



ValleyAIRNow Air Quality Outreach Program  
For the Northern Shenandoah Valley Air Quality Improvement Task Force

**Lord Fairfax Community College**  
**2005-2006**  
**Ozone Season Survey Analysis Report**

Problem Statement

Valley AIRNow needed some means of trying to determine the amount of impact our educational and outreach efforts had on the Winchester-Frederick County community during ozone season 2005. To try and establish some sense of impact, we performed two random phone surveys—one at the beginning of ozone season (a pre-survey concluding in June, 2005), and the other after the conclusion of ozone season (a post-survey concluding in winter, 2005-'06).

Method

Lord Fairfax Community College agreed to put together a phone survey team, consisting of students and a coordinator. The students were paid hourly; the coordinator, a faculty member, was engaged as part of general faculty/service expectations. Using the phone book, the students randomly dialed residential numbers and asked if respondents were interested in participating in a brief survey about regional air quality. The coordinator oversaw the phoning, acted as liaison with Valley AIRNow, and compiled the data at the end of both surveys.

The pre- and post-surveys were intended to perform two basic functions: elicit information about respondents' knowledge (mostly as self-report, but with some objective means included to help establish veracity of self-reports), and to educate respondents. The pre- and post-surveys were not identical, but they sought information from the same domains of knowledge. Table 1 compares the content of pre- and post-survey questions, along with response rates.

One note about the comparability of the pre- and post-results: the response rate for the pre-tests (n ~ 140) was much better than for the post-tests (n ~ 50). Statistically, the difference makes the post-results too unreliable to taken on their own merit. However, when the results are laid out side-by-side, as is done in Table 1, it seems evident the two samples are comparable, even if statistical reliability cannot be established.

Discussion

To begin, two things should be noted. First, in the pre-survey, each question allowed for three answers: "yes," "no," or "I don't know." In the post-survey, only one question allowed for the "I don't know" option; all other questions were either "yes" or "no." Secondly, and accordingly, the "results" columns reflect the largest plurality of responses for any given question. In the pre-survey, this means, for example, that the question "is ozone an emission?" elicited response rates of 29% (yes), 49% (no), and 22% (I don't know). For this item, the largest response (49%) is the largest. Comparability would have been enhanced had each post-survey question included an

option for “I don’t know”; as it stands, however, the response rates are nevertheless remarkably similar, lending face validity at least to the comparability of results.

That said, the pre- and post-surveys reveal some interesting patterns. In the pre-survey, while people claimed to have some general knowledge about ozone and air quality, they were unwilling to claim specific knowledge (about why ozone would be classified “bad”). This was reproduced in the post-survey identifying specific ill-effects to health and plants. The survey had been designed with the assumption in mind that people tend to over-estimate their knowledge if asked generally about topics, but will not claim to have specific knowledge if presented with details. The results seem to support the assumption. On that basis, the survey gains a measure of validity: it seems to accurately measure what it was intended to measure.

One item of note relates to the final post-survey question in Table 1, which asked whether respondents have changed their driving habits as a result of learning about air quality. The total n-size for that question was only 42 respondents, making it much too small a sample to assume adequate reliability. Only 7 respondents said they had changed their driving habits, and the survey allowed no means of independently verifying the truthfulness of the self-report. Still, such an answer is valuable—it points to the hope that further outreach efforts may have a marked difference in the community’s driving habits.

### Conclusions

A number of conclusions can be gleaned from the data, of which three are particularly important to Valley AIRNow’s future practices. First, our target population has a general knowledge about ozone, but lacks specificity in their knowledge. Furthermore, our target population is pleasantly open to further education about ozone, its effects on people and the environment, its causes, and its presence in Winchester-Frederick County.

Second, knowing that our target population is amenable to education is important. It means, in part, that Valley AIRNow needs to be more strategic and effective in getting our message out to people.

Third, the great majority of respondents said they get the bulk of their news from TV, yet mostly what they know about air quality comes from the newspaper. Valley AIRNow would benefit from developing a stronger presence and relationship with TV news outlets, develop some kind of informational public service campaign via TV, while concurrently improving our presence in The Winchester Star, the local newspaper.

**Table 1: Comparison of Pre- and Post-Survey Questions, Types of Solicitation, and Results**

Pre-Survey			Post-Survey		
Question	Type	Results	Question	Type	Results
Know what O <sub>3</sub> is?	S-R <sup>1</sup>	A <sup>3</sup> : Yes, 78%	Know that O <sub>3</sub> is a colorless gas in atmosphere?	S-R>O-B <sup>2</sup>	A <sup>3</sup> : Yes, 92%
Heard of Air Quality Index?	S-R	A: Yes, 75%	Know that Air Quality Index is scale of air pollutants?	S-R>O-B	A: Yes, 83%
Know that there is good and bad O <sub>3</sub> ?	S-R	A: Yes, 63%	Know that good O <sub>3</sub> is in upper atmosphere and bad O <sub>3</sub> is at ground-level?	S-R>O-B	A: No, 65%
Is O <sub>3</sub> an emission?	O-B <sup>1</sup>	A: No, 49%	Know that O <sub>3</sub> is not an emission, but a chemical reaction?	S-R>O-B	A: No, 63%
Know why it's called "bad ozone"?	S-R	AR <sup>3</sup> : No, 58%	Know O <sub>3</sub> is bad for our health and causes crop damage?	S-R>O-B	AR <sup>3</sup> : No, 68%
			Major sources of news:	TV 82%	Newspaper 61%
				Win Star: 67%	Wash Post: 22%
				Radio 36%	Top 2: WINC and Q102
			Heard anything about air quality in Winchester-Frederick County?	S-R	A: No, 54%
				If Yes: Source?	Newspaper 85%
					TV 15%
					Radio, word of mouth, and school not significant
			Changed your driving habits as a result?	S-R	A: No, 83%
					A: Yes, 17%

<sup>1</sup> "Type" (of solicitation), S-R = self-report, and O-B = Objectively Based.

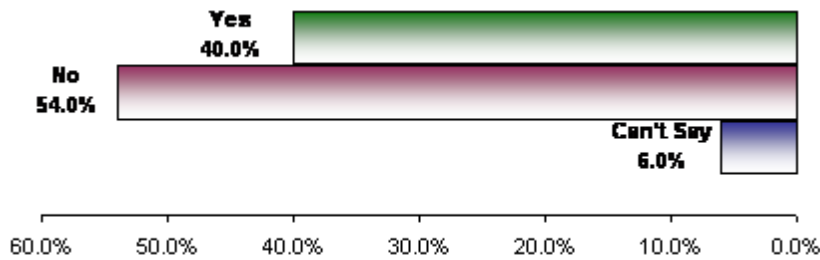
<sup>2</sup> Questions that are S-R>O-B are defined "self-report, but objectively based." While respondents might be assumed to over-estimate generally-stated knowledge (e.g., "Do you know what ozone is?"), they are assumed to be less likely to over-estimate (or falsely claim) specific factual knowledge ("Did you know ozone is a colorless gas in the atmosphere?").

<sup>3</sup> Under "Results," A = Answer, and AR = Admission Rate (i.e., rate at which respondents admitted not knowing a question

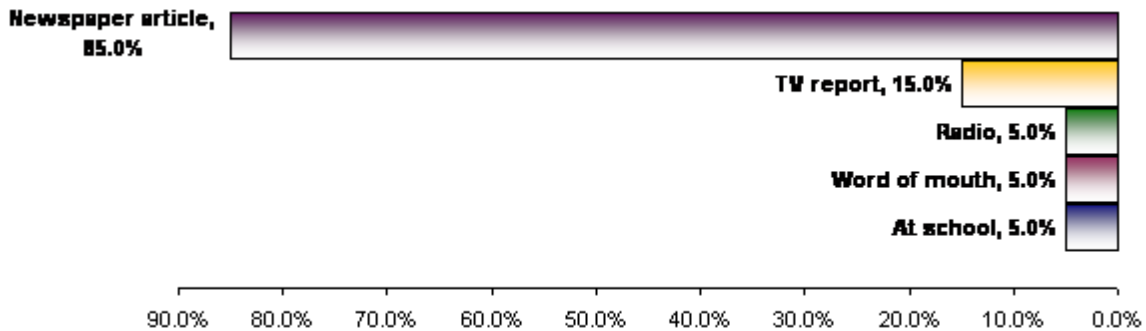
## Valley AIRNow Air Quality Outreach Program WinchesterFrederick County Survey Results

	Count	Percent
<b>Respondents</b>		
Accepted	49	29.9%
Declined	115	70.1%
Total	164	

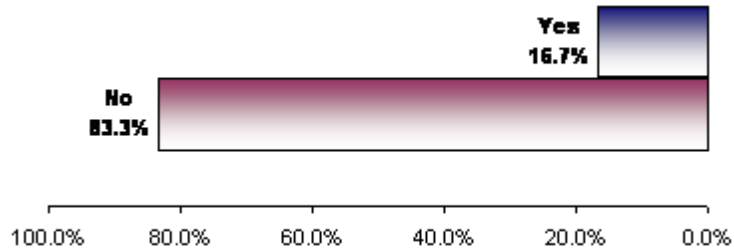
**Q1. Have you heard or seen anything in the last six months about air quality in Winchester-Frederick County?**



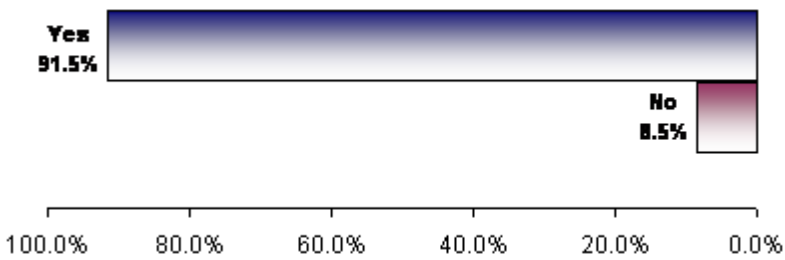
**Q2. (if yes to Q1) What did you hear or see? (newspaper article, TV report, radio report, poster, presentation, other)**



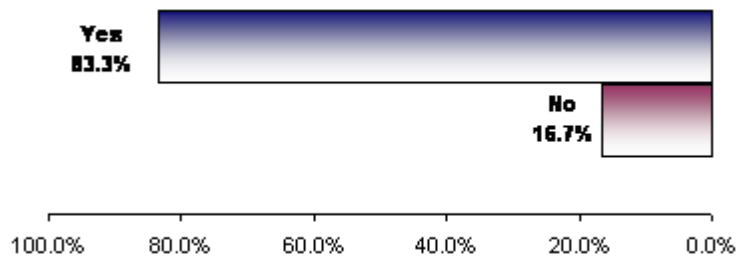
**Q3. In the last six months, have you changed any of your driving habits because of what you've learned about air quality maybe started ridesharing more often, or riding your bike, or refueling after dark, or trip chaining?**



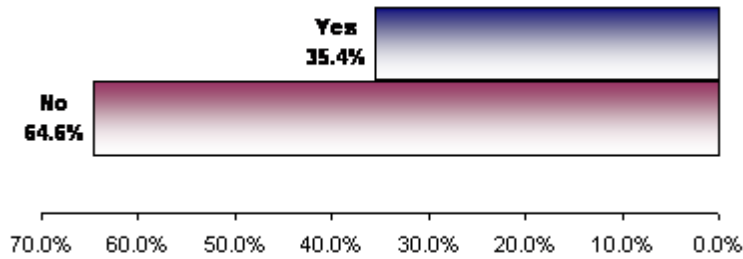
**Q4. Did you know that ozone is a colorless gas that occurs in the Earth's atmosphere?**



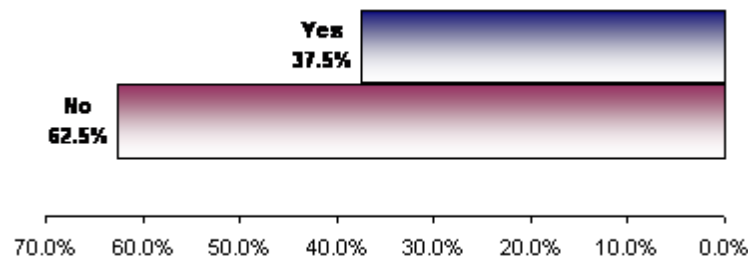
**Q5. Did you know the Air Quality Index is a scale used to report levels of pollutants in the air?**



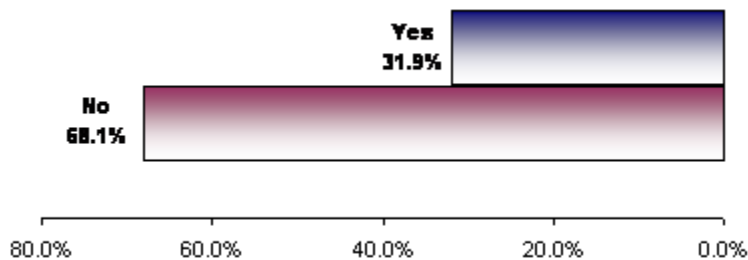
**Q6. Did you know good ozone occurs 1030 miles above the Earth's surface, in the upper atmosphere, and bad ozone, also called groundlevel ozone, occurs from ground level up to 10 miles?**



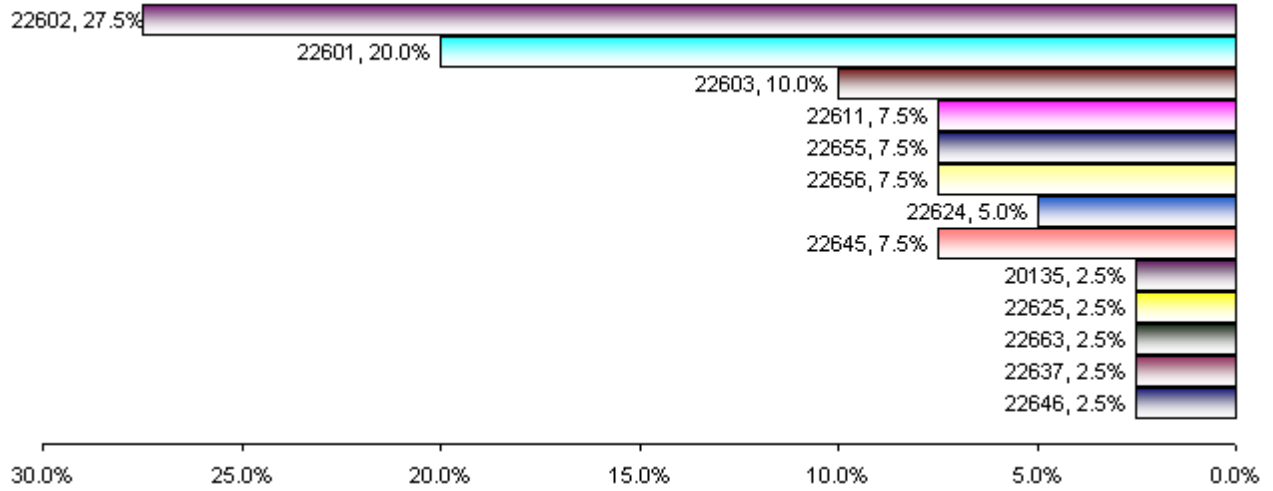
**Q7. Did you know that groundlevel ozone does not come out of smokestacks or tailpipes? It forms when sunlight and warm temperatures cook chemicals from sources such as car exhaust, consumer solvents, and industry.**



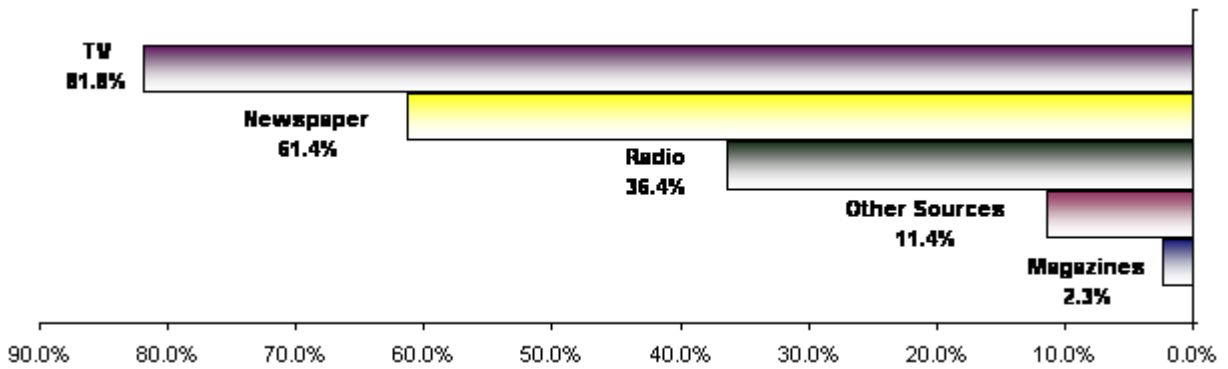
**Q8. Did you know that groundlevel ozone is bad for our health? It inflames and damages cells in our lungs. Children are especially vulnerable, and plants are vulnerable, too. In the U.S., crop damage from ozone is estimated to be over \$500 million a year.**



**Q9. Zip codes**



**Q10. Top two sources where you get your news?**



**Q10a. Named sources**

