Water Streets

Elizabeth Powers

Streets, Trails

Water Streets: Variations on the green street concept where two important things occur:

1. the street design and its integration with surrounding buildings and open spaces attempts to mimic pre-development hydrological function, or the most appropriate hydrological function for the area given changes development may have made on the local water cycle.

2. water is an integral part of the design, providing education on ecological function, contributing to the atmosphere the designer wishes to create, and enhancing psychological well being.

Consequently, a water street provides both ecological function and social benefit.

Context: A water street is particularly suited to an urban setting with limited horizontal space. A water street uses vertical and linear elements in revealing and collecting water. These elements have smaller footprints and can be layered vertically to fit in a dense urban environment. At the same time, a water street should reveal the flow and cycle of water through the city, either its natural flow along a topographical gradient or its "technical" flow as it is reused or distributed differently for human needs.

Essential Elements:

- Provides hydrological processes and/or helps conserve water resources
- Uses layers of vertical and horizontal elements
- Reveals the flow of water and uses

Acquisition / Implementation Mechanisms: As water streets are generally in the public right of way, their implementation will be largely dependent on the public sector. Initiative for a particular street or municipality could begin with neighborhood activism, such as the Growing Vine Street project (see next page), or be driven by the drainage utility like Seattle's Natural Drainage projects. Cooperation from transportation departments is essential and ideally they would play a leadership role, especially streets needing repair or retrofits. City leaders and planning departments can also take the leadership to put implementation mechanisms in place that encourage or require private developers along a street to develop components of the street.

Pattern: Build Green Streets on all residential streets draining directly to creeks and main city streets with a pedestrian focus. Install the Water Street variation of a green street on urban streets running to streams and shores and where a high level of activity is desired and space is limited.

Case Studies: Some examples from local projects are on the following pages and the last two pages comprise a design project based on this concept and developed while this research was conducted.

Photo: EADP Nov 2005

Case Studies

Growing Vine Street

The Growing Vine Street project is a community initiative to develop a set of green solutions for urban streets like Vine Street. Their objectives are three-fold: “to treat roof runoff through biofiltration, to create a refreshing green space for the community, and to reintroduce the natural hydrologic cycle into our urban lives.”

A central concept in their plan for the whole street is a runnel running the street’s entire eight-block length surrounded by native greenery. Storm water would be collected from roofs in large cisterns along the street and supply the runnel while the planting will treat the water. Completed projects along the street include the Beckoning Cistern and planted downspout at 81 Vine Street (above) and the cistern steps at the bottom of the hill, just completed this fall. All three provide functions of collection and treatment and reveal the urban water flow.

Seattle Natural Drainage Projects

Over the last five years, Seattle Public Utilities has been developing new approaches to managing the damage from storm water run-off in particular to respond to the first listing of a threatened species in a major urban setting - the Chinook salmon. Their projects, called “natural drainage systems” are designed to serve multiple functions. SPU outlines these essential elements for each project:

- They help to manage flooding in neighborhoods.
- They improve the appearance and function of the street right-of-way.
- They provide responsible stewardship of the environment.
- They help the City meet local, state and national environmental regulations.

Their first project call the Street Edge Alternatives or “SEA Streets” was very successful, retaining, infiltrating or transpirating 98% of the storm water run-off and was very popular with the residents. The 110th Cascade project treated a street with significantly more slope and installed weirs to contain water. This resulted in more exposure of water flow than the SEA Streets which had large planted beds. To date, all of the natural drainage projects have been on residential streets or neighborhoods. The concept of a water street with narrower treatment areas could perhaps be the next target for SPU’s projects.

Resources

Alexander, Christopher. A Pattern Language, Towns, Buildings, Construction 1977.

Augustin, Viola. A water boulevard vision for Jackson Street : getting storm water out of the pipes and into people’s minds. 2004.

Dreiseitl, Herbert. Waterscapes : planning, building and designing with water. 2001.

Green streets : innovative solutions for storm water and stream crossings. 1st ed. Portland, OR : Metro, 2002.

Growing Vine Street website, http://www.growingvinestreet.org/concept.php, accessed December 2005, and in person research Fall 2004.

Seattle Public Utilities Natural Drainage Projects, http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/index.asp. Accessed December 2005.

A Water Street for a Community Open Space Initiative in the Chinatown/International District

(the following is an excerpt from the final report for Landscape Architecture 503 Studio in the Fall of 2005, taught by

[Pedestrian Bridge to Weller]: Elizabeth Powers *An Unfolding Journey*

This design tackles three sections along a east- west axis that have inherent properties of or potential

to express three essential urban forms - the grand boulevard, a square, and a market. The concept for the design is to link and strengthen these three from with a "water street."

A Water Street

A water street is a type of green street in that it should be part of a natural drainage system for the buildings and surfaces surrounding it. In the case of this project the three sections link a proposed green street on Weller between 6th and 7th, and the original shoreline of the city which would cut just under Union Station. The Pioneer Square and Stadium Districts were once the tide lands of the city.

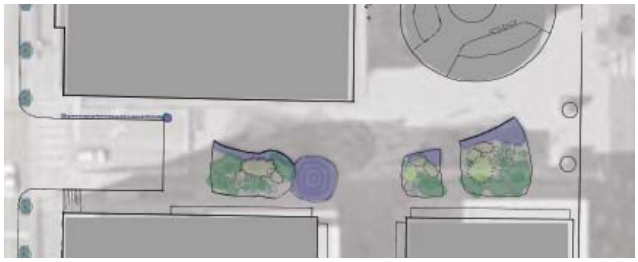
The idea of a water street should also reveal water through vertical and linear elements that collect and convey water. These elements have smaller footprints and can be layered vertically to fit in a dense urban environment.

Weller Street - Market and Water Collection. As water falls on the proposed market street between the current Uwajimaya and the Block 1 project it will begin collection and treatment through green roofs, planted gutters, and storm water planters on terraces. At the first floor level glass awnings will collect the water and funnel it into street cisterns. These cisterns are not meant to store water, but to express the idea of collection, adding art and energy to the street, while funneling water into an underground collection system. The example shown on the next page would show the level of water inside through glass portals that were also lit at night. At the street level, pervious paving would mark the parking and crosswalks. Large pavers in the crosswalks with small impressions would imply stepping stones and collect and reveal small bits of water. Through out the design impressions in the form of a stream system would line the curbs, also collecting small bits of water. The diagram at the top of the next column shows the collection system in a garage proposed under the new development for water reuse in the building.

Union Station - Square and Water Treatment. The node at the intersection of Weller and 5th and the Union Station plaza is alread a very successful area. The major change then is to use the existing planting areas to create water treatment bioswales to convey unused water from the collection system as well as continue to collect water. Some of this conveyance would be revealed through design of pools and runnels along the edge of the beds.

4th Avenue - Boulevard and Water Dispersal. There are many great boulevards that handle large amounts of traffic. To turn 4th Avenue to a great entry for both neighborhoods, to increase safety for bikers that now use the sidewalk, and to enhance the pedestrian environment for an expected increase in residents, the design reduces the street to one turn lane and two lanes in each direction with a bike lane on the west side. Trees will line both sides with a subsurface linear bioretention system collecting and dispersing water under the sidewalk. All water would eventually be piped back into the sewer system and discharged into the Sound, though ultimately the whole system could be infiltrated in the tidelands. Further storage and art have could be incorporated into backyard pools for the residences over the train tracks. Finally, vertical art display along the median by the bike path would reinforce neighborhood identity.

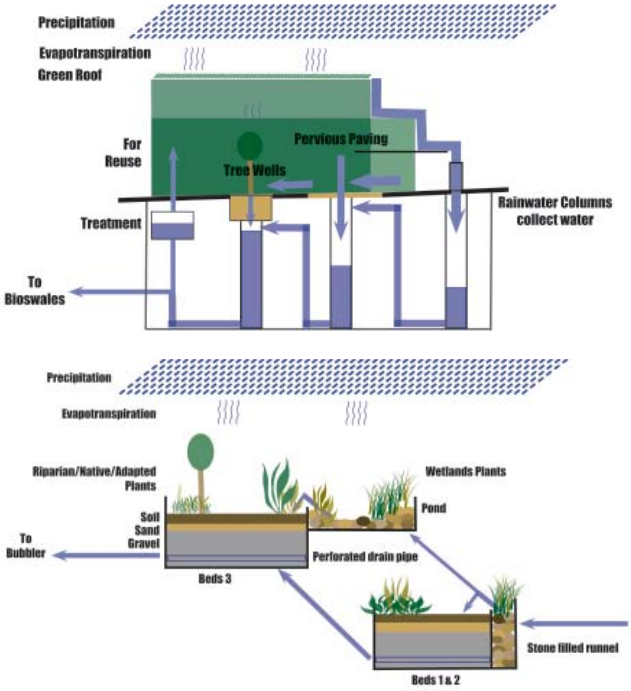
Site Plan - Weller between 4th and 5th



Site Plan - Union Station Square

Site Plan - 4th Ave Boulevard

Weller Street "Cisterns."



4th Avenue Grand Boulevard