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Ohio E-Check Customer Satisfaction Survey



Ohio E✓Check
Vehicle Emissions Testing Program

Prepared by
Voinovich Center for Leadership and Public Affairs – Ohio University

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Table of Contents

Table of Contents.....	i
Acknowledgements.....	ii
Executive Summary.....	1
How the Study was Conducted.....	3
Sample Size and Instrumentation.....	3
Sample Selection.....	3
Survey Process.....	5
Survey Response.....	5
Survey Findings.....	7
Satisfaction with E-Check Experience.....	7
Questions 2 and 2a.....	10
Questions 3-10.....	11
Questions 11 and 11a.....	13
Questions 12 – 16.....	14
Questions 17 – 28.....	15
Questions 29 - 32.....	17
Demographic Questions.....	18
Appendix I.....	22
Appendix II.....	27
Appendix III.....	37

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Executive Summary

- The 2005 Ohio E-Check Customer Satisfaction Survey (CSS) was conducted in the following counties and zones: Zone 1-Lorain, Lake, Geauga, Medina, Portage and Summit counties, and Zone 4-Cuyahoga County.
- Surveys were mailed to 1,200 motorists representing 600 vehicles tested at E-Check stations in Zones 1 and 4, respectively. Four hundred ninety four surveys were returned for a response rate of 41%.
- The response rate from each zone varied significantly; the response rate for Zone 1 was 45%, while the response rate for Zone 4 was 38%.
- Respondents reported “yes” 83% of the time when asked if they were satisfied with their overall experience at their last E-Check test. This was not significantly different from the 84% rate obtained in the 2005 On-Board Diagnostic II (OBD II) E-Check Satisfaction Survey.
- Similarly, 80% of respondents agreed or strongly agreed they were satisfied with their most recent test experience when asked as a scaled question. Satisfaction did not vary significantly by zone, gender, age, income, race or education.
- Respondents indicating satisfaction with their overall E-Check experience were more likely to positively endorse the Ohio EPA’s job of running the E-Check program and agree that they were treated well by employees at the E-Check facility.
- Respondents indicating dissatisfaction with their overall E-Check experience were more likely to indicate that they were concerned that their vehicle would be damaged during the E-Check process and that they did not understand why E-Check was not required statewide.
- Most respondents were not aware of, and did not use, the various resources available to them to obtain assistance or information about the E-Check program. No significant differences were found among respondents’ reporting of their use of these resources compared to reported use in the 2005 OBD II survey.

- The average cost of repairs reported by respondents whose vehicle failed their E-Check test was \$244, compared to \$331 from the OBD II survey.
- Most respondents did not find the various E-Check requirements hard to understand. However, persons with less than a high school diploma more frequently reported they found it hard to understand when their vehicle needed testing than those with higher educational levels.
- The majority (62%) of respondents found it hard to understand why E-Check is not a statewide program. Proportionally more respondents from Zone 1 (68%) than Zone 4 (54%) endorsed this statement.
- Most respondents (76%) disagreed with the statement that the length of wait at the E-Check facility was too long. Significantly more respondents from Zone 1 than Zone 4 disagreed with this statement, indicating that satisfaction with wait time was higher in Zone 1 than in Zone 4.
- The vast majority of respondents were pleased with their treatment at the E-Check station. Eighty nine percent or more agreed that the E-Check station was clean and easy to find, that the employees were polite, were helpful and knew how to do their job, and the respondents were treated well.
- The accuracy of E-Check testing was overwhelmingly accepted, with 94% of respondents agreeing or strongly agreeing to its accuracy. Just under half (45%) of respondents reported they would have liked a better explanation of what happened to their vehicle during testing.
- A majority of respondents, 59%, agreed that vehicle emissions testing can help reduce air pollution. Individuals with higher educational levels were more likely to agree with this statement.
- Just under half of respondents, 48% agreed or strongly agreed they are helping to reduce pollution by having their car tested, and 28% agreed or strongly agreed that motor vehicles create more ozone pollution than industry.
- There has been a significant increase in awareness of the Ohio EPA Web site over last year, with 18% of the current survey sample reporting they knew of this site, as compared to 13% in the 2005 study.

How the Study Was Conducted

Sample Size and Instrumentation

In July, 2005, representatives of the Voinovich Center (GVC) met with representatives of Envirotech Systems Corporation and Ohio Environmental Protection Agency (EPA) to discuss the process by which the E-Check Customer Satisfaction survey (CSS) would be conducted. Because E-Check emissions testing was soon to be discontinued in Zones 2 and 3¹, it was decided to only include vehicles tested in Zones 1 and 4² in the survey sample and to double the sample size in those zones to 600 each. To allow comparisons with a previous survey; only very minor modifications were made to the questionnaire: the order in which a number of questions appeared changed, and the Ohio E-Check Web address was added to one question. Subsequent to this meeting, drafts of all written materials associated with this project (including the survey instrument, cover letters and post cards) were reviewed by the representatives of Envirotech and EPA. These materials were submitted to the Ohio EPA Public Interest Center for final approval. Refer to Appendix I for the survey instrument.

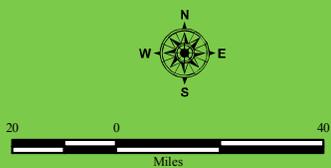
Sample Selection

The survey sample was selected from among 268,014 vehicles tested for emissions between May 1 and July 31, 2005. First, Envirotech randomly selected 3,000 of these vehicles and provided GVC with a database containing owner name and address, vehicle identification number (VIN), test location, vehicle make and model. Project staff then applied a random number generator to this database to select the 1,200 vehicle owners to receive the survey. As part of this selection process, vehicles associated with potentially troublesome addresses were removed from the sample, including those that appeared to

¹ The zones and counties where E-Check testing is being discontinued included: Zone 2-Clark, Greene, and Montgomery counties, Zone 3-Butler, Clermont, Hamilton, and Warren counties.

² See map, page 4.

Counties Participating in E-Check Vehicle Emissions Testing as of January 2006



Legend

Zone (Number of Surveys Returned)

- Zone 1 (268)
- Zone 4 (226)

Sources: Ohio E-Check Program, 2000 U.S. Census
TIGER Files
Map Design: D. Simon
ILGARD - Ohio University
February, 2006

be fleet vehicles, those owned by businesses, and those for which only a partial address was provided. This sample was stratified by E-Check zone to include 600 vehicles tested at stations located in Zones 1 and 4, respectively. The table below details the survey stratification and the number of returned surveys by zone.

Survey Process

The survey mailings were designed to correspond with the methodology outlined by Dan Dillman in Mail and Internet Surveys, 2nd Edition. This method recommends four mailings in order to maximize response. The first mailing was an advance postcard explaining the survey and requesting the prospective respondent to participate. Postcards were mailed to 600 vehicle owners on September 21 and to another 600 vehicle owners September 30. The two zones were represented equally in each of these mailings (600 total from each zone).

The second of the four mailings consisted of a cover letter explaining the study, the survey form and a stamped return address envelope. These were mailed on September 23 to the first half of the sample and on October 10 to the second half. On September 28 and October 10 the third mailing, a thank you/reminder postcard, was sent. Finally, on October 17 and 26 the fourth mailings were sent to non-respondents only. This mailing included a cover letter, a slightly revised survey form and a stamped self addressed envelope. The cover letter reiterated the importance of the project and asked the prospective respondent to please return the survey at that time.

Survey Response

2005 E-Check Survey Response

	# Mailed	# Returned	Response Rate
Zone 1	600	268	44.7%
Zone 4	600	226	37.7%
Total	1,200	494	41.2%

A total of 494 surveys were completed and returned to the Voinovich Center by December 7, 2005, for a response rate of 41%. A comparison of the response rates for

Zones 1 and 4 yielded a significant difference between the two. Proportionally more surveys were returned from Zone 1 than from Zone 4, ($\chi^2 (1, N = 1,200) = 6.07, p < 0.05$). Additionally, fewer letters were returned to the Voinovich Center as undeliverable from Zone 1 (18) than Zone 4 (32). Please note that Appendix II contains the response frequency tables, by zone, for all survey questions, along with the margin of error estimates associated with each response category.

Comparison of 2001-2005 E-Check Survey Response Rates

E-Check Survey Response Rates

Survey Period	Rate
September-October 2005 (CCS)	41.2%
January-February 2005 (OBD II)	52.2%
April-May 2004	45.6%
January-February 2003	61.4%
September-October 2002	54.9%
November-December 2001	62.0%

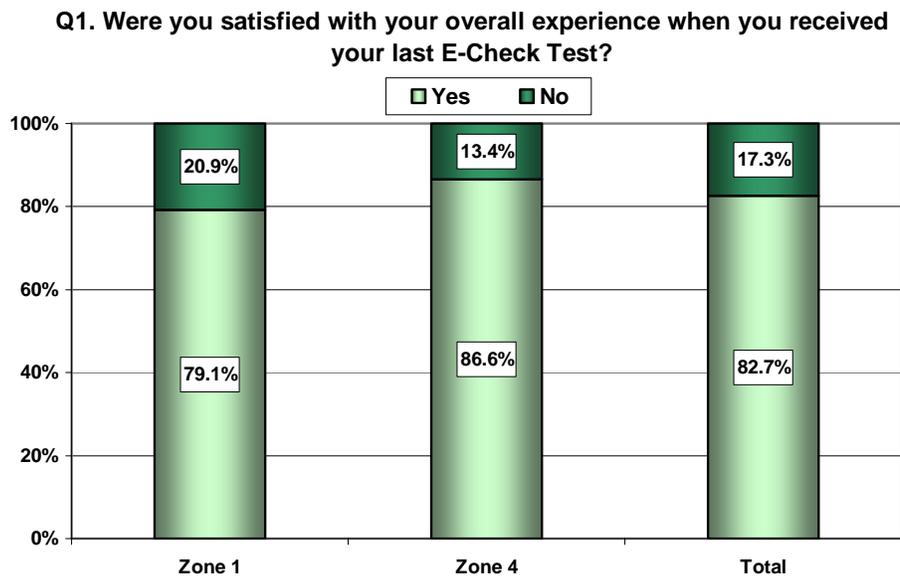
The response rates for the various E-Check surveys conducted since 2001 have ranged between 41 and 62 percent.³ Please note that these response rates, with the exception of the current survey, are based on four zones.

³ 2001 through 2004 response rates obtained from E-Check survey reports prepared by The Ohio State University Center for Survey Research.

Survey Findings

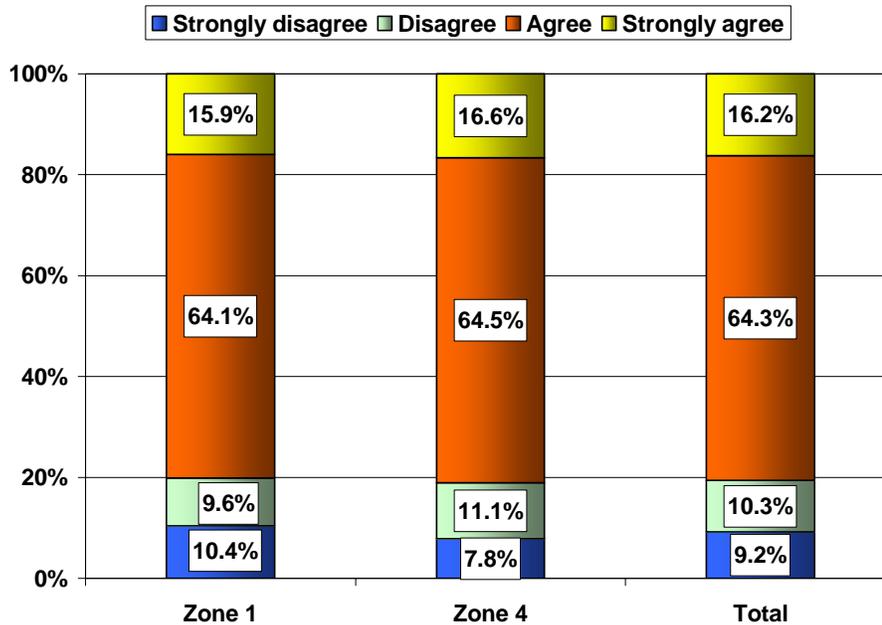
What follows is a detailed description of the results of the survey including comparisons with responses to other questions on the survey. Further, comparisons between responses to the current survey (CSS) and responses to the 2005 OBD II E-Check Survey will be made when appropriate. However, such comparisons are made only between past and current respondents from Zones 1 and 4. Refer to Appendix I for the complete text of each survey question from the current survey. Appendix II contains frequency distributions for all respondents and respondents by zone.

Satisfaction with E-Check Experience



- Eighty three percent answered “yes” they were satisfied with their most recent E-Check test.
- Satisfaction rates differed significantly by zone with more respondents indicating “yes” (i.e., they were satisfied) in Zone 4 ($p < 0.05$).
- The current satisfaction rate is slightly lower than the 84 percent rate obtained in the OBD II 2005 survey, but was not statistically significant ($\chi^2 (1, N = 692) = 2.83, p > 0.05$).

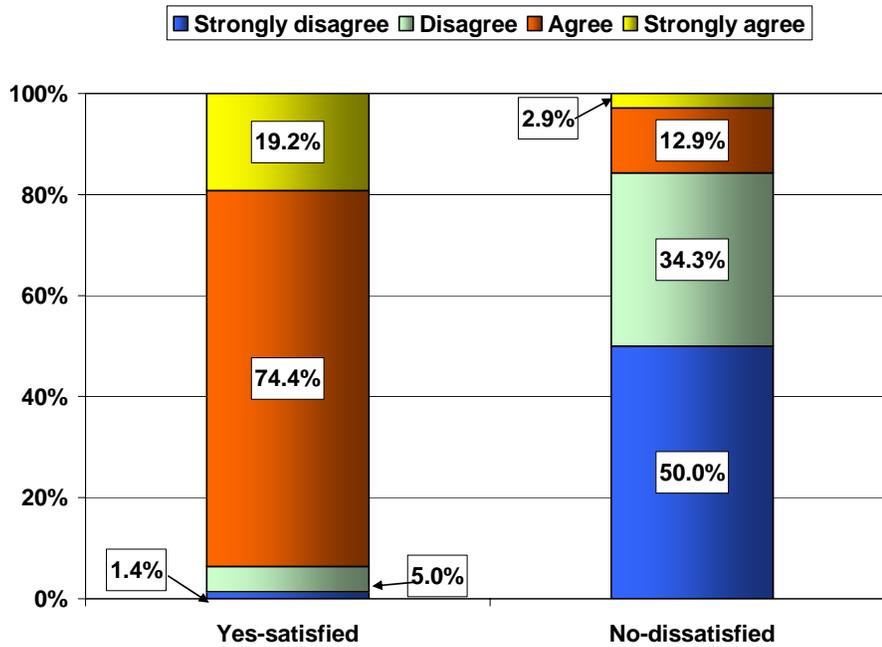
Q27. I was satisfied with my (most recent) overall test experience.



- Eighty percent of the sample agreed or strongly agreed that they were satisfied with their test experience.
- Overall satisfaction did not vary significantly by zone.
- Regression analyses⁴ indicate no significant demographic differences among respondents (i.e., gender, age, income, race or education).
- Respondents indicating satisfaction with their overall E-Check experience were more likely to positively endorse the Ohio EPA’s job of running the E-Check program and agree that they were treated well by employees at the E-Check facility.
- Respondents indicating dissatisfaction with their overall E-Check experience were more likely to indicate that they were concerned that their vehicle would be damaged during the E-Check process and that they did not understand why E-Check was not required statewide.

⁴ Regression analyses can be found in Appendix III.

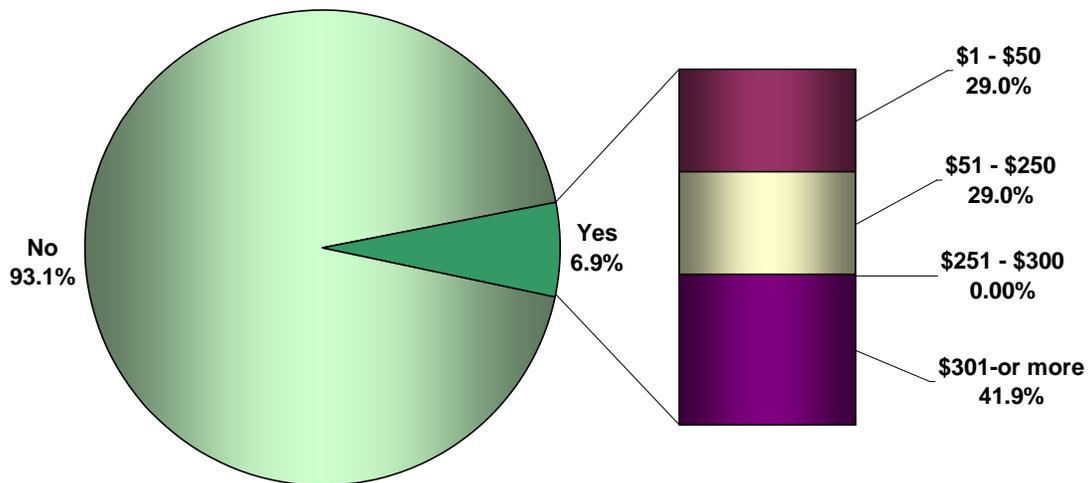
Q1 by Q27: I was satisfied with my overall OBD-II emissions test experience.



- Vehicle owners who responded “yes” to Question 1, “Were you satisfied with your overall experience when you received your last E-Check test” were more likely to answer “agree” or “strongly agree” to Question 27, the final question on the survey, “I was satisfied with my overall OBD II emissions test experience.”
- Vehicle owners who responded “no” to Question 1 were more likely to answer “disagree” or “strongly disagree” to Question 27.
- This finding is based on 429 responses to the two questions and is significant ($\chi^2(3, N = 429) = 243.63, p < 0.01$), indicating the survey findings are internally consistent.

Questions 2 and 2a

Q2. In anticipation of having the E-Check test, did you have any repairs performed on the vehicle?

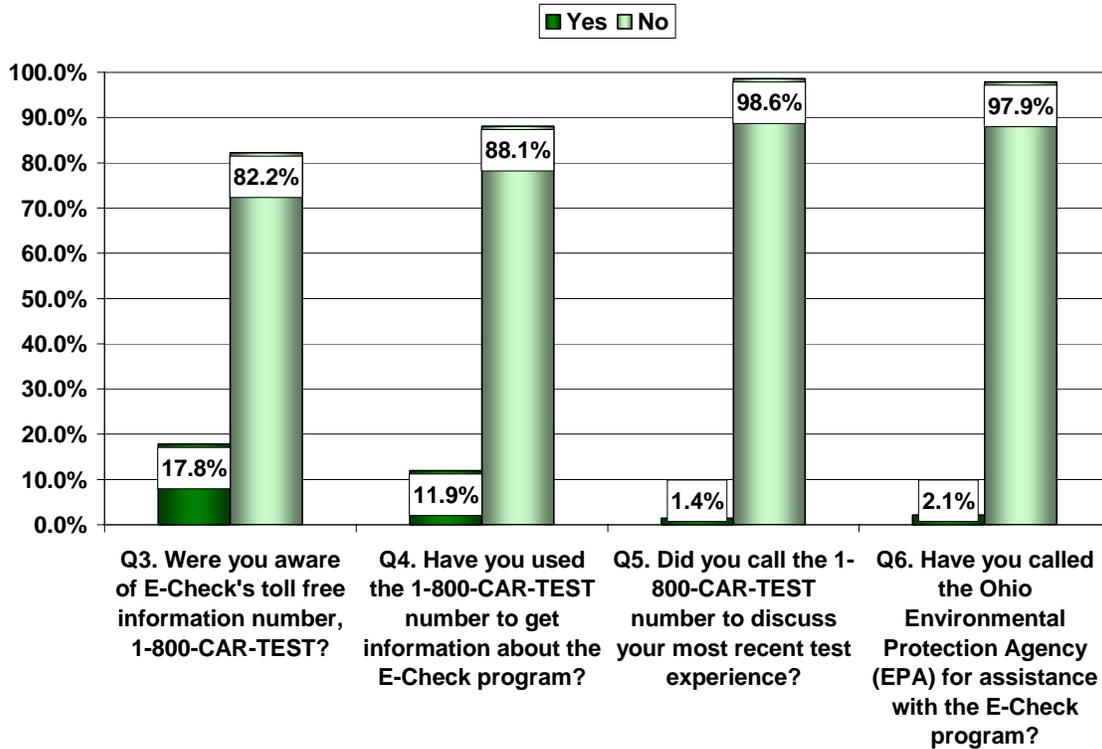


Q2a. If yes, how much did you spend?

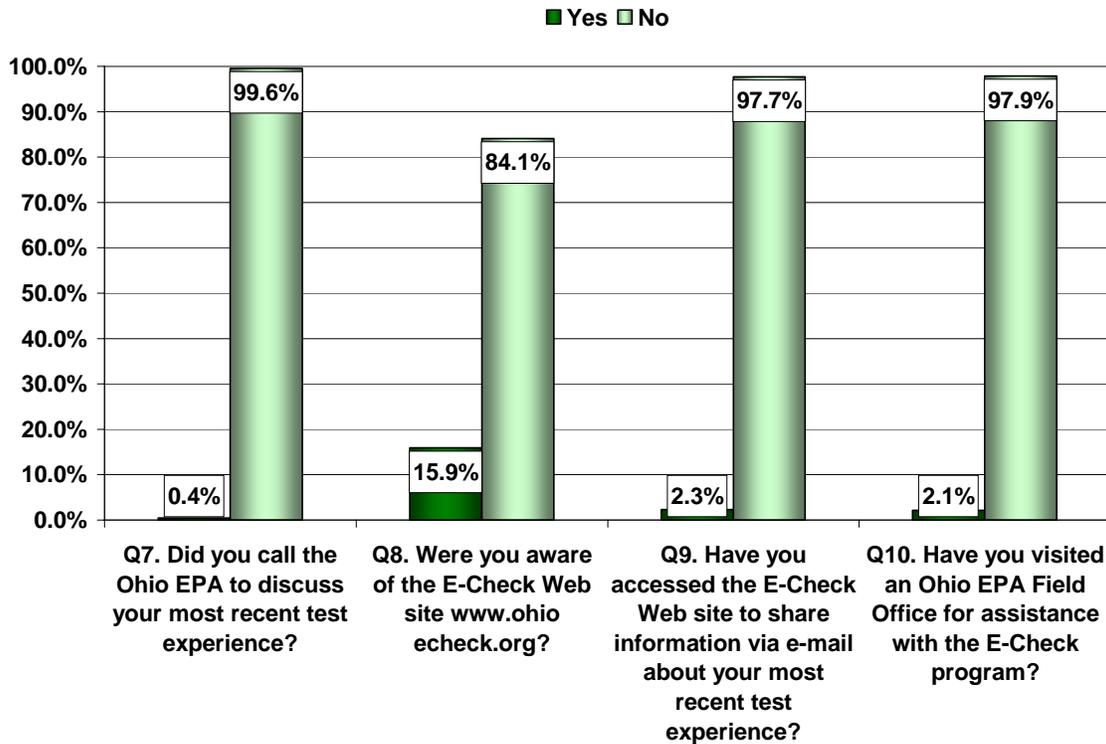
- The vast majority of respondents, 93%, did not have a repair done in preparation for their E-Check test.
- The response to question 2 did not vary by gender, income, race or educational level.
- Among the 33 persons (7%) who made repairs in anticipation of their test, the average amount spent was \$263 and the median amount was \$175. In the OBD II study the average repair cost was \$200 and the median amount was \$100.
- Age effects were present, with those aged 50-59 representing approximately half (47.1%) of those responding that they had repairs performed on their vehicles ($\chi^2(6, N = 470) = 15.74, p < 0.05$).
- The current survey found that the repair rate was up slightly (7%) compared to the OBD II repair rate (5%), but these rates were not significantly different ($\chi^2(1, N = 734) = 0.70, p > 0.05$).

Questions 3 – 10

The following questions provide information on respondent's awareness of various sources of E-Check information.



- Most respondents were not aware of, and did not use the various resources available to them to obtain assistance or information about the E-Check program.
- The responses to this series of questions did not vary significantly by E-Check zone, race, gender, income or educational level.
- The majority (89%) of those indicating that they had used the 1-800-CAR-TEST number reported that the number was helpful.
- More than half of the respondents (4 of 7) who reported calling the Ohio EPA for assistance with the E-Check program identified that the call was helpful.



- Two respondents reported that they called Ohio EPA to discuss their most recent test experience, with one reporting their issue had been resolved.
- More than half of the respondents (3 of 5) who reported that they accessed the E-Check Web site to share information about their most recent test experience felt that it was helpful.
- Most respondents (7 of 9) who had visited an Ohio EPA field office for assistance with the E-Check program felt that it was helpful.

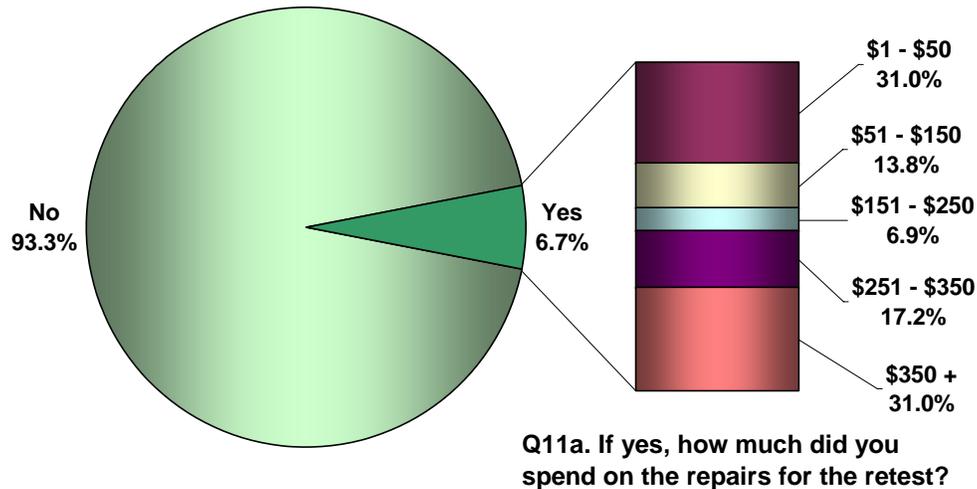
Comparing the 2005 CSS survey results and the OBD II survey results

	2005 CSS Survey				2005 OBD II Survey			
	Yes		No		Yes		No	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
3. Aware of toll free number	85	17.8%	392	82.2%	81	17.0%	396	83.0%
4. Used the toll free number for information	27	11.9%	199	88.1%	17	22.7%	58	77.3%
5. Called toll free number to discuss most recent test	3	1.4%	218	98.6%	1	1.3%	75	98.7%
6. Called the Ohio EPA for assistance with E-Check	10	2.1%	463	97.9%	5	1.0%	479	99.0%
8. Aware of the E-Check web site	76	15.9%	401	84.1%	83	17.7%	387	82.3%

- No significant differences were found among respondents reporting on their use of the various resources available for E-Check assistance or information between the 2005 CSS survey and the 2005 OBD II survey.

Questions 11 and 11a

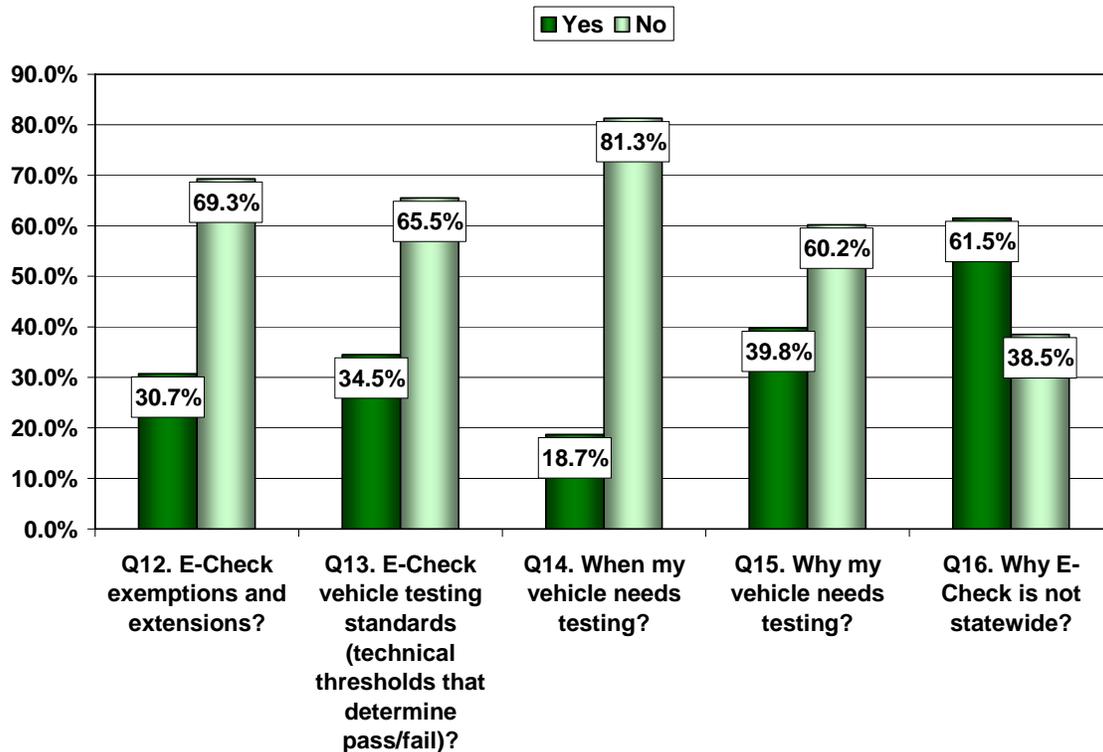
Q11. Did your vehicle fail the E-Check test?



- Approximately 93% of respondents reported that their vehicle did not fail the E-Check test.
- Among those whose vehicles did fail the test, the average amount spent on repairs was \$224 and the median amount was \$210. This compares to an average of \$331 and a median of \$175 from the OBD-II survey.
- Additionally, of 28 respondents who reported that their vehicle failed the E-Check test, 36% reported that they received a waiver while 64% reported that they did not receive a waiver.
- The number of respondents reporting that their vehicle failed their E-Check test did not vary significantly by zone ($\chi^2 (1, N=480) = 2.61, p > 0.05$).

Questions 12 – 16

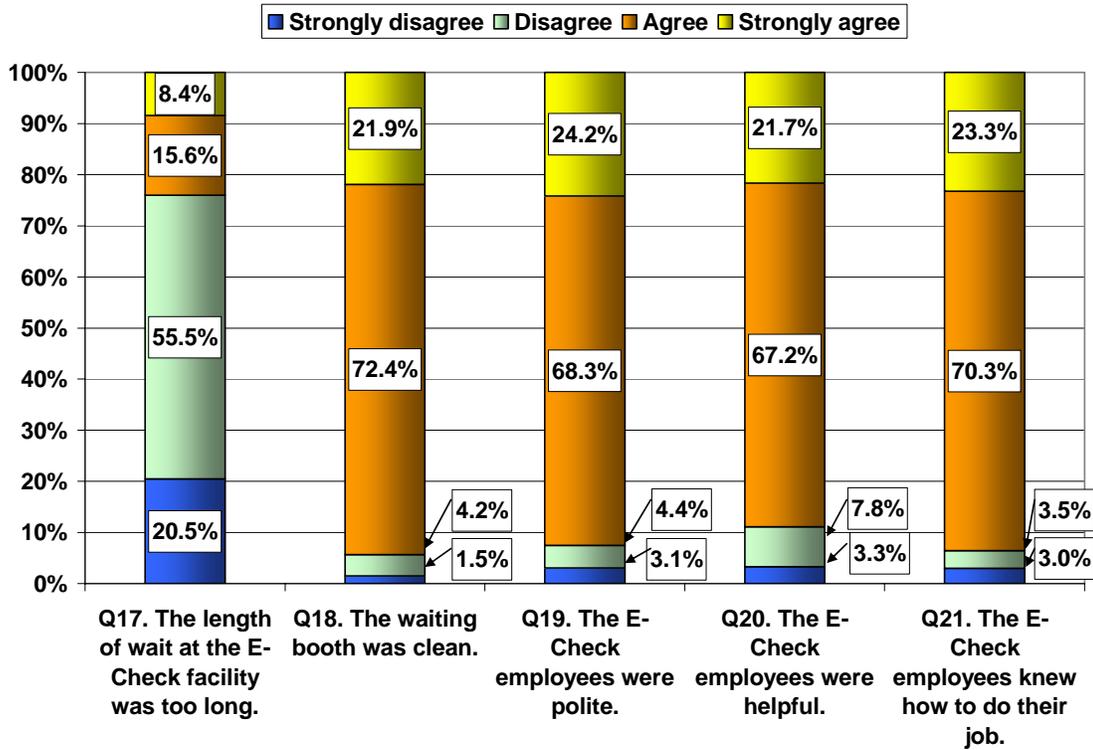
The following questions pertain to understanding E-Check requirements. Do you find the following hard to understand?



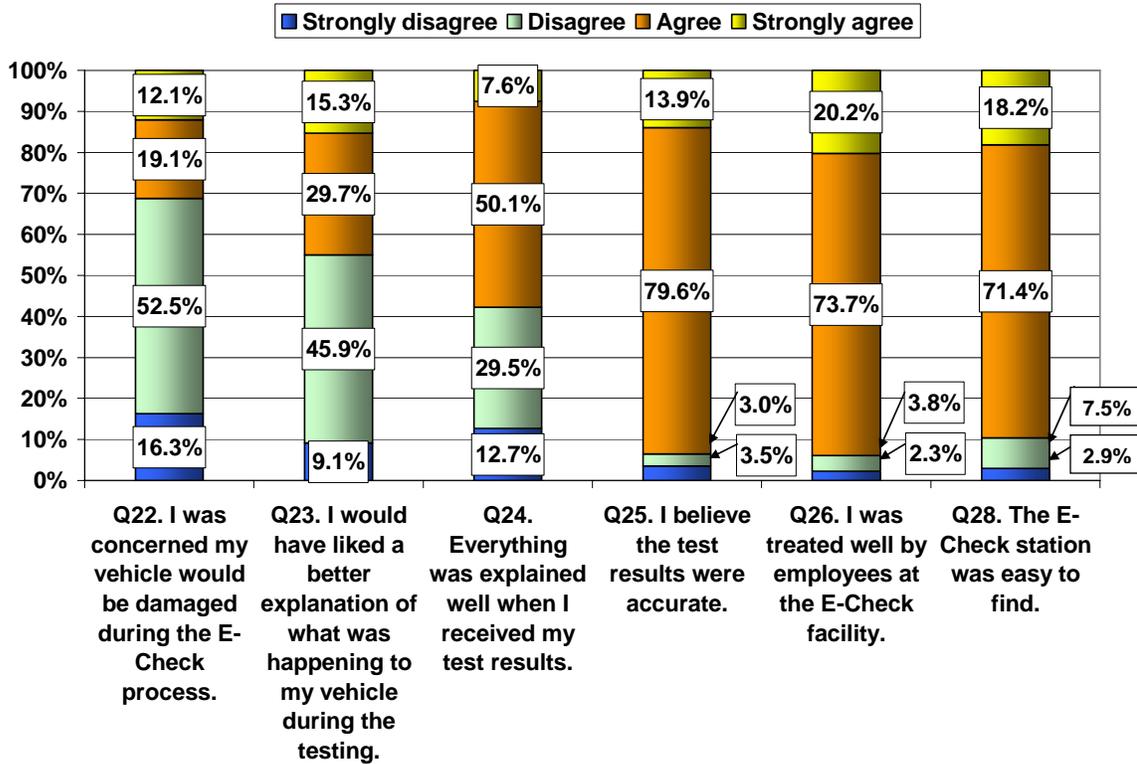
- With respect to the first four questions, most respondents did not find the various E-Check requirements hard to understand. Additionally, these differences did not vary significantly by E-Check zone, race, gender or income.
- Only one significant difference was found among these four questions, and it was related to the educational level of the respondents. Respondents with less than a high school diploma more frequently reported that they found it hard to understand when their vehicle needs testing ($\chi^2 (5, N = 441) = 19.63, p < 0.05$).
- Most respondents found it hard to understand why E-Check is not statewide (62%). This question was only significantly related to zone with more respondents proportionally endorsing this statement from Zone 1 than Zone 4, ($p < 0.05$).

Questions 17 – 28

The following questions pertain to respondents' most recent E-Check experience.

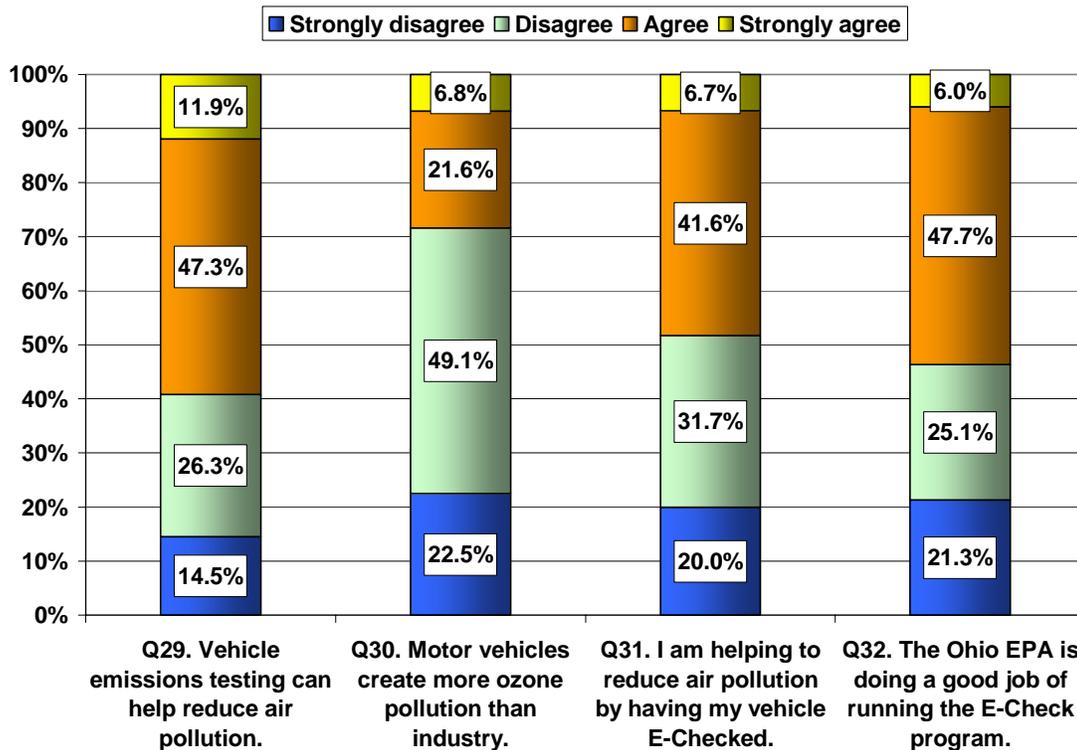


- Twenty-four percent of respondents either agreed or strongly agreed with the statement that the length of wait at the E-Check facility was too long. This was significantly negatively correlated with zone, such that those in Zone 1 more frequently agreed with the statement than those in Zone 4 ($r = 0.11, p < 0.05$).
- Most respondents (89% or above) agreed or strongly agreed with each of the statements listed in questions 18 – 21.



- Thirty one percent of respondents agreed or strongly agreed that they were concerned that their vehicles would be damaged during the E-Check process.
- Forty five percent of respondents agreed or strongly agreed that they would have liked a better explanation of what was happening to their vehicle during testing.
- The majority of respondents (58%) agreed or strongly agreed that everything was explained well when they received their last test results.
- The accuracy of E-Check testing was overwhelmingly accepted, with 94% of respondents agreeing or strongly agreeing with the statement that they believe the test results were accurate.
- A majority of respondents (90% or more) agreed or strongly agreed that they were treated well by the employees at the E-Check facility and that the E-Check station was easy to find.

Questions 29 – 32



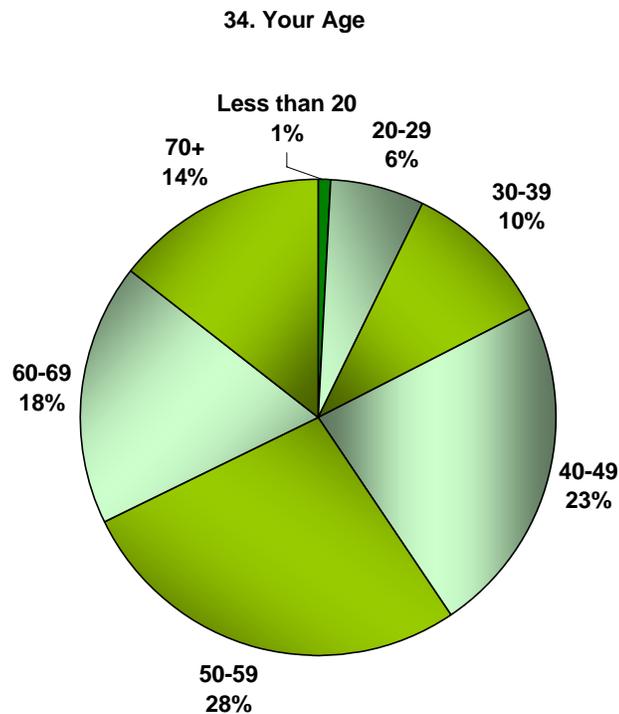
- Most respondents (59%) agreed or strongly agreed with the statement that vehicle emissions testing can help reduce air pollution. Furthermore, regression analyses revealed that individuals with more education were more likely to agree with this statement ($\beta = 0.15, p < 0.05$).
- Twenty-eight percent of respondents agreed or strongly agreed that motor vehicles create more ozone pollution than industry.
- Approximately half of respondents (48 %) agreed or strongly agreed with the statement that they are helping to reduce air pollution by having their vehicle E-Checked.
- Fifty four percent of respondents agreed or strongly agreed with the statement that the Ohio EPA is doing a good job of running the E-Check program. Subsequent regression analyses indicated that respondents in Zone 4 were more likely to agree with this statement ($\beta = 0.12, p < 0.05$) as were women ($\beta = 0.17, p < 0.05$).

Demographic Questions

33. Gender

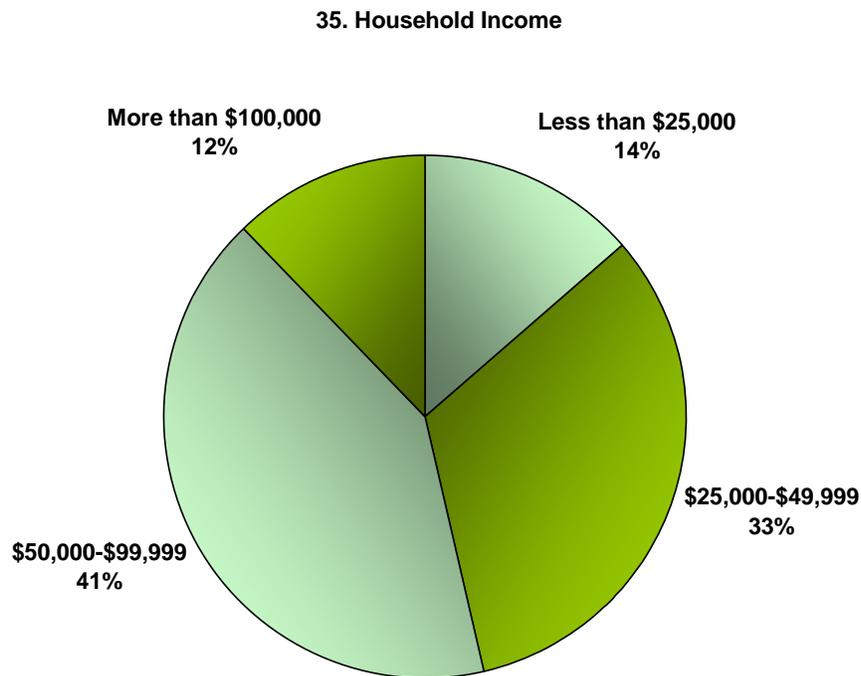
- Just over half (57%) of all respondents to the survey were male, and slightly less than half were female (43%). The proportion of males to females in the current survey was not statistically significantly different from that in the OBD II survey ($\chi^2 (1, N = 731) = 2.26, p > 0.05$).

34. Age



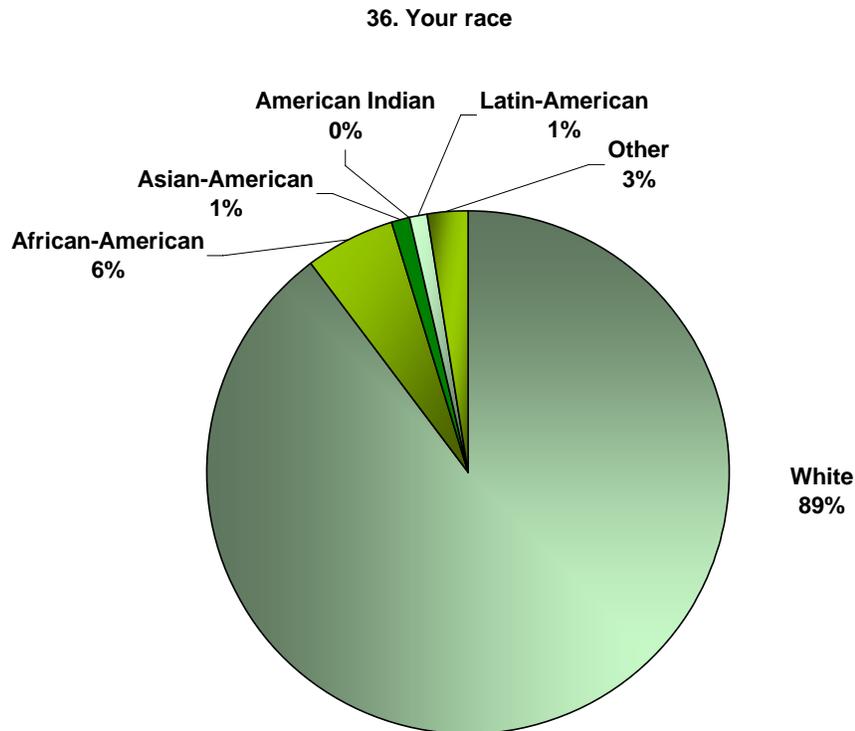
- Although all age groups are represented in the survey, there were more responses from persons 50-59 than from any other age group, followed by persons 40-49. Respondents aged 29 years or younger only represent 7% of the total sample.
- No significant differences were found in the proportions of those representing each age category compared to those in the OBD II survey ($\chi^2 (6, N = 730) = 5.01, p > 0.05$).

35. Household Income



- Over half (53%) of the 394 respondents who answered this question reported having incomes of \$50,000 or more.
- Just under half (47%) have incomes of less than \$50,000.
- No significant differences were found in the proportions of those representing each household income level compared to those in the OBD II survey ($\chi^2 (3, N = 608) = 1.66, p > 0.05$).

36. Race



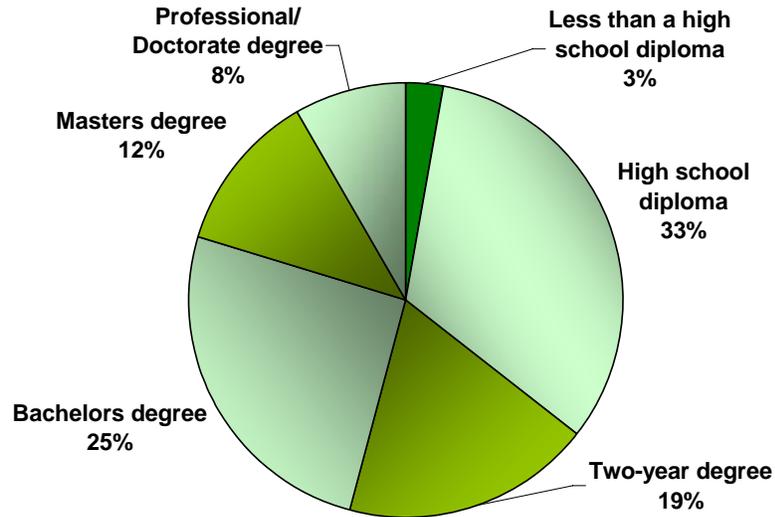
- The vast majority (89%) of all respondents described themselves as white, while another 6% described themselves as African-American.
- Zone 4, Cuyahoga County, has the largest percentage of non-white survey respondents (11%) compared to Zone 1 (1%).
- No significant differences were found in the proportions of those representing each racial category compared to those in the OBD II survey ($\chi^2 (5, N = 701) = 4.42, p > 0.05$).

37. Are you . . .

- The vast majority of respondents (95%) identified themselves as vehicle owners, while a smaller proportion of respondents (5%) identified themselves as relatives to the vehicle owners.

38. Educational Attainment

38. Adult in the home with the highest education



- The survey population included representation from individuals with all levels of education.
- No significant differences were found in the proportions of those representing each educational category compared to those in the OBD II survey ($\chi^2(5, N = 703) = 6.10, p > 0.05$).

Appendix I

2005 Ohio E-Check Customer Satisfaction Survey



Ohio E-Check

Vehicle Emissions Testing Program

2005 Customer Opinion Survey



- Correct Mark
- ✗ Incorrect Mark

Please use Pencil or Black Pen.

Please answer each question by completely filling the box.

1. Were you satisfied with your overall experience when you received your last E-Check test?	<input type="radio"/> Yes <input type="radio"/> No
--	--

Please turn over for more questions



2. In anticipation of having the E-Check test, did you have any repairs performed on your vehicle? Yes No
 If yes, how much did you spend on the repairs? \$.00

3. Before seeing this survey were you aware of E-Check's toll free information number, 1-800-CAR-TEST? Yes No
 (if no, go to #6)

4. Have you used the 1-800-CAR-TEST number to get information about the E-Check program? Yes No
 If yes, was the information helpful? Yes No

5. Did you call the 1-800-CAR-TEST number to discuss your most recent test experience? Yes No
 If yes, were your issues resolved? Yes No

6. Have you called the Ohio Environmental Protection Agency (EPA) for assistance with the E-Check program? Yes No
 If yes, was this helpful? Yes No

Comments about questions 1-6. Please tell us which questions you are referring to.

Question # ____ : _____

Question # ____ : _____

7. Did you call the Ohio EPA to discuss your most recent test experience? Yes No
 If yes, were your issues resolved? Yes No

8. Before seeing this survey, were you aware of the E-Check Web site www.ohiocheck.org? Yes No
 (if no, go to #10)

9. Have you accessed the E-Check Web site to share information via e-mail about your most recent test experience? Yes No
 If yes, were your issues resolved? Yes No

10. Have you visited an Ohio EPA Field Office for assistance with the E-Check program? Yes No
 If yes, was it helpful? Yes No

11. Did your vehicle fail the E-Check test? Yes No
 If yes, how much did you spend on the repairs for the retest? \$.00
 Did you receive a waiver? Yes No

Please continue on next page



Do you find the following E-Check requirements hard to understand...

12. E-Check exemptions and extensions? Yes No

13. E-Check vehicle testing standards (technical thresholds that determine pass/fail)? Yes No

14. When my vehicle needs testing? Yes No

15. Why my vehicle needs testing? Yes No

16. Why E-Check testing is not statewide? Yes No

Comments about questions 7-16. Please tell us which questions you are referring to.

Question # _____: _____

Question # _____: _____

For statements 17-28, please think about your most recent E-Check experience:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
17. The length of wait at the E-Check facility was too long.	<input type="radio"/>				
18. The waiting booth was clean.	<input type="radio"/>				
19. The E-Check employees were polite.	<input type="radio"/>				
20. The E-Check employees were helpful.	<input type="radio"/>				
21. The E-Check employees knew how to do their jobs.	<input type="radio"/>				
22. I was concerned my vehicle would be damaged during the E-Check process.	<input type="radio"/>				
23. I would have liked a better explanation of what was happening to my vehicle during the testing.	<input type="radio"/>				
24. Everything was explained well when I received my test results.	<input type="radio"/>				
25. I believe the test results were accurate.	<input type="radio"/>				
26. I was treated well by the employees at the E-Check facility.	<input type="radio"/>				
27. I was satisfied with my overall test experience.	<input type="radio"/>				
28. The E-Check station was easy to find.	<input type="radio"/>				

Please continue on next page



For each of the following statements, please fill the circle that best describes your opinion:

	Strongly Disagree	Disagree	Agree	Strongly Agree	Don't Know
29. Vehicle emissions testing can help reduce air pollution.	<input type="radio"/>				
30. Motor vehicles create more ozone pollution than industry.	<input type="radio"/>				
31. I am helping to reduce air pollution by having my vehicle E-Checked.	<input type="radio"/>				
32. The Ohio EPA is doing a good job of running the E-Check program.	<input type="radio"/>				

Comments about questions 17-32. Please tell us which questions you are referring to.

Question # ____: _____

Question # ____: _____

Please answer some questions so we can compare your answers to those of others.

33. Your gender:	<input type="radio"/> Male	<input type="radio"/> Female			
34. Your age:	<input type="radio"/> Less than 20	<input type="radio"/> 30-39	<input type="radio"/> 50-59	<input type="radio"/> 70+	
	<input type="radio"/> 20-29	<input type="radio"/> 40-49	<input type="radio"/> 60-69		
35. Your total annual household income:	<input type="radio"/> Less than \$25,000	<input type="radio"/> \$50,000-\$99,999			
	<input type="radio"/> \$25,000-\$49,999	<input type="radio"/> more than \$100,000			
36. Your race:	<input type="radio"/> White	<input type="radio"/> Asian - American	<input type="radio"/> Latin American (Hispanic)		
	<input type="radio"/> African - American	<input type="radio"/> American Indian	<input type="radio"/> Other _____		
37. Are you...	<input type="radio"/> The vehicle owner	<input type="radio"/> A relative of the vehicle owner			
	<input type="radio"/> A friend of the vehicle owner	<input type="radio"/> Other _____			
38. The adult in your home with the highest education has:	<input type="radio"/> Less than a high school diploma	<input type="radio"/> Bachelors degree			
	<input type="radio"/> High school diploma	<input type="radio"/> Masters degree			
	<input type="radio"/> Two-year degree	<input type="radio"/> Professional/Doctorate degree			

Thank you for participating in the E-Check Customer Opinion Survey!

**Please return your completed survey within two weeks in the stamped addressed envelope to:
ILGARD-Ohio University, Building 22-The Ridges, Athens, Ohio 45701, or fax to 740-593-4398.**



Appendix II

2005 E-Check Frequency Tables

2005 E-Check Survey Frequency Tables

Survey Response Rate

	All Zones		Zone 1		Zone 4	
	N	%	N	%	N	%
Number surveys returned	494	41.2%	268	44.7%	226	37.7%
Number surveys mailed	1,200		600		600	

1. Were you satisfied with the overall experience when you received your last E-Check Test?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	367	82.7%	3.5%	186	79.1%	181	86.6%
No	77	17.3%	3.5%	49	20.9%	28	13.4%
Total	444	100.0%		235	100.0%	209	100.0%

2. In anticipation of having the E-Check test, did you have any repairs performed on the vehicle?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	33	6.9%	2.3%	22	8.5%	12	5.5%
No	446	93.1%	2.3%	238	91.5%	207	94.5%
Total	479	100.0%		260	100.0%	219	100.0%

2a. If yes, how much did you spend?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Maximum	\$1,600			\$1,600		\$500	
Minimum	\$0			\$0		\$15	
Average	\$263			\$296		\$206	
Median	\$175			\$140		\$175	

3. Before seeing this survey, were you aware of the E-Check's toll free number, 1-800-CAR-TEST?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	85	17.8%	3.4%	40	15.4%	45	20.6%
No	392	82.2%	3.4%	219	84.6%	173	79.4%
Total	477	100.0%		259	100.0%	218	100.0%

4. Have you used the 1-800-CAR-TEST number to get information about the E-Check program?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	27	11.9%	4.2%	9	7.0%	18	18.4%
No	199	88.1%	4.2%	119	93.0%	80	81.6%
Total	226	100.0%		128	100.0%	98	100.0%

4a. If yes, was the information helpful?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	23	88.5%	12.3%	7	77.8%	16	94.1%
No	3	11.5%	12.3%	2	22.2%	1	5.9%
Total	26	100.0%		9	100.0%	17	100.0%

5. Did you call the 1-800-CAR-TEST number to discuss your most recent test experience?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	3	1.4%	1.5%	1	0.8%	2	2.1%
No	218	98.6%	1.5%	123	99.2%	95	97.9%
Total	221	100.0%		124	100.0%	97	100.0%

5a. If yes, were your issues resolved?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	1	33.3%	53.3%	0	0.0%	1	50.0%
No	2	66.7%	53.3%	1	100.0%	1	50.0%
Total	3	100.0%		1	100.0%	2	100.0%

6. Have you called the Ohio Environmental Protection Agency (EPA) for assistance with the E-Check program?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	10	2.1%	1.3%	5	1.9%	5	2.3%
No	463	97.9%	1.3%	254	98.1%	209	97.7%
Total	473	100.0%		259	100.0%	214	100.0%

6a. If yes, was it helpful?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	4	57.1%	36.7%	1	33.3%	3	75.0%
No	3	42.9%	36.7%	2	66.7%	1	25.0%
Total	7	100.0%		3	100.0%	4	100.0%

7. Did you call the Ohio EPA to discuss your most recent test experience?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	2	0.4%	0.6%	0	0.0%	2	0.9%
No	476	99.6%	0.6%	260	100.0%	216	99.1%
Total	478	100.0%		260	100.0%	218	100.0%

7a. If yes, were your issues resolved?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	1	50.0%	69.3%	0		1	50.0%
No	1	50.0%	69.3%	0		1	50.0%
Total	2	100.0%		0		2	100.0%

8. Before seeing this survey, were you aware of the E-Check Web site www.ohiocheck.org?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	76	15.9%	3.3%	35	13.5%	41	18.9%
No	401	84.1%	3.3%	225	86.5%	176	81.1%
Total	477	100.0%		260	100.0%	217	100.0%

9. Have you accessed the E-Check Web site to share information via e-mail about your most recent test experience?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	6	2.3%	1.8%	4	2.8%	2	1.7%
No	255	97.7%	1.8%	141	97.2%	114	98.3%
Total	261	100.0%		145	100.0%	116	100.0%

9a. If yes, were your issues resolved?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	2	40.0%	42.9%	2	66.7%	1	50.0%
No	3	60.0%	42.9%	1	33.3%	1	50.0%
Total	5	100.0%		3	100.0%	2	100.0%

10. Have you visited an Ohio OPA Field office for assistance with the E-Check program?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	10	2.1%	1.3%	4	1.6%	6	2.8%
No	466	97.9%	1.3%	250	98.4%	208	97.2%
Total	476	100.0%		254	100.0%	214	100.0%

10a. If yes, was it helpful?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	7	77.8%	27.2%	1	33.3%	6	100.0%
No	2	22.2%	27.2%	2	66.7%	0	0.0%
Total	9	100.0%		3	100.0%	6	100.0%

11. Did your vehicle fail the E-Check test?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	32	6.7%	2.2%	22	8.5%	11	5.0%
No	449	93.3%	2.2%	236	91.5%	211	95.0%
Total	481	100.0%		258	100.0%	222	100.0%

11a. If yes, how much did you spend on the repairs for the retest?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Maximum	\$800			\$800		\$400	
Minimum	\$5			\$5		\$6	
Average	\$244			\$277		\$173	
Median	\$210			\$300		\$144	

11b. Did you receive a waiver?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	10	35.7%	17.7%	6	31.6%	4	40.0%
No	18	64.3%	17.7%	13	68.4%	6	60.0%
Total	28	100.0%		19	100.0%	10	100.0%

Do you find the following E-Check requirements hard to understand. . .

12. E-Check exemptions and extensions?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	144	30.7%	4.2%	80	31.7%	64	29.5%
No	325	69.3%	4.2%	172	68.3%	153	70.5%
Total	469	100.0%		252	100.0%	217	100.0%

13. E-Check vehicle testing standards?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	159	34.5%	4.3%	77	30.9%	82	38.7%
No	302	65.5%	4.3%	172	69.1%	130	61.3%
Total	461	100.0%		249	100.0%	212	100.0%

14. When my vehicle needs testing?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	88	18.7%	3.5%	40	15.7%	48	22.2%
No	382	81.3%	3.5%	214	84.3%	168	77.8%
Total	470	100.0%		254	100.0%	216	100.0%

15. Why my vehicle needs testing?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	187	39.8%	4.4%	110	43.3%	77	35.6%
No	283	60.2%	4.4%	144	56.7%	139	64.4%
Total	470	100.0%		254	100.0%	216	100.0%

16. Why E-Check testing is not done statewide?

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Yes	288	61.5%	4.4%	174	68.2%	114	53.5%
No	180	38.5%	4.4%	81	31.8%	99	46.5%
Total	468	100.0%		255	100.0%	213	100.0%

For statements 17-28, please think about your most recent E-Check experience:

17. The length of wait at the E-Check facility was too long.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	40	8.4%	2.5%	15	5.9%	25	11.4%
Agree	74	15.6%	3.3%	37	14.6%	37	16.8%
Disagree	263	55.5%	4.5%	144	56.7%	119	54.1%
Strongly disagree	97	20.5%	3.6%	58	22.8%	39	17.7%
Total	474	100.0%		254	100.0%	220	100.0%

18. The waiting booth was clean.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	104	21.9%	3.7%	55	21.6%	49	22.4%
Agree	343	72.4%	3.7%	186	72.9%	157	71.7%
Disagree	20	4.2%	1.8%	11	4.3%	9	4.1%
Strongly disagree	7	1.5%	1.1%	3	1.2%	4	1.8%
Total	474	100.0%		255	100.0%	219	100.0%

19. The E-Check employees were polite.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	116	24.2%	3.8%	60	23.2%	56	25.5%
Agree	327	68.3%	3.8%	175	67.6%	152	69.1%
Disagree	21	4.4%	1.8%	15	5.8%	6	2.7%
Strongly disagree	15	3.1%	1.6%	9	3.5%	6	2.7%
Total	479	100.0%		259	100.0%	220	100.0%

20. The E-Check employees were helpful.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	98	21.7%	3.6%	52	21.2%	46	22.3%
Agree	303	67.2%	4.3%	161	65.7%	142	68.9%
Disagree	35	7.8%	2.3%	22	9.0%	13	6.3%
Strongly disagree	15	3.3%	1.6%	10	4.1%	5	2.4%
Total	451	100.0%		245	100.0%	206	100.0%

21. The E-Check employees knew how to do their job.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	101	23.3%	4.0%	47	19.8%	54	27.4%
Agree	305	70.3%	4.3%	173	73.0%	132	67.0%
Disagree	15	3.5%	1.7%	10	4.2%	5	2.5%
Strongly disagree	13	3.0%	1.6%	7	3.0%	6	3.0%
Total	434	100.0%		237	100.0%	197	100.0%

22. I was concerned my vehicle would be damaged during the E-Check process.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	56	12.1%	3.0%	30	12.0%	26	12.3%
Agree	88	19.1%	3.6%	52	20.9%	36	17.0%
Disagree	242	52.5%	4.6%	134	53.8%	108	50.9%
Strongly disagree	75	16.3%	3.4%	33	13.3%	42	19.8%
Total	461	100.0%		249	100.0%	212	100.0%

23. I would have liked a better explanation of what was happening to my vehicle during the testing.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	71	15.3%	3.3%	37	14.9%	34	15.8%
Agree	138	29.7%	4.2%	74	29.7%	64	29.8%
Disagree	213	45.9%	4.5%	115	46.2%	98	45.6%
Strongly disagree	42	9.1%	2.6%	23	9.2%	19	8.8%
Total	464	100.0%		249	100.0%	215	100.0%

24. Everything was explained well when I received my test results.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	36	7.6%	2.4%	19	7.4%	17	7.9%
Agree	236	50.1%	4.5%	139	54.1%	97	45.3%
Disagree	139	29.5%	4.1%	70	27.2%	69	32.2%
Strongly disagree	60	12.7%	3.0%	29	11.3%	31	14.5%
Total	471	100.0%		257	100.0%	214	100.0%

25. I believe the results were accurate.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	55	13.9%	3.4%	22	10.2%	33	18.1%
Agree	316	79.6%	4.0%	178	82.8%	138	75.8%
Disagree	12	3.0%	1.7%	8	3.7%	4	2.2%
Strongly disagree	14	3.5%	1.8%	7	3.3%	7	3.8%
Total	397	100.0%		215	100.0%	182	100.0%

26. I was treated well by the employees at the E-Check facility.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	95	20.2%	3.6%	51	20.1%	44	20.3%
Agree	347	73.7%	4.0%	185	72.8%	162	74.7%
Disagree	18	3.8%	1.7%	12	4.7%	6	2.8%
Strongly disagree	11	2.3%	1.4%	6	2.4%	5	2.3%
Total	471	100.0%		254	100.0%	217	100.0%

27. I was satisfied with my overall test experience.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	76	16.2%	3.3%	40	15.9%	36	16.6%
Agree	301	64.3%	4.3%	161	64.1%	140	64.5%
Disagree	48	10.3%	2.7%	24	9.6%	24	11.1%
Strongly disagree	43	9.2%	2.6%	26	10.4%	17	7.8%
Total	468	100.0%		251	100.0%	217	100.0%

28. The E-Check station was easy to find.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	87	18.2%	3.3%	44	17.2%	43	19.3%
Agree	342	71.4%	4.3%	194	75.8%	148	66.4%
Disagree	36	7.5%	2.7%	14	5.5%	22	9.9%
Strongly disagree	14	2.9%	2.6%	4	1.6%	10	4.5%
Total	479	100.0%		256	100.0%	223	100.0%

29. Vehicle emissions testing can help reduce air pollution.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	50	11.9%	3.1%	23	10.1%	27	14.1%
Agree	198	47.3%	4.8%	101	44.5%	97	50.5%
Disagree	110	26.3%	4.2%	60	26.4%	50	26.0%
Strongly disagree	61	14.6%	3.4%	43	18.9%	18	9.4%
Total	419	100.0%		227	100.0%	192	100.0%

30. Motor vehicles create more ozone pollution than industry.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	22	6.8%	2.7%	10	5.6%	12	8.2%
Agree	70	21.6%	4.5%	43	24.2%	27	18.5%
Disagree	159	49.1%	5.4%	80	44.9%	79	54.1%
Strongly disagree	73	22.5%	4.5%	45	25.3%	28	19.2%
Total	324	100.0%		178	100.0%	146	100.0%

31. I am helping to reduce air pollution by having my vehicle E-Checked.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	27	6.7%	2.5%	11	5.2%	16	8.5%
Agree	167	41.6%	4.8%	89	41.8%	78	41.5%
Disagree	127	31.7%	4.5%	62	29.1%	65	34.6%
Strongly disagree	80	20.0%	3.9%	51	23.9%	29	15.4%
Total	401	100.0%		213	100.0%	188	100.0%

32. The Ohio EPA is doing a good job of running the E-Check program.

	All Zones			Zone 1		Zone 4	
	N	%	ME*	N	%	N	%
Strongly agree	22	6.0%	2.4%	12	5.9%	10	6.1%
Agree	175	47.7%	5.1%	87	43.1%	88	53.3%
Disagree	92	25.1%	4.4%	52	25.7%	40	24.2%
Strongly disagree	78	21.3%	4.2%	51	25.2%	27	16.4%
Total	367	100.0%		202	100.0%	165	100.0%

33. Your Gender:

	All Zones			Zone 1		Zone 4	
	N	%		N	%	N	%
Male	270	56.6%		151	58.5%	119	54.3%
Female	207	43.4%		107	41.5%	100	45.7%
Total	477	100.0%		258	100.0%	219	100.0%

34. Your age:

	All Zones			Zone 1		Zone 4	
	N	%		N	%	N	%
Less than 20	4	0.8%		2	0.8%	2	0.9%
20-29	31	6.5%		16	6.2%	15	6.8%
30-39	48	10.0%		21	8.1%	27	12.3%
40-49	111	23.2%		54	20.8%	57	26.0%
50-59	130	27.2%		80	30.9%	50	22.8%
60-69	85	17.8%		48	18.5%	37	16.9%
70 or older	69	14.4%		38	14.7%	31	14.2%
Total	478	100.0%		259	100.0%	219	100.0%

35. Your total annual household income:

	All Zones			Zone 1		Zone 4	
	N	%		N	%	N	%
Less than \$25,000	54	13.7%		20	9.7%	34	18.2%
\$25,000-\$49,999	129	32.7%		70	33.8%	59	31.6%
\$50,000-\$99,999	163	41.4%		94	45.4%	69	36.9%
More than \$100,000	48	12.2%		23	11.1%	25	13.4%
Total	394	100.0%		207	100.0%	187	100.0%

36. Your race:

	All Zones			Zone 1		Zone 4	
	N	%		N	%	N	%
White	411	88.4%		236	97.1%	173	81.2%
African-American	30	6.5%		2	0.8%	24	11.3%
Asian-American	4	0.9%		1	0.4%	3	1.4%
American Indian	5	1.1%		0	0.0%	1	0.5%
Latin American	5	1.1%		1	0.4%	3	1.4%
Other	10	2.2%		3	1.2%	9	4.2%
Total	465	100.0%		243	100.0%	213	100.0%

37. Are you. . .

	All Zones		Zone 1		Zone 4	
	N	%	N	%	N	%
The vehicle owner	451	94.7%	241	94.1%	210	95.5%
Relative of vehicle owner	24	5.0%	14	5.5%	10	4.5%
Friend of vehicle owner	0	0.0%	0	0.0%	0	0.0%
Other	1	0.2%	1	0.4%	0	0.0%
Total	476	100.0%	256	100.0%	220	100.0%

38. The adult in your home with the highest education has:

	All Zones		Zone 1		Zone 4	
	N	%	N	%	N	%
Less than a high school diploma	13	2.8%	7	2.9%	6	2.8%
High school diploma	150	32.8%	82	33.9%	68	31.6%
Two-year degree	85	18.6%	51	21.1%	34	15.8%
Bachelors degree	116	25.4%	62	25.6%	54	25.1%
Masters degree	55	12.0%	29	12.0%	26	12.1%
Professional/doctoral degree	38	8.3%	11	4.5%	27	12.6%
Total	457	100.0%	242	100.0%	215	100.0%

Appendix III

Statistical Analyses

Two main types of statistical testing were applied to analyzing this survey. The first type of analysis used was the chi-square test. This test relies on frequency or count data and helps researchers see if the frequency of cases possessing a given quality (i.e., how respondents answer a given question) varies among levels of a given factor (e.g., demographic variables). Specifically, for the purposes of this survey we are often interested in detecting the presence of differences in response to questions among two or more groups.

The second form of statistical analysis applied to this survey was multiple linear regression. With this procedure we are interested in predicting the mean of a dependent variable by using one or more independent variables. For our purposes, we are interested in predicting respondents' answers to certain questions (e.g., overall satisfaction with the E-Check program) by using answers from other questions (e.g., demographics). Several statistics and parameters are provided below that present various pieces of information.

- First, the *adjusted R²* provides an index as to how much explanation power the predictors (or independent variables) have on the criterion (or dependent variable) and is indexed between 0 and 1. For the first regression analysis below, the *adjusted R²* is 0.67, which means that the regression model predicts 67% of the variation in scores of the dependent variable.
- Second, β is a standardized regression coefficient estimated from the regression model. It provides an indication of the magnitude and direction of relationship between the predictor and criterion. If the β is a positive number, then we know they are positively related. Conversely, if β is a negative number, then we know they are negatively related. It is important to take into consideration how the variables are coded in order to understand the nature of a positive or negative relationship.

*Regression Analysis for Variables Related to
Overall Test Experience Satisfaction Q27 (N = 202)*

Variable	β
Zone	-0.01
33. Gender	0.06
34. Age	-0.01
35. Household Income	0.01
38. Education	-0.06
11. Did your vehicle fail the E-Check test?	-0.01
12. E-Check exemptions and extensions?	0.09
13. E-Check vehicle testing standards (technical thresholds that determine pass/fail)?	-0.08
14. When my vehicle needs testing?	0.00
15. Why my vehicle needs testing?	0.06
16. Why E-Check is not statewide?	-0.11**
17. The length of wait at the E-Check facility was too long.	0.04
18. The waiting booth was clean.	-0.01
19. The E-Check employees were polite.	0.12
20. The E-Check employees were helpful.	0.03
21. The E-Check employees knew how to do their job.	0.07
22. I was concerned my vehicle would be damaged during the E-Check process.	-0.14**
23. I would have liked a better explanation of what was happening to my vehicle during the testing.	-0.04
24. Everything was explained well when I received my test results.	-0.03
25. I believe the test results were accurate.	0.06
26. I was treated well by employees at the E-Check facility.	0.40**
28. The E-Check station was easy to find.	0.03
32. The Ohio EPA is doing a good job of running the E-Check Program	0.29**

Note. Items 12-16 were coded 1 = Yes and 2 = No. Items 17-32 were coded 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree. For the sample, *Adjusted R*² = 0.67 (*F*(23,178) = 18.66, *p* < 0.05). ***p* < 0.05.

Regression Analysis for Variables Related to

Vehicle emissions testing can help reduce air pollution Q29 (N = 340)

Variable	β
Zone	0.10
33. Gender	0.04
34. Age	0.01
35. Household Income	-0.01
36. Education	0.15**

Note. Item 29 was coded 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree. For the sample, *Adjusted R*² = 0.02 (*F*(5,339) = 2.59, *p* < 0.05). ***p* < 0.05.

Regression Analysis for Variables Related

Ohio EPA is doing a good job of running the E-Check program to Q32 (N = 294)

Variable	β
Zone	0.12**
33. Gender	0.17**
34. Age	0.10
35. Household Income	-0.03
36. Education	0.08

Note. Item 32 was coded 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree. For the sample, *Adjusted R*² = 0.06 (*F*(5,293) = 3.69, *p* < 0.05). ***p* < 0.05.



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