The Cities of Kent and Tukwila

Stormwater Community Research Report

April, 2011

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Table of Contents

Goal

Research Goal:
The goal of this research is to measure the public's knowledge and practices regarding stormwater in the cities of Kent and Tukwila using a telephone survey. This research was completed at the request of the participating cities and may be used for stormwater planning and partial compliance with National Pollutant Discharge Elimination System (NPDES) Phase II permit compliance requirements in Washington State.

Content Areas for the Survey:
The "general public" is defined as: adults (18 years of age and older) who speak English and live in the cities of Kent and Tukwila. The subjects covered included:

- General impacts of stormwater flows into surface waters.
- Knowledge of the benefit of pervious surfaces.
- Source control BMPs and environmental stewardship actions and opportunities in the areas of pet waste, vehicle maintenance, and landscaping.
- BMPs for use and storage of automotive parts, hazardous cleaning supplies, carwash soaps and other hazardous materials.
- Knowledge of what constitutes an illicit discharge and how to report it.
- Yard care techniques relating to protecting stormwater quality and knowledge of what constitutes pollution in the yard.
- BMPs for use and storage of pesticides and fertilizers.
- BMPs for the disposal of carpet cleaning fluids.
- BMPs for auto maintenance.

Methodology

The survey was created for the general public for administration within each of the participating cities. Survey questions were developed by Hebert Research with input from each city. The survey consisted of 30 questions with 27 of them relating directly to knowledge about stormwater issues and practices respondents had adopted which protect the quality of stormwater. The remaining three questions dealt with an overall assessment of surface water quality, to whom illicit discharges should be reported and the age of the respondent.

Sample

The sample for Kent was determined through identifying Census Tracts from the US Census Bureau within Kent. Hebert Research then purchased a list of phone numbers of residents within the selected Census Tracts from a reputable vendor. A random sample of phone numbers was drawn from the selected Tracts by the vendor.

A list containing over 1000 telephone numbers appearing in the telephone directory was purchased from a reputable commercial list company for Tukwila. The list company maintains a record of all telephone numbers appearing in all phone books in the United States cross-referenced by zip code. Using the zip codes covering the study area, the list company drew a random sample of phone numbers.

The random draw of these phone numbers assures proper proportionate sampling. High density areas have more phone numbers and, by randomly drawing from the list, the high and low density areas are properly proportioned. The resulting list for each city was loaded into Hebert Research's CATI (Computer-Aided Telephone Interviewing) system which randomly selects phone numbers as required during the interviewing process. Phone numbers were called up to five times at different times during the day and evening. This helped to assure that the survey is administered to both those who are easy to reach and those who are more difficult to contact.

The following table represents the obtained, random sample for each of the participating cities:

Sample Totals	
City	**Sample Size**
Kent	104
Tukwila	100
Total Sample	**204**

Research Controls

Hebert Research applied a variety of controls to help ensure that the research and analysis reached the highest quality that can be provided. The primary research controls that were employed in this study included the following:

Interviewer Training
All interviewers participated in a special training session for this study. During this training session, the questionnaire was read and a discussion was held regarding the objectives of the study, screening questions, skip patterns, and techniques for handling potential problems. Interviewers raised questions and provided their professional feedback regarding potential interviewing issues. All issues were resolved.

Pre-test the Survey
After the questionnaire was programmed in our CATI system, it was rigorously tested to assure all questions were asked and that data was accurately recorded. Thirty surveys were conducted during the pretest. The programming was deemed to be valid.

Conduct Interviews
Following a successful pretest of the questionnaire, telephone interviews were conducted using Ci3 CATI software from Sawtooth Software, a recognized leader in computer-aided interviewing. Potential respondents were called on weekdays at various times throughout the afternoon and evening until 9:00 pm. An appointment and callback procedure was used when necessary to minimize refusals and allow respondents to complete the survey at a convenient time. Interviews were conducted in English.

Monitoring
Telephone interviews were regularly monitored by the data collection supervisor and were found to be properly conducted.

Internal Peer Review
Hebert Research uses an internal review process called "CERA" (create, edit, review, approve) which is similar to academic peer review to ensure that each study meets or exceeds rigorous quality control standards. Through this process, several analysts review the statistical findings and offer critical feedback designed to increase the utility of the research and produce a clear and insightful report.

Incidence and Response Rates, Margin of Error
A total of 204 surveys were completed with adults living within the zip codes of Kent and Tukwila. At the 95% confidence level, the maximum margin of error for a sample size of 104 respondents is ±9.6% and for a sample size of 100 is ±9.8%. For the entire sample of the two cities combined (204 respondents), the maximum margin of error is ±6.9%. This margin of error means that if the two-city survey was repeated 100 times, the resulting percents for each question for the two cities combined would be within ±6.9% (the margin of error) in 95 out of 100 cases for each question.

Over 1,000 phone numbers of residences in each city were called. Many of these calls went unanswered or went to voicemail. When a resident answered the phone and contact was made, we asked the respondent to participate in the survey. The *incidence rate* represents the percent of individuals we spoke to who were qualified to take the survey, meaning they spoke English and reported living within the city. The *response rate* represents the percent of qualified individuals we spoke to who agreed to participate and who completed an interview. Response

rates above 50.0% are higher compared to other community-wide surveys and serve to increase confidence in the survey's validity and reliability.

Sampling Frame		
City	**Incidence Rate**	**Response Rate**
Kent	55.0%	54.1%
Tukwila	37.9%	53.6%

Statistical Weighting

Statistical weighting is a technique that is commonly used in survey research to correct for sampling bias. During the process of data collection, demographic data from the U.S. Census was obtained to identify population parameters for the zip codes involved in the survey. Sample demographics—specifically, age and gender—were compared with distributions in the population within each city. To compensate for potential sampling bias (e.g., interviewing a disproportionately high number of females), weights were calculated and applied to the survey sample for each city in order to ensure that gender and age distributions were represented in the proper proportion according to census statistics. After being weighted by age and gender, the samples for each city were then weighted by population to assure a proper proportionate representation across the two cities combined to determine the results for the Region (the area made up of the two cities combined). In the final weighting analysis, it was concluded that each sample was representative of the population for each city within the critical parameters of gender and age and for the region (*region* is defined for this report as the two cities combined) according to gender, age and population density.

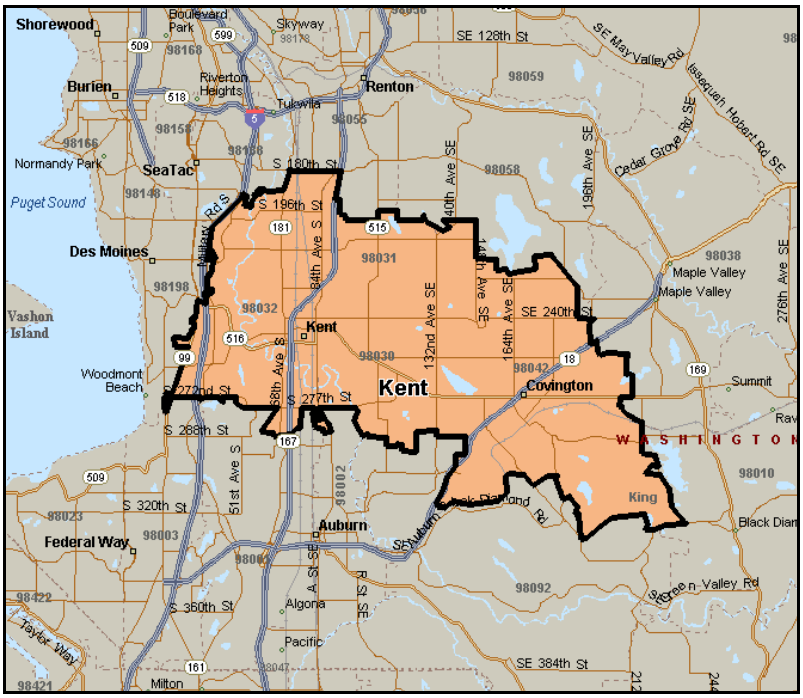
Use of Findings

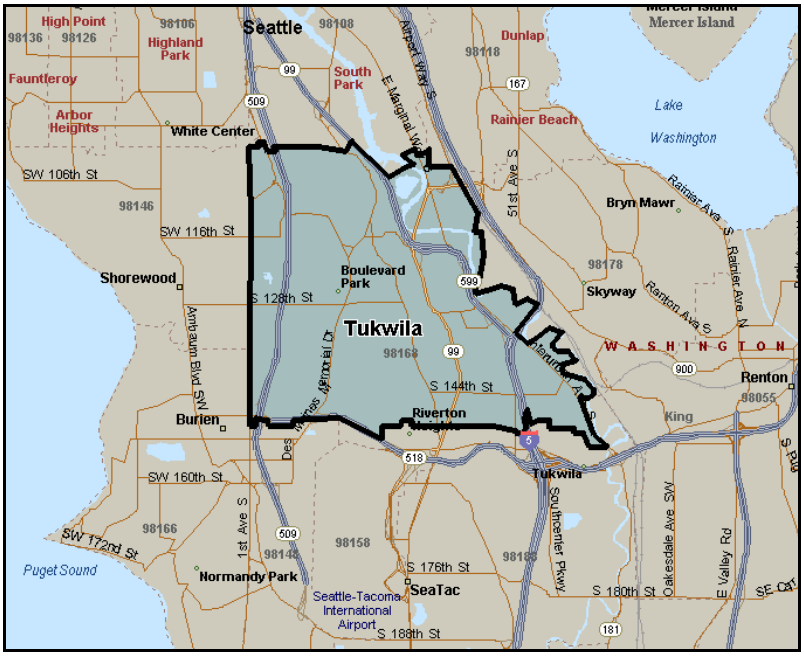
Hebert Research has made every effort to produce the highest quality research product within the agreed specifications, budget and schedule. The customer understands that Hebert Research uses those statistical techniques, which, in its opinion, are the most accurate possible. However, inherent in any statistical process is a possibility of error, which must be taken into account in evaluating the results. Statistical research can reveal information regarding community perceptions only as of the time of the sampling, within the parameters of the project, and within the margin of error inherent in the techniques used.

Evaluations and interpretations of statistical research findings and decisions based on them are solely the responsibility of the customer and not Hebert Research. The conclusions, summaries and interpretations provided by Hebert Research are based strictly on the analysis of the data gathered, and are not to be construed as recommendations; therefore, Hebert Research neither warrants their viability nor assumes responsibility for the success or failure of any customer actions subsequently taken.

Geographic Area Surveyed

The map below shows the geographic area covered by the zip codes of the two cities in the study (98030, 98031, 98032, and 98042 for Kent and 98168 for Tukwila).





Explanation of Multivariate Analysis

The data for the surveys were analyzed using the chi square statistic to examine differences between respondents on a regional basis according to age and gender. Responses for the knowledge questions were first categorized as being a correct response or an incorrect response. The incorrect response category was made up of wrong answers plus responses classified as "need more information," "don't know/refused," and "not applicable." Following classification, the chi square test was executed. For the questions dealing with the actions of the respondents, those who said the action did not apply to them were first eliminated from the data set. Following their removal, the categories were classified as being "correct" or "incorrect" with the "incorrect" classification consisting of the collapsed categories as described above. The statistical test was run using these two categories.

Hypotheses were tested using the *0.05 level of significance* as the criterion value for the chi square analysis. When differences between groups reached this value, the finding is reported along with its *level of significance* which is stated as a *p value* (e.g., $p = 0.04$). Chi square results that reach the 0.05 level of significance indicate there is at least a 19-out-of-20 likelihood that the finding is true. This is a generally accepted level of reliability for public surveys.

In addition to measures of significance in which differences have been determined at the 0.05 level, a measurement of association is also reported. This measure shows the strength of association or dependency between the variables being tested such as the response to a question and gender. A measurement of 0 indicates there is no association between the two. It represents a null relationship. A measurement of 1 indicates perfect association or, to continue the example, gender is completely predictive of the response to the question. This measure of association is called Cramer's V.

Respondent Profile

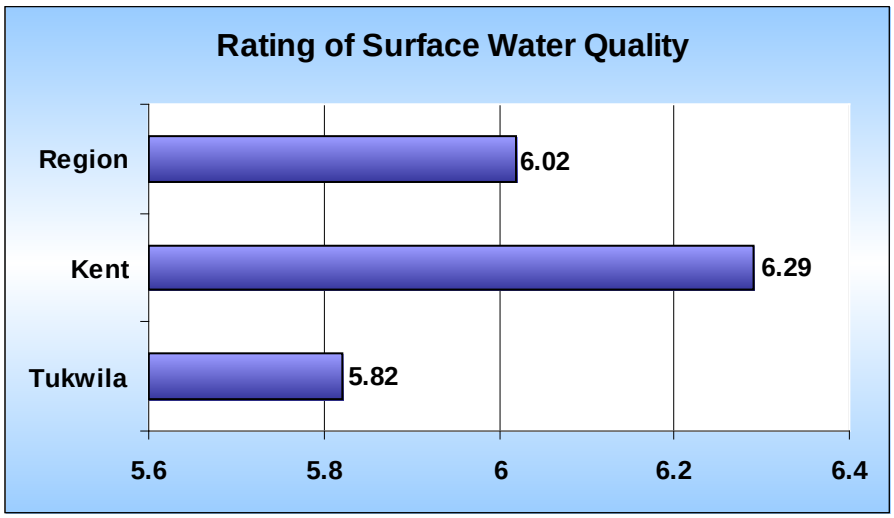
The following tables describe the demographic profile of the sample. As indicated in the methodology section, the sample was statistically weighted to match the populations of Kent and Tukwila by gender and age. The figures appearing in the table represent weighted values.

Age	Region	Kent	Tukwila
18 - 24	13.9%	14.4%	11.5%
25 - 34	22.2%	21.8%	24.2%
35 - 44	21.3%	21.2%	21.9%
45 - 54	19.4%	19.7%	18.1%
55 - 64	12.5%	12.1%	14.6%
65 or Older	10.6%	10.8%	9.6%

Gender	Region	Kent	Tukwila
Male	50.4%	50.5%	50.0%
Female	49.6%	49.5%	50.0%

Cities Show Similar Overall Perception Regarding Surface Water Quality
Respondents rated the quality of water in our rivers, wetlands and lakes and in Puget Sound on a "0" to "10" scale where "0" meant "extremely polluted" and "10" meant "extremely clean." Respondent ratings in Kent and Tukwila were similar in their assessment of the quality of surface water in our region with ratings of 6.29 for Kent and 5.82 for Tukwila.

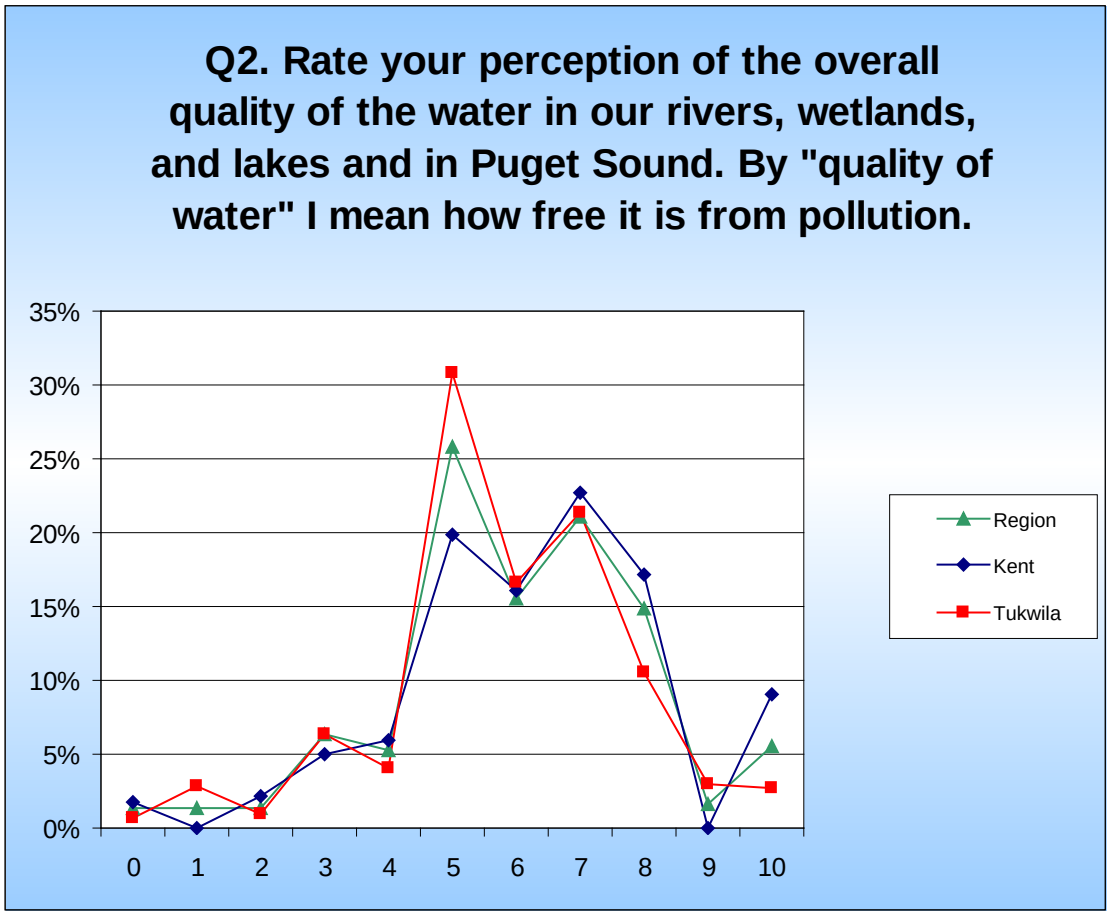
Figure 1. Respondent Rating of Surface Water Quality by Area



For the region represented by the two cities, the average rating of 6.02 suggests the public sees these waters as being clean, but on a relatively low level. The shape of the curve (see Figure 2 below) suggests a classic normal distribution of scores which is shifted to the right, toward the high end of the scale. A classic normal distribution would result if: 1) the information available to the public provided a confusing picture of surface water as being both high and low in quality, or 2) respondents possessed little knowledge about water quality and guessed at an answer.

The fact that residents rated the quality of water across the scale shows high variability in the public's perception of the quality of surface waters. The shift in average ratings from the middle toward the high end of the rating scale suggests the public, as a whole, views water quality as being generally clean but with some uncertainty. The similarity of the distribution of ratings to the normal curve suggests that the residents in each city are unclear about how clean the water is and that many respondents may have taken a guess at it.

Figure 2. Rating by General Public of the Quality of Water in the Environment (0 to 10 scale where "0" meant "extremely polluted" and "10" meant "extremely clean.")



Public Needs a Better Awareness of the Problem

The implication of this finding for education purposes is that the public needs to be more deeply informed regarding the current levels of pollution in rivers, wetlands and lakes and in Puget Sound. Using social marketing techniques, educational efforts should communicate: 1) the current nature, severity and negative effects of surface water pollution originating in stormwater, 2) the quality of stormwater that is desired and a vision of clean water in the future, 3) the many positive outcomes that will result from constructive public action to preserve the quality of stormwater, and 4) the helpful practices individuals need to adopt to prevent polluting stormwater. The more real the public perceives the problems and the benefits and the more advertising employs effective social marketing techniques, the greater the impact and response will be. If cities can go beyond simple education and offer programs that help to overcome obstacles to change, the opportunity for success increases. For example, many people resist changing their behavior if it will cost them money. Programs that will eliminate or reduce the monetary cost will have a much higher chance of success. If, for example, the city can offer a program where citizens receive money-saving coupons for using a commercial car wash instead of washing their car on the street where soapy water enters the stormwater drainage system, the likelihood of changing the public's behavior in a desirable direction rises.

Areas of Greatest Educational Need

The two main purposes of this survey are to establish a baseline of the public's knowledge and practices regarding stormwater and to provide direction for each city's public education program to meet the requirements in the NPDES Phase II Permit in WA. The survey tested the public's knowledge and practices regarding 27 key issues and the resulting data provides baseline measures against which to assess future improvement as a result of each city's social marketing programming.

The priorities for education resulting from this research are divided into three levels based on the percent of the respondents across the region who provided a correct answer—the lower the percent of correct answers given, the higher the priority for education.

- Priority 1: Less than 50% correct answers (Table 1)
- Priority 2: From 50 to 80% correct answers (Table 2)
- Priority 3: Over 80% correct answers (Table 3)

In administering the questionnaire, respondents were presented with statements that were either true or false and were asked if they agreed or disagreed with the statement. Each of the statements in the tables appearing below include a letter indicating the correct answer for that statement, an **A** for "Agree" and a **D** for "Disagree." When the word "**Adopt"** appears, it means the statement deals with whether respondents have "adopted" the desirable behavior mentioned in the statement. The combination of "**A Adopt**," then, means the question deals with behavior and the desired response is "**A"** for "Agree"—which equates to the respondent saying that he or she engages in the desired behavior mentioned in the statement.

Rank for Education
1
2
3
4-9
10-18
19-23
24
25
26
27

All issues in Tables 1, 2 and 3 are ordered by the city's rank for education. The ranking of issues for the Region is also shown with a color code as shown in the "Rank for Education" table on the left. The top rank item for education is colored bright green. Also a "1" appears underneath the percentage in the cell. The least important issue is a magenta color with "27" appearing underneath the percentage of correct answers given by respondents.

Priority 1 Issues: Less than 50% Correct Answers in the Region

Across the Region, less than 50% of the public gave the correct answer to seven issues (25.9% of the 27 issues tested, see Table 1). The seven lowest scoring issues for Kent and Tukwila were the same for the first five issues and varied by only one ranking position for two issues. Tukwila residents provided a higher percent of correct answers for every Priority 1 issue compared to Kent indicating a higher level of correct knowledge and awareness regarding these stormwater issues.

Table 1. Priority 1 Issues for Public Education Ranked by Region

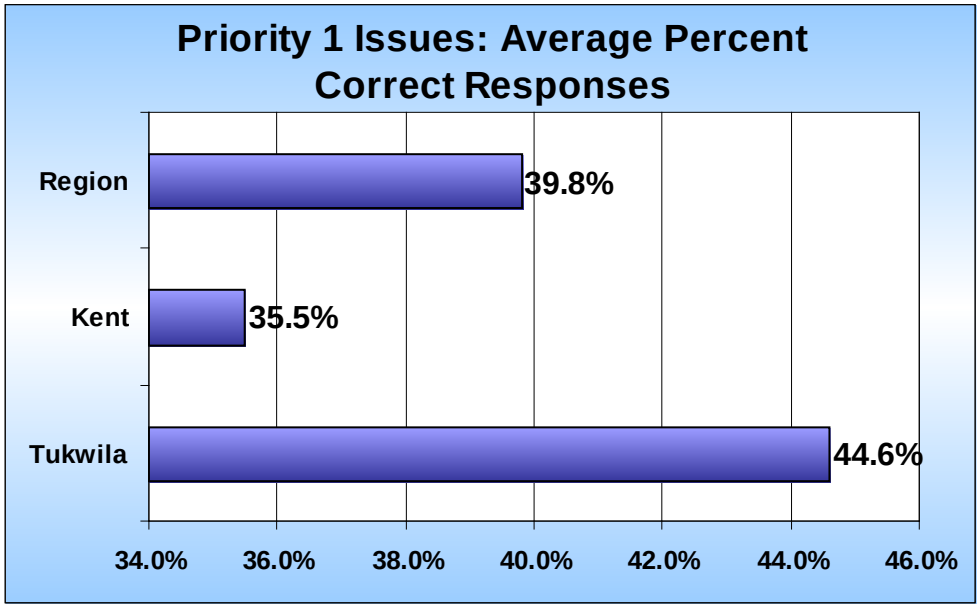
Rank for Education	Question	% Correct Responses by Area		
		Region	Kent	Tukwila
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	27.3% 1	24.5% 1	31.0% 1
2	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	35.3% 2	31.2% 2	42.1% 2
3	5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. **D**	38.2% 3	31.6% 3	43.6% 3
4	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	38.5% 4	32.3% 4	45.8% 4
5	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	43.9% 5	40.6% 5	46.5% 5
6	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	47.6% 6	41.6% 6	53.3% 7
7	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	47.8% 7	46.5% 8	50.0% 6

**Blue indicates a question dealing with behavior, what the respondent does. Percents apply only to respondents who said the question applied to them.*

Table Note: All "Does not apply" responses to knowledge questions were added to the "Incorrect" response category since all knowledge questions apply to all respondents. This rule applies to all the tables in the report.

Kent Shows a Greater Need for Education
As shown in Figure 3, residents of Kent, on average, gave a substantially lower percent of correct answers than Tukwila residents for Priority 1 issues, suggesting a stronger need for educational programming exists in Kent.

Figure 3: Percent Correct Responses to Priority 1 Issues by Area



Issues Involving Soap Show High Need for Education
The residents in Kent and Tukwila show low awareness of correct practices involving soap. Issues involving soap have the greatest potential for demonstrating improved community knowledge as a result of educational programming. Educational programming should convey the following messages:

- *Biodegradable soap is not a safe addition to stormwater drains and should be kept from running into the stormwater drainage system.*
- *Motor vehicles should be washed in an area where the soapy runoff will be absorbed by the ground or the vehicles should be taken to a commercial car wash. Soapy water, including biodegradable soap, should not be allowed to flow into the street or into a drainage ditch.*

Knowledge of Pollution Sources and the Stormwater Drainage System are Lacking
Other low scoring issues for the cities dealt with how the stormwater drainage system works. Six out of ten respondents in the two cities (61.8%) did not know that individual human activity, not industrial dumping, is the primary cause of pollution in rivers, wetlands, and lakes and in Puget Sound. Residents in both cities were similarly unaware that stormwater drains are not connected to the sanitary sewer system.

Knowledge of how rivers, wetlands, and lakes and the marine waters of Puget Sound become polluted by stormwater is an essential precursor to improving understanding, raising the desire to act responsibly, and bringing about behavioral change. Educational programming in both cities should convey the following messages:

- *The primary cause of pollution in stormwater runoff is individual human activity, not industrial dumping. Success in reducing environmental pollution depends upon everyone's participation in helping to make a difference.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is all stormwater treated to remove pollutants before being released into the environment. Therefore, the quality of stormwater going into the drainage system is what determines the level of pollution in surface water.*

Actions to Prevent Polluting Stormwater Need Emphasis

Responses to questions regarding pavers, sediment, and grass clippings also revealed relatively low levels of informed awareness in the community and indicated a need for public education. Nearly two out of three respondents in the combined cities (64.7%) were not aware that bricks and pavers offer an advantage in reducing storm water runoff. Less than half of the respondents across the two cities combined knew that sediment, grass clippings and leaves constituted pollution. The following messages should be conveyed:

- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*
- *Sediment is pollution and should be prevented from entering the stormwater drainage system.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Related Multivariate Analysis Findings

Q3. Men show significantly higher awareness than women that the drains on city streets for stormwater are not connected to the same sanitary sewer system used for treating human waste ($p < .001$, Cramer's $V = .298$).

Gender	Correct	Incorrect
Male	58.3%	41.7%
Female	28.7%	71.3%

Priority 2 Issues: From 50-80% Correct Answers

Priority 2 Issues represent areas of knowledge or behavior where at least half of the public knows what is correct. Thirteen issues made this list (see Table 2 on the next page) which constitutes 48.1% of the 27 issues tested. While this more desirable level of public knowledge is a step in the right direction, more can and needs to be done to further raise the public's level of knowledge. These areas continue to represent genuine opportunities for reducing surface water pollution in stormwater runoff.

Overall, the Priority 2 list shows a good deal of similarity in the rank of issues indicating that respondents in both cities are similarly informed regarding these stormwater subjects. However, the degree to which residents in Kent are informed about some issues did vary a good deal compared to Tukwila. Differences between cities in the percent of correct responses ranged from a low of 2.0% to a high of 15.0%. For example, Kent residents appeared to be less aware than Tukwila residents that all water in a stormwater drain is not treated (44.1% correct answers for Kent, 59.1% correct for Tukwila).

Two issues on the Priority 2 list should be included among the Priority 1 items as issues that are fundamental to generating increased responsible action in the public domain. The first issue is the fact that about half of the respondents in the Region were not aware that all water going into stormwater drains is not treated before being discharged into the environment. Correcting this lack of understanding can be a major step forward to expanded public recognition and alertness to actions that contribute to surface water pollution and to subsequent behavioral improvement. Awareness of the problem is the first necessary step on the road to behavioral change.

The second issue on the Priority 2 list that should be elevated to Priority 1 is knowledge of the definition of an illicit discharge. About four out of ten respondents overall were not aware that anything in stormwater other than water is pollution. As a beginning point and a key precursor for positive action, knowing the definition of an illicit discharge will help individuals make better decisions regarding how to protect stormwater quality when facing new situations with a potential for creating pollution. For this issue, Kent residents appeared to be better informed than Tukwila residents (67.2% correct responses for Kent vs. 58.5% for Tukwila).

Table 2. Priority 2 Issues for Public Education

Rank for Education	Question	% Correct Responses by Area		
		Region	Kent	Tukwila
8	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	51.1% 8	44.1% 7	59.1% 9
9	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	59.3% 9	56.1% 9	60.7% 10
10	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	60% 10	58.9% 10	62.5% 12
11	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	60.7% 11	59.5% 11	64.0% 13
12	29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	62.1% 12	67.2% 13	58.5% 8
13	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	64.3% 13	66.6% 12	61.5% 11
14	10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**	69.3% 14	73.3% 18	67.2% 14
15	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	71.1% 15	69.9% 15	71.9% 15
16	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	73.0% 16	69.2% 14	77.4% 16
17	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	74.7% 17	74.9% 19	78.0% 17
18	12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**	76.7% 18	72.2% 17	82.0% 20
19	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	77.8% 19	71.1% 16	85.6% 23
20	9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**	77.9% 20	75.4% 20	81.8% 19

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them.*

Related Multivariate Analysis Findings

Q6. Women showed significantly less awareness than men that all water going into stormwater drains is not treated before being discharged into the environment (p = .003, Cramer's V = .206).

Gender	Correct	Incorrect
Male	61.2%	40.6%
Female	40.7%	59.4%

Q17. Men were significantly more aware than women that washing a car at a commercial car wash creates less pollution than washing a car on the street with biodegradable soap (p = .027, Cramer's V = .155).

Gender	Correct	Incorrect
Male	67.6%	32.4%
Female	52.5%	47.5%

Q27. Men showed significantly higher awareness compared to women that carpet shampoo wastewater cannot safely be added to a stormwater drain (p = .033, Cramer's V = .150).

Gender	Correct	Incorrect
Male	79.6%	20.4%
Female	66.3%	33.7%

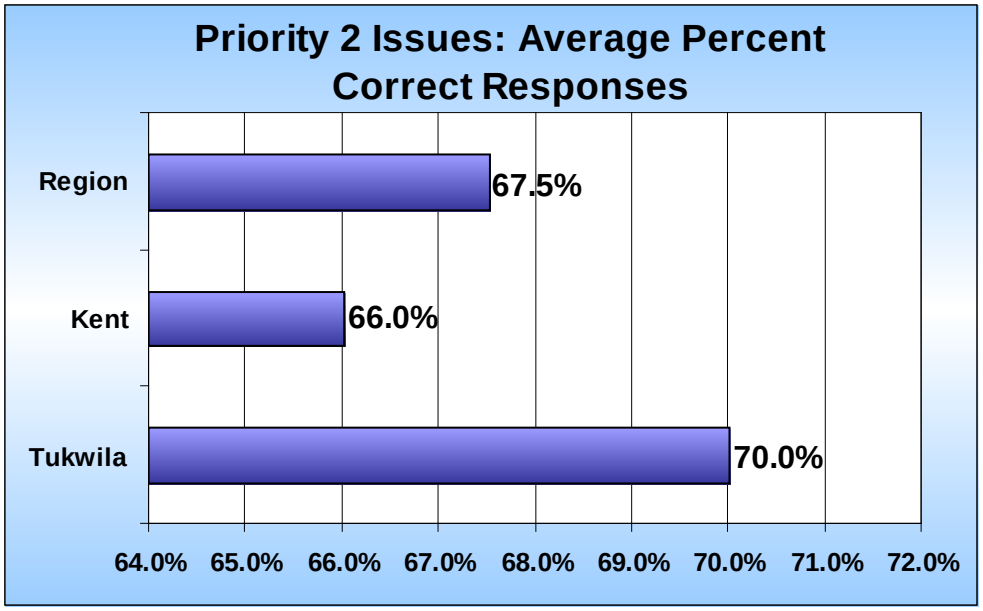
Q29. Men were significantly more aware than women that an illicit or unlawful stormwater discharge is primarily defined as anything that enters a stormwater drain system that is not made up entirely of stormwater (p = .004, Cramer's V = .200).

Gender	Correct	Incorrect
Male	71.8%	28.2%
Female	52.5%	47.5%

Cities Vary in Correct Knowledge about Priority 2 Issues

Figure 4 compares the percent of correct responses given by citizens in each city for all Priority 2 issues. Respondents living in Tukwila showed a higher percent of correct responses across Priority 2 issues (70.0%) than did respondents living in Kent (66.0%).

Figure 4: Percent Correct Responses to Priority 2 Issues by Area



Educational Messages Are Needed for These Issues

In order of importance, the following messages should be included in educational programming on a regional basis:

- *All water going into stormwater drains is **not** treated before being discharged into the environment.*
- *Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. Therefore, to reduce environmental pollution, the challenge to the community is to help keep stormwater runoff pollution free.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*
- *An illicit or unlawful discharge is anything that enters a storm drain system that is not made up entirely of stormwater.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *Applying soap to oil and grease spots on outdoor concrete or asphalt and rinsing it off with a hose is not a good method for protecting stormwater runoff.*
- *Hard surfaces are significant contributors to pollution in stormwater runoff. Hence, it is important to keep hard surfaces clean using acceptable cleaning techniques and, where possible, convert impervious surfaces to pervious surfaces.*
- *Carpet shampoo wastewater causes pollution to the environment and should not be disposed of in a stormwater drain.*

- *A mulching lawnmower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *Store auto or truck parts with oil or grease on them under a roof or cover.*
- *Direct downspouts to areas on land where the runoff will be absorbed by the ground to avoid the water entering the stormwater system.*
- *Clean up oil and grease spots on outdoor concrete or asphalt with soap and absorb the residue using kitty litter or paper towels which should then be disposed of in the garbage can.*

Priority 3 Issues: Higher than 80% Correct Answers

The remaining seven issues (25.9% of the 27 issues tested) deal with specific practices respondents reported engaging in. High uniformity in rank and percent of correct answers given by residents in the two cities can be seen in Table 3 below, indicating that residents in the two cities are quite similar in how they deal with these issues in their lives.

While respondents indicated in high percentages that they engage in these positive behaviors, a question can be raised whether this is actually the case or whether respondents are simply providing the recognized, and socially acceptable correct answer. What this data indicates is that at least respondents are quite aware of the proper actions to take if not actually practicing them. Since a high percentage of respondents say they are already practicing these desirable behaviors, dollars spent to further raise public awareness and promote behavioral change in these areas will have a rather small target market—namely, the 4% to 20% of the population in the Region who are not currently engaging in these desirable behaviors. Because the number of people is so small, the ability to raise the percent of correct responses in these areas will be much more difficult to achieve and document compared to Priority 1 and Priority 2 issues.

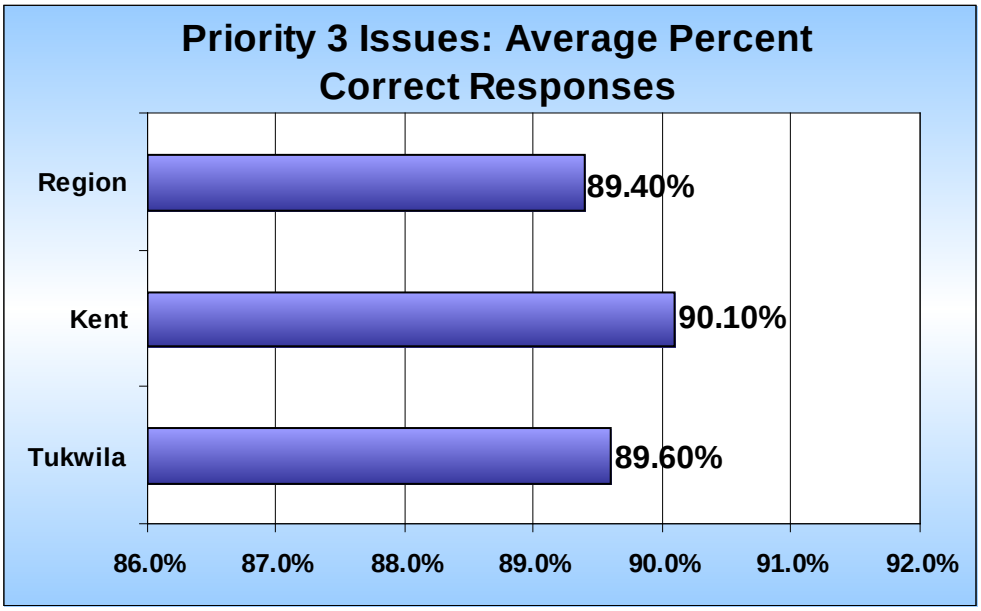
Table 3. Priority 3 Issues for Public Education

Rank for Education	Question	% Correct Responses by Area		
		Region	Kent	Tukwila
21	13. My household recycles all used motor oil. **A Adopt**	80.6% 21	82.4% 21	80.3% 18
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	86.6% 22	87.4% 22	85.5% 22
23	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	89.0% 23	93.8% 26	85.4% 21
24	26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**	90.9% 24	89.9% 23	93.2% 25
25	25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**	91.1% 25	92.0% 25	91.1% 24
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	92.0% 26	91.0% 24	93.2% 26
27	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	95.9% 27	94.5% 27	98.2% 27

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them.*

On average, respondents living in Kent and Tukwila showed a similar level of high compliance with Priority 3 behaviors which are friendly to stormwater.

Figure 5: Percent Correct Responses to Priority 3 Issues by Area



Practices

Because of their already high awareness, one may assume that minimal social marketing needs to be done in these areas. Given the potential for negatively impacting stormwater which these items represent, however, it remains advisable to continue educating the public on these issues but at a lower level of emphasis compared to Priority 1 and 2 issues. The messages to be communicated are:

- *Recycle used motor oil.*
- *Fix auto or truck oil leaks within three weeks.*
- *Pick up pet waste when outside.*
- *Apply fertilizer at recommended rates.*
- *Apply insecticides or weed killer at recommended rates*
- *Store containers holding oil or antifreeze under a roof or cover.*
- *Store all yard fertilizers and pesticides inside a building or in a covered area out of the rain.*

Related Multivariate Analysis Findings

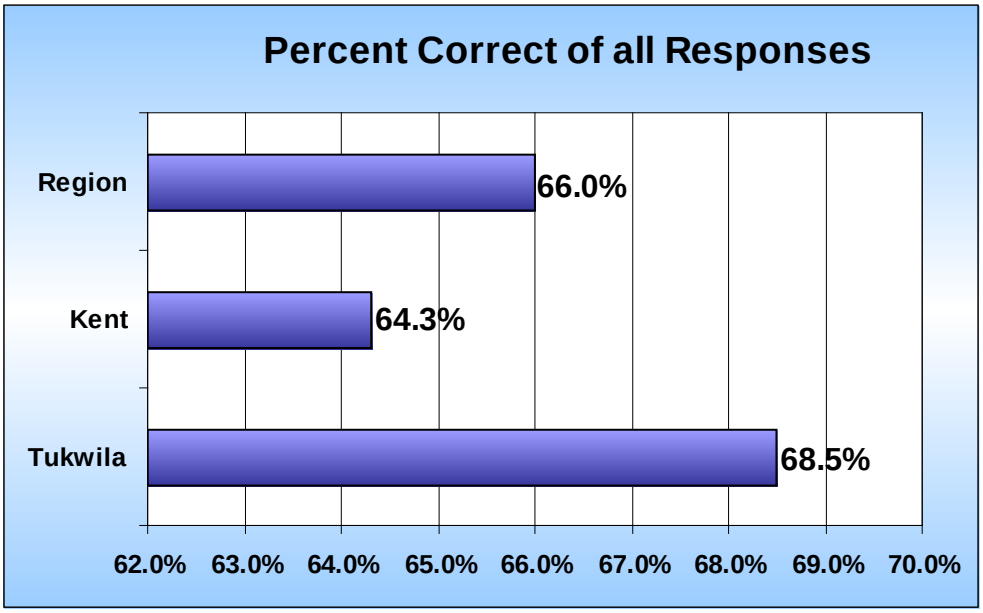
Q24. Men were significantly more likely than women to report that they store all of their household's fertilizers and pesticides in a building or covered area (p = .038, Cramer's V = .160).

Gender	Correct	Incorrect
Male	98.9%	1.1%
Female	92.5%	7.5%

All Issues: Overall Percent Correct Responses is Very Uniform

Figure 6 shows the average percent of correct responses for all questions for Kent and Tukwila. The average number of correct responses for the two cities combined was 66.0%. The difference overall between the two cities in the number of correct responses was only 4.2%. Overall, Tukwila residents provided a higher percent of correct responses and appeared slightly more knowledgeable about the broad spectrum of stormwater issues tested in this research.

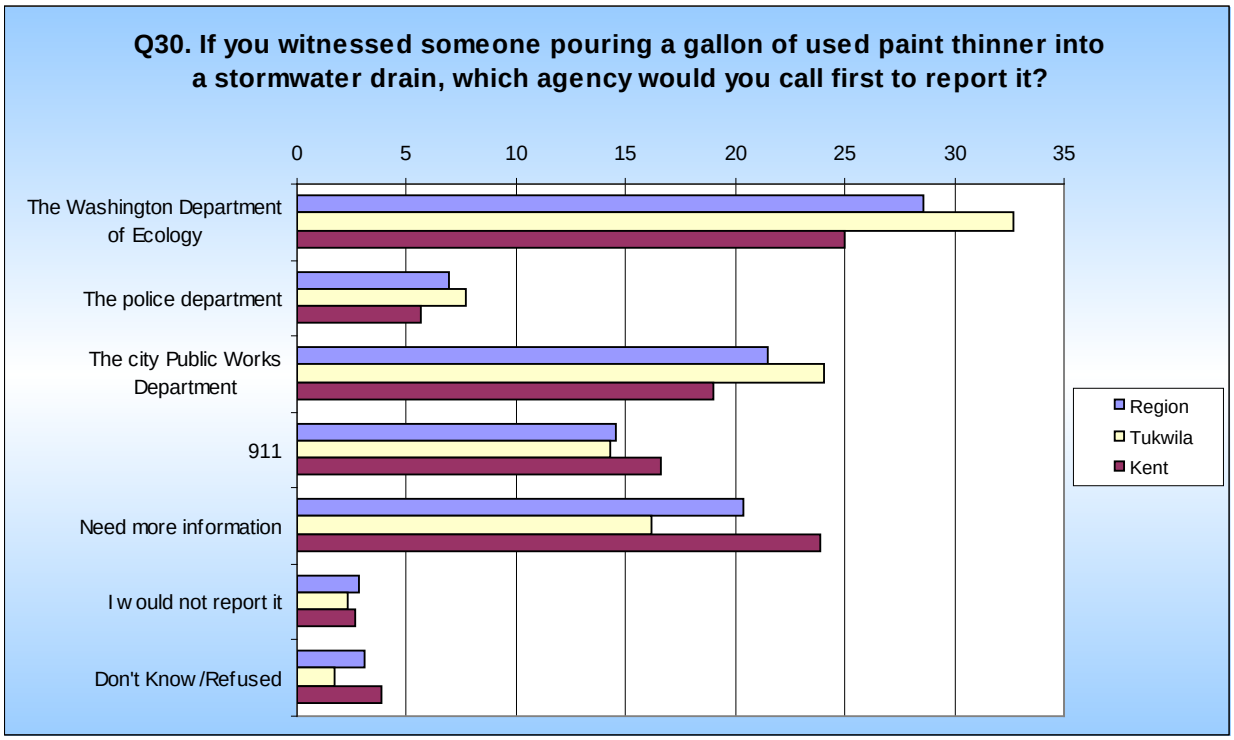
Figure 6: Percent Correct Responses Across All Questions by Area



Reporting an Illicit Discharge

To report an illicit discharge, respondents would call a variety of agencies with only 19.0% of Kent residents and 24.0% of Tukwila residents calling their City Public Works Department, the correct choice. If paint thinner in the stormwater system is regarded as a genuine emergency and 911 is included as a correct choice, then 35.6% of Kent respondents and 38.3% of Tukwila residents would have provided a correct answer. The fact that more than six out of ten respondents said they needed more information or would call an inappropriate agency such as the Department of Ecology, it is apparent that a good deal of public education is needed if illicit discharges are to be reported to the proper agency in the future. The following graph presents the responses by individual city.

Figure 7: Reporting an Illicit Discharge



The actual percent of responses given by respondents in each city appears in Table 4 below.

Table 4. Percent Reporting an Illicit Discharge to an Agency by City and Region

Agency	Region	Kent	Tukwila
The Washington Department of Ecology	28.6%	25.0%	32.1%
The Police Department	7.0%	5.7%	7.7%
The City Public Works Department	21.4%	19.0%	24.0%
911	14.5%	16.6%	14.3%
Need more information	20.4%	23.9%	16.1%
I would not Report it	2.8%	2.7%	2.3%
Don't Know / Refused	3.1%	3.9%	1.7%

City of Kent
Priority 1 Issues: 50% or Less Correct Answers

Knowledge and Practices

All Priority 1 questions for the City of Kent are shown in Table 5 below. These issues represent the areas which need the most attention. In order of importance, the following messages should be included in educational programming:

- *Biodegradable soap is not a safe addition to stormwater drains and should be kept from entering the stormwater drainage system.*
- *The primary cause of pollution in stormwater runoffs is individual human activity, not industrial dumping. Success in reducing environmental pollution depends upon everyone's participation in helping to make a difference.*
- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*
- *Wash your car in an area where the soapy runoff will be absorbed by the ground or take your car to a commercial car wash. Soapy water should not be allowed to flow into the street or into a drainage ditch.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is all stormwater treated to remove pollutants before being released into the environment. Therefore, the quality of stormwater going into the drainage system is what determines the level of pollution in surface water.*
- *Sediment is pollution and should be prevented from entering the stormwater drainage system.*
- *All water going into stormwater drains is **not** treated before being discharged into the environment.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Table 5. Priority 1 Issues for Public Education

Rank for Education	Question	% Correct Responses
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	24.5% 1
2	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	31.2% 2
3	5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. **D**	31.6% 3
4	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	32.3% 4
5	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	40.6% 5
6	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	41.6% 6
7	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	44.1% 7
8	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	46.5% 8

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them*

Related Multivariate Analysis Findings for Kent

*Q3. Men were significantly more aware than women that drains on city streets are **not** connected to sanitary sewer systems (p < .001, Cramer's V = .348).*

Gender	Correct	Incorrect
Male	57.5%	42.3%
Female	23.5%	76.5%

Q6. Women showed significantly less awareness than men that all water going into stormwater drains is not treated before being discharged into the environment (p = .004, Cramer's V = .285).

Gender	Correct	Incorrect
Male	57.7%	42.3%
Female	29.4%	70.6%

City of Kent
Priority 2 Issues: 50% - 80% Correct Answers

Knowledge and Practices

All Priority 2 questions for the City of Kent are shown in Table 6 below. Although not as important as Priority 1 messages, Priority 2 areas retain importance in their ability to significantly reduce water pollution. In order of importance, the following messages should be included in educational programming:

- *Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. Therefore, to reduce environmental pollution, the challenge to the community is to help keep stormwater runoff pollution free.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *An illicit or unlawful discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *Carpet shampoo wastewater causes pollution to the environment and should not be disposed of in a stormwater drain.*
- *Hard surfaces are significant contributors to pollution in stormwater runoff. Hence, it is important to keep hard surfaces clean using acceptable cleaning techniques and, where possible, convert impervious surfaces to pervious surfaces.*
- *Direct downspouts to areas on land where the runoff will be absorbed by the ground to avoid the water entering the stormwater system.*
- *Store auto or truck parts with oil or grease on them under a roof or cover.*
- *Applying soap to oil and grease spots on outdoor concrete or asphalt and rinsing it off with a hose is not a good method for protecting stormwater runoff.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *Clean up oil and grease spots on outdoor concrete or asphalt with soap and absorb the residue using kitty litter or paper towels which should then be disposed of in the garbage can.*

Table 6. Priority 2 Issues for Public Education

Rank for Education	Question	% Correct Responses
9	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	56.1% 9
10	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	58.9% 10
11	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	59.5% 11
12	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	66.6% 12
13	29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	67.2% 13
14	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	69.2% 14
15	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	69.9% 15
16	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	71.1% 16
17	12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**	72.2% 17
18	10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**	73.3% 18
19	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	74.9% 19
20	9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**	75.4% 20

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them*

Related Multivariate Analysis Findings for Kent

Q10. Men were significantly more aware than women that scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is not a good way to prevent polluting stormwater runoff (p = .006, Cramer's V = .272).

Gender	Correct	Incorrect
Male	84.9%	15.1%
Female	60.8%	39.2%

Q23. Men were significantly more aware than women that using a mulching lawnmower reduces the need to fertilize a lawn (p = .005, Cramer's V = .278).

Gender	Correct	Incorrect
Male	86.8%	13.2%
Female	62.7%	37.3%

Q29. Men were significantly more aware than women that an illicit or unlawful stormwater discharge is primarily defined as anything that enters a stormwater drain system that is not made up entirely of stormwater (p < .001, Cramer's V = .341).

Gender	Correct	Incorrect
Male	83.0%	17.0%
Female	51.0%	49.0%

City of Kent
Priority 3 Issues: Higher than 80% Correct Answers

Knowledge and Practices

A high percentage of respondents in Kent gave the correct responses to seven questions regarding behaviors that are protective of stormwater. This suggests that high compliance with recommended actions is already taking place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal. Education should communicate the following actions to the public:

- *Recycle used motor oil.*
- *Fix auto or truck oil leaks within three weeks.*
- *Apply fertilizer at recommended rates.*
- *Store containers holding oil or antifreeze under a roof or cover.*
- *Apply insecticides or weed killer at recommended rates.*
- *Pick up pet waste when outside.*
- *Store all yard fertilizers and pesticides inside a building or in a covered area out of the rain.*

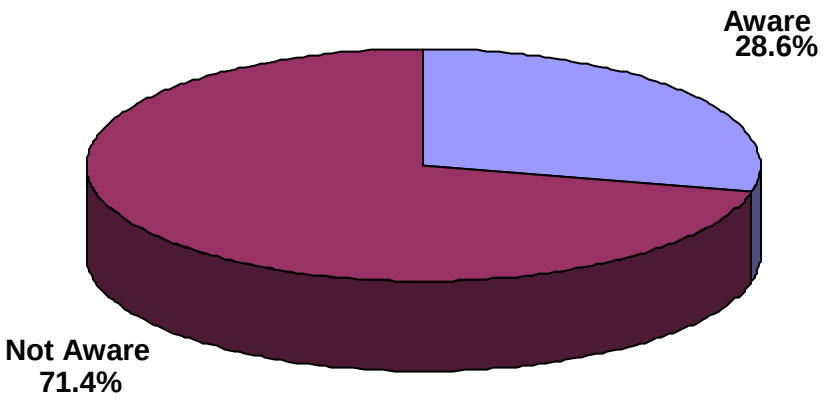
Table 7. Priority 3 Issues for Public Education

Rank for Education	Question	% Correct Responses
21	13. My household recycles all used motor oil. **A Adopt**	82.4% 21
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	87.4% 22
23	26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**	89.9% 23
24	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	91.0% 24
25	25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**	92.0% 25
26	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	93.8% 26
27	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	94.5% 27

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them*

Only 28.6% of respondents in Kent agreed with the statement that the city is carrying out *The Clean Water Project*. Nearly all other respondents said they did not know or needed more information.

The City of Kent is currently carrying out a program called *The Clean Water Project*.



City of Tukwila
Priority 1 Issues: 50% or Less Correct Answers

Knowledge and Practices

All Priority 1 questions for the City of Tukwila are shown in Table 8 below. These issues represent the areas which need the most attention. In order of importance, the following messages should be included in educational programming:

- *Biodegradable soap is not a safe addition to stormwater drains and should be kept from entering the stormwater drainage system.*
- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*
- *The primary cause of pollution in stormwater runoffs is individual human activity, not industrial dumping. Success in reducing environmental pollution depends upon everyone's participation in helping to make a difference.*
- *Wash your car in an area where the soapy runoff will be absorbed by the ground or take your car to a commercial car wash. Soapy water should not be allowed to flow into the street or into a drainage ditch.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is all stormwater treated to remove pollutants before being released into the environment. Therefore, the quality of stormwater going into the drainage system is what determines the level of pollution in surface water.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Table 8. Priority 1 Issues for Public Education

Rank for Education	Question	% Correct Responses
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	31.0% 1
2	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	42.1% 2
3	5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. **D**	43.6% 3
4	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	45.8% 4
5	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	46.5% 5
6	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	50.0% 6

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them*

Related Multivariate Analysis Findings for Tukwila

Q3. Men show significantly higher awareness than women that the drains on city streets for stormwater are not connected to the same sanitary sewer system used for treating human waste (p = .016, Cramer's V = .241).

Gender	Correct	Incorrect
Male	58.0%	42.0%
Female	34.0%	66.0%

City of Tukwila
Priority 2 Issues: 50% - 80% Correct Answers

Knowledge and Practices

All Priority 2 questions for the City of Tukwila are shown in Table 9 below. Although not as important as Priority 1 messages, Priority 2 areas retain importance in their ability to significantly reduce water pollution. In order of importance, the following messages should be included in educational programming:

- *Sediment is pollution and should be prevented from entering the stormwater drainage system.*
- *An illicit or unlawful discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *All water going into stormwater drains is **not** treated before being discharged into the environment.*
- *Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. Therefore, to reduce environmental pollution, the challenge to the community is to help keep stormwater runoff pollution free.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*
- *Applying soap to oil and grease spots on outdoor concrete or asphalt and rinsing it off with a hose is not a good method for protecting stormwater runoff.*
- *Hard surfaces are significant contributors to pollution in stormwater runoff. Hence, it is important to keep hard surfaces clean using acceptable cleaning techniques and, where possible, convert impervious surfaces to pervious surfaces.*
- *Carpet shampoo wastewater causes pollution to the environment and should not be disposed of in a stormwater drain.*
- *A mulching lawnmower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*

Table 9. Priority 2 Issues for Public Education

Rank for Education	Question	% Correct Responses
7	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	53.3% 7
8	29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	58.5% 8
9	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	59.1% 9
10	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	60.7% 10
11	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	61.5% 11
12	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	62.5% 12
13	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	64.0% 13
14	10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**	67.2% 14
15	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	71.9% 15
16	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	77.4% 16
17	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	78% 17

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them*

City of Tukwila
Priority 3 Issues: Higher than 80% Correct Answers

Knowledge and Practices

A high percent of respondents in Tukwila gave the correct responses to ten questions regarding behaviors that are protective of stormwater. This suggests that high compliance with recommended actions is already taking place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal. Education should communicate the following actions to the public:

- *Recycle used motor oil.*
- *Clean up oil and grease spots on outdoor concrete or asphalt with soap and absorb the residue using kitty litter or paper towels which should then be disposed of in the garbage can.*
- *Store auto or truck parts with oil or grease on them under a roof or cover.*
- *Pick up all pet waste when outside.*
- *Fix auto or truck oil leaks within three weeks.*
- *Direct downspouts to areas on land where the runoff will be absorbed by the ground to avoid the water entering the stormwater system.*
- *Apply insecticides or weed killer at recommended rates.*
- *Apply fertilizer at recommended rates.*
- *Store containers holding oil or antifreeze under a roof or cover.*
- *Store all yard fertilizers and pesticides inside a building or in a covered area out of the rain.*

Table 10. Priority 3 Issues for Public Education

Rank for Education	Question	% Correct Responses
18	13. My household recycles all used motor oil. **A Adopt**	80.3% 18
19	9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**	81.8% 19
20	12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**	82.0% 20
21	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	85.4% 21
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	85.5% 22
23	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	85.6% 23
24	25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**	91.1% 24
25	26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**	93.2% 25
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	93.2% 26
27	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	98.2% 27

**Blue indicates a question dealing with what the respondent does. Percents apply only to respondents who said the question applied to them*

Conclusions and Recommendations

It is clear that the residents living in Kent and Tukwila do not regard the water in our rivers, wetlands, and lakes, and in the marine waters of Puget Sound as "extremely clean" (meaning free from pollution) nor "extremely polluted." The distribution of opinions across the rating scale suggests the public tends to either think of these waters as being somewhat clean, or to be uncertain regarding the level of pollution due to receiving a mix of both positive and negative information. Effort is needed to more definitively educate the public as to the level of pollution in these waters which can serve as a motivation for change.

The public in these two cities shows varying degrees of knowledge regarding key issues for controlling stormwater pollution. In many cases, respondents lacked awareness of basic information which substantiates the need for public education programming. Results for Priority 1 Issues also show a high level of similarity in the two cities in what citizens know and do not know. The results are also very similar to the results from the same survey conducted in fourteen other cities in Snohomish, King, Pierce and Lewis Counties from the summer of 2009 through the spring of 2011.

Results show that the public needs to be better informed regarding current levels of pollution in surface waters. Awareness of the problem is the first step to motivating action. Educational programming should raise the public's consciousness by highlighting the detrimental nature of surface water pollution, the threats current levels pose and the negative or destructive outcomes that currently result. Second, programming should help to establish a common vision of pollution-free rivers, wetlands, and lakes and a healthier Puget Sound as the goal to be achieved. Third, the direct and indirect positive outcomes of maintaining pristine conditions in surface waters and in Puget Sound should be highlighted—these are all the good things that will result. Fourth, the means of achieving these outcomes—meaning the helpful practices individuals can implement—need to be presented through effective social marketing practices in a way that is interesting, immediately understandable, convincing, and memorable and is able to tap into the beliefs, values and emotional benefits that will motivate behavioral change. Social marketing programs that provide a practical means to help people overcome obstacles to change will likely be most successful in modifying behavior.

Since Priority 1 Issues show the lowest correct knowledge in the Kent/Tukwila Region, these subject areas offer an opportunity where success in improving the public's knowledge and subsequent behavior can be most directly realized and documented. Educational messaging should communicate the following Priority 1 messages:

- *Biodegradable soap is not a safe addition to stormwater drains and should be kept from running into the stormwater drainage system.*
- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*
- *The primary cause of pollution in stormwater runoff is individual human activity, not industrial dumping. Success in reducing environmental pollution depends upon everyone's participation in helping to make a difference.*

- *Wash your car in an area where the soapy runoff will be absorbed by the ground or take your car to a commercial car wash. Soapy water should not be allowed to flow into the street or into a drainage ditch.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is all stormwater treated to remove pollutants before being released into the environment. Therefore, the quality of stormwater going into the drainage system is what determines the level of pollution in surface water.*
- *Sediment is pollution and should be prevented from entering the stormwater drainage system.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Priority 1 issues should be communicated in repeated educational messaging. Social marketing seeks to produce behavioral change which means learning new ways of acting. Learning requires repetition (practice). Hence, important messages need to be repeated through different communication channels and at different times to effectively promote assimilation and bring about change over time. As mentioned previously, practical programs that help citizens to overcome obstacles to change or reduce the "cost" for citizens in changing their behavior (such as reducing the amount it costs citizens to use a commercial car wash) offer the greatest potential for bringing about positive results.

The rank order of Priority 2 issues showed high similarity between the two cities, more so than for Priority 1 issues. Two issues appearing on the Priority 2 list should be included among the Priority 1 items because of their standing as knowledge that is fundamental to improving behavior: the understanding that all water going into stormwater drains is not treated before being discharged into the environment, and, second, the definition of an illicit discharge. Both concepts serve as precursors to increasing positive action. Messaging also needs to focus on establishing the concept that everyone is responsible for reducing pollution in surface waters.

The public shows the highest level of correct knowledge regarding Priority 3 issues which primarily involved actual behaviors. At minimum, this finding demonstrates a wide public understanding of the right actions. At best, it indicates the public has adopted and is already widely practicing these desirable behaviors. Continued messaging is recommended regarding these issues, with less intensity than for Priority 1 and 2 Issues, to reinforce, maintain and extend positive action.

Baseline Stormwater Survey Results for 16 Cities: Priority 1 Issues

The following three tables present the percent correct answers for each of sixteen cities that have administered a baseline survey beginning in the summer of 2009. Priority rankings for education were determined by the overall percent of correct responses for all cities combined (labeled All Cities).

Table 11. Priority 1 Issues (Under 50% Correct Responses) for Sixteen Northwest Washington Cities

Rank for Education	Question	% Correct Responses by Area															
		All Cities	Aberdeen	Centralia	Duvall	Edmonds	Enumclaw	Kenmore	Kent	Lakewood	Maple Valley	Mercer Island	Mill Creek	Mountlake Terrace	Mukilteo	Newcastle	Tukwila	Woodinville
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	29.8% 1	23.8% 1	18.3% 1	30.4% 1	31.8% 1	32.4% 1	36.6% 2	24.5% 1	31.7% 3	22.5% 2	26.5% 1	31.8% 2	23.3% 2	22.8% 1	31.4% 3	31.0% 1	30.7% 1
2	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	35.1% 2	47.4% 6	44.8% 7	36.8% 3	37.1% 2	42.4% 4	36.2% 1	32.3% 4	33.0% 4	19.5% 1	35.2% 2	24.9% 1	21.4% 1	38.9% 4	19.2% 1	45.8% 4	33.3% 2
3	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	38.2% 3	36.8% 3	30.9% 3	48.9% 7	40.8% 3	48.3% 8	46.3% 6	31.2% 2	30.0% 2	38.4% 4	49.1% 5	39.6% 3	30.3% 4	33.1% 2	29.9% 2	42.1% 2	34.4% 3
4	5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. **D**	40.0% 4	34.4% 2	41.2% 6	40.4% 6	43.8% 5	39.4% 3	44.2% 4	31.6% 3	35.5% 5	44.2% 5	47.7% 4	44.1% 6	41.3% 6	39.2% 5	46.9% 7	43.6% 3	37.6% 5
5	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	42.7% 5	50.5% 8	38.0% 4	38.0% 4	52.6% 6	46.3% 6	43.8% 3	41.6% 6	50.7% 8	32.5% 3	49.2% 6	44.1% 5	29.0% 3	36.8% 3	33.6% 4	53.3% 7	36.0% 4
6	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	46.6% 6	47.0% 5	40.2% 5	49.2% 8	43.3% 4	43.8% 5	50.7% 7	46.5% 8	53.4% 9	45.9% 6	40.7% 3	49.2% 7	47.0% 8	53.5% 6	46.7% 6	50.0% 6	41.5% 6
7	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	46.7% 7	56.4% 10	28.4% 2	36.7% 2	55.1% 7	36.6% 2	45.3% 5	40.6% 5	27.5% 1	49.0% 7	57.5% 9	40.5% 4	41.6% 7	53.9% 7	45.9% 5	46.5% 5	50.9% 7

Baseline Stormwater Survey Results for 16 Cities: Priority 2 Issues

Table 12. Priority 2 Issues (50% to 80% Correct Responses) for Sixteen Northwest Washington Cities

Rank for Education	Question	% Correct Responses by Area															
		All Cities	Aberdeen	Centralia	Duvall	Edmonds	Enumclaw	Kenmore	Kent	Lakewood	Maple Valley	Mercer Island	Mill Creek	Mountlake Terrace	Mukilteo	Newcastle	Tukwila	Woodinville
8	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	53.2% 8	49.2% 7	54.8% 10	39.8% 5	59.6% 9	52.3% 10	62.1% 10	56.1% 9	46.5% 6	57.1% 9	56.6% 8	50.6% 9	53.9% 9	59.5% 8	56.2% 8	60.7% 10	58.6% 9
9	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	57.8% 9	44.4% 4	52.3% 9	52.3% 9	72.8% 14	51.7% 9	62.2% 11	58.9% 10	48.7% 7	55.9% 8	78.7% 20	57.1% 10	64.2% 11	64.6% 10	67.8% 12	62.5% 12	53.9% 8
10	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	58.2% 10	56.1% 9	46.8% 8	59.6% 11	61.0% 11	56.2% 11	58.3% 9	44.1% 7	58.1% 11	59.4% 10	67.7% 14	50.0% 8	56.3% 10	67.2% 12	57.7% 9	59.1% 9	59.6% 10
11	29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not made up entirely of stormwater. **A**	58.3% 11	66.9% 13	59.2% 12	66.4% 16	60.8% 10	48.2% 7	57.0% 8	67.2% 13	66.8% 12	62.6% 11	60.1% 11	67.6% 13	37.6% 5	63.5% 9	58.4% 10	58.5% 8	59.7% 11
12	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	63.2% 12	58.6% 11	63.2% 15	64.5% 14	59.0% 8	60.4% 12	63.8% 12	59.5% 11	57.1% 10	68.5% 14	66.3% 12	62.8% 11	67.8% 14	68.7% 15	70.6% 15	64.0% 13	64.9% 13
13	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	65.0% 13	66.5% 12	60.9% 13	62.4% 12	74.1% 15	60.5% 13	64.5% 13	66.6% 12	69.9% 14	63.6% 12	59.5% 10	70.4% 15	66.8% 13	68.2% 13	62.7% 11	61.5% 11	60.5% 12
14	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	70.5% 14	72.6% 15	60.9% 14	63.9% 13	76.2% 17	76.9% 18	66.0% 14	69.2% 14	73.1% 17	77.9% 17	56.2% 7	75.7% 19	70.6% 15	85.2% 21	70.0% 13	77.4% 16	69.8% 14
15	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	70.7% 15	74.6% 17	58.8% 11	59.0% 10	80.3% 21	75.8% 16	69.5% 15	69.9% 15	70.4% 15	67.3% 13	76.4% 17	72.7% 17	83.7% 20	68.6% 14	70.4% 14	71.9% 15	71.9% 16
16	10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**	72.6% 16	74.9% 18	67.1% 16	65.4% 15	79.2% 19	77.2% 19	71.9% 16	73.3% 18	71.1% 16	78.2% 18	76.7% 18	70.8% 16	73.5% 16	74.2% 16	74.9% 18	67.2% 14	71.8% 15
17	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	73.5% 17	75.3% 19	88.7% 22	69.2% 17	72.3% 13	71.1% 14	79.4% 18	71.1% 16	88.4% 24	77.6% 16	66.5% 13	65.4% 12	84.9% 21	66.1% 11	72.9% 16	85.6% 23	82.3% 20
18	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	75.1% 18	72.4% 14	76.7% 18	89.6% 23	79.3% 20	81.4% 20	75.7% 17	74.9% 19	69.8% 13	73.9% 15	73.9% 15	69.3% 14	81.9% 19	75.2% 17	73.6% 17	78% 17	75.9% 17
19	9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**	77.2% 19	78.5% 21	75.8% 17	70.1% 18	69.7% 12	83.7% 22	82.4% 19	75.4% 20	75.7% 18	83.5% 21	75.0% 16	75.6% 18	81.0% 18	77.1% 18	79.5% 19	81.8% 19	78.8% 18

Baseline Stormwater Survey Results for 16 Cities: Priority 3 Issues

Table 13. Priority 3 Issues (Over 80% Correct Responses) for Sixteen Northwest Washington Cities

Rank for Education	Question	% Correct Responses by Area															
		All Cities	Aberdeen	Centralia	Duvall	Edmonds	Enumclaw	Kenmore	Kent	Lakewood	Maple Valley	Mercer Island	Mill Creek	Mountlake Terrace	Mukilteo	Newcastle	Tukwila	Woodinville
20	13. My household recycles all used motor oil. **A Adopt**	81.1% 20	87.1% 23	87.3% 21	77.0% 19	76.1% 16	75.0% 15	91.2% 25	82.4% 21	83.7% 20	84.9% 22	86.5% 21	87.4% 20	66.7% 12	79.9% 19	83.9% 20	80.3% 18	82.0% 19
21	12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**	82.0% 21	73.9% 16	81.8% 20	88.0% 21	77.0% 18	76.5% 17	85.6% 23	72.2% 17	86.9% 22	81.6% 19	78.6% 19	88.6% 21	93.3% 23	83.8% 20	85.8% 21	82.0% 20	84.2% 21
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	87.5% 22	86.2% 22	90.0% 25	89.5% 22	89.4% 22	84.1% 23	86.0% 24	87.4% 22	86.7% 21	82.8% 20	96.3% 24	90.5% 22	78.7% 17	91.8% 25	88.7% 23	85.5% 22	94.1% 25
23	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	87.7% 23	75.4% 20	76.8% 19	84.9% 20	89.6% 23	82.2% 21	84.9% 21	93.8% 26	88.3% 23	89.4% 24	95.3% 22	94.2% 23	93.1% 22	85.9% 22	95.8% 26	85.4% 21	86.5% 22
24	25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**	91.1% 24	89.5% 24	93.8% 27	97.0% 25	91.1% 24	92.1% 24	83.3% 20	92.0% 25	89.7% 25	89.9% 25	95.8% 23	96.9% 25	98.7% 27	88.8% 23	88.4% 22	91.1% 24	89.4% 24
25	26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**	91.6% 25	90.9% 25	89.1% 23	92.8% 24	91.8% 25	94.2% 26	85.2% 22	89.9% 23	83.5% 19	89.0% 23	96.3% 25	98.4% 26	98.1% 25	89.0% 24	91.3% 24	93.2% 25	89.0% 23
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	94.1% 26	96.3% 27	89.8% 24	97.7% 27	93.1% 26	92.7% 25	93.7% 26	91.0% 24	90.0% 26	95.9% 26	97.2% 26	96.8% 24	98.5% 26	95.8% 26	93.1% 25	93.2% 26	98.6% 27
27	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	95.0% 27	95.9% 26	93.0% 26	97.3% 26	93.8% 27	94.3% 27	95.0% 27	94.5% 27	91.1% 27	99.1% 27	98.3% 27	99.7% 27	97.2% 24	98.1% 27	96.5% 27	98.2% 27	97.7% 26

THE CITY OF KENT STORMWATER COMMUNITY SURVEY

QUESTIONNAIRE – MARCH, 2011

V3.4

Hello, my name is _____ and I am calling on behalf of the City of Kent.

[IF SPEAKING TO A CHILD] May I speak to someone who is at least 18 years of age? Thank you. **[RE-INTRODUCE YOURSELF]**

Hello, my name is _____ and I am calling on behalf of the City of Kent. We are asking citizens about an important environmental issue and we would like to include your opinions. All your answers are strictly confidential and will not be connected to your name.

S1. **[SCREENING QUESTION]** Before we actually begin, I need to verify your city/county. What city/county do you live in?

1. Kent
2. Other Municipality **[THANK AND POLITELY DICONTINUE]**
3. Don't Know **[THANK AND POLITELY DICONTINUE]**
4. Refused **[THANK AND POLITELY DICONTINUE]**

1. What is your age? **[RECORD NUMBER]**

2. Great, thank you. My first question is about the water in our area. I'd like you to rate your perception of the overall quality of the water in our rivers, wetlands and lakes and in Puget Sound. By "quality of water" I mean how free it is from pollution. Rate it on a 0 to 10 scale where "0" means the water is "extremely polluted" and 10 means the water is "extremely clean." **[RECORD NUMBER]**

[READ]

Now, I'm going to read a number of statements to you regarding stormwater. Some of these statements may be true, they all may be true or they all may be false. If you believe that a statement is true, please say "Agree." If you believe the statement is false, say "Disagree." If you are not certain about the statement and need more information, you can answer with "need more information." If the question does not apply to you or your family, say "Doesn't Apply." Here is the first one. Do you Agree, Disagree or need more information about the following statement:

Responses for each:

1. Agree

2. Disagree

3. Need more information

4. Uncertain, Don't Know

5. Refused

6. Doesn't Apply

NOTE: *Following each statement, you will see the correct answer indicated by an "A" for Agree or a "D" for Disagree. When the word "Adopt" appears, it means the statement addresses whether or not the respondent has "Adopted the correct behavior."*

3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**

4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**

5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. **D**

6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**

[ROTATE Q7-Q28] [NOTE: These questions will be asked in a random order to prevent sequencing bias.]

[AFTER ASKING THE NEXT NINE QUESTIONS, SAY: You are doing really well. We are halfway through and I'll try to get through this as quickly as I can. Here's the next one, do you Agree, Disagree or Need More Information about this statement.]

7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**

8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**

9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**

10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**

11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**

12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**

13. My household recycles all used motor oil. **A Adopt**

14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**

15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**

16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**

17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**

18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**

19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**

20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**

21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**

22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**

23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**

24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**

25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**

26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**

27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**

28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**

29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not composed entirely of stormwater. **A**

29a. The City of Kent is currently carrying out a program called *The Clean Water Project*. **A**

30. If you witnessed someone pouring a gallon of used paint thinner into a stormwater drain, which agency would you call first to report it: **[READ 1-5]**

1. The Washington Department of Ecology

2. The police department

3. The city Public Works Department **A**

4. 911 **A (for the City of Kent)**

5. Need more information

6. I would not report it

7. Don't Know/Refused

8. Other **[SPECIFY]**

That concludes our survey. I want to thank you very much for your time and cooperation. You have been very helpful. Have a good day!

POSTCODE GENDER:

1. MALE

2. FEMALE

DATE: _____INTERVIEWER: _____

THE CITY OF TUKWILA STORMWATER COMMUNITY SURVEY

QUESTIONNAIRE – APRIL, 2011

V3.4

Hello, my name is _____ and I am calling on behalf of the City of Tukwila.

[IF SPEAKING TO A CHILD] May I speak to someone who is at least 18 years of age? Thank you. **[RE-INTRODUCE YOURSELF]**

Hello, my name is _____ and I am calling on behalf of the City of Tukwila. We are asking citizens about an important environmental issue and we would like to include your opinions. All your answers are strictly confidential and will not be connected to your name.

S1. **[SCREENING QUESTION]** Before we actually begin, I need to verify your city/county. What city/county do you live in?

1. Tukwila
2. Other Municipality **[THANK AND POLITELY DICONTINUE]**
3. Don't Know **[THANK AND POLITELY DICONTINUE]**
4. Refused **[THANK AND POLITELY DICONTINUE]**

1. What is your age? **[RECORD NUMBER]**

2. Great, thank you. My first question is about the water in our area. I'd like you to rate your perception of the overall quality of the water in our rivers, wetlands and lakes and in Puget Sound. By "quality of water" I mean how free it is from pollution. Rate it on a 0 to 10 scale where "0" means the water is "extremely polluted" and 10 means the water is "extremely clean." **[RECORD NUMBER]**

[READ]

Now, I'm going to read a number of statements to you regarding stormwater. Some of these statements may be true, they all may be true or they all may be false. If you believe that a statement is true, please say "Agree." If you believe the statement is false, say "Disagree." If you are not certain about the statement and need more information, you can answer with "need more information." If the question does not apply to you or your family, say "Doesn't Apply." Here is the first one. Do you Agree, Disagree or need more information about the following statement:

Responses for each:

1. Agree

2. Disagree

3. Need more information

4. Uncertain, Don't Know

5. Refused

6. Doesn't Apply

NOTE: *Following each statement, you will see the correct answer indicated by an "A" for Agree or a "D" for Disagree. When the word "Adopt" appears, it means the statement addresses whether or not the respondent has "Adopted the correct behavior."*

3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**

4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**

5. Pollution in our rivers, wetlands and lakes and in Puget Sound is more the result of industrial dumping practices than individual human activity. **D**

6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**

[ROTATE Q7-Q28] [NOTE: These questions will be asked in a random order to prevent sequencing bias.]

[AFTER ASKING THE NEXT NINE QUESTIONS, SAY: You are doing really well. We are halfway through and I'll try to get through this as quickly as I can. Here's the next one, do you Agree, Disagree or Need More Information about this statement.]

7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**

8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**

9. The best way to clean up spilled oil on the driveway is to fully absorb it using kitty litter or paper towels and deposit this waste in a garbage can. **A**

10. Scrubbing oil and grease spots on outdoor concrete or asphalt with soap and hosing it off is a good way to prevent polluting stormwater runoff. **D**

11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**

12. All of my family's auto or truck parts with oil or grease on them are stored under a roof or cover. **A Adopt**

13. My household recycles all used motor oil. **A Adopt**

14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**

15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**

16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**

17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**

18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**

19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**

20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**

21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**

22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**

23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**

24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**

25. In the past 12 months, I may have applied a higher dose of insecticide or weed killer around my house than the directions say to use. **D Adopt**

26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**

27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**

28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**

29. An *illicit* or *unlawful stormwater discharge* is primarily defined as anything that enters a storm drain system that is not composed entirely of stormwater. **A**

30. If you witnessed someone pouring a gallon of used paint thinner into a stormwater drain, which agency would you call first to report it: **[READ 1-5]**

1. The Washington Department of Ecology

2. The police department

3. The city Public Works Department **A**

4. 911

5. Need more information

6. I would not report it

7. Don't Know/Refused

8. Other **[SPECIFY]**

That concludes our survey. I want to thank you very much for your time and cooperation. You have been very helpful. Have a good day!

POSTCODE GENDER:

1. MALE

2. FEMALE

DATE: _____INTERVIEWER: _____