planBTV South End Revisions
Brownfields & Stormwater Elements
Staff Revisions for LRPC Meeting 05/11/2016

Stormwater Management

The vital connection between the City of Burlington and Lake Champlain relies on the thoughtful management of stormwater, and reducing our impact on the Lake is among our highest priorities as a community. As an urban industrial landscape where 'things are made,' we see a lot of infrastructure dedicated to transportation and storage of cars and freight—e.g. surface parking lots and large building footprints—which typically involves a lot of pavement. These paved areas, however, generate stormwater runoff that follows several different paths to the Lake. As we know from page XX in the "About the South End" section, stormwater runoff for the South End is either collected in underground combined sewer pipes that drain to the wastewater treatment plant, or it drains directly into Englesby Brook or Lake Champlain (via the Barge Canal or Blanchard Beach).

The primary stormwater issues that impact our receiving waters are the **amount** of runoff for areas that drain to the combined sewer or Englesby Brook and the water **quality** of the runoff for areas draining to Englesby Brook or the Lake. The aim of a sustainable stormwater management system is to first reduce the total amount of runoff. This can be done through minimization of impervious surface and use of green stormwater infrastructure. For the runoff that cannot be held on-site, a sustainable stormwater management system aims to slow down the water to reduce peak flows to the combined sewer and to provide treatment to the runoff that drains to our receiving waters.

Lake Champlain is considered to be "impaired" due to excessive phosphorus levels. To correct this impairment, the City will need to substantially reduce the phosphorous entering Burlington Bay (by as much as 11% from existing surfaces), and ensure that future development has a net zero impact on phosphorus runoff. To meet this ambitious target, the City will need to seek out any and all opportunities to reduce and clean stormwater, ranging from retrofits to existing systems, to implementing the most effective and innovative systems in new public and private projects. We should also be proactive about curbing potential impacts on Lake Champlain from chloride, a contaminant associated with the use of road salt for clearing ice and snow in winter conditions. Some communities have identified road salt as a toxin and have adopted guidelines for its use, while others are testing additives—such as beet juice or sand—that will help reduce the amount that is needed to be effective.

The planBTV South End stormwater management strategy is integral to advancing climate change resiliency, managing extreme weather events, and reducing the day-to-day impacts of localized flooding in the neighborhood. This strategy starts with a commitment to better utilize our resources to manage and treat stormwater runoff to improve our impaired waterbodies and comply with the Clean Water Act by:

- Identifying opportunities to expand stormwater capacity within existing infrastructure
- Reducing neighborhood runoff

- Improving the quality of runoff before it reaches its destination

Strategies

Expand stormwater capacity within the neighborhood. Deploy creative thinking and planning for stormwater in a systematic way by retooling our existing infrastructure.

Plan it as a system. With the ever increasing focus on cleaning up Lake Champlain, both the City and private developers will be asked to do more to slow down and clean runoff from their property. An eco-district approach can be used in the South End so that the most effective stormwater solutions can be put to work in the right places. Much like the "Green Machine" for stormwater management downtown, a district system should be explored for the South End using the public right-of-way for bioswales, retention pockets, tree wells, and other techniques to "bank" stormwater credits, giving more flexibility for future projects.

- Explore the feasibility and alternatives for establishing a stormwater management district
- Community & Economic Development Office; Department of Planning & Zoning; Department of Public Works

Rethink the role of parks and open spaces. The City's first-ever Parks, Recreation & Waterfront Master Plan, adopted in 2015, identifies a major role for the City's parks and open spaces in stormwater management. Burlington's parks can perform essential ecological and biological functions for the City, as well as help capture stormwater runoff, prevent erosion and reduce the impact of floods. Management priorities will be established for each city park to identify its role in stormwater management, followed by an assessment of its geology and topography. This will guide decisions about each park's capacity for and placement of amenities to ensure that its use compliments its natural qualities and its larger role in the ecological health of the City.

- Implement Stewardship recommendations from the BPRW Master Plan; continue to advance Oakledge Park siting study.
- Parks, Recreation & Waterfront Department; Department of Public Works

Reduce neighborhood runoff. As future development and redevelopment occur, both public and private entities should expand the use of low-impact development techniques to meet or exceed the City's performance standards for stormwater.

Minimize paved areas, which are the primary source of runoff. In the spirit of "an ounce of prevention is worth a pound of cure" every square foot of pavement or roof are should be evaluated for its necessity. For example, parking areas should be sized for average use, not peak needs, and alternatives to driving and parking at high demand times. Driveway widths and streets should be just wide enough to accommodate the largest vehicles that typically come and go, and not necessarily

the largest trucks that may ever show up. Multi-story buildings should be encouraged over single-story spaces so that the "per person" or "per job" roof area is reduced.

- Revise land development regulations to encourage or require minimization of parking lot sizes, street widths and roof surfaces, and to expand the use of pervious pavements and/or green roofs.
- Department of Planning & Zoning; Department of Public Works

Slow the water down with measures that will disperse runoff rather than concentrate the flows. New developments, road projects, and parks can accomplish this quite easily by design, with stormwater being dispersed to multiple points and travel over planted areas before entering the City's network of stormwater pipes. Existing systems can be retrofitted, where "green pockets" are inserted between the paved area and the collection systems for stormwater dispersal or filtration into the ground. Parking areas can be surfaced with permeable asphalt or paver systems that absorb or even store some stormwater.

- Identify the "low hanging fruit" for reducing flows into the systems for retrofits of existing infrastructure.
- Department of Public Works

Flow restoration for Englesby Brook. Englesby Brook is an impaired waterbody primarily due to the uncontrolled volume of stormwater runoff draining from impervious surfaces in the area. The Flow Restoration Plan for the brook identifies that best management practices need to first be implemented throughout the watershed to reduce runoff to meet its target flow. Once the reduced flow has been met, we can set our sights on enhancing its capability by restoring the riparian zone along the brook's edge. This means installing and maintaining plants and trees along its banks to hold in the soil, and provide treatment and filtering of rainwater before it enters the brook.

- Complete the Englesby Brook Flow Restoration Plan and pursue prioritized implementation of the proposed stormwater management retrofits
- Engage the Champlain School and Neighborhood Association for interest, and apply for an Ecosystem Restoration Grant to fund riparian enhancement.
- Department of Public Works

Improve water quality

Treat the water to remove phosphorous and other pollutants before it heads to the lake. Because the soil types and water table in the South End are less well suited to infiltration practices than other parts of the city, underdrains will be needed in most stormwater treatment projects. Bioretention cells or raingardens and sand filters are nothing more than landscaped pockets of soil and gravel of various shapes and sizes, which provide a place for stormwater to soak in and give life

to plants and be cleaned in the process. Street trees can be planted in SilvaCell™ stormwater planters, which take in water from the street, clean and filter it with the soil, and then allow the water to be taken up by the tree while also providing adequate soil volume for tree survival. These types of features should be used routinely in public and private development projects in favor of the conventional "collect and send into the lake" systems. In addition, retrofits of existing systems will be needed to meet the City's goals, which can be spurred on by pilot demonstration projects in the South End. Three possible ideas are:

- **Plant more trees** along the Champlain Parkway or Pine Street with SilvaCell System that stores and filters runoff.
- **Green bus bulbs.** The planned curb extensions in the Champlain Parkway project can be "upgraded" to also serve a stormwater management function by becoming mini-bioretention cells. Public art can further be incorporated to make these distinctive, attractive places.
- **Living Bioswales.** Within the South End and particularly along Pine Street, linear Stormwater Planters can be introduced to provide both reduction and treatment of runoff.

- Identify opportunities for applying the City's College Street stormwater toolkit into new projects and to existing infrastructure in areas where change is not expected.
- Department of Public Works

The Barge Canal & Brownfield Sites

The South End's industrial history left behind brownfields, sites with documented or potential soil and/or groundwater contamination from previous uses. Contamination has to be mitigated before these sites can be safely turned into something new and beneficial for the South End—more industrial or maker space, small offices or even open spaces. Remediating contaminated sites will both allow for new active uses to take place and improve environmental quality in the neighborhood.

The largest and best known of the South End's contaminated sites is the Pine Street Barge Canal site—a former coal gasification plant with such serious environmental issues it was designated by the federal government as a Superfund site. The Barge Canal site has a long history of clean-up, monitoring and planning efforts. Other brownfields scattered throughout the neighborhood have experienced varying levels of testing and remediation. More information about these brownfield sites is available in the South End Phase 1 Existing Conditions Report at www.planBTVSouthEnd.com

There are limited federal and state resources available to help with testing and clean-up, so prioritizing a course of action is critical. Which sites are most important to be redeveloped and which sites need the most help? What new uses are appropriate for these re-claimed sites and how can they contribute to achieving land use, urban design and development objectives?

planBTV South End outlines a strategy to:

- Provide necessary assistance to support redevelopment of key brownfield sites
- Continue to advance cleanup and reuse of South End brownfield sites

Strategies

Provide necessary assistance to support redevelopment of key brownfields

Planning, technical and financial assistance can be critical to helping owners of brownfield sites better understand the types of contamination on their land, assess the degree of remediation required, and take the steps involved in safely transforming sites into something new. Partnerships between CEDO, the federal Environmental Protection Agency (EPA) and the Vermont Department of Environmental Conservation (VT DEC) can facilitate the process of evaluation, remediation, and redevelopment.

Finalize plans underway for key South End brownfield sites. Through the Area Wide Plan and the Railyard Enterprise Project (REP), the City is studying future opportunities for brownfield sites in and around the railyard and Barge Canal sites. The Area Wide Plan serves as an implementation plan for the redevelopment concepts in this plan, and the REP These plans identify future infill and redevelopment opportunities, evaluate options for needed infrastructure connections, and outline the steps to safely transform these sites.

- Complete the Brownfield Area Wide Plan and Railyard Enterprise Project Alternatives Assessment.

- Community & Economic Development Office, Department of Public Works, Department of Planning & Zoning

Provide technical assistance to owners of brownfield sites. Based on the extent of contamination and other factors, such as deed restrictions, owners face myriad remediation requirements and/or future land use restrictions. The City should continue to work owners of these sites to ensure they better understand contamination levels and have tools available for the clean-up and reuse of these sites.

- Conduct further studies to quantify contamination and level of remediation.
- Community & Economic Development Office, Department of Planning & Zoning, private property owners.

Pursue federal and state funds for evaluation and remediation of sites. While remediation is possible for most sites, it drives up the cost of development. For priority brownfield sites, compete for funding assistance from federal Environmental Protection Agency (EPA) and Vermont Department of Environmental Conservation grants.

- Complete funding application process. Complete studies and begin remediation efforts.
- Community & Economic Development Office, Department of Planning & Zoning, private property owners.

Complete remediation and begin redevelopment. Once sites have been appropriately remediated, implement redevelopment plans to return them to active and productive use for the South End. Additional technical and financial support may be needed to make these projects feasible.

- Engage developers and designers to create plans that integrate environmental considerations into future reuse of sites.
- Community & Economic Development Office; Department of Planning & Zoning; private property owners

Continue to advance cleanup and reuse of South End brownfield sites

In order preserve and enhance the characteristics of the South End, this plan identifies potential redevelopment of and future uses for underutilized sites throughout the neighborhood—many of which are considered to be high- or medium-risk brownfield sites. Through additional planning and studies, opportunities for implementing planBTV South End's vision for these sites, and the reuse other properties, can be explored.

Prioritize the reuse of the Barge Canal site and the land around it. Continue to study opportunities for transforming the Barge Canal site into a publicly accessible open space and activate land around it by encouraging remediation and appropriate reuse. One vacant site on Pine Street east of the canal (453 Pine Street) and one larger site south of the canal (the former General Electric Lakeside location, which includes the Innovation Center) are subject to the Barge Canal deed restrictions on allowable land uses.

Any reuse of these sites has to be designed and located in a way that does not disturb the protective soil cap on the canal site.

- Complete Brownfield Area Wide Plan and implement recommendations for these sites; investigate successful redevelopment of Superfund sites as public open spaces.
- Community & Economic Development Office; Department of Planning & Zoning; private property owners

Infill development along Industrial Parkway. Add more industrial space along Industrial Parkway to take advantage of the location and current uses. Infill development made possible by consolidating parking in a shared facility will give existing users room to grow, while staying in the same place. Any redevelopment here may be subject to VT DEC regulations.

- Conduct further studies to quantify the contamination and level of remediation. Pursue EPA and VT DEC grants as needed. Integrate environmental considerations into future redevelopment plans for these sites.
- Community & Economic Development Office; Department of Planning & Zoning; private owners

Identify other priority sites for further studies. In addition to the key redevelopment sites outlined here, there are several other sites in the South End that will require further investigation to determine the extent of contamination and type of remediation needed before redevelopment can be considered. The former Vermont Structural Steel site, the self-storage site on Flynn Avenue and the existing Mobile terminal are examples of uses that may change over time, but have contamination concerns that are considered to be medium or high risks to redevelopment.

- Prioritize remaining brownfield sites for environmental study and future redevelopment based on location, potential reuse, visibility and other factors.
- Community & Economic Development Office, Department of Planning & Zoning