

*Helping Communities face the challenge and impacts of growth while maintaining community character and a sense of place.*

**FACT SHEET: 9**

## Stormwater Management

iTRaC is the Nashua Regional Planning Commission's new approach to community planning that focuses on integrating transportation, land use and environmental planning. The program was developed to assist communities in dealing with the challenges of growth in a coordinated way that sustains community character and a sense of place.

### What is Stormwater?

Stormwater is the flow of water that results from precipitation which occurs immediately following rainfall or as a result of snowmelt.

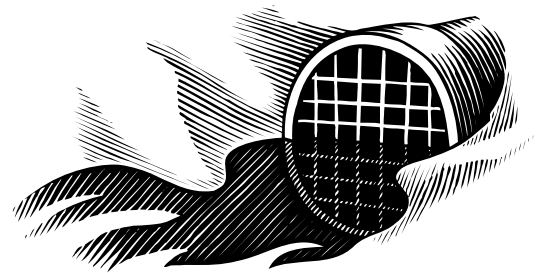
When a rainfall event occurs, several things can happen to the precipitation. Some of the precipitation infiltrates into the soil surface, some is taken up by plants, and some is evaporated into the atmosphere. Stormwater is the rest of the precipitation that runs off land surfaces and impervious areas.

### Stormwater Runoff = Water Pollution

Runoff from rainwater will carry chemicals, nutrients, sediments and other forms of nonpoint source (NPS) pollution across impervious surfaces like roofs and parking lots, over lawns and into local waterways (either directly or through storm sewers). This stormwater runoff is the most common way that NPS pollution reaches local rivers, streams, and lakes.



The major goal of stormwater management is to reduce impervious surfaces and increase absorption of rainwater by soil and vegetation to, usually by reducing the speed of flow or by retaining the water in basins or decentralized areas. This will reduce the amount of pollutants being carried off into storm sewers and streams, as well as reduce flooding. Increasing absorption by soil has the added benefit of helping to maintain ground water supplies in our aquifers, which are the source of many community drinking water supplies throughout the Nashua



### *Stormwater Management Planning 101*

Stormwater planning is required by federal agencies such as FEMA (flood control) and EPA (pollution reduction goals/Phase II program). Planning requires forethought, goals, coordinated efforts of many entities, and the efficient and strategic use of time and resources. The following are the principle objectives of Stormwater Planning:

- Protect human health and safety
- Minimize damage to private property and structures within the community
- Minimize damage to roads, bridges, parks, utilities and sidewalks
- Reduce expenditures of public money for constructing expensive flood control
- Preserve wetlands and waterways
- To wisely spend time, energy and resources of town employees and equipment in pursuit to best serve the interests of the community.

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## Stormwater Management Techniques

### Open vs. Closed Drainage... Doesn't it all end up in the same place?

Yes and no. Most local regulations require stormwater to be "directed to enter the nearest open stream channel." This allows both open and closed drainage systems to be integrated into local stormwater management, but can still result in environmental impacts like flooding, aquifer depletion, stream channel erosion, and habitat destruction.



So what are the differences between open and closed systems and how can communities use both of them without impacting the environment or the community? First, let's define the two systems. An open drainage system uses swales and open channels to convey stormwater and is often integrated with Low Impact Development techniques. Closed drainage systems use pipes, culverts and manholes to convey stormwater to detention basins or other centralized infiltration areas.

So which one should you use? Open, Closed or BOTH! Stormwater management systems should be designed for the particular characteristics of the site in order to avoid environmental impacts and be the most cost-effective for monitoring and maintenance after the project is complete. Water will follow a natural path, so designing a system that respects the characteristics of your site and planning for a monitoring and maintenance schedule will go a long way towards successful stormwater management.

Open and closed drainage - this bioretention swale (open) treats sidewalk runoff before it is directed into the storm water system (closed). Photo: Nevue Ngan Associates - [www.gradingandexcavation.com/sw\\_0701\\_integrating.html](http://www.gradingandexcavation.com/sw_0701_integrating.html)



Open drainage system on Christmas Tree Lane in Milford

### Benefits of Open and Closed Drainage Systems

#### Open

vs.

#### Closed

- Aquifer recharge and environmental protection
- Solution to Pollution is Dilution - open systems allow increased residency of water to breakdown pollutants
- Less Maintenance Costs
- Inspections are easier to perform - they're not buried
- Wicks the water off of the roadway (prevents overuse of deicing chemicals)

- Contains water on road en route to a catch basin
- Less surface area dedicated to conveying water
- May reduce erosion by limiting contact with erosive soils
- Conveyance systems reduce leakage in areas of denser development

#### How can I start implementing Stormwater Management in my community?

There are numerous models available to develop a stormwater management ordinance that fits your community. Please visit the NRPC iTRaC website for a list of resources with available models that you can apply to your town.

#### How can I learn more about Stormwater Management?

Contact Camille Pattison, iTRaC Program Manager to schedule the iTRaC introductory presentation. [camillep@nashuarpc.org](mailto:camillep@nashuarpc.org)



Permeable Parking Lot Demonstration - Open Drainage  
Seattle, WA

<http://depts.washington.edu/cwvs/Research/stormwater.html>

