

Northwestern Vermont Case Study: Implementing Green Infrastructure with your Code

Vermont Municipal Green Infrastructure toolkit

Green Infrastructure (GI) means different things to different people depending on the context in which it is used. In Vermont we define it as “a wide range of multi-functional, natural and semi-natural landscape elements located within, around, and between developed areas at all spatial scales.” This includes everything from forests and meadows to wetlands, floodplains, and riparian areas. For municipalities Green Infrastructure can be promoted in two ways: by using Low Impact Development (LID) concepts at both the macro-level of town planning and site design and by promoting the use of Green Stormwater Infrastructure (GSI) practices and techniques. LID seeks to maintain a site’s pre-development ecological and hydrological function through the protection, enhancement, or mimicry of natural processes. GSI consists of systems and practices that restore and maintain natural hydrologic processes in order to reduce the volume and water quality impacts of the built environment while providing multiple societal benefits.

The Water Quality Connection

Stormwater runoff can have a negative impact water quality. In developed areas, water runs over impervious surfaces such as buildings and roads and picks up pollutants that ultimately discharge into our waterways. In rural areas, water flows over fields and downstream banks often causing land erosion which carries phosphorus laden soils in nearby streams. Excess stormwater is currently a serious problem in St. Albans City and Town where Stevens Brook and Rugg Brook are listed as impaired waterways. In 2013, these issues triggered a requirement that each municipality comply with a federal stormwater permit. Increased amounts of stormwater is a contributor to water quality in the St. Albans and Missisquoi Bays of Lake Champlain where eroded banks and nutrients get washed into the streams and rivers during large storm events.



Addressing Stormwater in Highgate

NRPC assisted the Town of Highgate with combining their 2011 zoning and 2008 subdivision regulations into a joint Development Regulation that was adopted on March 5, 2015. As a part of this update process the Town revised the way the regulations address stormwater.

Requesting Information for Informed Decision-Making

Highgate’s regulations requested basic information on existing site features and drainage provisions for the ZA and DRB review with a proposed development. However, the information applicants provided was not consistent in how it was presented or in the level of detail necessary to understand the impact the proposed development would have on site drainage. The Planning Commission was interested in clarifying the type of information applicants provide to standardize it across application reviews as well as better inform the town’s decision-making.

Highgate adopted language that requires permits for both conditional use and site plan reviews to provide a grading and drainage plan. This should show any proposed stormwater infrastructure or low impact development design features. To clarify information received in the subdivision process, the requirements were formatted into a table; a drainage plan and stormwater management plan are required for preliminary and final plats.

Stormwater Management Plans address the collection, retention, and treatment of stormwater with detail on site grades, direction of drainage flow, and design of any detention basins, LID practices to be employed and GSI.

Planning and Design Standards for Stormwater

Highgate previously had general standards for subdivision applications that addressed LID practices and stormwater infrastructure but they were general in approach. Applicants had to show “due regard for the preservation and protection of existing aesthetic features” and a drainage plan was required that accommodated runoff from the two and ten year storm. Both of these standards did not provide specific language as to how applicants should meet this requirement.

To standardize expectations, Highgate adopted Planning and Design Standards that cover *Site Preservation, Stormwater, and Erosion Control*. These standards are now used to evaluate Subdivision applications as well as Site Plan and Conditional Use review.

These standards ensure existing site features that naturally aid in stormwater management are protected to the maximum extent practical and outline techniques for site preservation and minimizing land disturbance. For example, there are specific measures for how to minimize tree removal outside the building envelope to retain their benefits such as reducing erosion, maintaining screening and providing wildlife habitat.

In regards to the management of stormwater, the standards give the DRB the ability to require a stormwater management plan and state a preference for the use of LID and GSI practices over traditional methods to the maximum extent practical given site conditions.

*If GI approaches are not proposed, the applicant shall provide justification as to why their use is not possible before proposing to use conventional stormwater management measures which channel stormwater away from the development site.
(Highgate Development Regulations, Article 7, Section 7.8 F5)*

Maintaining the Landscape’s Function

Highgate’s regulations contained a provision for the creation of open space as a part of a Planned Unit Development. The regulations previously did not include provisions for the amount of open space to be created or a definition of allowable uses within the open space. Now, the DRB can require up to 25% of the gross area proposed for development to be set aside for open space. The regulations also identify uses that are not compatible with the intent of the open space such as easements and right-of-ways for roads or utilities, parking, conventional stormwater facilities and septic systems. Preserving open space is not a direct implementation of LID practices as this land could be used for passive recreation or agriculture. Open space does protect a part of the landscape from being developed. Retaining undeveloped areas maintain the existing vegetation and the qualities of the landscape which play a role in filtering stormwater runoff.

Challenged by Site Constraints

A challenge the Town faces is attributed to the underlying geology. Sandy soils are highly suitable for infiltration practices and are present in areas zoned for medium and high density development as well as the Industrial/Commercial district. However in some areas a layer of clay sits beneath the sand. This geologic pattern has led to landslides along steeper terrain if groundwater levels rise above the clay layer – a scenario that happened in the spring of 2011 with rapid snowmelt and high rainfalls. Given occurrences of landslides in recent years, the Town is hesitant to implement infiltration practices that could exacerbate erosion issues.

Next Steps

The Town plans to identify areas that are susceptible to landslides to get a better sense of where soils are more vulnerable to erosion and infiltration practices should not be used. This information could be used to develop a landslide overlay district that will identify areas sensitive to landslides and provide specific standards that should be met.

For more information on building Green Infrastructure in the Northwest region, please contact the Northwest Regional Planning Commission, 75 Fairfield St., St. Albans, VT 05478 or 802-524-5958

or, visit <http://vpic.info/GreenInfrastructureToolkit.html>