ISSUE PAPER #1

Rate Structure

Issue

Whatcom County recently established a sub-flood control zone district in the Birch Bay Watershed to fund the implementation of the Birch Bay Comprehensive Stormwater Plan. RCW 86.15.160 (4) authorizes such districts to fix rates and charges "for the furnishing of service to those who are receiving or will receive benefits from storm water control facilities and who are contributing to an increase in surface water runoff."

What stormwater fee structure basis is best suited for the County, and specifically the Birch Bay Watershed, in terms of legal defensibility, equity, applicability to the unique characteristics of the watershed and ease of implementation and administration?

Alternatives

There are a number of approaches, or bases, which can be used to structure an appropriate stormwater fee.

- Impervious surface area. The most common basis for charging stormwater fees is impervious surface area. The term refers to hard surface area that prevents or slows water permeation into the ground. Impervious surface area is widely accepted as an appropriate measure of a property's contribution of runoff, providing a clear relationship, or "rational nexus," to service received from a stormwater program.

  To administer a rate structure based on impervious surface area, data quantifying the applicable area by parcel is required. To minimize administrative and data collection costs, stormwater utilities typically develop a uniform rate for single family residential customers based on an estimated average amount of impervious surface area per developed residential parcel. The charge basis for all other customer types is generally actual measured impervious surface area by parcel. The charge itself is most commonly calculated as a dollar amount per unit of impervious surface area, or an equivalent unit of service, especially when the fee structure is implemented as a uniform charge for residential customers. For example, one unit may equate to 3,500 square feet of impervious surface area, with all single-family residences assumed to be one unit.

- Density of development. As an alternative measurement of runoff contribution, density of development can be used. The term refers to density factors that can be applied to parcel size. It may also be used in combination with actual impervious surface area measurements to adjust charges depending on the percentage of the parcel covered by hard surface. As an adjusting factor, it is used to acknowledge that, for example, 5,000 square feet of impervious surface on a 6,000 square foot lot more directly impacts the public system than 5,000 square feet of hard surface on a 30,000 square foot lot. As with

impervious surface area, density of development is an appropriate charge basis because it adequately quantifies the relationship between the rate paid and the amount of service received.

- Runoff coefficients. Yet another measurement of a property's contribution to surface water impacts is a runoff coefficient. The factor is similar to density of development, but it is more closely associated with the physical characteristics of properties. When applied to lot size, runoff coefficients are generally accepted as a measure of surface water contribution and hence, service received. Information required to charge under this basis includes basic physical characteristics of land (such as slope and soil type), land use, and lot size. Under this approach, undeveloped parcels may also be charged depending upon slope variables and soil characteristics. Runoff coefficients are typically charged either as a fee per unit of area or as an adjustment factor to impervious surface area to modify the final charge based on a parcel's runoff characteristics. In measuring contribution to surface water runoff by evaluating property-specific characteristics that cause impacts, this approach adequately recovers the costs of various activities within a stormwater program.

- Land use. Another basis that can be used to adjust rates based on distinct characteristics of properties is land use. Using this fee basis, adjusting factors are created to proportion rates across different contributors of stormwater based on assumed runoffs attributable to types of land use. For example, empirical analysis may find that industrial land use has a more significant contribution to water quality problems from stormwater runoff than undeveloped land and therefore, should be charged a proportionately higher rate for its share of program costs.

- Trip generation. While the fee structures discussed above focus on runoff contribution, trip generation as a fee basis attempts to relate automobile traffic to non-point source pollution contributed by properties. Data used to measure traffic is available from the Institute of Transportation Engineers' *Trip Generation Manual*, which assigns a number of daily trips generated by specific categories of land use. In addition to this information, customer land uses and lot size would be required to accurately calculate rates. This fee approach would be best used to recover the costs of specific water quality activities within a stormwater program.

- Area-specific rates. The district could apply different rates in different areas within the zone. Area can be defined as the basin or sub-basin in which a parcel is located or its proximity to receiving waters or flood plains. Presumably, areas to be charged differ in required levels of service in terms of capital construction and/or

ongoing maintenance costs. By separating these costs by location served, charges can correspondingly be set in relation to such levels.

Almost all activities performed by a stormwater program are applicable for location-specific user fees because service provided can be directly linked to the amount paid. As examples, properties in flood plains could pay a proportionately higher share of flood control costs, developments on hillsides could pay for causing additional runoff impacting those downstream, and waterfront properties could bear more of the costs of water quality improvements. It is important to note that if specific locations are less-developed than others or simply require costly activities, the resulting user fee could be economically impractical to charge property-owners.

- Other approaches. For various reasons, stormwater utilities have used a number of other rate approaches, most often as interim measures. While it is difficult to correlate assessed values with runoff contribution, assessed valuation has been used as a measure of benefit received from such activities as flood control. As a user fee, this approach has been applied as an annual rate for groups of parcels that fall into ranges of assessed valuation. In some jurisdictions, stormwater rates have been based on average winter water use – usually as part of the wastewater rate but at times as a stand-alone rate basis.

Analysis

A rate may be found legally valid if the funded services generally benefit those who pay the fee. There need not be a property-specific link between the fee paid and level of service delivered. In fact, *Teter vs. Clark County* (Washington) established that a reasonable effort must be made to link services delivered to fees charged, but that the linkage need only be indirect. It is important to note, that *Teter* dealt with a program in which the service area was a single major watershed, the Burnt Bridge Creek Watershed, as is contemplated here for the Birch Bay Watershed.

The Birch Bay Stormwater Comprehensive Plan identifies a decline in the water quality of Birch Bay as the most publicized problem to be addressed by the program. The following is also noted:

> Besides declining water quality in Birch Bay, several other types of surface water problems occur in the area. Localized drainage issues, including flooding and erosion/sedimentation, have developed or worsened in several neighborhoods. Aquatic habitat in wetlands, freshwater creeks, and the saltwater bay has been lost. Surface water quality of local freshwater bodies has also declined. These issues are generally the result of historical and recent development in the area. The problems have been made worse by the greater impervious surface and non-point source pollution that accompanies increasing development.

Throughout the United States, impervious surface area is a widely accepted measure of contribution of runoff, providing the basis for surface and stormwater rates in most utilities. As such, it is considered

rational and understandable as a basis for charging drainage, surface water and flood control fees. In addition, as a fee basis, impervious surface area appropriately links land development with the problems addressed in the Birch Bay Comprehensive Stormwater Plan. Finally, the "functional" nexus between impervious surface area, contribution of runoff, and increased flooding, water quality degradation, and damage to habitat is "scientifically" strong and supportable – particularly within a given watershed.

The following selection from Stormwater Strategies: Community Responses to Runoff Pollution describes this nexus clearly:

> The problem of polluted stormwater runoff has two main components: the increased volume and rate of runoff from impervious surfaces and the concentration of pollutants in the runoff. Both components are highly related to development in urban and urbanizing areas. When impervious cover (roads, highways, parking lots, and rooftops) reaches 10 and 20 percent of the area of a watershed, ecological stress becomes clearly apparent. Everyday activities, including driving and maintaining vehicles, maintaining lawns and parks, disposing of waste, and even walking pets, often cover these impervious surfaces with a coating of various harmful materials. Construction sites, power plants, failed septic systems, illegal discharges, and improper sewer connections also contribute substantial amounts of pollutants to runoff. Sediments, toxic metal particles, pesticides and fertilizers, oil and grease, pathogens, excess nutrients, and trash are common stormwater pollutants. Many of these constituents end up on roads and parking lots during dry weather only to be washed into waterbodies when it rains or when snow melts.
>
> Together, these pollutants and the increased velocity and volume of runoff cause dramatic changes in hydrology and water quality that result in a variety of problems. These include increased flooding, stream channel degradation, habitat loss, changes in water temperature, contamination of water resources, and increased erosion and sedimentation. These changes affect ecosystem functions, biological diversity, public health, recreation, economic activity, and general community well-being. Urban stormwater is not alone in causing these impacts. Industrial and agricultural runoff are equal or greater contributors. But the environmental, aesthetic, and public health impacts of diffuse pollution will not be eliminated until urban stormwater pollution is controlled. [1]

In addition to increasing the deposition of pollutants, supporting scientific research shows that the impervious surface area in even moderately developed areas greatly increases peak flows to streams, while decreasing base flows. The higher peak flows cause flooding and erosion, increasing sediment deposition and damage to aquatic habitat. The lower base flows can also damage habitat.

---

[1] *Peter H. Lehner, George P. Aponte Clarke, Diane M. Cameron, and Andrew G. Frank,* Stormwater Strategies Community Responses to Runoff Pollution *(Natural Resources Defense Council, May 1999), xi.*

An impervious surface area-based rate structure can be enhanced by incorporating density of development, based on the fact that more intense development more directly requires surface water management. The runoff coefficient approach is less defensible as a fee basis because it incorporates physical land characteristics over which the property owner has little or no control. A land use based approach is typically used in the absence of property-specific information. Trip generation, while supportable for water quality-related functions, provides little if any advantage over impervious surface area at greater administrative effort and associated cost.

There has been much interest expressed in area-specific rates. In practice, area-specific rates and charges raise a number of issues. First, they can be difficult and costly to administer. They generally require a new level of detail and tracking for any billing system, and add to the complexity of any rate or charge structure. Administrative requirements for area-specific rates would include designation of area locations in the customer billing system, dealing with properties which overlap areas, and tracking rate receipts. The complexity will likely increase costs for both implementation and maintenance of the billing database and providing customer service.

Second, In terms of efficiency, the use of area-specific rates will begin to dictate a number of related decisions. For example, the use of cash-funded capital improvements will be impractical, due to the short-term increases in rates needed at any time that a significant project is implemented. Revenue bonds supported through rates will almost certainly require the full support of the program's revenues to be issued, and a commitment to meet coverage requirements, so some County-wide obligation or support would result.

If area-specific rates are pursued, an additional issue must address what costs will be imposed specifically by area. This could be limited to just capital outlays. However, the same rationales used to support isolating capital costs would support maintenance costs as well. In particular, some capital improvements might reduce maintenance requirements, while others would increase maintenance costs. Therefore, to fully implement area-specific rates, maintenance costs would need to be tracked by area, and allocation rules for general costs would need to be established.

As a final practical issue, area-specific approaches often result in large disparities among rates in different parts of a service area. In one part of the watershed, the rate could be fairly minimal while a neighboring sub-basin faced burdensome charges. This can be difficult to explain to customers who perceive that they are receiving the same service.

Philosophically, the conflict is between the ethic of one community (in which all share in costs to an extent) and the ethic of each should pay their own way. Taken to their respective extremes, each of these positions is difficult to defend. The idea of all sharing in a cost without

regard to actual demand for service is a tax-based approach and is inconsistent with the objectives of user fees. Yet, the idea that each should pay their own way would result in a system sized to meet only existing needs because no one would consent to build capacity they didn't need. There would be no room for growth without incremental infrastructure improvements at high marginal cost.

Recommendation

We recommend that the County pursue a stormwater rate structure that is based on impervious surface area, with single family residential customers defined as one equivalent service unit (ESU). An impervious-based rate structure defines a linkage between a parcel's contribution to runoff impacting the system infrastructure and the fee that parcel pays. The fee basis creates a standard of charging that quantifies how different amounts of impervious surface area cause proportionately different impacts on the environment in terms of flooding, water quality, and habitat degradation. By recognizing that relationship, the fee structure basis proportionately charges different customers their share of the system's cost burden and provides an equitable, defensible means of cost recovery for stormwater management.

Due to the mix of both urban-style and rural parcel characteristics in the watershed, we further recommend that the County consider incorporating density of development along with impervious surface area. This will provide an adjustment factor that acknowledges the percentage of the parcel covered by hard surface.

Finally, regarding area-specific rates, we recommend that the County implement a rate structure to be applied uniformly throughout the Birch Bay Watershed.