	49.6%	36.2%
Public transportation?	Invest less	9.9%	4.4%	8.8%	7.2%
	About right	42.6%	39.2%	48.2%	42.0%
	Invest more	47.5%	56.4%	43.1%	50.8%

ASSESSMENT OF AND PREFERENCE FOR INFORMATION SOURCES ON AIR QUALITY

In this section, we present findings concerning sources of information on air quality. We present findings about how believable, competent, and reliable potential information sources are perceived to be by Texas residents as well as the preferred media for that information.

Believability of Information Sources

Respondents were asked to rate the believability of a variety of groups as sources of information on the issue of air quality. In general, the public viewed most of the groups as fairly believable. University scientists ranked as the most believable, while sport and entertainment stars ranked as the least believable in terms of statements they might make about air quality issues. In addition to university professors, TNRCC, EPA, and

TxDOT also ranked above the mid-point in believability. Table 14 summarizes the average scores of believability of these potential information sources of air quality, on a scale from 0 to 10, where 10 represents completely believable.

Table 14. Believability of Potential Sources of Information about Air Quality. (0 to 10 scale, where 0 is not at all believable)	
How believable are the following groups when it comes to statements they might make about air quality? (0-10 scale)	
EPA	5.92
Environmental Groups	5.62
Utility Companies	4.72
Oil Companies	3.72
TxDOT	5.80
TNRCC	6.34
University Scientists	7.09
Local Elected Officials	4.71
State Elected Officials	4.61
CEOs of Large Companies	3.75
Sports Stars	3.05
Entertainment Stars	3.21

Competence of Information Sources

Similarly, the public was asked about the competence to understand and make decisions about air quality of the same groups of potential information sources. The results were similar to those for the believability of these sources. University scientists scored the highest marks for competence, while sport and entertainment stars scored the lowest marks for competence. TNRCC, EPA, TxDOT, and Environmental Groups also ranked above the midpoint on this dimension. Utility companies ranked above the midpoint on competence but not on believability. Table 15 summarizes the competence rankings for the potential sources of information about air quality.

Table 15. Competence of Potential Sources of Information about Air Quality. (0 to 10 scale, where 0 is not at all competent)	
How competent are the following groups in terms of understanding and making decisions about air quality? (0-10 scale)	
EPA	6.33
Environmental Groups	5.91
Utility Companies	5.17
Oil Companies	4.41
TxDOT	5.95

Table 15. Competence of Potential Sources of Information about Air Quality. (0 to 10 scale, where 0 is not at all competent)	
How competent are the following groups in terms of understanding and making decisions about air quality? (0-10 scale)	
TNRCC	6.53
University Scientists	7.38
Local Elected Officials	4.66
State Elected Officials	4.67
CEOs of Large Companies	4.15
Sports Stars	2.71
Entertainment Stars	2.81

Reliability of Information Sources

As the third in this series of questions, respondents were asked about the reliability of potential information sources of air quality. Rather than ranking each potential source from 0 to 10, respondents were asked to pick the single most reliable source of information about air quality. The results are similar to the previous results on believability and competence. The general public viewed university scientists as the most reliable source of information and entertainment and sports stars as the least reliable. Table 16 summarizes the reliability of potential information sources of air quality.

Table 16. Reliability of Potential Information Sources of Air Quality.		
If you were seeking information about air quality, which of the following do you consider to be the most reliable source of information?	Frequency	Percent
EPA	125	17.1
Environmental groups	63	8.6
Electric utility companies	15	2.0
Oil companies	8	1.1
TxDOT	30	4.1
TNRCC	136	18.6
University scientists	315	43.0
Local elected officials	19	2.6
Elected state officials	9	1.2
CEOs of large companies	6	.8
Sports stars	2	.3
Entertainment stars	4	.5
Total	732	100.0

Preferred Information Media

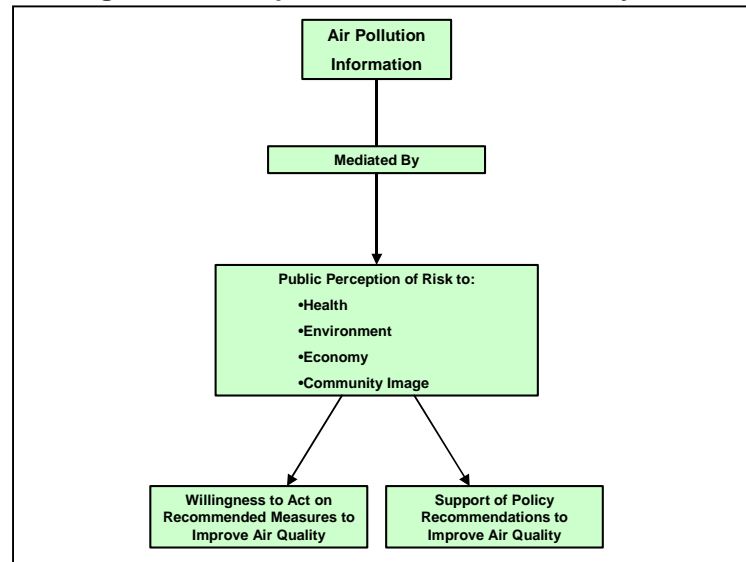
In general, Texans reported they preferred information on air quality be made available by public service announcements on television. The internet ranked as the next most preferred source, but was particularly high for those under 50 years of age and the college educated. Table 17 summarizes Texans' preferred media for air quality information.

Table 17. Preferred Media for Air Quality Information.						
Which of the following methods for obtaining information would you most prefer?						
	PSA On TV	PSA On Radio	PSA In Paper	Internet	Recorded Phone Message	Other
<i>Age</i>						
<26	43.4%	18.9%	5.7%	30.2%	1.9%	
26-50	41.2%	13.1%	12.3%	29.6%	2.0%	1.7%
51+	49.8%	7.9%	21.8%	16.6%	2.2%	1.7%
<i>Education</i>						
<High School	74.4%	7.0%	4.7%	11.6%	2.3%	
High School Grad	45.2%	13.3%	12.8%	24.5%	2.3%	1.9%
College Grad	38.0%	11.3%	18.2%	29.6%	1.8%	1.1%
Total	44.2%	12.2%	14.3%	25.6%	2.1%	1.5%

CLUSTER ANALYSIS RESULTS

All the previous results have been presented as separate questions. For example, the distribution of how Texans feel about the various risks of air pollution was presented independently from results on how Texans rated the air in their areas. In this section, however, we present the results of a cluster analysis that pulls several dimensions of the air quality issue into condensed statements about who is most affected by air pollution information and who is most or least likely to act on those feelings.

Respondents were clustered on their perception of the risks of air pollution to their health, the environment, their local economy, and the overall image of their communities. The analysis yielded 5 clusters of respondents, with respondents in each cluster reporting response patterns on perceived risks of air pollution that were similar to those of other members of that cluster. Using the 5 clusters, we examined how these clusters of people, who perceive risk differently, report how they might act on recommendations to improve air quality and how much they would support policy options to improve air quality. Figure 1 presents the conceptual model of the cluster analysis.

Figure 1. Conceptualization of Cluster Analysis

As the figure illustrates, information about the air quality and individual's willingness to act on recommendations and support policy recommendations is mediated by the individual's perception of the risks of air pollution. Table 18 shows the results from the cluster analysis.

Table 18. Cluster Analysis Results: Average scores on clustering risk variables and dependent variables.							
		Clustering Variables Perceived Risks (0 to 10)				Dependent Variables	
Cluster	% of Sample	Health	Environment	Economic	Overall Image	Support of Policy Options (1-7)	Willingness to Participate in Measures (0-10)
1	8.5	5.34	5.18	7.28	7.41	5.06	5.98
2	28.4	6.74	6.55	4.85	5.31	4.98	6.11
3	25.9	5.10	4.57	2.10	2.50	4.61	5.61
4	13.5	9.15	9.01	7.60	7.87	5.23	7.06
5	23.6	1.78	1.69	0.82	1.00	3.73	4.60

Table 18 shows, for example, that cluster number 4 perceives the highest risks in all risk categories when compared with other clusters. Cluster 4 also reports the greatest willingness to act on measures to improve air quality and to support policy options to improve air quality. Conversely, Cluster 5 shows the lowest perception of risk in all risk categories. Cluster 5 also reports the least willingness to participate in measures or to support policy options to improve air quality. The other three clusters (Clusters 1-3) vary among the risk categories to which they are more sensitive. Similarly, the other three clusters vary in the degree to which they are willing to act on recommendations or support measures to improve air quality.

Table 18 shows that people do vary in terms of their perceived risk and willingness to support and participate. In the next step of the analysis, we present the demographic profiles of the clusters, that is, how

the clusters differ from one another in terms of demographic patterns. This tells us the characteristics of those who are most and least risk sensitive and who is the most and least willing to act on recommendations and to support measures to improve air quality. Table 19 presents the demographic profiles of the clusters.

Table 19. Demographic Characteristics of the Clusters.						
	Cluster					
	1	2	3	4	5	Total
<i>Gender</i>						
Female	58.8%	55.5%	58.2%	63.9%	39.2%	53.8%
Male	41.2%	44.5%	41.8%	36.1%	60.8%	46.3%
<i>Age</i>						
<26	16.7%	18.1%	15.8%	16.8%	14.9%	16.5%
26-50	53.0%	59.7%	50.2%	66.4%	50.5%	55.4%
51+	30.3%	22.1%	34.0%	16.8%	34.6%	28.1%
<i>Education</i>						
<High School	13.0%	3.6%	5.8%	13.9%	6.9%	7.2%
HS Grad	50.7%	58.2%	56.3%	65.7%	58.5%	58.2%
College Grad	36.2%	38.2%	37.9%	20.4%	34.6%	34.7%
<i>Race/Ethnicity</i>						
White	37.3%	53.6%	65.6%	30.6%	64.7%	55.0%
Black	16.9%	11.4%	8.9%	19.4%	5.2%	10.8%
Hispanic	40.7%	24.6%	22.4%	45.9%	23.1%	27.8%
Other	5.1%	10.4%	3.1%	4.1%	6.9%	6.4%
<i>Attainment Status</i>						
Attainment	32.4%	25.9%	39.9%	24.1%	59.8%	37.8%
Non Attainment	52.9%	52.2%	40.9%	63.9%	24.3%	44.3%
Near non-attainment	14.7%	21.9%	19.2%	12.0%	15.9%	17.9%

Cluster 1 expresses minimal belief in risks to health and environment (5.3 and 5.2 respectively) but more concern for the impact of air quality on economy and image (7.3 and 7.4). The support for policy and reported likelihood of behavior change are weakly positive. (Note that the midpoint for support of policy options is 4, and the midpoint for willingness to participate is 5.) This group is composed primarily of female residents of non-attainment cities with the next highest group in attainment cities. Their income levels are relatively high as is their educational level, with a just over a third having a college education. However this is also a group that is predominately non-white.

Cluster 2 expresses a pattern of concern that reverses that of Cluster 1. They are more concerned about the health and environmental risks of air pollution than about the economic risks. Their support for policies is also slightly positive (5.0-rounded), but their reported likelihood of behavior change is somewhat higher than it is for Cluster 1. Members of this group are somewhat more likely to be female and tend to be residents of either non-attainment or near non-attainment areas – areas that are officially more threatened by air pollution. Income levels are high, and as a group they are somewhat more educated than Cluster 1. The ethnic/racial composition is predominately white.

Cluster 3 shows a modest concern for all of the risk categories even though perceived risks for health and environment are relatively higher than those for economy and image. Support for policy falls just above the midpoint, and willingness to participate is also weakly positive. This group is weighted more heavily with females and is divided almost equally between attainment and non-attainment cities. Income is relatively high – falling somewhere between Clusters 1 and 2. Educational and income levels are both fairly high, and the group is predominately white (66%).

Cluster 4 is the group that expresses the most concern across all categories of risk, the most support for policy, and estimates the greatest likelihood of behavior change. The risks to health and environment are seen as greater than the risks to the economy or community image. This cluster is the most heavily female (64%) and the youngest. It is also the group most heavily concentrated in the non-attainment areas. Income for this cluster is the lowest for all the clusters and educational levels are also relatively low. Like Cluster 1, the majority of this group is nonwhite (65.3%).

Cluster 5 expresses the least concern for risks and the least support for either policy or personal behavior change. Even though the overall level of concern is very low, it should be noted that risks to health are seen as relatively more important than risks to the economy. This is the only cluster that is predominately male (61%). They are located primarily in attainment cities, income is high as is education. It is also a predominately white group.

In general, women are more risk-sensitive, particularly to health risks and also indicate more willingness to change their behavior and support air quality improvement policies. Men, on the other hand, are less likely to perceive risks from air pollution as serious. Consequently, they indicate less willingness to act or support measures to improve air quality.

In terms of race/ethnicity, whites report less willingness to change their behavior or to support policy options. However, whites, who also tend to be higher in income and education, are more concerned about health risks than about economic or image risks. Minorities indicate more willingness to change their behavior and also to support options. They are particularly sensitive to economic risks. It can also be seen that the attainment status of the cities that dominate the clusters affects the degree to which the air quality problem is seen as serious and the likelihood of taking action in response to it.

FINDINGS FROM THE STAKEHOLDER INTERVIEWS

As noted in the section on methods of analysis, 102 stakeholders from non-attainment and near non-attainment cities were interviewed to get in-depth information on the perceived extent of the problem and awareness of air quality in the local area, unique aspects of the air quality issue in individual cities, existing programs to address air quality issues in place, recommendations for specific solutions to the air quality problem, and recommendations for incentives to change driving and other behaviors that affect air quality. In this section we present the summarized findings from those interviews.

Stakeholder responses to questions that mirrored those on the public survey were very consistent with findings from the public surveys. Stakeholders in non-attainment cities viewed the air quality as lower and their problems more serious than stakeholders in near non-attainment cities. Their perceptions of the willingness of the public to engage in behavior change was also consistent with public survey findings with one exception. Although stakeholders also believed that emissions testing and maintenance programs would be an effective way to improve air quality and believed that the public would be moderately willing to participate in such a program, they also believed that this kind of testing would only be effective if there was

some kind of meaningful enforcement. Many of them did not believe that such a measure would be popular among elected officials, however.

Because of the consistency between stakeholder responses and responses by the Texas public on the questions shared by the two research instruments, this section reports primarily on the questions that were unique to the stakeholder interviews. The focus is on the kinds of programs that stakeholders highlighted in their conversations, the kinds of incentives they thought would be effective locally, particular air quality issues or problems that they believed characterized their cities, and innovative programs or recommendations that emerged during the interviews.

CURRENT AIR QUALITY PROGRAMS

Stakeholders were asked about air quality programs currently in place in their cities. Below is a list of those programs identified by the stakeholders. This list is not an exhaustive list of programs that exist. However, these are the programs that stood out in the minds of stakeholders when they were asked about local efforts. In the most general terms, stakeholders thought that most of the programs currently in place were effective at reaching their target audiences and in creating some awareness among the public. These programs were largely seen as being ineffective at changing behavior of the public.

AIR QUALITY PROGRAMS: NEAR NON-ATTAINMENT CITIES

Austin

- Clean Air Force
- Greater Austin Chamber of Commerce – Clean Air Task Force
- City of Austin Programs
- Capital Metro programs
- Texas Campaign for the Environment
- Clean Air Partners
- Texas Clean Air Coalition

Corpus Christi

- Corpus Christi Air Quality Commission
- Ozone Awareness Days
- Pollution Prevention Partnership
- City Carpooling
- Flexible Attainment Agreement

Tyler-Longview

- North East Texas Air Care
- Longview Ozone Action Day Program
- Carpooling on ozone action days

San Antonio

- Air Quality Alert Days – AACOG
- Commute Solutions – AACOG
- Clean Cities – AACOG
- Gas Cap Check – DPS
- Teaching the Teachers
- Public Education Seminars like the “County Road Show”
- Public Outreach in Boys and Girls Clubs

- Car Care Clinics
- Air Quality Improvement Resources Committee (AIRCO)
- Public Outreach and Education Efforts
- Bill Stuffers on Air Quality
- Highway Signs Announcing Air Alert Days
- Transportation Steering Committee
- Programs Internal to Companies and Agencies

Victoria

- Ozone Action Days by Ozone Committee, Victoria
- Clean Air Counts. /Air Quality Committee
- Victoria Ozone Task Force
- Air Quality Study Workshop Sponsored by David Allen from UT's Center of Energy, Rotary Club and Lions Club and Victoria Partnership.
- Public Education Committee
- Public Outreach Committee of the MPO
- Port of Victoria's Program to change the behavior of the older grandfather companies
- Gulf Rivers Inter-modal Partnership
- Gulf Coast Regional Planning Program

AIR QUALITY PROGRAMS: NON-ATTAINMENT CITIES

Beaumont/Port Arthur

- Ozone Action Program
- TNRCC Local Government and Small Business Assistance
- TNRCC P2 "Pollution Prevention" Program
- TNRCC Education & Outreach
- Chamber of Commerce Industry Program
- EPA/TNRCC Mandates & Recommendations
- Master plan through 2020 on Alternative Fuels Initiative
- Sierra Club Lawsuit
- Gulf Coast Hazardous Substance Research Center's "Texas Air Quality Center"
- Bike to Work & Carpooling Days
- Express Bus Service
- Carpool Park Lots
- "The Link"
- National Transit Week
- Emission Testing and/or Fines
- Back to Work Program

Dallas/Fort Worth

- North Texas Campaign
- HEB Chamber Business Education Program
- HEB Chamber Clean Air Coloring Contest

- North Texas Air Coalition
- Chambers of Commerce's Business Outreach
- Environmental Quality Committee
- TNRCC Small Business Outreach
- Clean Air Coalition
- North Texas Clean Air Coalition
- No name. Program offering repair alternatives for business and public in accordance with Senate Bill 5.
- North Texas Clean Air Coalition
- North Texas Air Cleaning Committee
- Texas Clean Air Working Group
- Business outreach for own members
- Public Awareness and Informational Talks
- Alternate Scheduling to Encourage Car Pooling
- Bulletins to employees about other programs and general information
- Ozone Action Days
- DART
- North Central Texas Council of Governments (NCTCOG)
- Emission Reduction Programs for Buses

El Paso

- Clean Air Partnership and the Ozone Action Days by Clean Cities
- Ozone Action Days
- University of Texas El Paso's web-based ozone map for public information purposes
- EMPACT – Environmental Monitoring for Public Access and Community Tracking.
- US-Mexico Joint Advisory Committee for Improvement of Air Quality.

Houston/Galveston

- Greater Houston Partnership
- Coalition for Cleaner Air
- Business Coalition for Clean Air
- Local Community Action Programs
- Clean Cities
- Clean Air Coalition
- Billboards for Car Pools
- Ozone Watch Program
- 1-800 Number for Air Quality Checks
- Businesses' Personal programs (car pooling, flex time, telecommuting etc.)
- General Public Transit Programs (U-Pass, Free Student Tickets, Rewards, Van Pools)
- Automobile Emissions Checking Program
- Public Education Campaigns
- TMC System Program

INCENTIVES FOR CHANGE: STAKEHOLDER-SUGGESTED INCENTIVES TO MOTIVATE INDIVIDUALS, BUSINESSES, AND LOCAL GOVERNMENTS TO CLEAN THE AIR IN TEXAS

There was remarkable consistency in the kinds of incentives that stakeholders suggested to encourage individuals, businesses, and government agencies to engage in changes that have the potential to reduce driving or alter the way automobiles are used and serviced. Because of the consistency across all cities in the kinds of things suggested by stakeholders, one list is presented for all cities.

Individual Incentives for Change

Respondents were asked what incentives they thought would encourage individual citizens to alter driving behavior.

Information

Factual information from believable sources was an almost universal recommendation. This information should document the seriousness of the problem and the need for action. There should also be information on what action could be taken and the reasons why the action would help the situation.

Alternatives

There should be options available at work to facilitate changes in driving behavior. Specific examples included flex time, guaranteed rides in emergencies, ride share programs, and more telecommuting options.

Most stakeholders mentioned that the infrastructure that is necessary if cars are to be used less is missing or inadequate in most cases. Examples included, better public transportation systems, bike lanes, safe places for bikes at work, and even shower facilities at work.

Financial Incentives and Other Rewards for Driving Less or Differently

More than half of the stakeholders mentioned rewards for compliance as important inducements for change. The specific recommendations included reduced fare on buses, lower prices or coupons for going inside instead of using drive through lines, cash-out options for parking space, better parking for van or car pooling groups, and subsidies for gas for car or vanpools.

More Stringent Enforcement of Current Regulations

Many stakeholders saw enforcement and regulation as part of a larger package rather than as an isolated “incentive” for change. Comments on existing programs included a more serious consequence for smoking vehicles that are reported and more conscientious examination of cars in order to qualify for safety stickers

Increase in the Costs of Driving as Usual

The relatively low cost of continuing current driving patterns was cited as an important aspect of the difficulty of change. Although relatively few saw the following recommendations as having much of a chance of succeeding, the following types of changes were mentioned by a significant portion of stakeholders: increase the cost of gas, close stations in the middle of the day or have cheaper gas in the evenings, increase the cost of parking, restrict the building of parking lots, reduce the prices at fast food locations for “inside” customers or serve those customers first.

Leadership

Leadership on the part of elected officials in the form of policies to improve air quality and high-profile participation in programs that implement these policies – at both the local and the state levels – is required.

When respondents were asked what they thought citizens could do to influence one another, three suggestions were made repeatedly:

- Act as a role model
- Talk to people and tell them why you are taking a stand
- Show them a better way

Business Incentives for Change

Stakeholders were asked what incentives they thought would encourage businesses to either adopt air quality practices in their own operations or implement programs for employees.

Financial Incentives

Financial incentives were felt to be especially important for the business community. Some of the most commonly mentioned included tax breaks, seed money for implementing programs, rebates on new equipment.

Credit for Implementing Change

Special privileges in recognition of changes was another kind of incentive commonly mentioned. Examples included faster processing of paperwork such as building permits, and less frequent air quality inspections

Information

In contrast to most other groups, including the public, reliable and believable information for this group tended to include other business organizations and peer and professional organizations. Important types of information included information on the extent and sources of the problem, information on what actions could be expected to help; why they would help and how much; information on how changes would help them do business better or more cheaply, gain more customers, or acquire some other direct benefit.

REGULATIONS AND PENALTIES

Firm policies requiring changes and penalties for not doing so were seen by some as the only real incentive.

Recognition

Some businesses have taken a leadership role in implementing clean air policies in the way they operate and as incentives for their employees. Target these and also give public recognition to businesses that implement change.

Government Incentives for Change

Stakeholders were asked what incentives would encourage government agencies to adopt clean air policies and programs. Generally speaking, this was a more difficult question for respondents.

Information

Information on how this activity would personally benefit the official – such as increase popularity and improved image with voters was one specific type of information mentioned. Also important was information on the consequences of not acting

Loss of Funding

Many in non-attainment and near non-attainment areas thought the loss of federal funding and its consequences should be incentive enough.

Money for Programs

It was pointed out that un-funded mandates are not popular and are generally ineffective. The money available for public outreach limits the types of media used and the staff available for outreach activities.

Financial Incentives

Continuing with the funding theme, financial incentives were also considered important for governments. These incentives included budget bonus incentives for improvement, flexibility to spend funds where they are needed, and necessary money for enforcement

Leadership

Leadership exercised at the state level would influence local officials. This leadership would include strong state policy on the air quality improvement issue and the means for achieving the air quality goals.

SPECIFIC SOLUTIONS: STAKEHOLDER SUGGESTIONS FOR CLEANING THE AIR IN TEXAS

The overall message from the cities is that there are no magic bullets – no single solutions. There is a high degree of consensus that mobile sources are the cause of air pollution problems in Texas. However, modifying driving behavior will require efforts and changes at a variety of levels. Nevertheless, stakeholders did mention several novel mechanisms for addressing parts of the problem.

Increasing Public Awareness

There was agreement that TV spots reach the most people but little money to put into this expensive medium. Visibility is the key – for example, air quality awareness was highest in San Antonio when the fires in Mexico were making the air visible, and the visibility of the air in El Paso is one aspect of awareness there. An effective TV spot that was mentioned by several people was one that showed auto and other vehicle emissions as purple bubbles that emerged from tail pipes and gas caps and stuck to children as they got on the school buses, stuck to co-workers' clothes in the parking lot, dripped from car windows on the highways, etc.

Enabling Change

Significant changes in driving patterns and behavior can't take place until there are alternatives that are both convenient and cheap. A first – and the cheapest – step would be to encourage businesses to consider introducing flex time, van pools, and guaranteed rides in emergencies.

Another element that is needed is education for businesses on the business benefits of flex time, and how to arrange flex time and inform employees about it. One stakeholder in Dallas reported that he only implemented flex time after receiving specific information on its benefits and how to do it during a seminar sponsored by the Chamber of Commerce.

Providing incentives for implementing these changes was generally seen as an essential step. This could be in the form of direct compensation for providing vans or benefits of other kinds. For example, some kinds of organizations might respond to special-rapid processing of permits or licenses. Senate Bill 5 is seen as having the potential to provide some of the necessary resources.

Reducing Urban Sprawl

Location Efficient Mortgages are special rate mortgages that reward businesses for locating in the inner portions of a city, thus acting as a curb to urban sprawl. Maryland was mentioned as a state that has successfully implemented this strategy.

Improve the inner city schools to a degree that middle class families are encouraged to stay in the more densely settled portions of the city instead of moving farther and farther out into the fringes.

Increasing the Costs of Polluting

Many stakeholders mentioned the effectiveness of a mandatory inspection and maintenance program. This would need to be enforced and would need to have significant consequences if it is to work. Many mentioned the burden on the poorer segments of the population. However, some also pointed out that the poor aren't allowed to get out of paying their taxes. One suggestion for dealing with the regressive aspect of mandatory emissions and maintenance programs was to spread the costs into the marketplace. When a car was traded in, there would be a better trade-in price if the car was up to standard. If not up to standard, the car would have to be brought up to standard – or no license – and the cost of improving it would be passed along in the purchase price.

Leadership

For changes to take place, leadership will have to be exercised by elected officials and by businesspersons. Recognition for outstanding leadership in this area might encourage others to take chances. This could be the ideal time for such a campaign because the national oil supply is threatened, and patriotism is at a high level. Leadership will have to be exercised at the state level as well.

DIFFERENT CITIES, DIFFERENT ISSUES: CITY SUMMARIES

The stakeholders who were interviewed were, for the most part, very involved in the lives of their cities. In the context of the interviews, they attempted to tell us their cities' stories. Each of our interviewers was assigned a city so that he or she could become a short-term expert in that location. The following brief summaries represent condensations of the conversations our interviewers had with the stakeholders in their cities.

Near Non-Attainment City Summaries from Air Quality Stakeholder Interviews

Austin

Internal combustion engines, specifically single-occupant vehicles (SOVs), were cited as the single greatest source of air pollution in the Austin area, although two respondents mentioned industrial sources in addition to gas and diesel powered engines. Respondents recognized that there is little enthusiasm for telling people that their cars are the main source of pollution and that they will have to alter their driving habits.

Lack of public awareness about air quality problems was mentioned consistently as the greatest challenge to be overcome. Respondents mentioned that residents are unaware of the most basic issues associated with air quality and have not been educated as to the severity of the problem in the Austin area, including the impact poor air quality has on public health and the economy.

Respondents called for programs to educate the public on a number of fronts, beginning with why air quality is an important issue for the Austin area and the consequences of poor air quality. Additional education is needed on the positive cumulative effects small-scale individual actions can have on air quality, particularly on days with high ozone readings. Education is also needed to inform the public about actions that can be taken that do not require huge behavioral or lifestyle changes; for instance, standard passenger cars with much lower emissions are currently available.

Financial incentives were universally mentioned as the way to encourage changes in driving behavior. Almost everyone mentioned the need to increase transit use and provide additional alternatives to SOVs. Several mentioned linking light rail lines and bus routes. Incentives to encourage transit use were mostly employer-based and financial in aspect.

Austin residents tend to be better educated and more aware of issues affecting the entire state. Since it is the state capital, issues in other part of the state tend to get local Austin coverage, because media coverage of state government.

Corpus Christi

Corpus Christi is a proud city that cares about its natural resources. Most people believe they have more to give than larger cities that have already wiped out the majority of their resources. They feel as though they are proactive and working towards improving their air quality.

Industry is perceived to be the most prominent source of air pollution in Corpus Christi, followed by personal automobiles. Popular ideas for solving the air quality issues caused by individuals included vehicle buyout/trade-ins, raising the price of gas, and lowered registration fees for compliant automobiles. In addition to programs targeting air quality issues, respondents overwhelmingly felt as though the best method for achieving air quality standards is for government agencies to prove to the public that there is an air quality problem, as well as illustrate the consequences of the status quo.

Many respondents felt that the industries were at least trying to do their part in improving air quality, and commented that the city relies heavily on industry as a source of jobs and money. When asked about the importance of industry in Corpus Christi, one respondent replied, “What are we going to do, make tortillas?”

Local government is working towards effective programs to clean up Corpus Christi’s air. Despite programs like Air Quality Committees and Ozone Awareness Days, many respondents felt as though regulations would have to come from Austin or the Federal Government in order to achieve lower pollution levels. In addition, some respondents think that the state and federal government should reward cities for avoiding non-attainment, instead of awarding cities at non-attainment status with funding.

Although Corpus Christi is at near non-attainment status, its people are aware that they live in a beautiful city with a lot of natural resources. They are proud of where they live and feel as though the amount of tourism to their area is a testament to the city’s attractiveness.

Longview

Most people interviewed view industry as the main source of air pollution in the Longview area. Other responses included trees (bioorganic sources), vehicle emissions, and imported air from Houston/Gulf Coast. Three stakeholders identified imported pollution as a problem and raised the concern that air pollution in the Longview area is not just a local problem. They feel that people will be more willing to participate in local programs if other cities/areas also participate.

Everyone was aware of at least one local program, either the Longview Ozone Action Day Program or NETAC (North East Texas Air Care). Most people (4 out of 7) were aware of NETAC, and everyone who mentioned NETAC felt that it was effective. However, the 2 people that mentioned the Longview Ozone Action Day Program felt that it was ineffective in getting people to change their behavior.

Finally, most stakeholders claimed that a lack of financial/economic incentives and public transportation were challenges to reducing air pollution in the Longview area. Financial/economic incentives are viewed as necessary because most businesses in the Longview area are small, and regulation is likely to be burdensome. In addition, several stakeholders feel that enforceable national/state standards will prevent the Longview area from bearing too much of the burden for clean air.

San Antonio

San Antonio appears to be making whole-hearted efforts to address the air quality problem in Bexar and Comal Counties. The focus of these efforts is the Alamo Area Council of Governments, a regional planning organization that seeks and receives cooperation from other organizations in the city, including the City of San Antonio. Although substantial efforts are being made to educate the public, the scope of these efforts is limited by the size of staff (1 person in many organizations) and the size of budgets (dollars limit the types of coverage that can be invested in.)

It is believed that the allocations for action on air quality go to the non-attainment areas. The near non-attainment areas that want to be more proactive are hampered by lack of funds.

In spite of efforts, it is believed that the level of public awareness in the city is still relatively low and that the commitment to change is lower still. The fact that the city is still more or less in attainment keeps air quality off the radar screen for both citizens and elected officials. Unless the level of awareness is raised, non-attainment will become a reality. When respondents refer to the fact that San Antonio is still in attainment, they refer more often than not to the cooperation of the weather this year rather than to the cooperation of the citizens in effecting changes.

There are some special problems faced by this city. Respondents also point out that NAFTA will increase truck traffic passing through the city, and this will worsen the problem. There are also other problems that are more pressing at this time and divert public attention and official energy from the problem of air quality. These more pressing problems are ground and water pollution with water availability being the second most frequently mentioned.

Tyler

There were several themes prevalent in the Tyler area. First, almost all of the stakeholders noted that the air pollution problem was not simply a Tyler problem. Most stakeholders mentioned trees as a primary source of pollution and migrating air pollution (background pollution), especially from Dallas-Fort Worth and the Houston area. Another common theme was the prevalence of NETAC -- North East Texas Air Care. While some stakeholders knew much more than others about NETAC, all but one specifically mentioned the efforts of NETAC. In fact, it was the ONLY campaign or program related to air quality mentioned by stakeholders in Tyler. In general most stakeholders thought NETAC was effective at increasing awareness, but not at changing behavior. Finally, several respondents mentioned that changing behavior is difficult, especially in an area like Tyler, because people can't see that air quality is an issue. The air "doesn't look dirty, it doesn't smell dirty, and so it's hard to get people to change their behavior."

Victoria

The city of Victoria is a near non-attainment region under the 8-hour EPA standard. The stakeholders in Victoria think that ozone transport from Houston is the major cause of their air quality problems. They are very afraid of becoming a non-attainment region and losing highway transportation funds down the road. As in other non-attainment areas, the primary challenge for any air quality program to succeed is in making the general population aware of the necessary changes to protect air quality while the air in the area is still rated attainment. Underdeveloped mass transit system and shortage of funds tagged for air quality prevention purposes are the other major challenges. The stakeholders agree that comprehensive media campaigns centered on air quality are yet to be thoughtfully crafted for the area. A few programs that have started are in their initial stage and the general public is little aware of their existence.

Non-Attainment City Summaries from Air Quality Stakeholder Interviews

Beaumont-Port Arthur

Almost all underscored that independent character of East Texans. They are not open to mandates, particularly on individual behavior and from people outside their area. And yet felt to successfully bring about individual behavioral/lifestyle changes, it would take enforced legal mandates/requirements and some sort of financial incentive for the individual. Financial incentives included direct financial gain for the individual and direct financial loss (cost), as well as increased inconvenience, to the individual.

Beaumont/Port Arthur residents like their pick up trucks and vehicles with engine power, they need much stronger evidence to be convinced to drive at slower speeds and do not think people will drive slower, they see reducing trip length as unrealistic, and they like the independence and flexibility of driving their own vehicle (public transit appears to be nearly non-existent in the area, except for some bus service). They are not only against emissions testing, but have a history of successfully opposing it.

For many, there is a sense of helplessness in that they felt external factors played a significant role in the quality of their air. These are: (1) air blowing into the area, particularly from Houston/Galveston; (2) I-10 traffic (high volume non-resident truck and auto traffic) over which they have no control and if emissions testing was applied only to areas with high air pollution they would still have the possibly non-compliant traffic to contend with; (3) economic dependence on industry as the major employer, and (4) possibly natural sources like trees (although this was only hinted at in side comments).

The Southeast Texas Regional Planning Commission (SETRPC) is the central organization in the Golden Triangle area for promoting public awareness and public education on air quality issues, particularly through the *Ozone Action Program*. Many of the programs listed by interviewees had some type of link to or involvement of the SETRPC. According to several of those interviewed, SETRPC information appears to come largely from industry. The SETRPC's *Air Quality Committee* apparently spearheads the successful effort to reclassify the area's status from serious to moderate non-attainment area by showing how Houston/Galveston air pollution contributed.

Those who felt industry was making positive, significant strides tended to focus on automobile emissions and emissions blowing into the area as the focus to make improvements. Those who saw industry as the

major contributor, seemed significantly less concerned about cars. Most compared their area to Houston. In comparison to Houston the Beaumont-Port Arthur, their area had significantly less traffic and people, so in general respondents felt changes on the individual level by residents would not make that great a difference in air quality.

Those who felt industry was the major source of emissions, saw enforcement of current standards in Beaumont/Port Arthur as substandard/lax and believes that the regulations needed to be more stringent. They did, however, seem to appreciate the public awareness/education efforts of SETRPC's *Ozone Action Program*. However, data about industry progress and "upsets" was distrusted.

The petrochemical industry is the primary employer in the area. Community leaders (mayors, the local chambers, the Beaumont newspaper, etc.) appear to have a strong, close working relationship with industry. Many community leaders felt industry had made significant strides, was proactive, and have done as much as it could in such a short time frame.

Dallas/Fort Worth

The stakeholders from the Dallas-Fort Worth metropolitan area provided a wide range of responses in regards to air quality, perhaps due to the tremendous size of the region. The only clear consensus (11 or 12 respondents) was that vehicles were the primary source of the air quality problem. Half of the respondents were aware of the North Texas Clean Air Coalition. Though not universal, a common theme among respondents was that financial incentives would be necessary for individuals and businesses to change their behavior enough to create real air quality improvement.

El Paso

The air quality problem in El Paso is a regional problem, crossing state lines with New Mexico and international lines with Mexico. A regional planning strategy is called for. Although there seems to be considerable awareness of this situation and a *willingness* to cooperate in efforts to improve the situation, stakeholders do not believe they have the means to implement any effective strategies. New Mexico is unlikely to change the way its power plants work without incentives or sanctions in place. Existing program funds do not allow money to flow to Juarez where it could do more to alleviate the problem than if it were spent in El Paso. The result is a sense of isolation, frustration and powerlessness to alter the situation.

The impacts of air quality on the lives of El Paso citizens are perceived to be strong in the health area. They are less noticeable in the economic area because the economy is also strongly affected by factors such as lack of a trained labor force. Public awareness of poor air quality is relatively high because it is *visible* on many days. However, stakeholders believe that the public awareness of direct connections between air quality and specific outcomes, such as increases in respiratory distress, is relatively low.

As in other cities, there are a number of factors that decrease the population's ability to take action by changing driving behavior. These include the lack of a good public transportation system, a very low median income, and a general perception that the behavior of one individual is not going to make a difference, cheap gas, and lack of interest in enforcement.

One datum illustrating El Paso's uniqueness and the power of countervailing forces concerns the bridge traffic. There are daily traffic jams and waits on the international bridges as people drive into El Paso for work or school. The significant number of commercial vehicles active in international trade also contributes to this situation. The idling cars and trucks contribute to the pollution, but INS decisions to profile drivers in reaction to recent concerns regarding terrorism is now increasing these waits. Even if the means to facilitate the flow of traffic were found, in order to reduce emissions, lengthy waits would be maintained so that the practice could continue.

Houston/Galveston

There were several general themes that emerged in most all of the Houston elite interviews. There was a general concern about the seriousness of the air pollution problem in Houston and general agreement that it's main causes were both the concentration of petrochemical companies and mobile sources. There was consensus that the weather conditions played an exacerbating role. There was also agreement that EPA rule

enforcement was generally unfair to Houston because of our special role in the US as a provider of essential petrochemicals and our weather. Rule application, in their opinions, should be less across the board and more area specific.

There was a significant concern for both the health and economic aspects of air pollution. Health aspects were lung and vulnerable populations focused. Economics dealt with image—not an attractive place for businesses to re-locate or stay and expand—and the negative consequences of being in non-attainment as well as losing DOT dollars and having more restrictive enforcement policies.

They felt that individual choices for behavior change were important, but only one aspect of the solution. It was clear that business and government system changes were needed to make a real difference. A lot of emphasis was placed on making incentives as material as possible and showing all concerned—individuals, businesses and government agencies—the direct benefits of air quality improvements and related behavior changes (save gas, reduce taxes, rebates, lower regulations).

A major insight by one of the interviewees was the important role of children in the education and behavior patterns of their parents.