Duvall, Edmonds, Kenmore, Mill Creek,
Mountlake Terrace and Woodinville

Stormwater Community Research Report
September, 2009

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Goal

Research Goal:
The goal of this research is to measure the public's knowledge and practices regarding stormwater in the cities of Duvall, Edmonds, Kenmore, Mill Creek, Mountlake Terrace and Woodinville 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.

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 Duvall, Edmonds, Kenmore, Mill Creek, Mountlake Terrace and Woodinville. 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 and auto maintenance.

Methodology

The survey was created for the general public for administration within each of the six 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

A list of telephone numbers was purchased from a reputable commercial list company. 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 was loaded into Hebert Research's CATI (Computer-Aided Telephone Interviewing) system which randomly selects phone numbers as required during the interviewing process. Each phone number was called at least five times at different times during the day and evening before being replaced by a new number. 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 six participating cities:

Sample Totals	
City	**Sample Size**
Duvall	100
Edmonds	100
Kenmore	200
Mill Creek	200
Mountlake Terrace	100
Woodinville	200
Total Sample	**900**

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. Fifteen 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 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 900 surveys were completed with adults living within the zip codes of Duvall, Edmonds, Kenmore, Mill Creek, Mountlake Terrace and Woodinville. At the 95% confidence level, the maximum margin of error for a sample size of 100 respondents is ±9.8%; for a sample size of 200 respondents, it is ±6.9%; and for the entire sample of all six cities (900 respondents) the maximum margin of error is ±3.3%. This margin of error means that if the six city survey were conducted 100 times, the resulting percents for each response would be within ±3.3% (the margin of error) in 95 out of the 100 cases for each question.

The *incidence rate* represents the percent of individuals contacted who were eligible to take the survey. The *response rate* represents the number of completed interviews as a percent of all eligible individuals contacted. The lower incidence rate for Mill Creek resulted from the city's zip codes including many individuals who live in Bothell and who had to be screened out.

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**
Duvall	100%	64.0%
Edmonds	100%	55.0%
Kenmore	100%	58.0%
Mill Creek	46.7%	83.0%
Mountlake Terrace	100%	68.0%
Woodinville	100%	60.0%

Statistical Weighting

Statistical weighting is a technique that is commonly used in survey research to correct for sampling error. 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 of the general public. Sample demographics—specifically, age and gender—were compared with distributions in the population within each city. To compensate for potential sampling error, weights were calculated and applied to the survey sample for each city in order to ensure that various 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 among all 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 according to gender, age and population density.

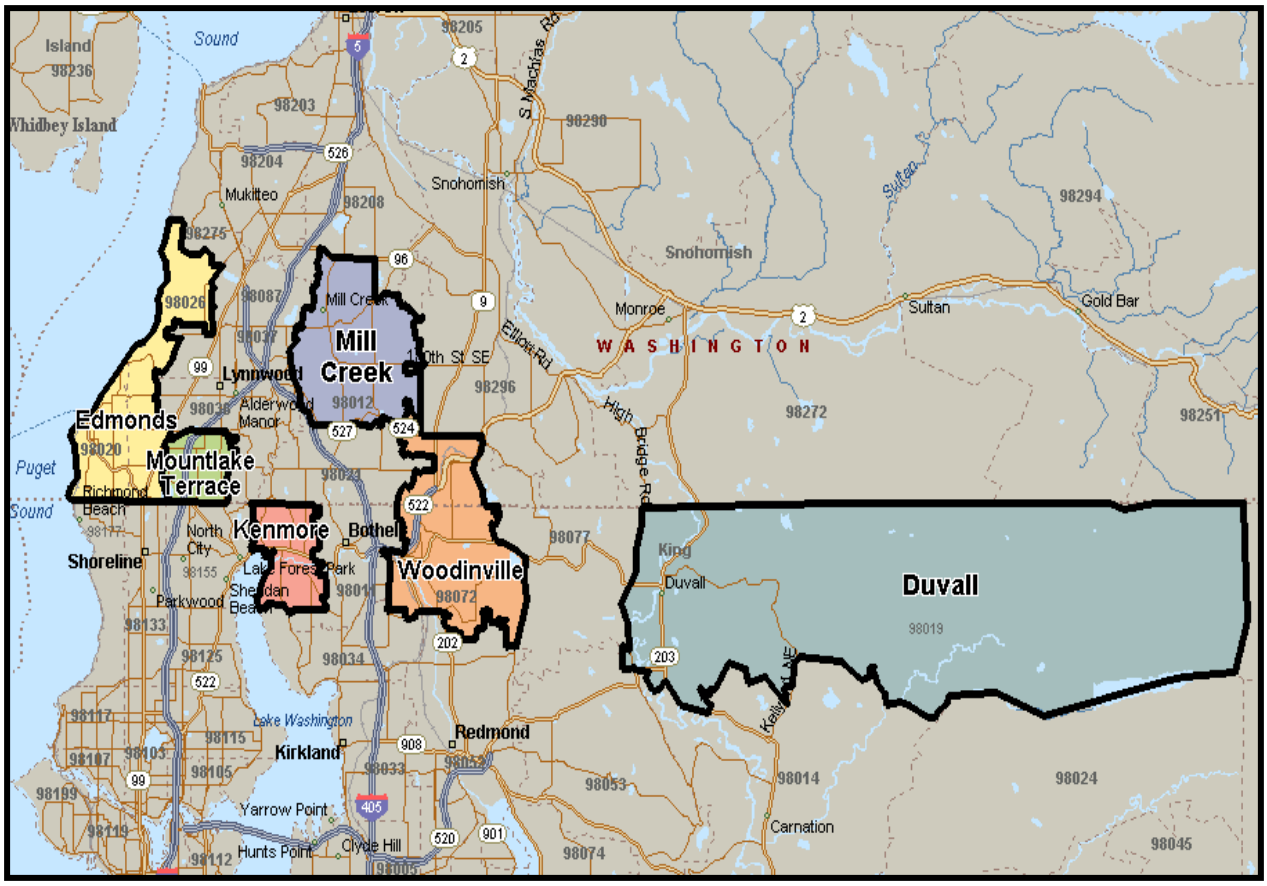
Use of Findings

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 each of the six cities in the study (98019 for Duvall, 98020 and 98026 for Edmonds, 98028 for Kenmore, 98012 for Mill Creek, 98043 for Mountlake Terrace and 98072 for Woodinville).



Explanation of Multivariate Analysis

The data for the survey(s) 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 by city and by all cities combined (termed here as *Overall*, which will also be referred to in this report as the *region*). As indicated in the methodology section, the sample was statistically weighted to match the population by gender and age. The percentages listed below are the weighted frequencies for age and gender based upon the city and the region.

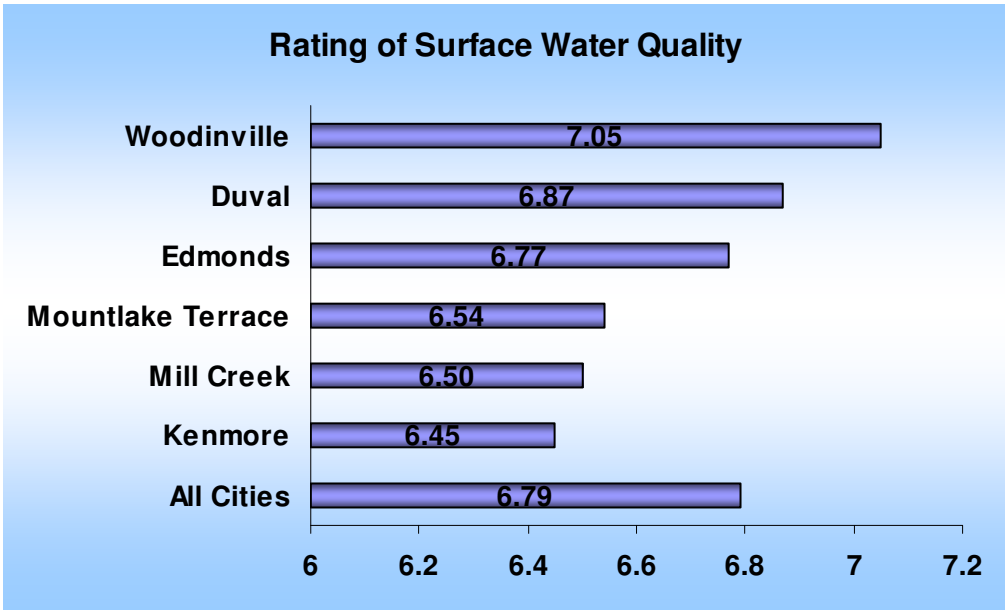
Age	Overall	Duvall	Edmonds	Kenmore	Mill Creek	Mountlake Terrace	Woodinville
18-24	7.9%	4.6%	3.6%	5.5%	11.1%	6.8%	8.8%
25-34	20.3%	21.7%	15.3%	19.3%	20.7%	24.7%	14.0%
35-44	25.2%	36.4%	24.7%	25.2%	26.3%	25.9%	28.8%
45-54	20.9%	21.3%	19.5%	22.2%	21.5%	19.8%	28.2%
55-64	14.0%	13.6%	22.9%	14.0%	10.6%	9.1%	11.7%
65 or older	11.7%	7.0%	14.0%	13.8%	9.8%	13.7%	8.5%

Gender	Overall	Duvall	Edmonds	Kenmore	Mill Creek	Mountlake Terrace	Woodinville
Male	49.9%	52.9%	47.1%	51.4%	48.8%	49.3%	49.8%
Female	50.2%	47.1%	52.9%	48.6%	51.2%	50.7%	50.2%

Cities Show Similar Overall Perception Regarding Surface Water Quality

Respondents rated the quality of water in our rivers, watersheds 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 the six cities surveyed were remarkably similar in their assessment of the quality of surface water in our region. Average ratings for the six cities fell in a tight range of 6.45 to 7.05, only a 5.5% difference. The lowest ratings (see Figure 1) came from the cities of Kenmore (6.45) and Mill Creek (6.50) and the highest rating for the city of Woodinville (7.05).

Figure 2. Respondent Rating of Surface Water Quality by City

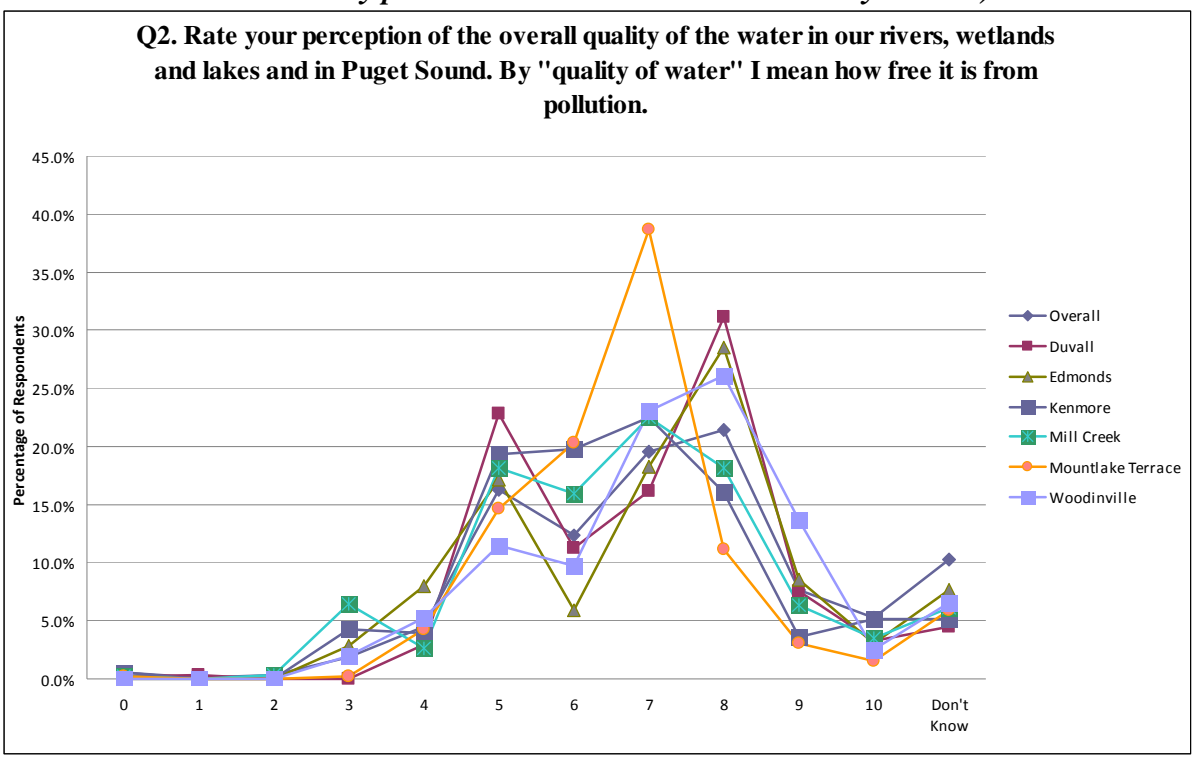


For the region represented by the six cities, the average rating of 6.79 suggests the public sees these waters as being clean, but on a low level. The shape of the curve (see Figure 2) suggests a classic normal distribution of scores which is shifted to the right, toward the high end of the scale, meaning a perception that surface water is clean. A classic normal distribution would result if : 1) the information available to the public provided a mixed view of surface water as being both high and low quality or 2) respondents possessed little knowledge about water quality and guessed at an answer.

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 many in the region are unclear about how clean the water is and may have taken a guess at it.

Figure 1. 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 and severity of surface water pollution originating in stormwater, 2) the vision of clean water in the future, 3) the many positive outcomes that will result from constructive public action, and 4) the helpful practices individuals need to adopt to prevent polluting stormwater. The more real the public perceives the problems and the benefits, the greater the response will be.

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 to the pubic education requirements in the NPDES Phase II Permit. The survey tested the public's knowledge and practices regarding 27 key issues and the resulting data provides baseline data points 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 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**gree—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 their regional rank for education. The ranking of issues for each city 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 in the cell.

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 twenty-seven issues tested, see Table 1). The lowest scoring issues from city to city showed very high similarity. Even though respondents lived in different locations, their knowledge about stormwater issues showed only minor variations. From a practical point of view, the widespread uniformity of responses means the cities could easily join together in social marketing campaigns to address Priority 1 Issues.

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

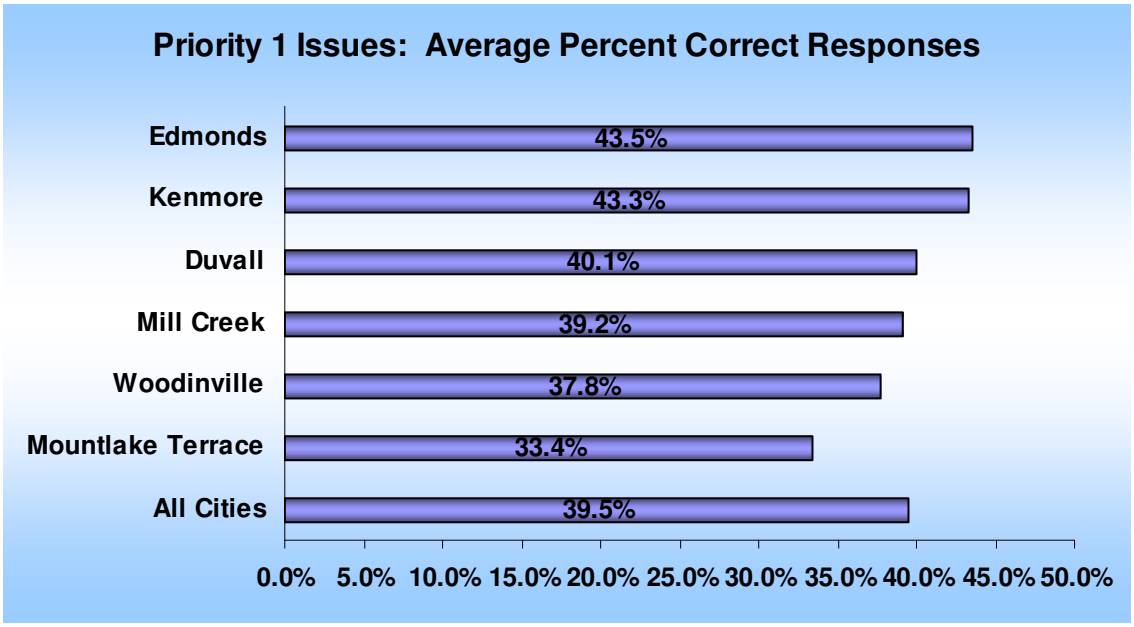
Rank for Education	Question	% Correct Responses by Area						
		Region	Duvall	Edmonds	Kenmore	Mill Creek	Mountlake Terrace	Woodinville
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	32.1%	30.4% 1	31.8% 1	36.6% 2	31.8% 2	23.3% 2	30.7% 1
2	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	36.5%	48.9% 7	40.8% 3	46.3% 6	39.6% 3	30.3% 4	34.4% 3
3	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt***	36.9%	36.8% 3	37.1% 2	36.2% 1	24.9% 1	21.4% 1	33.3% 2
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**	39.7%	40.4% 6	43.8% 5	44.2% 4	44.1% 6	41.3% 6	37.6% 5
5	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	44.4%	36.7% 2	55.1% 7	45.3% 5	40.5% 4	41.6% 7	50.9% 7
6	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	46.4%	38.0% 4	52.6% 6	43.8% 3	44.1% 5	29.0% 3	36% 4
7	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	48.7%	49.2% 8	43.3% 4	50.7% 7	49.2% 7	47.0% 8	41.5% 6

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

Table Note: All "Does not apply" responses were lumped into the "Don't Know" response category for the knowledge questions since all of the knowledge questions apply to everyone. This rule applies to all the tables in the report.

Some Cities Show a Need for Wider Education
As shown in Figure 3, residents in the cities of Edmonds and Kenmore gave the highest percent of correct answers for Priority 1 issues. Mountlake Terrace residents gave the lowest percent of correct answers indicating a need for wider public education.

Figure 3: Average Percent of Correct Responses to Priority 1 Issues by City



Issues Involving Soap Show High Need for Education
Of all the issues tested, the public across the region shows the least 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.*
- *Wash your car on the lawn. To best protect the environment, soapy water from washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*

Knowledge of the Stormwater Drainage System and Pollution Sources is Lacking
Other low scoring issues for the region dealt with how the stormwater drainage system works. Six out of ten respondents (60.3%) 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 and nearly six out of ten respondents (55.6%) were 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 across the region should convey the following messages:

- *The water in stormwater drains is not connected to the sanitary sewer system nor is it treated in any way 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.*
- *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.*

Related Multivariate Analysis Findings

Q3. *Women show significantly less awareness than men that stormwater drains on city streets are not connected to the same sanitary sewer system used for treating human waste ($p < .001$, Cramer's $V = .205$).*

Gender	Correct	Incorrect
Male	55.1%	44.9%
Female	36.9%	63.1%

Actions to Prevent Polluting Stormwater Need Emphasis

Responses to questions regarding pavers, sediment, and grass clippings also revealed relatively low awareness in the community and indicated a need for public education. Nearly two out of three respondents (63.5%) were not aware that bricks and pavers offer an advantage in reducing storm water runoff. Less than half of the respondents 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

Q19. *Men show significantly less awareness than women that grass clippings **are** regarded as harmful in stormwater (p = .018, Cramer's V = .115).*

Gender	Correct	Incorrect
Male	43.7%	56.3%
Female	52.3%	47.7%

Q28. *While both men and women show a relatively low level of awareness that bricks or pavers offer an advantage for reducing runoff over concrete or asphalt pavement, women show significantly less awareness than men (p < .001, Cramer's V = .157).*

Gender	Correct	Incorrect
Male	40.4%	59.6%
Female	33.7%	66.3%

Q28. *While all age groups show a relatively low level of awareness that bricks or pavers offer an advantage for reducing runoff over concrete or asphalt, those under 25 and over 64 show a significantly lower awareness compared to other age groups (p = .03, Cramer's V = .111).*

Age	Correct	Incorrect
18-24	26.3%	73.7%
25-34	35.6%	64.4%
35-44	39.8%	60.2%
45-54	41.3%	58.7%
55-64	38.0%	62.0%
65 or Older	28.7%	71.3%

Priority 2 Issues: From 50-80% Correct Answers

Priority 2 Issues represent areas of knowledge or practice where at least half of the public knows what is correct. Twelve issues made this list which constitutes 44.4% of the 27 issues tested. While this level of public knowledge is a step in the right direction, more can and needs to be done to continue to raise the public's level of knowledge concerning these issues. These areas continue to represent genuine opportunities for reducing surface water pollution.

Compared to Priority 1 Issues, Priority 2 Issues showed increased variation in how items were ranked from city to city (see Table 2 on the next page). Rankings varied by as mush as 11 places and 28.8% in the level of correct knowledge from city to city. In Mountlake Terrace, for example, the public is much lower in its understanding of what constitutes an illicit discharge (37.6% correct responses, rank 5 for education) compared to Duvall (66.4% correct responses, rank 16 for education). However, when it comes to knowing that hard surfaces are significant sources of pollution, Mountlake Terrace possessed 83.7% awareness (rank 20 for education) while the public's level of awareness in Duvall was only 59.0% (rank 10 for education). Each city must concentrate its messaging in those specific areas where the lack of their citizens' knowledge is widest.

Overall, however, the Priority 2 list also shows a good deal of similarity and uniformity across cities in many of the areas tested. Differences in correct responses between cities occasionally ranged higher than 20%, as mentioned, but most of the differences were within several to about ten or twelve percentage points. This concentration of results adds additional weight to the thought that cities can and should engage in joint efforts at social marketing.

One issue on the Priority 2 list should be included among the Priority 1 items as an issue that is fundamental to generating increased responsible action in the public domain. The issue is the fact that almost half of the respondents in the region (45.9%) hold the erroneous belief that all water going into stormwater drains on the street is treated before being discharged into the environment. Correcting this misunderstanding 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.

A second issue on the Priority 2 list that should be elevated to Priority 1 is knowledge of what constitutes an *illicit discharge.* Four out of ten respondents did not know the correct definition of an *illicit discharge*. As a beginning point and a key precursor for positive action, knowing this definition will help individuals make better decisions regarding how to protect stormwater quality when facing new situations involving a pollution potential.

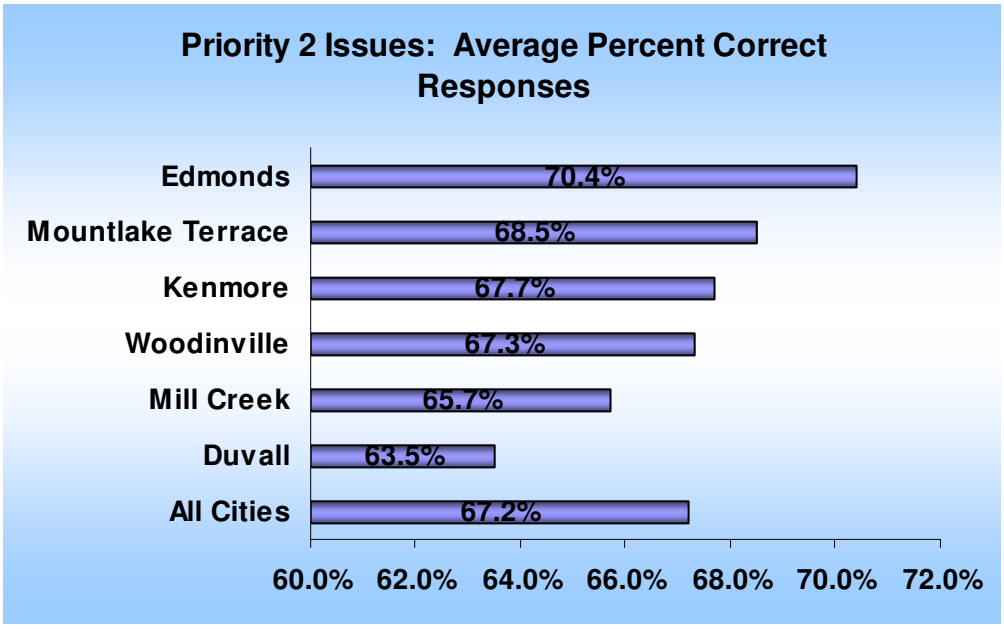
Table 2. Priority 2 Issues for Public Education

Rank for Education	Question	% Correct Responses by Area						
		Region	Duvall	Edmonds	Kenmore	Mill Creek	Mountlake Terrace	Woodinville
8	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	54.1%	59.6% 11	61.0% 11	58.3% 9	50.0% 8	56.3% 10	59.6% 10
9	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	55.5%	39.8% 5	59.6% 9	62.1% 10	50.6% 9	53.9% 9	58.6% 9
10	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	59.0%	64.5% 14	59.0% 8	63.8% 12	62.8% 11	67.8% 14	64.9% 13
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**	59.1%	66.4% 16	60.8% 10	57.0% 8	67.6% 13	37.6% 5	59.7% 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**	61.6%	52.3% 9	72.8% 14	62.2% 11	57.1% 10	64.2% 11	53.9% 8
13	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	66.2%	62.4% 12	74.1% 15	64.5% 13	70.4% 15	66.8% 13	60.5% 12
14	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	68.0%	63.9% 13	76.2% 17	66% 14	75.7% 19	70.6% 15	69.8% 14
15	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	72.9%	59.0% 10	80.3% 21	69.5% 15	72.7% 17	83.7% 20	71.9% 16
16	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt***	73.1%	69.2% 17	72.3% 13	79.4% 18	65.4% 12	84.9% 21	82.3% 20
17	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**	73.6%	65.4% 15	79.2% 19	71.9% 16	70.8% 16	73.5% 16	71.8% 15
18	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	75.2%	89.6% 23	79.3% 20	75.7% 17	69.3% 14	81.9% 19	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%	70.1% 18	69.7% 12	82.4% 19	75.6% 18	81.0% 18	78.8% 18

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

Cities Show Wide Variation 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. As seen in Priority 1 issues, those living in Edmonds showed the highest percent of correct responses across Priority 2 issues (70.4%). Duvall residents showed the lowest (63.5%).

Figure 4: Average Percent of Correct Responses to Priority 2 Issues by City



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 and in Puget Sound. Therefore, to reduce environmental pollution, the challenge to the community is to help keep stormwater runoff pollution-free.*
- *Disposing of the excess water from cleaning a latex brush is best done in a sink and not outside where the water is more likely to run into a storm drain.*
- *An illicit or illegal discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *Carpet shampoo waste water 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, employ pervious surfaces.*
- *Direct downspout runoff to a place on your property where it can be absorbed by the ground to keep it from running off and potentially adding pollution to the stormwater drainage system.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*

Related Multivariate Analysis Findings

Q22. Compared to m*en, women show a significantly higher belief that downspouts convey stormwater runoff to an area where it is absorbed by the ground (p = .004, Cramer's V = .125).*

Gender	Correct	Incorrect
Male	67.7%	32.3%
Female	77.0%	23.3%

Q27. W*omen show significantly less awareness than men that shampoo wastewater cannot be safely added to a stormwater drain (p = .026, Cramer's V = .111).*

Gender	Correct	Incorrect
Male	72.3%	27.7%
Female	64.9%	35.1%

Q6. T*hose who are 65 and older show a significantly lower awareness than other age groups that all water going into a stormwater drain is not treated (p = .001, Cramer's V = .118).*

Age	Correct	Incorrect
18-24	50.1%	49.9%
25-34	55.2%	44.8%
35-44	64.1%	35.9%
45-54	65.6%	34.4%
55-64	56.3%	43.7%
65 or Older	43.2%	56.8%

Q17. *Those who are 18-24 show significantly less awareness than other age groups that washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using biodegradable soap (p = .01, Cramer's V = .106).*

Age	Correct	Incorrect
18-24	44.4%	55.6%
25-34	55.2%	44.8%
35-44	60.9%	39.1%
45-54	61.9%	38.1%
55-64	57.2%	42.8%
65 or Older	68.6%	31.4%

Q20. *While all age groups show a relatively high belief that chemical treatments used to kill moss on roofs pose a risk for polluting stormwater, those who are 18-24 show a significantly higher belief compared to other age groups (p = .011, Cramer's V = .105).*

Age	Correct	Incorrect
18-24	82.4%	17.6%
25-34	74.1%	25.9%
35-44	68.5%	31.5%
45-54	61.9%	38.1%
55-64	67.8%	32.2%
65 or Older	65.9%	34.1%

Priority 3 Issues: Higher than 80% Correct Answers

The remaining eight issues (29.6% of the 27 issues tested) which make up the Priority 3 section deal with specific practices engaged in by respondents. High uniformity was again in evidence throughout most of these issues indicating that respondents are at least quite aware of the proper actions to take if not regularly practicing them. Dollars spent on raising public awareness and behavioral change in these areas will have a much smaller target market than for Priority 1 and 2 issues except for a few instances. For over 20% of the residents in Duvall, Edmonds and Mountlake Terrace, recycling used motor oil remains an area in need of educational programming. The proper storing of auto parts in Edmonds and the prompt repair of auto leaks in Mountlake Terrace are behaviors practiced to a relatively lower degree compared to other behaviors in this group and are in need of emphasis in each city's educational efforts.

Table 3. Priority 3 Issues for Public Education

Rank for Education	Question	% Correct Responses by Area						
		Region	Duvall	Edmonds	Kenmore	Mill Creek	Mountlake Terrace	Woodinville
20	13. My household recycles all used motor oil. **A Adopt***	80.8%	77.0% 19	76.1% 16	91.2% 25	87.4% 20	66.7% 12	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**	86.0%	88.0% 21	77.0% 18	85.6% 23	88.6% 21	93.3% 23	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**	90.4%	89.5% 22	89.4% 22	86.0% 24	90.5% 22	78.7% 17	94.1% 25
23	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	90.5%	84.9% 20	89.6% 23	84.9% 21	94.2% 23	93.1% 22	86.5% 22
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**	93.3%	92.8% 24	91.8% 25	85.2% 22	98.4% 26	98.1% 25	89.0% 23
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**	93.7%	97.0% 25	91.1% 24	83.3% 20	96.9% 25	98.7% 27	89.4% 24
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	95.5%	97.7% 27	93.1% 26	93.7% 26	96.8% 24	98.5% 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**	97.1%	97.3% 26	93.8% 27	95.0% 27	99.7% 27	97.2% 24	97.7% 26

**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
No response differences based on age or gender were found to be statistically significant for Priority 3 Issues. This was due to the uniformly high number of "correct" responses to the survey statements across the region. For Priority 3 Issues, men and women in all age groups responded in a very similar fashion.

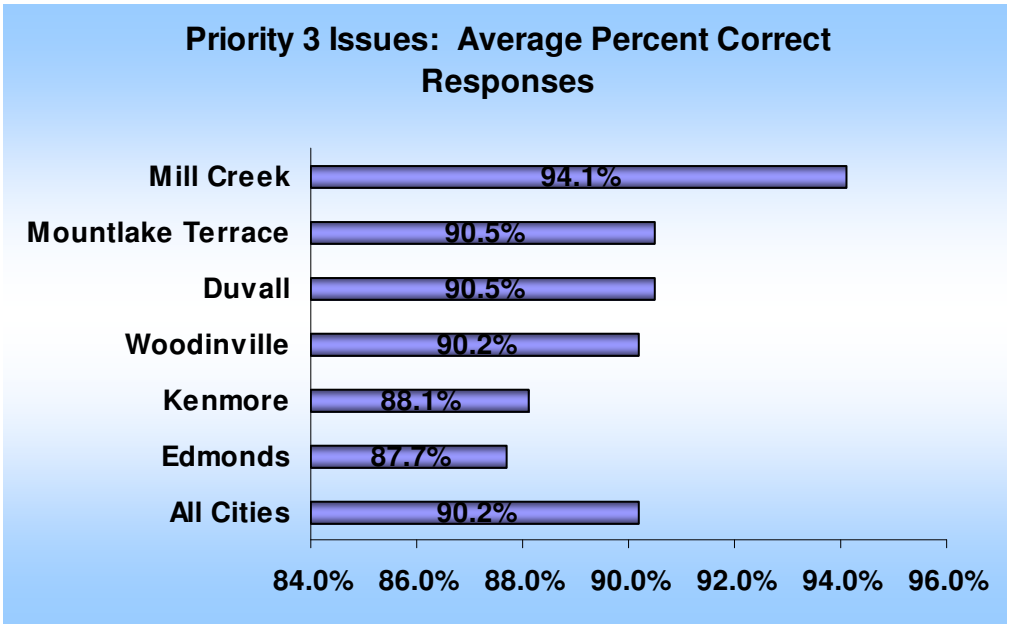
Practices
The relatively high percent of respondents across the region who gave the correct responses to the issues in this category (see Figure 5) suggests that high compliance is already taking place. At minimum, it can be said that respondents knew the right thing to do and answered accordingly. One may assume that minimal social marketing needs to be done in these areas, but given the potential for negatively impacting stormwater which these items represent, it remains advisable to continue educating the public on these issues but at a lower level of emphasis:

- *Recycling used motor oil.*
- *Storing auto or truck parts with oil or grease on them under a roof or cover.*
- *Fixing auto or truck oil leaks within three weeks.*
- *Picking up pet waste when outside.*
- *Applying insecticides or weed killer at recommended rates*
- *Storing containers holding oil or antifreeze under a roof or cover.*

The one area where full compliance may be claimed (97.1% compliance) and any additional improvement would be difficult to realize is:

- *Storing all yard fertilizers and pesticides inside a building or in a covered area out of the rain.*

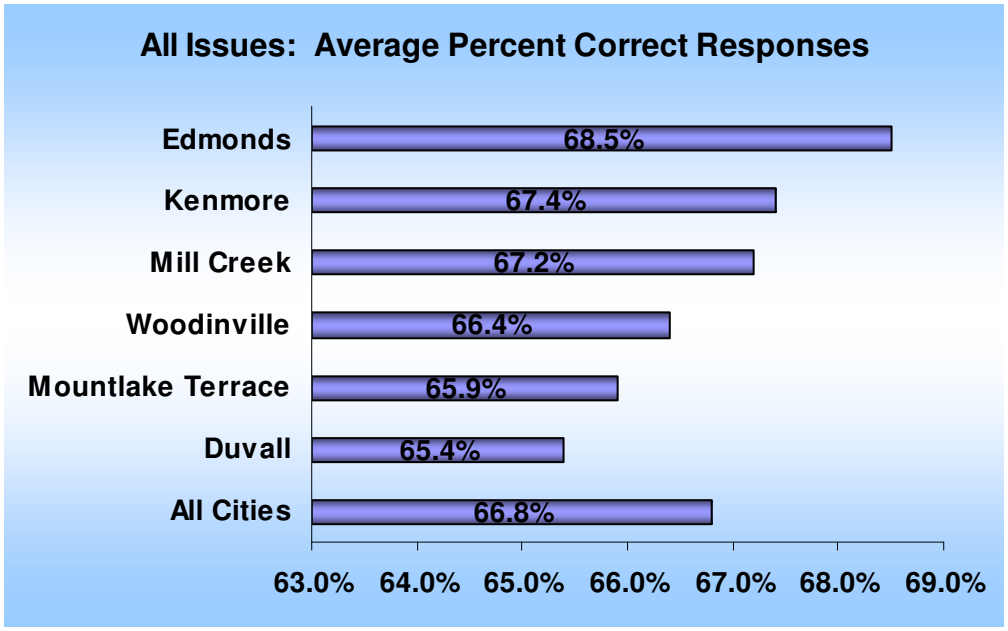
Figure 5: Average Percent of Correct Responses to Priority 3 Issues by City



All Issues: Overall Percent Correct Responses is Very Uniform

Figure 6 shows the average percent of correct responses for all questions by city. The average number of correct responses for all cities combined was 66.8%. Residents living in Edmonds showed the highest overall number of correct responses. The difference between highest and lowest is only 3.1%. This suggests that, overall, residents in the region are comparatively knowledgeable about a broad spectrum of stormwater issues, but differ in the specifics. Consequently, in addition to social marketing that may be engaged in on a regional basis by all cities joining together, a need also exists for each city to address the problems which are more specific to its citizens in a more targeted way.

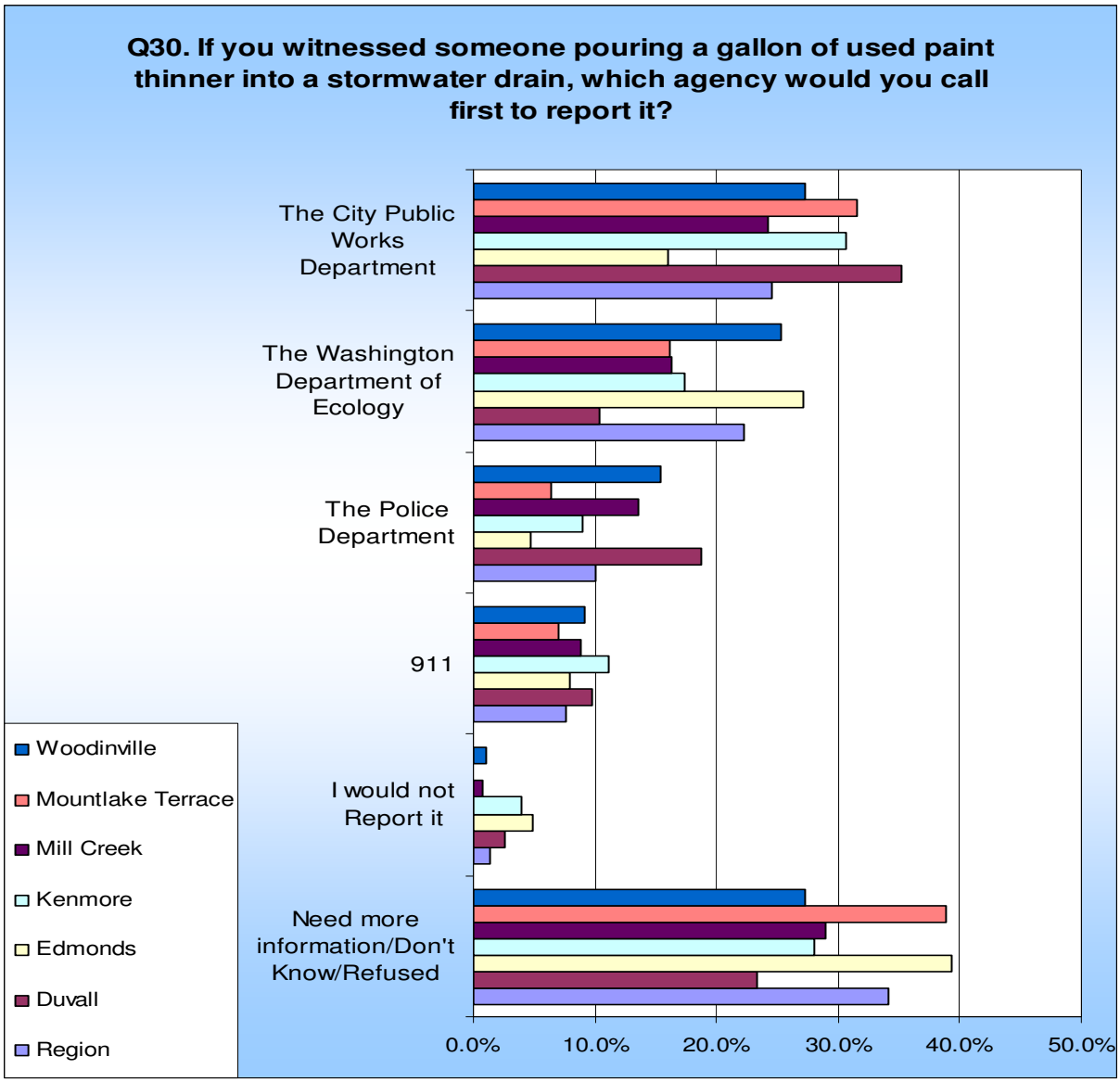
Figure 6: Average of All Correct Responses by City



Reporting an Illicit Discharge

To report an illicit discharge, respondents would call a variety of agencies with only a small group calling their City Public Works Department (24.5%), the correct choice. The fact that more than one third of respondents (34.2%) said they needed more information or did not know who to call leads us to believe that a good deal of public education is needed if illicit discharges are to be reported to the proper agency. The following graph presents the responses by region and by individual city.

Figure 7: Reporting an Illicit Discharge



The actual percent of responses given by respondents in each city appears in the table below:

Agency	Region	Duvall	Edmonds	Kenmore	Mill Creek	Mountlake Terrace	Woodinville
The City Public Works Department **A**	27.6%	35.2%	16.0%	30.6%	24.3%	31.5%	27.3%
The Washington Department of Ecology	25.0%	10.4%	27.1%	17.4%	16.3%	16.2%	25.3%
The Police Department	11.2%	18.8%	4.8%	9.0%	13.6%	6.4%	15.4%
911	8.6%	9.7%	7.9%	11.1%	8.9%	7.0%	9.2%
I would not Report it	1.6%	2.6%	4.9%	3.9%	0.8%	0.0%	1.0%
Need more information/Don't Know/Refused	25.9%	23.3%	39.3%	28.0%	28.9%	38.9%	27.3%

Related Multivariate Analysis Findings

Q30. *While both men and women show a low level of awareness that the City Public Works Department is the correct agency to call if they were to witness someone pouring a gallon of used paint thinner into a stormwater drain, men show significantly less awareness than women (p = .036, Cramer's V = .122).*

Gender	Correct	Incorrect
Male	25.2%	74.8%
Female	29.4%	70.6%

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

Knowledge and Practices

All Priority 1 questions for the City of Duvall are shown in Table 4 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 water in stormwater drains is not connected to the sanitary sewer system nor is it treated in any way 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.*
- *To best protect the environment, soapy water form washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*
- *Sediment is pollution and should be prevented from entering the stormwater drainage system.*
- *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 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.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Table 4. Priority 1 Issues for Public Education

City of Duvall		
Rank for Education	**Question**	**% Correct**
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	30.4% 1
2	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	36.7% 2
3	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	36.8% 3
4	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	38.0% 4
5	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	39.8% 5
6	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**	40.4% 6
7	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	48.9% 7
8	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	49.2% 8

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

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

Knowledge and Practices

All Priority 2 questions for the City of Duvall are shown in Table 5 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:

- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *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, use pervious surfaces.*
- *All water going into stormwater drains is **not** treated before being discharged into the environment.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *Carpet shampoo waste water causes pollution to the environment and should not be disposed of in a stormwater drain.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned but not hosed away with water.*
- *An illicit or illegal discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *Direct downspout runoff to a place on your property where it can be absorbed by the ground to keep it from running off and potentially adding pollution to the stormwater drainage system.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*
- *Plant trees to help reduce the runoff. Trees reduce the amount of rain hitting the water and, by absorbing the water in the soil for their growth, help to improve water absorption.*
- *Recycle used motor oil.*

Table 5. Priority 2 Issues for Public Education

City of Duvall		
Rank for Education	**Question**	**% Correct**
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**	52.3% 9
10	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	59% 10
11	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	59.6% 11
12	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	62.4% 12
13	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	63.9% 13
14	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	64.5% 14
15	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**	65.4% 15
16	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**	66.4% 16
17	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	69.2% 17
18	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**	70.1% 18
19	13. My household recycles all used motor oil. **A Adopt**	77.0% 19

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

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

Knowledge and Practices

A relatively high percent of respondents in Duvall (over 80%) gave the correct responses to eight questions regarding stormwater issues. This suggests that high compliance with recommended action is already taken place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal in the following areas:

- *Picking up pet waste when outside.*
- *Storing auto or truck parts with oil or grease on them under a roof or cover.*
- *Fixing auto or truck oil leaks within three weeks.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *Applying fertilizer at recommended rates.*

The areas where full compliance may be claimed and improvement would be difficult in the City of Duvall are:

- *Applying insecticides or weed killer at recommended rates (97.0%).*
- *Storing all yard fertilizers and pesticides inside a building or in a covered area out of the rain (97.3%).*
- *Storing containers holding oil or antifreeze under a roof or cover (97.7%)*

Table 6. Priority 3 Issues for Public Education

City of Duvall		
Rank for Education	**Question**	**% Correct**
20	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	84.9% 20
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**	88% 21
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	89.5% 22
23	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	89.6% 23
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**	92.8% 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**	97% 25
26	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	97.3% 26
27	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	97.7% 27

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

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

Knowledge and Practices

All Priority 1 questions for the City of Edmonds are shown in Table 7 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.*
- *To best protect the environment, soapy water form washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*
- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of 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.*

Table 7. Priority 1 Issues for Public Education

City of Edmonds		
Rank for Education	**Question**	**% Correct**
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	31.8% 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**	37.1% 2
3	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	40.8% 3
4	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	43.3% 4
5	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**	43.8% 5

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

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

Knowledge and Practices

All Priority 2 questions for the City of Edmonds are shown in Table 8 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.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is it treated in any way 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.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*
- *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.*
- *An illicit or illegal 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.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*
- *Direct downspout runoff to a place on your property where it can be absorbed by the ground to keep it from running off and potentially adding pollution to the stormwater drainage system.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *Recycle used motor oil.*
- *Carpet shampoo waste water causes pollution to the environment and should not be disposed of in a stormwater drain.*
- *Store auto or truck parts with oil or grease on them under a roof or cover.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned but not hosed away with water.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*

Table 8. Priority 2 Issues for Public Education

City of Edmonds		
Rank for Education	**Question**	**% Correct**
6	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	52.6% 6
7	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	55.1% 7
8	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	59% 8
9	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	59.6% 9
10	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**	60.8% 10
11	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	61% 11
12	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**	69.7% 12
13	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	72.3% 13
14	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	72.8% 14
15	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	74.1% 15
16	13. My household recycles all used motor oil. **A Adopt**	76.1% 16
17	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	76.2% 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**	77% 18
19	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**	79.2% 19
20	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	79.3% 20

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

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

Knowledge and Practices

A relatively high percent of respondents in Edmonds (over 80%) gave the correct responses to seven questions regarding stormwater issues. This suggests that high compliance with recommended action is already taken place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal in the following areas:

- *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, use pervious surfaces.*
- *Fix auto or truck oil leaks within three weeks.*
- *Picking up pet waste when outside.*
- *Applying insecticides or weed killer at recommended rates.*
- *Applying fertilizer at recommended rates.*

The areas where full compliance may be claimed and improvement would be difficult in the City of Edmonds are:

- *Storing containers holding oil or antifreeze under a roof or cover (93.1%).*
- *Storing all yard fertilizers and pesticides inside a building or in a covered area out of the rain (93.8%).*

Table 9. Priority 3 Issues for Public Education

City of Edmonds		
Rank for Education	**Question**	**% Correct**
21	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	80.3% 21
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	89.4% 22
23	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	89.6% 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**	91.8% 25
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	93.1% 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**	93.8% 27

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

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

Knowledge and Practices

All Priority 1 questions for the City of Kenmore are shown in Table 10 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.*
- *To best protect the environment, soapy water form washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*
- *Sediment is pollution and should be prevented 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.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is it treated in any way 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.*
- *Bricks or pavers help to reduce the volume of stormwater runoff and, therefore, help to reduce stormwater pollution in the environment.*

Table 10. Priority 1 Issues for Public Education

City of Kenmore		
Rank for Education	**Question**	**% Correct**
1	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	36.2% 1
2	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	36.6% 2
3	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	43.8% 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**	44.2% 4
5	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	45.3% 5
6	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	46.3% 6

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

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

Knowledge and Practices

All Priority 2 questions for the City of Kenmore are shown in Table 11 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:

- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*
- *An illicit or illegal 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.*
- *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.*
- *Carpet shampoo waste water 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, use pervious surfaces.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned but not hosed away with water.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *Direct downspout runoff to a place on your property where it can be absorbed by the ground to keep it from running off and potentially adding pollution to the stormwater drainage system.*

Table 11. Priority 2 Issues for Public Education

City of Kenmore		
Rank for Education	**Question**	**% Correct**
7	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	50.7% 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**	57.0% 8
9	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	58.3% 9
10	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	62.1% 10
11	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	62.2% 11
12	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	63.8% 12
13	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	64.5% 13
14	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	66% 14
15	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	69.5% 15
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**	71.9% 16
17	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	75.7% 17
18	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	79.4% 18

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

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

Knowledge and Practices

A relatively high percent of respondents in Kenmore (over 80%) gave the correct responses to nine questions regarding stormwater issues. This suggests that high compliance with recommended action is already taken place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal in the following areas:

- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*
- *Applying insecticides or weed killer at recommended rates.*
- *Picking up pet waste when outside.*
- *Applying fertilizer at recommended rates.*
- *Storing containers holding oil or antifreeze under a roof or cover.*
- *Fix auto or truck oil leaks within three weeks.*
- *Recycle used motor oil.*

The areas where full compliance may be claimed and improvement would be difficult in the City of Kenmore are:

- *Storing all yard fertilizers and pesticides inside a building or in a covered area out of the rain (93.7%).*
- *Storing containers holding oil or antifreeze under a roof or cover (95.0%).*

Table 12. Priority 3 Issues for Public Education

City of Kenmore		
Rank for Education	**Question**	**% Correct**
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**	82.4% 19
20	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**	83.3% 20
21	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	84.9% 21
22	26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**	85.2% 22
23	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**	85.6% 23
24	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	86% 24
25	13. My household recycles all used motor oil. **A Adopt**	91.2% 25
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	93.7% 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% 27

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

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

Knowledge and Practices

All Priority 1 questions for the City of Mill Creek are shown in Table 13 below. These issues represent the areas which need the most attention. In order of importance, the following messages should be included in educational programming:

- *To best protect the environment, soapy water form washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*
- *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 water in stormwater drains is not connected to the sanitary sewer system nor is it treated in any way 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.*
- *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.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Table 13. Priority 1 Issues for Public Education

City of Mill Creek		
Rank for Education	**Question**	**% Correct**
1	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	24.9% 1
2	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	31.8% 2
3	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	39.6% 3
4	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	40.5% 4
5	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	44.1% 5
6	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**	44.1% 6
7	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	49.2% 7

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

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

Knowledge and Practices

All Priority 2 questions for the City of Mill Creek are shown in Table 14 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:

- *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.*
- *Direct downspout runoff to a place on your property where it can be absorbed by the ground to keep it from running off and potentially adding pollution to the stormwater drainage system.*
- *An illicit or illegal discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned but not hosed away with water.*
- *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, use pervious surfaces.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*
- *Carpet shampoo waste water causes pollution to the environment and should not be disposed of in a stormwater drain.*

Table 15. Priority 2 Issues for Public Education

City of Mill Creek		
Rank for Education	**Question**	**% Correct**
8	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	50% 8
9	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	50.6% 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**	57.1% 10
11	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	62.8% 11
12	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	65.4% 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**	67.6% 13
14	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	69.3% 14
15	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	70.4% 15
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**	70.8% 16
17	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	72.7% 17
18	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**	75.6% 18
19	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	75.7% 19

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

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

Knowledge and Practices

A relatively high percent of respondents in Mill Creek (over 80%) gave the correct responses to nine questions regarding stormwater issues. This suggests that high compliance with recommended action is already taken place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal in the following areas:

- *Recycle used motor oil.*
- *Store auto or truck parts with oil or grease on them under a roof or cover*
- *Fix auto or truck oil leaks within three weeks.*

The areas where full compliance may be claimed and improvement would be difficult in the City of Mill Creek are:

- *Picking up pet waste when outside (94.2%).*
- *Storing containers holding oil or antifreeze under a roof or cover (96.8%).*
- *Applying insecticides or weed killer at recommended rates (96.9%)*
- *Applying fertilizer at recommended rates (98.4%).*
- *Storing all yard fertilizers and pesticides inside a building or in a covered area out of the rain (99.7%)*

Table 16. Priority 3 Issues for Public Education

City of Mill Creek		
Rank for Education	**Question**	**% Correct**
20	13. My household recycles all used motor oil. **A Adopt**	87.4% 20
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**	88.6% 21
22	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	90.5% 22
23	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	94.2% 23
24	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	96.8% 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**	96.9% 25
26	26. In the past 12 months, I may have used more fertilizer or applied it more frequently than the label directions require. **D Adopt**	98.4% 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**	99.7% 27

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

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

Knowledge and Practices

All Priority 1 questions for the City of Mountlake Terrace are shown in Table 17 below. These issues represent the areas which need the most attention. In order of importance, the following messages should be included in educational programming:

- *To best protect the environment, soapy water form washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*
- *Biodegradable soap is not a safe addition to stormwater drains and should be kept from entering the stormwater drainage system.*
- *Sediment is pollution and should be prevented 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.*
- *An illicit or illegal discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *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.*
- *The water in stormwater drains is not connected to the sanitary sewer system nor is it treated in any way 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 17. Priority 1 Issues for Public Education

City of Mountlake Terrace		
Rank for Education	**Question**	**% Correct**
1	16. When I wash a motor vehicle at home, the soapy water ends up in a ditch or on the street. **D Adopt**	21.4% 1
2	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	23.3% 2
3	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	29% 3
4	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	30.3% 4
5	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**	37.6% 5
6	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**	41.3% 6
7	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	41.6% 7
8	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	47% 8

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

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

Knowledge and Practices

All Priority 2 questions for the City of Mountlake Terrace are shown in Table 18 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.*
- *All water going into stormwater drains is **not** treated before being discharged into the environment.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *Recycle used motor oil.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*
- *Carpet shampoo waste water causes pollution to the environment and should not be disposed of in a stormwater drain.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned but not hosed away with water.*
- *Fix auto or truck oil leaks within three weeks.*

Table 18. Priority 2 Issues for Public Education

City of Mountlake Terrace		
Rank for Education	**Question**	**% Correct**
9	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	53.9% 9
10	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	56.3% 10
11	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	64.2% 11
12	13. My household recycles all used motor oil. **A Adopt**	66.7% 12
13	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	66.8% 13
14	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	67.8% 14
15	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	70.6% 15
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**	73.5% 16
17	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	78.7% 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 Mountlake Terrace
Priority 3 Issues: Higher than 80% Correct Answers

Knowledge and Practices

A relatively high percent of respondents in Mountlake Terrace (over 80%) gave the correct responses to nine questions regarding stormwater issues. This suggests that high compliance with recommended action is already taken place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal in the following areas:

- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *Hard surfaces are significant contributors to pollution in stormwater runoff.*
- *Direct downspout runoff to a place on your property where it can be absorbed by the ground to keep it from running off and potentially adding pollution to the stormwater drainage system.*
- *Picking up pet waste when outside.*
- *Store auto or truck parts with oil or grease on them under a roof or cover.*

The areas where full compliance may be claimed and improvement would be difficult in the City of Mountlake Terrace are:

- *Storing all yard fertilizers and pesticides inside a building or in a covered area out of the rain (97.2%)*
- *Applying fertilizer at recommended rates (98.1%).*
- *Storing containers holding oil or antifreeze under a roof or cover (98.5%).*
- *Applying insecticides or weed killer at recommended rates (98.7%).*

Table 19. Priority 3 Issues for Public Education

City of Mountlake Terrace		
Rank for Education	**Question**	**% Correct**
18	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% 18
19	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	81.9% 19
20	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	83.7% 20
21	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	84.9% 21
22	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	93.1% 22
23	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**	93.3% 23
24	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	97.2% 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**	98.1% 25
26	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	98.5% 26
27	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**	98.7% 27

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

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

Knowledge and Practices

All Priority 1 questions for the City of Woodinville are shown in Table 20 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.*
- *To best protect the environment, soapy water form washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*
- *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.*
- *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.*
- *Grass clippings and leaves in stormwater are regarded as pollution and should be kept out of the stormwater drainage system.*

Table 20. Priority 1 Issues for Public Education

City of Woodinville		
Rank for Education	**Question**	**% Correct**
1	15. The runoff from washing a car with biodegradable soap is safe in stormwater drains. **D**	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**	33.3% 2
3	28. Bricks or pavers offer no advantage for reducing runoff over concrete or asphalt pavement. **D**	34.4% 3
4	21. Sediment or dirt in stormwater is natural and not regarded as pollution. **D**	36% 4
5	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**	37.6% 5
6	19. Grass clippings and leaves are not regarded as harmful in stormwater. **D**	41.5% 6

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

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

Knowledge and Practices

All Priority 2 questions for the City of Woodinville are shown in Table 21 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:

- *The water in stormwater drains is not connected to the sanitary sewer system nor is it treated in any way 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.*
- *Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle at home with biodegradable soap.*
- *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.*
- *All water going into stormwater drains is **not** treated before being discharged into the environment.*
- *An illicit or illegal discharge is anything that enters a storm drain system that is not made up of entirely stormwater.*
- *The residue from chemical treatments that kill moss is a source of pollution.*
- *The best place to clean paint brushes is in a sink that drains into the sanitary sewer system, not outdoors.*
- *Carpet shampoo waste water causes pollution to the environment and should not be disposed of in a stormwater drain.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned but not hosed away with water.*
- *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, use pervious surfaces.*
- *A mulching lawn mower reduces the need for using fertilizer and, hence, represents a valuable method for eliminating fertilizer pollution in stormwater.*
- *Oil and grease spots on outdoor concrete or asphalt should be cleaned up with soap and the residue absorbed using kitty litter or paper towels which should then be disposed of in the garbage can.*

Table 21. Priority 2 Issues for Public Education

City of Woodinville		
Rank for Education	**Question**	**% Correct**
7	3. Drains on city streets for stormwater are connected to the same sanitary sewer system used for treating human waste. **D**	50.9% 7
8	17. Washing a vehicle at a commercial car wash causes less pollution than washing a vehicle on the street using a biodegradable soap. **A**	53.9% 8
9	4. Stormwater runoff is the leading cause of pollution in rivers, wetlands and lakes. **A**	58.6% 9
10	6. All water going into stormwater drains on the street is treated before being discharged into the environment. **D**	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**	59.7% 11
12	20. Chemical treatments to kill moss on roofs pose little risk for polluting stormwater. **D**	60.5% 12
13	18. The best place to dispose of water from cleaning a Latex paint brush is in a sink inside, not outdoors. **A**	64.9% 13
14	27. Carpet shampoo wastewater can be safely added to a stormwater drain. **D**	69.8% 14
15	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**	71.8% 15
16	7. Hard surfaces such as roads and driveways are not significant sources of pollution in stormwater. **D**	71.9% 16
17	23. Using a mulching lawnmower reduces the need to fertilize a lawn. **A**	75.9% 17
18	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**	78.8% 18

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

City of Woodinville
Priority 3 Issues: 80% or Higher Correct Answers

Knowledge and Practices

A relatively high percent of respondents in Woodinville (over 80%) gave the correct responses to nine questions regarding stormwater issues. This suggests that high compliance with recommended action is already taken place. Given the nature of the items tested, however, improvement in these practices is still desirable and should remain a goal in the following areas:

- *Recycle used motor oil.*
- *Direct downspout runoff to a place on your property where it can be absorbed by the ground to keep it from running off and potentially adding pollution to the stormwater drainage system.*
- *Store auto or truck parts with oil or grease on them under a roof or cover.*
- *Picking up pet waste when outside.*
- *Applying fertilizer at recommended rates.*
- *Applying insecticides or weed killer at recommended rates.*

The areas where full compliance may be claimed and improvement would be difficult in the City of Woodinville are:

- *Fix auto or truck oil leaks within three weeks (94.1%)*
- *Storing all yard fertilizers and pesticides inside a building or in a covered area out of the rain (97.7%).*
- *Storing containers holding oil or antifreeze under a roof or cover (98.6%).*

Table 22. Priority 3 Issues for Public Education

City of Woodinville		
Rank for Education	**Question**	**% Correct**
19	13. My household recycles all used motor oil. **A Adopt**	82% 19
20	22. The downspouts at my house convey the water to an area where it is absorbed by the ground. **A Adopt**	82.3% 20
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**	84.2% 21
22	8. When I am outside with my pet, I always pick up my pet's waste. **A Adopt**	86.5% 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% 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**	89.4% 24
25	11. If my car or truck is dripping oil, I make sure the leak is fixed within three weeks. **A Adopt**	94.1% 25
26	24. My household stores all yard fertilizers and pesticides inside a building or in a covered area out of the rain. **A Adopt**	97.7% 26
27	14. My family stores all containers holding oil or antifreeze under a roof or cover. **A Adopt**	98.6% 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 public in the region represented by the six cities does not regard the water in rivers, wetlands, 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 how polluted surface waters are due to receiving a mix of both positive and negative information.

The public in the region, and in individual cities, shows varying degrees of knowledge regarding key issues for controlling stormwater pollution which substantiates the need for public education programming. Results for Priority 1 Issues also show a high level of similarity across the region represented by the six cities in what citizens do not know. This finding supports the recommendation that cities join together on projects for social marketing.

The public needs to be better informed regarding the current level of pollution in rivers, wetlands and lakes and in Puget Sound. Awareness of the problem is the fundamental understanding that leads to becoming motivated to act on it. Educational programming should raise the public consciousness by highlighting the critical nature of pollution in our surface waters and the threats and negative or destructive outcomes that result. Second, programming should help to establish a common vision of pollution-free rivers, wetlands, and lakes and in Puget Sound which is the goal to be achieved. Third, the direct and indirect positive outcomes of maintaining pristine rivers, wetlands, and lakes and marine waters 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 in a way that is interesting, immediately understandable, convincing and memorable using the techniques of social marketing.

The public is least aware of the correct response to Priority 1 Issues. Priority 1 Issues may be addressed on a regional basis through combined social marketing by the six cities. When a city's results vary from the regional results, the city will need to emphasize those issues in its target marketing to its own residents. Since Priority 1 Issues show the lowest correct knowledge in the region, these subject areas also offer an opportunity where success in improving the public's knowledge and subsequent action can be most directly realized and documented.

Educational messaging should communicate the following Priority 1 messages on a regional basis:

- *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.*
- *To best protect the environment, soapy water form washing the car is best handled by allowing it to be absorbed by a lawn. It should not be allowed to flow into the street or into a drainage ditch.*

- *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 it treated in any way 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.*

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: all water going into stormwater drains on the street is not treated, and the definition of an illicit discharge. Knowledge of both is a precursor to increasing positive action. Messaging also needs to focus on establishing the concept that everyone is responsible for reducing pollution to surface waters.

Priority 1 issues should be communicated in repeated educational messaging. Social marketing seeks to produce behavioral change, and part of behavioral change comes from 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. One-time communication efforts are rarely effective.

Priority 2 Issues vary in their priorities from city to city more than Priority 1 and Priority 3 Issues. Cities should adjust their education efforts to reflect the priorities for their citizens.

The public shows the highest level of correct knowledge regarding Priority 3 issues which all 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 maintain and extend positive action.

Mill Creek, Woodinville, Mountlake Terrace, Edmonds, Kenmore, Duvall

STORMWATER COMMUNITY SURVEY

QUESTIONNAIRE – JULY, 2009

V3.1

Hello, my name is _____ and I am calling on behalf of the city of _____ (Mill Creek, Woodinville, Mountlake Terrace, Edmonds, Kenmore).

[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 _____ (Mill Creek, Woodinville, Mountlake Terrace, Edmonds, Kenmore, Duvall). 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. What city do you live in?

1. Survey city (Mill Creek, Woodinville, Mountlake Terrace, Edmonds, Kenmore, Duvall)
2. Other City **[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: A letter follows each statement below 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**gree—which equates to the respondent saying that he or she engages in the desired behavior mentioned in the statement.

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 made up 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
8. Refused

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: _____