Statement of Douglas V. Siglin
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Before the Senate Committee on Environment and Public Works
March 24, 2010

Chairwoman Boxer, Senator Inhofe and other distinguished members of the EPW Committee, I am grateful for the opportunity to be here today to encourage you to include in your upcoming Federal Surface Transportation Act new policy language to minimize the water pollution impacts of our federal-aid highways.

I begin with reference to the Chesapeake Bay, which is the waterbody that I know best. You are all aware that large areas of the Bay continue to be severely deprived of oxygen during much of the year, a condition that the federal government has been attempting to understand and ameliorate since this committee authorized six million dollars in the Rivers and Harbors Act of 1965 – four and a half decades ago. Since then, many billions of federal dollars have been authorized, appropriated, and spent. Yet still we have a serious nonpoint pollution problem to which highways are a significant contributor.

Water quality in the mainstem of the Chesapeake Bay, and in the streams and rivers throughout its 64,000 square mile watershed, remains impaired by inadequately controlled discharges of nitrogen, phosphorus and sediment from many sources. The effects of this pollution are felt across the watershed, from the loss of high-quality trout streams in New York, Pennsylvania, and West Virginia to the loss of watermen communities in Virginia and Maryland that are over 300 years old.. Excess nutrient pollution is responsible for algal blooms and oxygen free dead-zones that destroy habitat, aquatic life and the commercial and recreational fisheries dependent upon them in the mainstem of the Bay. Sediment pollution buries aquatic vegetation and habitat. Excess nutrient pollution in particular is a phenomenon of global significance, and has been extensively explored in the world's scientific literature, by among others, Dr. Jim Galloway of the University of Virginia.

The six states of the Chesapeake Bay basin, the District of Columbia and the federal government have long recognized the decline in the Bay's water quality, prompting several inter-jurisdictional agreements to fix the problem, none of which have been successful. Today, cooperative work is underway to complete the largest and most ambitious Total Maximum Daily Load ever developed pursuant to the Clean Water Act, and this committee has before it legislation introduced by Senator Cardin, Senator. Carper and others that holds promise for eventually restoring the Bay's water quality at some unknown date after 2025 – perhaps seven or eight decades after you first authorized funds to study the problem.

In the meantime, pollution running off impervious surfaces in the Chesapeake Bay watershed continues to grow as regional population increases and the associated paving-over of the land proceeds at a rapid pace. Stormwater runoff from these areas contributes a significant amount of pollutants to the streams and rivers that supply freshwater to the Bay. The Environmental Protection Agency's Chesapeake Bay Program has reported that 17 % of phosphorus, 11 % of nitrogen and 9 % of sediment loads to the Bay come from stormwater runoff.[1] Furthermore, the Bay Program notes that, "Transportation and its infrastructure (roads, parking lots and driveways) account for 55 to 75 % of all paving of open space in cities, towns and subdivisions. This conversion of natural land to impervious surfaces creates excess stormwater runoff, which contributes a growing amount of pollution to the Bay and its rivers and streams".[2] The Bay Program also notes that "Chemical contaminants from runoff can rival or exceed the amount reaching local waterway from industries, federal facilities and wastewater treatment plants."[3]

Among the major contributors of impervious runoff in the Chesapeake region are the 97,044 miles of federal-aid highways that run through the six Chesapeake Bay states and the District of Columbia. Statistics from the Maryland State Highway Administration provide an illustrative example of the lack of controls to mitigate pollution from roadways. As of October 2008, SHA calculates that 89.9% of the impervious surfaces that it manages (overwhelmingly highways) in Maryland's eight largest counties have not installed pollution reduction mechanisms to control stormwater runoff. In other words, 90% of the highways in Maryland's eight largest counties channel pollution to local waterways and the Chesapeake Bay every time it rains. Even worse is that Maryland routinely outperforms the other Bay states in treating discharges from these impervious surfaces.

Stormwater Runoff from Federal-Aid Highways is a National Problem

Roads and highways built with federal financial assistance have an enormous negative impact on water quality, not just in this region but throughout the nation. Rain and melting snow runoff from the nation's 985,139 federal-aid highway miles are directly responsible for a huge quantity of pollutants that enter and degrade nearby lakes, streams, rivers, bays, and coastal areas across the nation. This includes many pollutants in addition to nutrients and sediment. Heavy metals, toxics, nutrients, bacteria and other pollutants can all be discharged into waterways through stormwater runoff.

According to a recent assessment of the nation's waters, for the nation as a whole, 39% of assessed stream miles, 45% of assessed lake acres, and 51% of assessed estuary acres remain impaired, largely by nonpoint source pollution. I certainly do not mean to suggest that all impairment is related to highways, although the effect of highways is, in fact, significant. The most recent 303(d) list of impaired waterbodies, required by the Clean Water Act, includes over 28,000

[1] EPA Chesapeake Bay Program, http://www.chesapeakebay.net/stormwater.aspx?menuitem=19515
[2,3] EPA Chesapeake Bay Program, http://www.chesapeakebay.net/transportation.aspx?menuitem=14672

separate impairments which are impacted by stormwater discharges from federal-aid roadways. Over 9,000 of these impairments are related to mercury, and more than 6,000 each are related to heavy metals, sediment and nutrients such as nitrogen and phosphorus.

Highways contribute to water quality impairments in three ways. First, an expanding roadway network generates increases in vehicle miles traveled, which in turn increases the discharge of nitrogen compounds and other particulate matter into the atmosphere. Several studies, including those of Dr. Robert Howarth of Cornell University show that these pollutants settle back onto roadways and areas relatively close to them. Nitrogen compounds deposited onto roadways join all of the other pollutants that have been directly deposited there by vehicular traffic, including those from the wearing down of tires, brake pads, engine parts, and chassis parts, fluid leaks, and chemical applied on or near roadways. This stew of pollutants can include toxics, heavy metals, bacteria, sediments and nutrients including pollutants such as mercury, asbestos, petroleum products and copper. In the absence of adequate controls, these vehicle-generated and roadway-associated pollutants are simply channeled off of roadways during weather events.

The following chart lists some of the sources and pollutants directly associated with roads.

Source of Pollutant	Pollutant
Brake Lining Wear	Asbestos, Nickel, Copper, Chromium
Metal Painting and Rust	Particulates, Nickel, Iron, Copper, Chromium
Tire Wear	Rubber, Pesticides, PCBs, Zinc, Lead, Calcium
Fuel and Exhaust	Petroleum, Particulates, Sulphate, Bromide, Lead, Nickel, Nitrate
Oil Grease and Hydraulic Fluids	Petroleum, Sodium, Calcium, Zinc, Lead, Nickel
Engine and Parts Wear	Particulates, Asbestos, Lead, Manganese, Iron, Copper, Chromium
Roadbed and Roadside Wear	Petroleum, Pathogenic Bacteria, Particulates, Sulphate, Nickel
Sanding and De-icing agents	Particulates, Sulphate, Sodium, Cyanide, Chlorine, Calcium
Herbicide, Pesticide and Fertilizer Use	Pesticides, PCBS, Phosphorous, Nitrogen, Copper, Cadmium

Second, the impervious highway surface acts as a collector and efficient delivery system for other types of pollution that are generated elsewhere. Wind-blown sediment, nitrogen compounds from industries and agriculture, and a variety of additional airborne pollutants land on roadways. Road design features intended to channel water off of roadways quickly carry these additional

pollutants into nearby waterbodies as well. All of us have seen, for example, bridges where rainwater is simply shunted to open grating or some other drainage system and dropped into the stream below, carrying the load of chemicals with it.

I want to provide an example of the impact of chemical accumulation on our environment that comes from the river only a few thousand yards from this hearing room. The Anacostia River watershed is only 176 square miles, about half in Prince Georges County Maryland, and the rest split between Montgomery County and the District. Runoff from the Capitol Complex flows into the Anacostia. US Fish and Wildlife Service scientists have documented the highest liver tumor rates in the Anacostia's bottom-dwelling catfish of any species ever studied. The tumors are linked to a family of chemicals called polycyclic aromatic hydrocarbons that accumulate in the water and the bottom sediments. PAHs are the products of the use, particularly the combustion of, products derived from petroleum, and enter the river system by washing off the region's roadways and other impervious surfaces.

Third, in addition to the transport of pollutants collected on the roadways and directed into adjacent areas,, the volume and rate of flow of water discharges from certain roadways can cause severe sediment erosion during heavy rainfall events. Powerful discharges cause stream bank erosion along unprotected creeks and streams, increasing smothering sediment pollution loadings and contributing to loss of habitat. Additionally, phosphorus and other pollutants attached to sediment molecules are added to pollution loadings when stormwater discharges are not channeled properly and nearby stream banks are left unprotected.

Current Requirements and Approaches

In the roughly two decades since the development of the Clean Water Act's stormwater program and the subsequent passage of the 1991 ISTEA legislation, increasing attention has been given to the water quality impact of federal-aid highways. Within the surface transportation statute and programs there currently are several policies, requirements and initiatives intended to improve the water quality performance of federally-assisted highways. Since 2005, Title 23 has declared that "transportation should play a significant role in promoting economic growth, improving the environment, and sustaining the quality of life". The Federal Highway Administration has among its objectives to "improve the environmental quality of transportation decision-making" and "increase ecosystem and habitat conservation" through the use of "context sensitive solutions". Both Transportation Enhancement funds and core Surface Transportation Program funds and National Highway System funds can be used for environmental restoration and pollution control projects, including retrofits, and funds can be used for planning and environmental coordination in some circumstances. Moreover, as it has done for more than 40 years, the National Environmental Policy Act requires that an environmental assessment or environmental impact statement be done for federally-assisted highway projects in most cases to highlight environmental concerns.

The problem is that the language, the assessments, and the availability of funding doesn't add up to keeping America's waters clean and healthy.

The experience of the Transportation Enhancements Fund is illustrative. In ISTEA, Congress allowed 10 % of highway funds to be allocated to "environmental mitigation to address water pollution due to highway runoff" – one of ten uses of the set-aside, expanded to 12 in subsequent reauthorization bills. However, only 1.1% of available transportation enhancement funds have been used for environmental mitigation of any kind since 1992 according to the National Transportation Enhancements Clearinghouse[4]. The same summary of nationwide spending of TE funds notes that since the program was created, bicycle and pedestrian trails and facilities, historic preservation and landscaping and scenic beautification have accounted for 88.4 % of the TE expenditures.

Some will point to the regulatory aspects of the Clean Water Act as the mechanism that ensures that highways control stormwater pollution to needed levels. The Clean Water Act requires that EPA, or far more commonly the state regulatory agencies, issue National Pollution Discharge Elimination System stormwater permits to protect water quality degradation from stormwater in defined urbanized areas, as well as in larger construction projects outside those areas, and where special circumstances related to "Total Maximum Daily Loads" apply. Federally-aid highway projects sometimes, but not always, enter into that framework. Even when they do, the rigor with which permit requirements are developed and applied is highly variable.

This variability was a principal theme of the Water Science and Technology Board of the National Academies of Science in its 2008 report, Urban Stormwater Management in the United States. The report says

> *States and municipalities have not been very rigorous in determining what constitutes an adequate level of compliance. The self-defined compliance threshold has been translated into a wide range of efforts at program implementation.*

Even more explicitly, this passage, from the report's Executive Summary, calls into question the entire approach:

> *EPA's current approach to regulating stormwater is unlikely to produce an accurate or complete picture of the extent of the problem, nor is it likely to adequately control stormwater's contribution to waterbody impairment. The lack of rigorous end-of-pipe monitoring, coupled with EPA's failure to use flow or alternative measures for regulating stormwater, make it difficult for EPA to develop enforceable requirements for stormwater dischargers. Instead, the stormwater permits leave a great deal of discretion to the regulated community to set their own standards and to self-monitor. Current statistics on the states' implementation of the stormwater program, discharger compliance with stormwater requirements, and the ability of states and EPA to incorporate stormwater permits with Total Maximum Daily Loads are uniformly*

[4] *Transportation Enhancements Summary of Nationwide Spending as of FY2008*. National Transportation Enhancements Clearinghouse. May 2009. www.enhancements.org

discouraging. Radical changes to the current regulatory program appear necessary to provide meaningful regulation of stormwater dischargers in the future.

In a 2008 report requested by your colleagues in the House (Surface Transportation Programs: Proposals Highlight Key Issues and Challenges in Restructuring the Programs), the General Accountability Office recommends that Congress consider restructuring the multitude of surface transportation programs so that they (1) have goals with direct links to an identified national interest and role, and (2) make grantees more accountable through more performance-based links between funding and program outcomes. The GAO report also notes that a principal theme of most of the seven public and private sector restructuring proposals that it reviewed was to "link transportation policy and funding to the environment and energy sectors". [5]

Clearly, cleaning up and preserving America's water resources is a matter of high national interest. Despite the policy language, regulatory requirements for certain new projects, and funding availability cited above, the fact remains that most of the nation's nearly one million miles of federal-aid roads continue to funnel pollution into America's streams and rivers.

If this committee could ensure that federal-aid roads meet an ambitious stormwater control standard, not only when they are built, but when they are reconstructed, rehabilitated, resurfaced, or restored, and then make the federal dollars available to do so, it would ensure cleaner water throughout the nation, reduce flooding and stream bank erosion. It is because of this nexus between infrastructure and environmental health that this committee has jurisdiction over both the Clean Water and Air Acts and the Transportation Bill being considered today.

A New Policy Standard for Water Pollution

The Chesapeake Bay Foundation, representing a coalition of over 150 organizations including environmental and conservation groups, water treatment agencies, and industry associations, respectfully asks that the reauthorization of the Federal Surface Transportation Act set a policy standard for controlling stormwater discharges from federally subsidized roadways. Given the importance of cleaning up the nation's waterways, the role that highway-generated and channeled pollution plays in them, the unwillingness or inability of most states to issue strong stormwater permits, and the competing need for every transportation dollar, we believe that the current system of carrots and no sticks simply isn't likely to get the job done.

The governors of the six Chesapeake Bay states and the Mayor of the District of Columbia made the same request in their May 2009 letter to the House Transportation and Infrastructure Committee (letter attached). They wrote:

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[5] *Surface Transportation Programs: Proposals Highlight Key Issues and Challenges in Restructuring Programs.* U.S. Government Accountability Office. GAO-08-843R. July 29, 2008.

"As your Committee prepares to reconsider the Federal Surface Transportation Act, we respectfully ask that you include in the reauthorization law a clear policy that triggers the necessary standards and guidance to ensure that all new construction and significant reconstruction of Federal-aid roadways mitigate the impacts of stormwater runoff. We believe that these policies should require construction that mimics pre-construction hydrologic conditions to the maximum extent feasible; and take into consideration the localized water quality impacts of roadway projects."

We agree with the governors that the stormwater policy standard should apply to new federal-aid roads as well as significant reconstruction or retrofit projects.

Developing a policy standard for federal-aid highways would parallel and complement the work that Senator Cardin and other members of this committee did in the 2007 Energy Independence and Security Act to ensure effective stormwater management for federal facilities. The statutory language of section 438, now U.S.C. Title 42, Section 17094, provides that

"The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

The EPA technical guidance for the statute, developed in coordination with other federal agencies, employs a performance-based approach which allows site designers maximum flexibility in selecting control practices appropriate for the site. It also allows for two options for compliance, creating a flexible system that takes into account regional topographic and weather variations. The first option requires that a site must retain stormwater discharges for a 95th percentile storm, or a storm whose rainfall equals or exceeds 95% of storms. Maintaining this amount of stormwater is akin to mimicking the natural or preexisting hydrology. In the event that this standard is either too lenient to protect water quality, or too stringent, the second option allows for site-specific hydrologic analysis, provided in recognition that there are established methodologies that can be utilized to estimate the volume of infiltration based on site specifics. Such guidance allows for a uniform performance standard with various options for how to achieve it. We believe that a similar standard makes sense for our nation's highway system.

Implementing such a policy standard would also assist the FHWA and other federal agencies to come more into line with the October 5, 2009 Executive Order on Federal Leadership in Environmental, Energy and Economic Performance. The EO affirms federal policy that Federal agencies shall, among other things, "conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services." It is further ordered that to achieve these goals and support their respective

missions, agencies shall prioritize actions based on a full accounting of both economic and social benefits and costs.

There are several ways that such a policy standard could be written. For the purpose of beginning a discussion we suggest that in addition to eliminating pollutants, an obligation, as with Section 438, should be to maintain or restore the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow to the maximum extent technically feasible. We further suggest four sequenced steps towards those ends:

- Preserve and retain natural features such as trees and shrubs as much as possible when new roadways are built or current ones expanded. These natural features reduce flow rates and allow for water to settle and be absorbed.

- Require measures such as frequent sweeping, catch basin cleaning, storm drain flushing, and management plans for deicing agents and roadside fertilizers.

- Treat as much runoff as possible on site utilizing elements of low impact development such as retention basins, swales and infiltration trenches and basins.

- Treat remaining stormwater discharges offsite or create appropriate offsets when onsite treatments are not viable.

In practice, such a standard would work as follows:

The first and most basic design feature should be that federal-aid highways, when possible, shall not destroy natural features that allow for infiltration and evapotranspiration of stormwater. By avoiding construction along steep banks, or by reducing the amount of vegetation that must be disturbed to complete a construction project, stormwater runoff can be defused or infiltrated cheaply and naturally.

Next, we suggest that standards should be developed to ensure that as many pollutants are removed or kept off of roadways prior to a rain event. Again, moderately inexpensive BMPs such as street sweeping and de-icing agent management plans can dramatically reduce total pollution discharges during a rain event.

However, retention of natural features and basic maintenance measures can only do so much. It is important that stormwater be treated onsite and allowed to settle into groundwater rather than directly discharging into waterways. The project must be designed in such a manner that it mimics the natural hydrology to the maximum extent practicable. "Maximum extent practicable" is the technical standard used in section 402 of the Clean Water Act. Since it has never been rigorously defined, it provides a good deal of flexibility to meet local conditions. In fact, regulations promulgated by the EPA in 1999 for Phase II of the stormwater program note that "the pollutant reductions than represent MEP may be different for each [permittee] given the unique local

hydrological and geological concerns that may exist and the differing possible pollutant control strategies." By defining an obligation but leaving the details to local designers, we can ensure that local conditions are respected and taken into account.

Finally, we recognize that right-of-way to construct appropriate infiltration techniques will not always be available. As it will be difficult to address stormwater runoff in these areas, we suggest that the policy standard require mitigation offsets and wetland restoration whenever on-site stormwater management is impossible or infeasible.

Such a standard for stormwater controls on federal-aid highways is similar to the guidance created per Section 438 of the Energy and Independence Act. It sets a goal and allows for various means of compliance, all based on local hydrology and weather. Yet whichever approach is chosen by a project developer, it will reduce stormwater discharges and impact water quality.

As noted above, we offer these recommendations to begin a discussion. They surely should be the subject of extensive technical discussion and revision. However, it is entirely appropriate that this committee consider the national interest in restoring and maintaining adequate water quality in the nation's streams, rivers, lakes, estuaries and coastal areas and recognize that the current arrangements are not getting the job done.

Thirty eight years ago, this committee declared a national goal to achieve adequate water quality to provide for the protection of fish, shellfish, and wildlife by 1985. We are still working towards that. You also declared a national policy to develop both point and nonpoint programs to achieve that goal. Programs have been developed, but more needs to be done. We ask you to give careful consideration to the benefits of a national policy standard for polluted stormwater management on the nation's federal-aid highways.

May 27, 2009

The Honorable James L. Oberstar
Chairman
House Committee on Transportation and Infrastructure
2165 Rayburn House Office Building
Washington, D.C. 20515

The Honorable John L. Mica
Ranking Member
House Committee on Transportation and Infrastructure
2163 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Oberstar and Ranking Member Mica:

As your Committee prepares to reconsider the Federal Surface Transportation Act, we respectfully ask that you include in the reauthorized law a clear policy that triggers the necessary standards and guidance to ensure that all new construction and significant reconstruction of Federal-aid roadways mitigate the impacts of stormwater runoff. We believe that these policies should require construction that mimics pre-construction hydrologic conditions to the maximum extent feasible, and take into consideration the localized water quality impacts of roadway projects. Finally, it will be critical that these standards promote cost-effective practices that maximize waterway protection while not compromising construction and maintenance of highway miles.

Nationwide, roads and related infrastructure comprise at least two-thirds of all paved surfaces. These impervious surfaces promote runoff—carrying with it pollutants from tailpipe emissions, fluid leaks, brake linings and tire wear – thereby delivering the roadway's pollutant load to the nearest receiving waterway.

Runoff from highways and related facilities constitutes a major part of the national water pollution problem. Most Federal-aid highways were built prior to this understanding, and therefore lack any stormwater controls. But best management practices to mitigate such impacts are now known and well understood and should therefore be an integral part of the reauthorized law.

In the Chesapeake Bay watershed, according to a 2002 Maryland study, highways account for 22 percent of urban nitrogen and 32 percent of urban phosphorus; 36 million pounds of nitrogen annually fall on Maryland alone from mobile and highway loads combined. One third of that, 12 million pounds, comes from mobile sources. By comparison, wastewater treatment plants contribute 17 million pounds of nitrogen a year.

The importance of mitigating the impacts of highway runoff stretch far beyond the Chesapeake. A study in Wisconsin showed that roadways produced some of the highest concentrations of phosphorus, suspended solids, bacteria and heavy metals. And a North Carolina Department of Transportation study showed that atmospheric sources related to automobiles accounted for up to 90 percent of nitrogen found in runoff from urban highways. Of the 42,256 impaired waters on the national Clean Water Act 303(d) list, 28,000 of the impairments are directly related to highway runoff. Unfortunately, over 28 percent of the impairments (12,001 water body

segments) are located within the Chesapeake Bay watershed jurisdictions. (DE 101; DC 27; MD 501; NY 610; PA 6,957; VA 2,534; WV 1,271).

Improved stormwater management is a national challenge presenting a vexing problem in the Chesapeake and waterways nationwide. Via the reauthorization process, we believe that it is possible to ensure that stormwater mitigation strategies are incorporated into all new construction and major retrofits of federal-aid roadways. Without this change, taxpayers will be forced to pay the more costly price of restoration to recover their degraded waterways.

We look forward to working with you on this important issue,

Governor Martin J. O'Malley
Maryland

Governor Edward G. Rendell
Pennsylvania

Governor Timothy M. Kaine
Virginia

Governor David A. Paterson
New York

Governor Joseph A. Manchin
West Virginia

Governor Jack A. Markell
Delaware

Mayor Adrian M. Fenty
District of Columbia

Delegate John A Cosgrove, Chairman
Chesapeake Bay Commission