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Concept Plan for Old Ellicott City LID Project

On May 16, 2012, a design charrette was held to discuss opportunities for implementing Low Impact Development (LID)–type solutions in Old Ellicott City. We use the term LID to encompass all site-scale and micro-scale stormwater management technologies which are a component of Environmental Site Design (ESD) in Maryland regulations and are also called "green infrastructure" in EPA parlance. This concept plan summarizes the outcome of that charrette and describes possible projects that could be undertaken in both the near-term and longer-term future.

Figure 1. View of Old Ellicott City business district from Patapsco River and railroad bridge

1. Background

The business district in Old Ellicott City is a good example of urban development with little to no stormwater control. Owing to the high percentage of impervious cover (i.e., the streets, parking lots, sidewalks, and rooftops) within the catchment, there is minimal "time of concentration" for stormwater runoff after it rains, which quickly becomes a water management issue. The lack of stormwater controls flushes nutrients, sediment, litter, and other pollutants directly into the headwaters, Tiber Creek, and the main stem of the Patapsco

River**.** The lack of stormwater controls in parking lots in the upper part of the city are also causing significant erosion to headwaters draining into the Tiber and Patapsco.

To date there has been limited effort to dampen or treat these flows. Efforts to infiltrate stormwater are hampered by the lack of available green space, shallow bedrock, poor soils, and steep slopes (Figure 1), as well as piped streams that cannot expand into their historic flood plains in response to increased flows, leading to water backups, flooding, and erosion of surrounding soils.

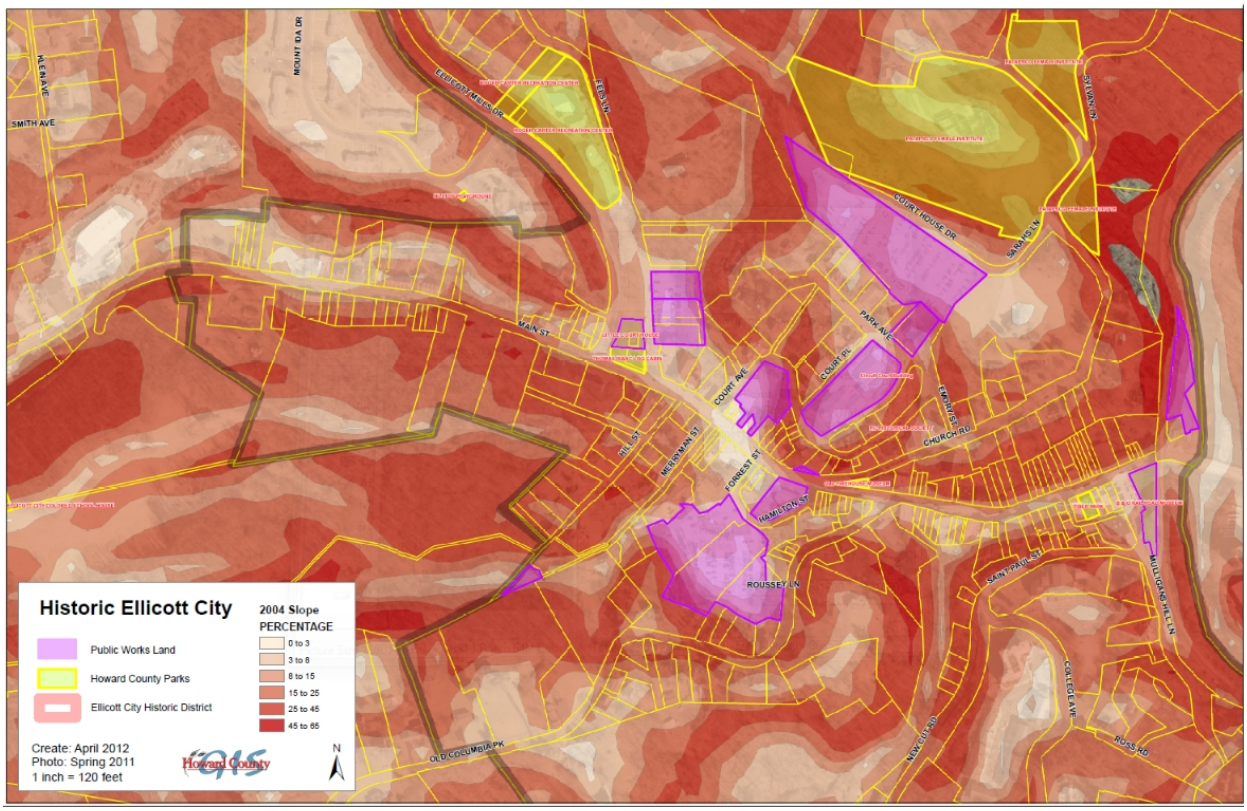


Figure 2. Topography in Historic Old Ellicott City

With the advent of LID best management practices (BMPs) that focus on treating stormwater immediately where it falls (i.e., on the site- or micro-scale), there are now options available to better manage rainwater even in highly urbanized business districts like Old Ellicott City. Concepts like street bump outs, permeable pavement, rain gardens, down spout gardens, and green roofs could have applications for better controlling stormwater runoff in Old Ellicott City. These BMPs can also provide other environmental and amenity benefits to the business district and watershed.

2. Purpose

The goal of this project is to develop a concept plan for the business district of Old Ellicott City comprising a variety of state-of-the-art LID stormwater BMPs. Such BMPs include bioretention cells, pervious surfaces, green roofs, subterranean infiltration chambers, and artistic stormwater management features (see Appendix A for photos for example LID stormwater BMPs and "LID art").

Figure 2 shows the area of study. These BMPs, often called retrofits when applied to already developed areas, will serve to control smaller rain events (including the first flush of runoff), but will not necessarily alleviate the larger issue of flooding from larger storm events. This plan will be developed in coordination with the local community stakeholders and will consider the historic importance of the area and its value as a tourism hotspot.

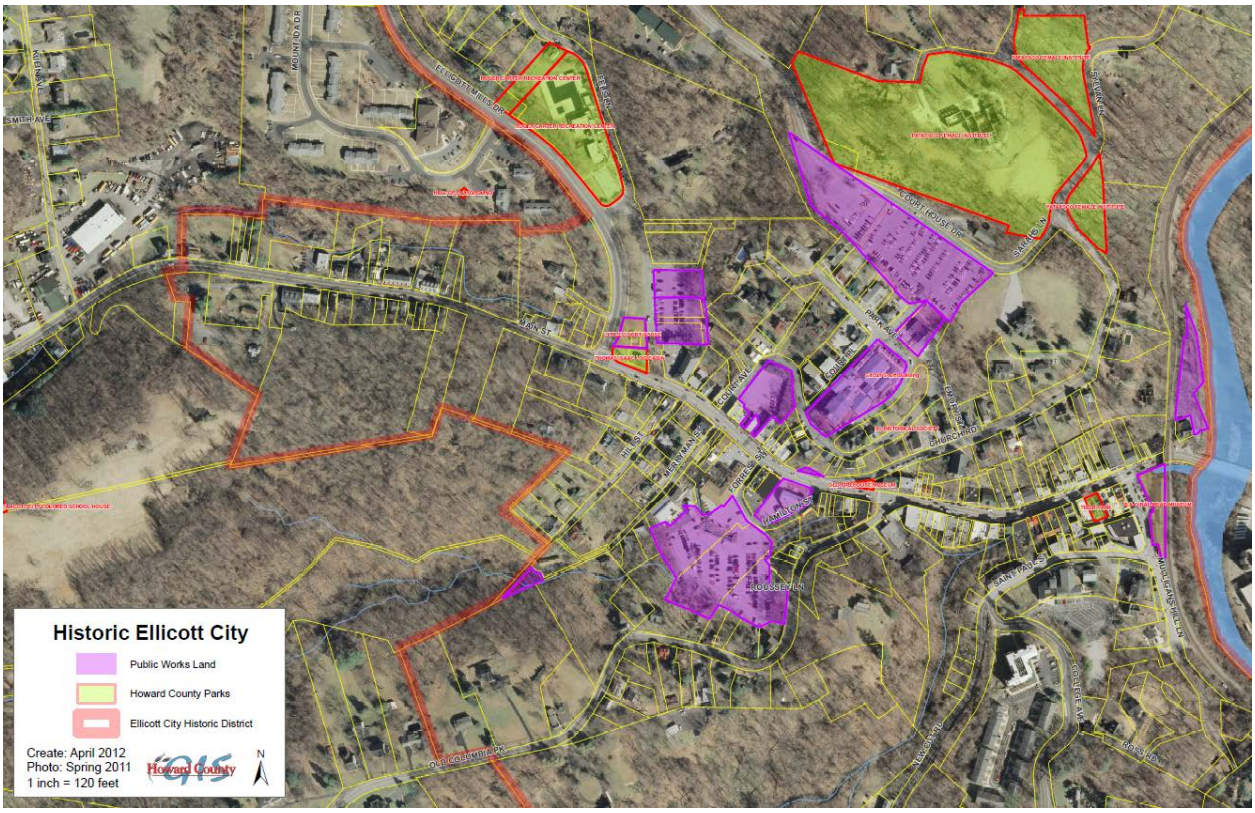


Figure 3. Historic District of Old Ellicott City in aerial view showing Howard County property managed by the Departments of Public Works and Recreation and Parks

A project like this has many hurdles to overcome. Notwithstanding the usual hesitation associated with innovative designs, there are issues with physical space constraints, business community concerns about the impact on customers (both during and after construction), and historic district considerations. All are a challenge, but one to which LID stormwater BMPs are

perfectly suited. Further, the demonstration of "green street" designs in this high visibility area will serve as a showcase for these new BMPs and their ability to blend into unique neighborhoods. This project can thus serve as a model for future county projects.

3. Charrette Summary

On May 16, the design charrette for this project was held at the Robinson Nature Center in Columbia, MD (Figure 3). The Howard County (HC) Office of Environmental Sustainability convened the meeting, which was facilitated by Versar under contract to the HC Stormwater Management Division of the Department of Public Works. Experts from engineering, environmental planning, and parks disciplines, as well as the Old Ellicott City community and historic commission, were included along with staff from various HC agencies.

Figure 4. Charette participants discussing options for implementing Low Impact Development (LID) Best Management Practices (BMPs) for Old Ellicott City

The following 17 agency staff, stormwater experts, and interested stakeholders participated:

- Jim Caldwell — HC Office of Environmental Sustainability
- Evelyn Tomlin — HC Department of Public Works
- Mark Richmond — HC Department of Public Works
- Brad Killian — HC Department of Planning and Zoning
- Beth Burgess — HC Department of Planning and Zoning
- John Byrd — HC Department of Recreation and Parks
- Mark Southerland — Versar

- Alexi Boado — Versar
- Chris Brooks — McCormick Taylor
- Guy Hager — Parks & People Foundation
- Elliot Rhodeside — Rhodeside and Harwell
- Bill Stack — Center for Watershed Protection
- Jennifer Zielinski — Biohabitats
- Charles Alexander — Business owner (Alexander Design Studio)
- Dave Carney — Business owner (Wine Bin)
- Grace Kubofcik — Ellicott City Restoration Foundation
- Allan Shad — Historic District Commission

After a welcome and charge from Jim Caldwell of the Howard County Office of Environmental Sustainability, Guy Hager of Parks and People Foundation made a brief presentation on LID projects completed in Baltimore City and Mark Southerland presented photographs of other LID projects constructed in Washington, DC, Portland, OR, and Seattle, WA, including "LID art" by Buster Simpson. Dr. Southerland concluded the introductory presentations with a quick photographic tour showing ground-level views of key locations in the business district of Old Ellicott City. Fifty photographs were indexed to an Old Ellicott City map and reviewed when each location was discussed later in the meeting; "street views" from Google Maps were also used to illustrate specific locations. Hard-copy, large-format maps were used to record notes on specific locations and facilitate discussion.

The consensus of all participants was that there are many opportunities for LID stormwater BMPs, and green redevelopment in general, within the business district of Old Ellicott City. More than that, all felt that the area was ripe for such investment, both in terms of (1) invigorating the local community and (2) providing of model of LID for the rest of the county. The local business owners and HC agency staff agreed that concern for parking will be a contentious issue, but many within the community believe that parking is adequate or can be addressed as part of the LID project. The participants also recognized that existing zoning regulations, building codes, and state regulations, will have an effect on ultimate implementation, but these constraints were not viewed as complete barriers to the ideas discussed. Everyone espoused the hope that once this concept plan was completed, there would be support for a second phase of design that could address any regulatory constraints and public concerns.

3.1 Types of LID Stormwater BMPs

The morning session focused on identifying the types of LID stormwater BMPs most suited to Old Ellicott City. Useful background on the historical changes and current uses of specific locations was provided by the local stakeholders. A list of the 32 BMP types or ideas related to implementing LID in Old Ellicott City that was developed by the participants is included as Appendix B. BMP types are listed in the order in which they were generated.

3.2 Specific Recommendations for BMPs in Old Ellicott City

The afternoon session focused on selecting the most desirable locations for implementing LID stormwater BMPs in Old Ellicott City and providing specific details on the appropriate BMPs for each location. About two dozen general and specific locations were identified on hard-copy maps and discussed throughout the meeting. These locations were organized into the following categories:

- Parking lots
- Main Street proper
- Courthouse to Main Street pedestrian connection
- Intersections with Main Street
- Stream day-lighting
- Residential areas

Each location was discussed and a list of potential BMPs created. Figure 5 is a map of each location selected for possible LID implementation. Table 1 includes a photo of each location and a synopsis of the LID strategy envisioned for the location. In some cases, qualitatively different strategies were developed and each strategy is included separately. In general the LID strategies to not reach the level of conceptual designs but are instead a list of component techniques that would be used to realize each strategy. Some members of the group offered to refine specific location strategies with conceptual drawings of possible designs.

At the end of the afternoon session, the participants voted for 3 to 5 favorite location-specific LID strategies, in order of personal preference. The result of this voting is shown below:

1.	Tiber Creek parking lot south of Main Street	31.5% of votes
2.	Courthouse parking lot	15.2
3.	Intersection of Columbia Pike and Main Street	15.2
4.	Main Street as a whole	12.9
5.	Attractive step connection from Main Street to Courthouse	7.9
6.	Ellicott Mills Road parking lot	4.5
7.	Public parking lot behind brewery	3.4
8.	Intersection of Maryland Avenue and Main Street	3.4
9.	Stream restoration watershed-wide	3.4
10.	Main Street demonstration projects	1.1
11.	Intersection of Ellicott Mills Road and Main Street	1.1
12.	B&O Railroad parking lot	0.6

The following additional location-specific LID strategies did not receive top 5 votes from participants. As such they are included below but are not in priority order:

- Parking lot along Patapsco River north of Main Street
- Elevator connection from Main Street to Courthouse
- Gondola lift connection from Main Street to Courthouse
- Bike pathways
- Specific stream segments
- Residential LID programs

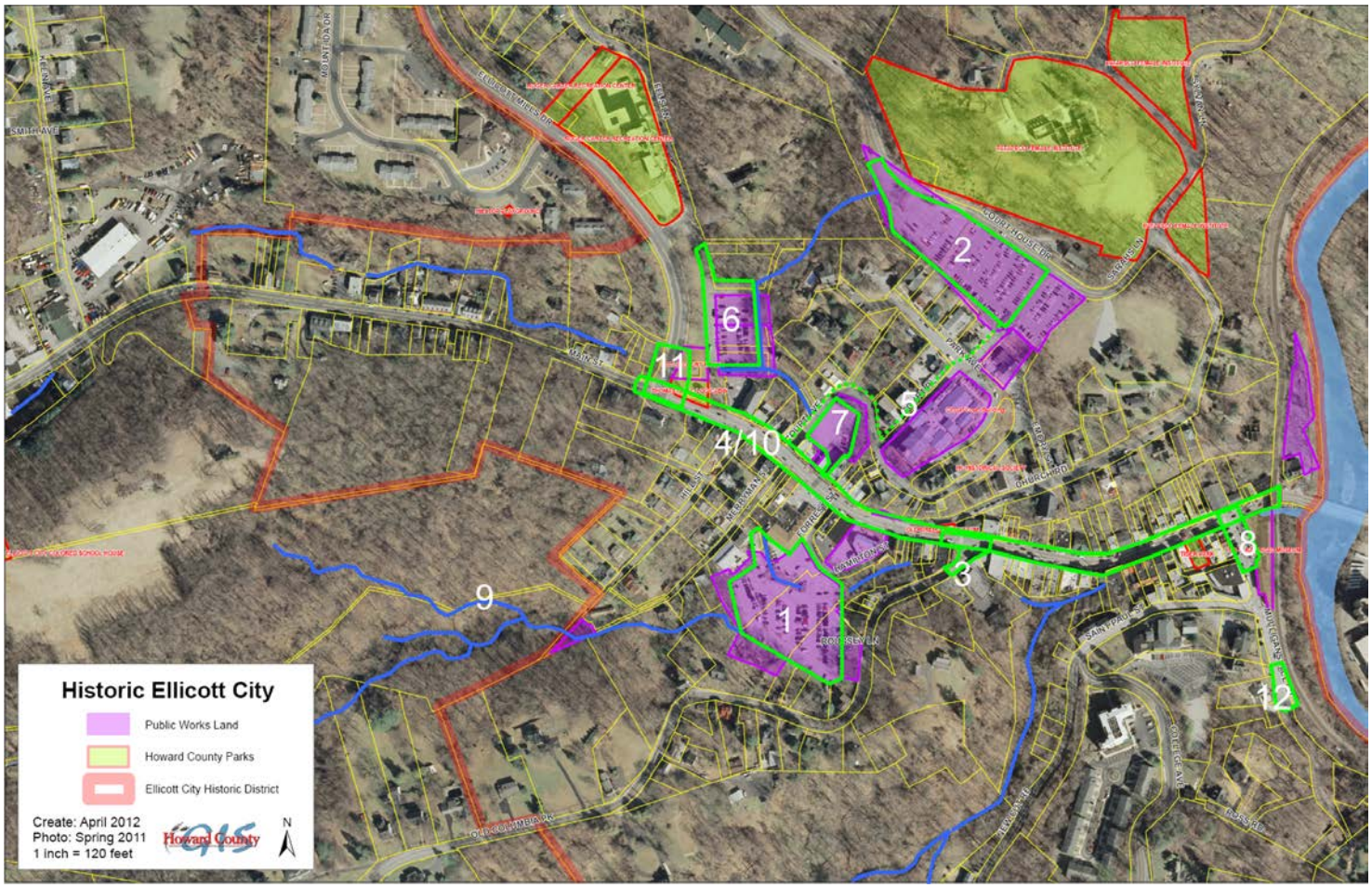
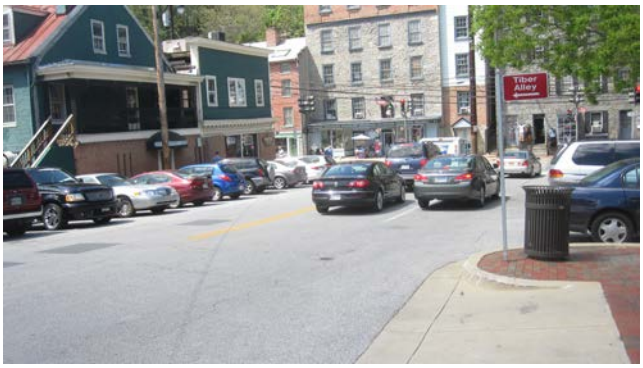


Figure 5. Locations within Old Ellicott City for which LID strategies were developed in the charrette

Table 1. Photograph and synopsis of each LID strategy developed for the 12 locations within Old Ellicott City

Location	LID Strategy and Options
1. Tiber Creek parking lot, south of Main Street 	• Multi-story covered garage with green roof for stormwater management • Pervious pavement with subterranean storage and infiltration (water table permitting) with improved parking configuration to increase available spots • Bioretention cells throughout with reconfigured parking to retain or add parking spots • Day-light remainder of stream • Any combination of the above
2. Courthouse parking lot 	• Pervious pavement with subterranean storage and infiltration plus improved parking configuration to increase available spots • Bioretention cells throughout with reconfigured parking to retain or add parking spots • Subterranean chambers for quantity and quality control of runoff • Pervious pavement with subterranean storage • Any combination of the above • Step Pool Conveyance in northwest portion of parking lot to protect the headwater
3. Intersection of Old Columbia Pike and Main Street 	• Daylight stream and create bridge intersection • Artistic feature incorporating innovative stormwater management • Reduce impervious and extend existing pocket park owned by county to incorporate bioretention • Narrow street and eliminate second turn lane to increase pedestrian safety and provide space for bioretention and educational displays

4. Main Street as a whole 	• Removal of all street parking (with exception of commercial vehicles making deliveries) and extension of sidewalk along one or both sides to include bump-outs with bioretention • Artistic stormwater management features throughout main street • Increase tree canopy with tree boxes • Impervious sidewalks • Planter boxes for downspouts visible on Main street • Combination of the above as technically feasible. • Rerouting of overhead utilities from Main street to allow behind buildings or underground to create more space for LID and appease merchants
5. Attractive step connection from Main Street to Courthouse 	• Covered walkway with bioretention cells and/or LID art from Courthouse public surface parking down to Main street to encourage use of upper parking lot in conjunction with reduction in parking on main street to allow for bump-outs and bioretention
6. Ellicott Mills Road parking lot 	• Pervious pavement with subterranean storage and infiltration • Bioretention cells throughout with reconfigured parking to add parking spots • Subterranean chambers for quantity and quality control of runoff • Pervious pavement with subterranean storage • Multi-story covered garage with green roof for stormwater management • Stabilize small tributary to Tiber which runs along east side of parking lot and which drains Courthouse parking lot • Any combination of the above • Improvements would add value to nearby historic buildings and museum

7. Public parking lot behind brewery 	• Pervious pavement with subterranean storage and infiltration with improved parking configuration to increase available spots • Bioretention cells throughout with reconfigured parking to retain or add parking spots • Subterranean chambers for quantity and quality control of runoff • Pervious pavement with subterranean storage • Multi-story covered garage with green roof for stormwater management • Any combination of the above
8. Intersection of Maryland Avenue and Main Street 	• Artistic feature incorporating innovative stormwater management especially along Maryland Avenue and tied into corner park • Reconfigure street parking to be more efficient and include bump-outs with bioretention • Reduce impervious surface and extend existing park owned by county to incorporate bioretention • Add bioretention along center of Maryland avenue near intersection • Narrow street and eliminate second turn lane to increase pedestrian safety and provide space for bioretention and educational displays
9. Stream restoration watershed-wide 	• Incorporate natural channel design and day-lighting for Tiber Creek and tributaries watershed-wide

10. Main Street demonstration projects 	• Retrofit a discrete section of Main Street as a way to demonstrate new stormwater technologies • Retrofits could be implemented in series as redevelopment occurs • Demonstration could include one artistic stormwater feature or perhaps a prominent bioretention cell, planters draining roof leaders, or tree boxes
11. Intersection of Ellicott Mills Road and Main Street 	• Artistic feature and/or bioretention cells making use of the generous green space available along east and west sides of Ellicott Mills road and which would be capturing road runoff
12. B&O Railroad parking lot 	• Pervious surfaces with subterranean storage and infiltration plus improved parking configuration to increase available spots • Bioretention cells with reconfigured parking in order to retain or add parking spots • Any combination of the above

4. Next Steps

Completing any of the LID strategies described above would move Howard County closer to treating the impervious cover required under its stormwater permit and meeting the nutrient and sediment load reductions of the Chesapeake Bay TMDL. More than the quantitative improvements would be the demonstration of such BMPs in the highly visible downtown Old Ellicott City. These improvements would also serve to invigorate the local business and residential community.

As this concept plan includes only LID strategies (with specific BMP options), the next steps would include

- Generating artistic renderings and conceptual designs
- Additional public outreach and stakeholder involvement
- Developing cost estimates and funding sources
- In-house or contracted design and construction

Appendix A. Examples of Low Impact Development (LID) Best Management Practices (BMPs)

Figure 1. Bioretention in curb bump out, Portland, OR

Figure 2. Bioretention cell draining Senate office parking lot, 1st and D St NE, Washington DC

Figure 3. Bioretention strip at US Navy Yard, Washington, DC

Figure 4. Permeable pavers at US Navy Yard, Washington, DC

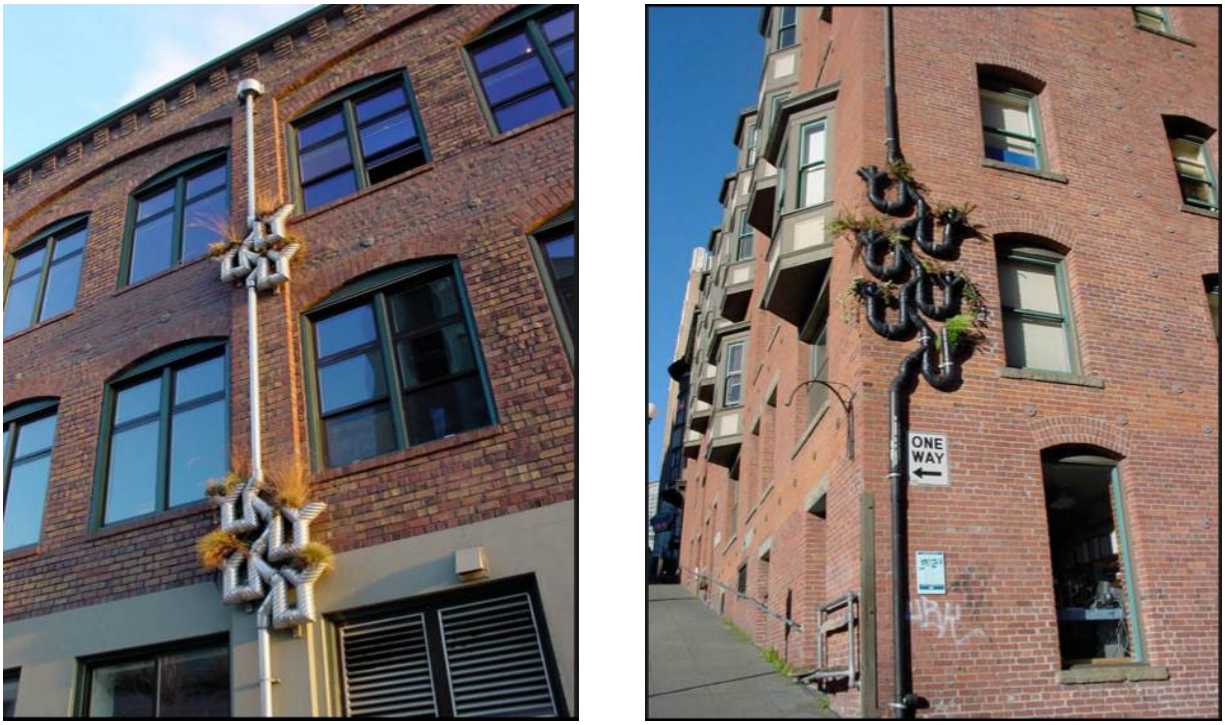


Figure 5. Artistic downspout feature, created by artist Buster Simpson. Vine Street, Seattle, WA

Figure 6. Artistic stormwater feature, created by artist Buster Simpson. Vine Street, Seattle, WA

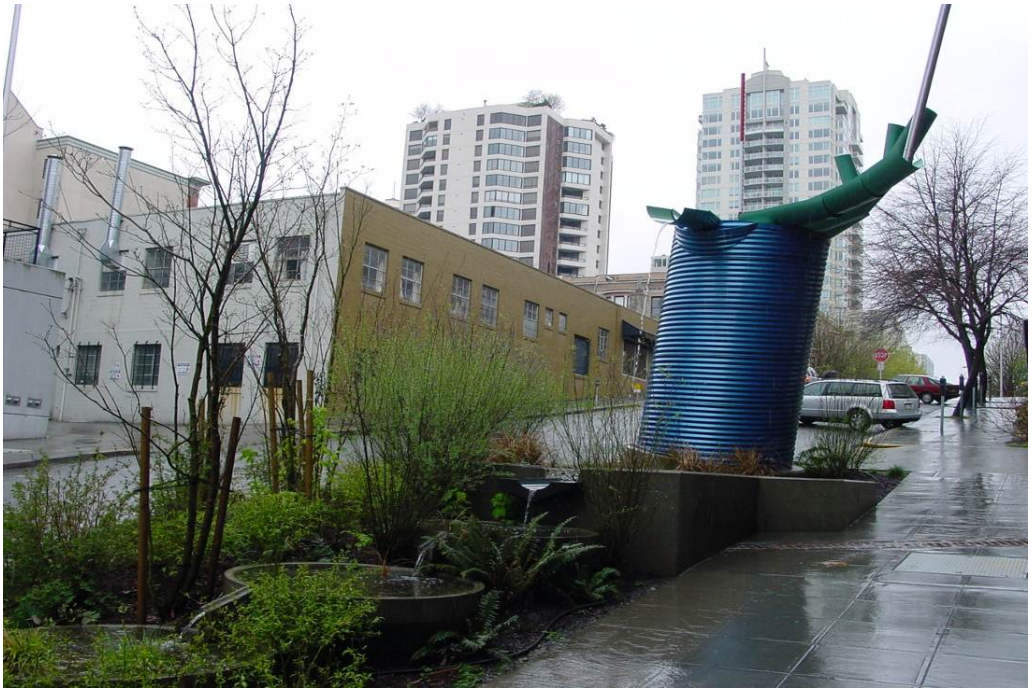


Figure 7. Artistic stormwater feature, "Beckoning Hand", created by artist Buster Simpson. Vine Street, Seattle, WA

Figure 8. Artistic stormwater feature, "Whole Flow", created by artist Buster Simpson for a Whole Foods store. Pasadena, CA

Appendix B. List of types of Low Impact Development (LID) Best Management Practices (BMPs) recommended in the charrette (listed in the order in which they were generated)

1. Walking tour for educating public
2. Integrate with pending renovations
   - New Roger Carter facility
   - Patapsco Female Institute and botanical garden
   - Old tourism office
   - Collapsed wall near railroad
3. LID along Main Street
   - Curb extensions with varied curb height to protect shops from overflow
   - Focus on flat areas as steep slope defeats LID
   - Use cobblestone to identify LID
4. Solve parking issue to liberate space for LID and provide water quality control
   - Parking garage on south Tiber lot only need 1/3 footprint
   - Shuttle among parking lots
   - New initiative will monitor 453 spots with App to identify vacant spots
   - 80 spots on Main Street in double and single segments
   - Construct multi-level parking garage with green roof
   - Need to consider parking access for delivery and construction for commercial vehicles.
5. Upstream flood control is being addressed in a separate study
6. Extend storm drain network for additional conveyance with LID
7. Repurpose cobblestone alley as pervious
8. Planters along alleys and streets
9. Use pervious pavement in parking areas
10. Daylight and un-channelize Tiber Creek in south Tiber parking lot, including buried street under La Palapa restaurant
    - Tiber River should be an amenity
    - Main Street has unique river system running under it which needs to be highlighted and embraced not hidden under roadways
11. Porous pavers to mimic cobblestone history
12. Restore streams through parking lots and tributaries
    - Daylight and riparian and flood plain
13. Augment urban tree canopy, especially on main street (would help control smaller stormwater events.
14. Signage showing flow off parking lots and across properties
    - Paint stream on pavement where stream daylighting is not possible
15. Direct Church Road flow into private grassy lot and/or church office parking lot
16. Decrease pavement on parking lots with more efficient spacing

17. Reduce runoff from large Courthouse parking lot
    - Medians with LID
    - Eliminate or reduce NW corner lot along Court House Avenue
    - Direct runoff into SE grassy space near Patapsco Female Institute
18. Green roofs on flat roofs that can bear weight and new structures such as parking decks
19. LID planters next to B&O Museum, Wine Bin, and La Palapa
20. Direct rooftop runoff through downspouts into tree pits, rainbarrels, and planters
21. Use Courthouse courtyard to capture rooftop runoff in visible LID setting
22. Enhance corridor from Courthouse and Main Street for use of large parking lot
    - Funicular, gondola lift, or elevator
    - Attractive meandering staircase
    - Raingarden at intersection of Courthouse and Main Street
23. Bury or relocate overhead utility lines behind buildings and use as appeasement for new LID practices on Main St
24. LID and stream daylighting at Hilltop community and Roger Carter site
    - Roger Carter to be razed and new development will be incorporate LID
25. Full Main Street renovation in architectural rending, including
    - widen sidewalks and deemphasize traffic with narrower roadway
    - Elimination of parallel parking would decrease traffic jams
    - Remove parking on Street for sidewalks and LID
    - Stage LID as demonstration segments
    - Integrated design with garbage collection and other city functions
26. Program to encourage residential LID (e.g., rain barrels) projects by neighborhood
27. Restore stream and recover slag/rocks near old quarry
28. LID at condos next to old elementary school
29. Renovate Old Columbia Pike–Main Street intersection (over bridge)
    - Narrow street and eliminate two turn lanes with cobblestone for walkway to increase pedestrian safety issue
    - LID park such as feeding planter with from old theater roof
    - Use wall space for educational display
30. LID at small parking lot behind old post office
31. Renovate Maryland Avenue-Main Street intersection with changes to road width and parking to create visual entrance and LID
32. Highlight historic mill town theme using LID waterwheel sculpture, etc.