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Environmental Planning and Management

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Introduction:

The following report on the Department of Public Works in Highland Park, New Jersey is part of a Green Audit, conducted by students in the Environmental Planning and Management course offered in the spring semester 2004, at the Bloustein School of Planning and Public Policy at Rutgers University. The goal of this report is to evaluate the current practices of the HPDPW, and identify the potential for incorporating more environmentally sound solutions.

Methodology:

Part One: A closer look at HPDPW

1. review HPDPW Web site and Highland Park handbook (determine scope of duties)
2. interview Don Rish, Acting Superintendent of Public Works
3. study maps at Borough Hall
4. scout and digitize points of discharge into River
5. read available literature on best management practices
6. formulate recommendations
7. graphically display information

Part Two: Stormwater Management

1. consult Carl Hann, local environmental activist, and Abbie Fair with ANJEC
2. study various stormwater awareness projects
3. suggest a cooperative project for HPDPW and community members
4. disseminate information about cooperative projects at Highland Park Street Fair

Part One - The HPDPW:

There are many duties of the Highland Park Department of Public Works, some of which include: sanitation collection, maintenance of streets, signs, and municipal buildings, as well as caring for the town's shade trees. For the purposes of this report, I will focus on the following responsibilities related to stormwater management: fleet vehicle and road maintenance, grounds upkeep, and the maintenance of storm sewers.

Fleet Vehicle Maintenance:

The fleet of vehicles at the HPDPW consists of roughly 20 trucks in total, 3 of which are garbage trucks with complex computer systems requiring a warm up period of 15 minutes before use. The Superintendent, Don Rish, has considered more fuel-efficient options, such as vehicles that run on natural gas. However, he has been unimpressed with the feedback from other municipal departments that have used these types of vehicles. The biggest complaint was the difficulty in finding stations for re-fueling.

Maintenance of the HPDPW vehicles consists of a brief weekly once-over, and a full servicing three or four times a year. Although the HPDPW does have an on-site collection for used oil, this repository is not intended for public refuse. Mr. Rish was aware of at least one tire store in Highland Park, which provides this service to the public.

I found that both Ubry's Mechanic Shop on Raritan and 1st Ave. and the Sunoco on Raritan and 2nd Ave. are both willing to take used oil from the public. Neither of the two shops charge a fee for this service, although their oil is collected by the Oil Recovery Service at a price of \$2.00 per gallon. Both mechanics said they did not have too many requests for this service.

Road Maintenance:

The job of maintaining the system of roads requires the repair of damage as well as on-going efforts to keep the streets clean and free of debris. Any damage to the surface of the roads is typically repaired with hot asphalt, which is available through the warmer months beginning in the end of March. Emergency repairs to potholes that must be conducted in the winter are accomplished with the use of a cold, tar-less patching material, which lacks the sticky nature of the hot application, and therefore is intended to provide only a temporary fix.

The topic of alternative paving materials was also addressed. Mr. Rish was somewhat familiar with the use of porous materials, which allow improved water recharge and reduce stormwater run-off. According to the EPA, there are two types of porous pavement: porous asphalt, and porous concrete. "Porous asphalt consists of an open-graded coarse aggregate, bonded together by asphalt cement...pervious concrete consists of specially formulated mixtures of Portland cement, uniform, open-graded coarse aggregate, and water."

Unfortunately, neither of these materials are intended for surfaces that experience a high volume of traffic, the frequent use of heavy trucks and machinery, or require snow removal operations.

Thus, alternative materials would probably not be sufficient for most streets and parking lots in Highland Park, although their use on park roads might be appropriate – depending on the cost. However, given the failure rate of 75%, typical of most porous

pavement applications as reported by the EPA in 1999, this alternative warrants strict scrutiny before implementation.

In order to keep streets clean, street sweeping is conducted on a daily basis. It takes at least a week to sweep the entire town. Debris from the street sweeping is stockpiled at the HPDPW until a yearly deposit is made at the Quantex Landfill in Edgeborough NJ, operated by the Municipal County Utility Authority. Quantex charges on a sliding scale based on the contamination of the debris. Mr. Rish has estimated that he sends between 50 and 60 trucks per year, each with a capacity of 18 yards, at an average cost of \$10.00 per truckload. According to Mr. Rish, in the event that the debris is too contaminated for the Landfill, it is then taken to an incinerator, as part of a new protocol established 4 or 5 years ago.

The largest contribution to the road debris is the sand from the winter road maintenance. The price of removing the sand from the roads is a major factor in the decision to change the current deicing procedure. The HPDPW was using a mixture of one part rock salt to two parts sand, but plans to switch to a de-icing mixture of one part salt to one part calcium chloride as soon as next winter. The town has recently purchased special tanks, which will attach to the side of the existing trucks and act much like the calibrators recommended in the BMPs on de-icing. The EPA promotes the use of calcium magnesium acetate (CMA) as deicing material alternative, which is less harmful to the environment and less corrosive than salt. However, ample documentation supports the fact that CMA requires the use of larger quantities to accomplish the same results using salt, and costs are higher by a minimum factor of 10. According to the findings in a U.S. DOT study comparing salt and CMA;

After reviewing the evidence, the committee concluded that the widespread use of CMA as a general replacement for salt is unlikely and unwarranted. The committee did not rule out the use of CMA on a more selective basis--such as on corrosion-prone bridges and in environmentally sensitive areas--but the cost-effectiveness of such uses can only be determined on a case-by-case basis.

Many European cities use a liquid salt solution on roads, before a snowfall. This type of pre-emptive spreading (before weather conditions arise) is used to prevent the ice from forming in the first place, rather than dealing with its removal after the storm has arrived. However, it is not clear from the literature, if the weather conditions in these European cities are comparable to those here in Middlesex County, New Jersey.

Grounds Upkeep:

In addition to the roads, HPDPW is responsible for the care of various municipal grounds, which typically includes attention to soil/plant fertility and the control of unwanted plants/weeds. Although the department historically relied on Scotts Garden Products, known to contain harmful chemical compounds, no inputs (of any type) are currently used on the borough's grounds. Mr. Rish explained that there is a team of students, with one of the horticultural programs at Rutgers University, in the process of conducting research on Highland Park's soils, in order to make recommendations for the use of organic amendments.

With respect to other aspects of ground maintenance, it is not clear whether the HPDPW plans to seed a mixture of broad leaf grasses, which create a healthier, more diverse lawn environment. However, no herbicides are used on municipal lawns, nor is it likely they will be in the future.

The department's intention to use organic products is a positive step towards better management practices. The reduction or elimination of harmful chemicals from lawn care practices not only benefits the soil, but protects the watershed as well. Lawn care products wash into our gutters, and leach into our streams, ultimately ending up in the river. This makes the job of storm water management more difficult, as it requires the participation of individual home and business owners to effectively reduce this particular form of non-source point pollution.

Maintenance of Storm Sewers:

In December of 2003, New Jersey Department of Environmental Protection Commissioner Bradley M. Campbell stated, "Few people realize the overwhelming impact of everyday litter and materials running off into our stormwater systems." The DEP has issued a stormwater control proposal requiring municipalities to be more proactive in reducing non-point source pollution. According to Bill Pugh, Director of Public Works in Tacoma, Washington, "If we can't prevent non-point pollution in the first place, the next best thing is to stop it at the catch basin – it's much more expensive to deal with stormwater pollution at the outfall than it is to manage at the source." Here in Highland Park, Mr. Rish does hope to be able to conduct catch basin cleanings on a weekly basis. Currently, the cleaning of catch basins does not follow a regular schedule. However, at this time the HPDPW simply responds to complaints from residents when catch basins have become noticeably clogged.

Part Two - Stormwater Management:

According to the EPA, more than 25% of New Jersey's waters are impaired. Urban Runoff, in particular, causes 13% of the impairment of our rivers and streams, 18% of our lakes, ponds and reservoirs, and 32% of our estuaries. And, "more than one-half of the substances on EPA's list of 129 priority toxic chemicals have been found in urban runoff."

When asked about any efforts to raise awareness regarding watershed management, Mr. Rish responded that he had seen some stormwater stenciling of the catch basins in Highland Park. However, his department was not responsible for the stenciling, nor did they know anything about it. Mr. Rish said he did not have a problem with the stenciling, although it seemed largely ineffective to him, since the paint used wore off rather quickly.

Community Effort to Raise Awareness in New Brunswick:

One community activist, Carl Henn shared his experience of marking catch basins in New Brunswick as Chairman of the city's Environmental Commission. Mr. Henn joined Donna Caputo, Recycling Coordinator for the Department of Public Works in New Brunswick, as well as volunteers from the community and the McKinley Community School. Participants worked in 9 teams, which consisted of 2 adults and 5 youth. Because of the age of the participants, the group decided not to use any toxic materials to get their message across. The decision was made to mark the drains with a plastic disc bearing the message, "No Dumping – Drains to River."

Ultimately, Mr. Henn felt the selection of the plastic disc proved a poor choice, because the tags, affixed with non-toxic glue, had disappeared within a month, at a cost of \$300 for a kit including 100 markers. The funding for this project was part of a larger grant of \$5,000.00 from the Environmental Endowment of New Jersey, Inc. for the Raritan River Estuary Education Project, sponsored by The New Brunswick Environmental Commission.

Catch Basin Filters:

Several methods exist, from stenciling to affixing markers, for raising awareness concerning protection of the watershed. However, regardless of their life span, these techniques are limited because they lack the immediacy of efforts, which visually reduce the amount of pollution. The development of catch basin filters, have provided a new tool for several municipalities, seeking to improve their community's watershed management practices.

"Grate Mates", as one company call their filters, are designed to capture the oils and sediment that enter storm drains, before they are end up in the river. According to a year-long study, funded by the National Fish and Wildlife Foundation entitled, "Bench Testing of a Sock-Type Catch Basin Insert for Removal of Free Petroleum", each filter is capable of capturing up to 55 pounds of sediment, 30% of which is likely to contain toxics and heavy metals, as well as more than 50% of the free oil that passes through the basin.

This particular filter works like a conical piece of cheesecloth placed under the catch basin, with over-flow vents in case of heavy storms. Installation requires a grate

design that enables its shield to be lifted from its frame, in order to place the filter into the drain. The excess fabric of the filter sits along the outside rim of the drain, which is then, held in place by the weight of the shield. Without testing this type of filter, it is not clear whether this particular brand of filter would be appropriate for the conditions in Highland Park. There are several companies manufacturing different types and styles of catch basin filters, some of which may be better suited for states on the central eastern seaboard.

One staff member with the Association of New Jersey Environmental Commissions voiced concern regarding the accumulation of debris inside the basin inserts, resulting in the need for frequent maintenance. This concern is corroborated by the findings in one field study conducted by the Santa Clara Valley Urban Runoff Pollution Prevention Program. The study included several different types of inserts including the StormGuard brand, for which it was noted, "drain inlet insert results show that reductions in metals, hydrocarbons, and solids are consistent with expectations for the technology; however, frequent flow bypass required more maintenance than anticipated." Furthermore, the study found that even with "excessive" maintenance considerable flow passed through unfiltered. "Due to the tendency to clog and the high maintenance needed for drain inserts, the study concluded that drain inserts were low in effectiveness."

It is important to note that different designs have vastly different success rates. According to the data provided in the Minton study ("Bench Testing of a Sock-Type...") the accumulation of debris does not have an adverse effect on the effectiveness of the drain insert. In fact, the claim is made that the filter actually works better when it is "partially occluded", due to the slower flow of water through the sock, thereby allowing

more absorption of oils and small -often toxic- particles. Given the wide array of choices in drain inserts, further research may be necessary before implementing an insert program in Highland Park.

Conclusions:

As noted in many of the sections in this report, the HPDPW is making many strides towards better stewardship. The superintendent of the department deserves credit for his role in adopting organic methods of lawn care, as well as his careful consideration of options for snow removal and vehicles with alternative fuel sources. However, better stormwater management requires a commitment on the part of the residents of the borough in accomplishing this goal.

Increasing awareness is an important component of bringing environmental change to a community, and it is appropriate for the municipal departments to lead the way. In fact, in some municipalities projects, such as the installation and maintenance of catch-basin filters, were led by employees of the Department of Public Works in partnership with non-profit organizations and public schools. Given the extensive environmental regulations with which Public Works agencies now need to comply, the community could benefit immensely from sharing in this knowledge.

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Interview: Donald Rish, CPMW. Acting Superintendent, Borough of Highland Park, Department of Public Works.

Interview: Carl Henn. Former Chairman, New Brunswick Environmental Commission.

Interview: Abbie Fair, Project Coordinator. Association of New Jersey Environmental Commissions.

