SITE-SPECIFIC EXAMPLES

Each of the following sites represents an opportunity to employ general ecological strategies in a specific context. The suggestions for each site reference the broad strategies (listed in parentheses) and are coupled with analysis drawings and landscape prototype sketches. As the specifics of the site change, so too should the strategies be flexible to respond to the needs of a district, a neighborhood, a block, or a parcel.

Girard/Aramingo Interchange

Festival Pier

Penn's Landing

Walmart/Pier 70

Girard/Aramingo Interchange

- Capitalize on historic streambed physiography and soils for wetland buffer. (Reference Strategies: 1A , 8A-F)
- Employ areas beneath I-95 interchange as infiltration basins and interactive water parks. (Reference Strategies: 2B , 2D , 7B , 7F, 8A)
- Widen the buffer into the Anderson site to accommodate the mitigation area necessary to treat stormwater released from rain gardens beneath the I-95 interchange. (Reference Strategies: 1B , 2C , 4A)
- Connect continuous riverfront trail to existing neighborhoods via Berks St. and Cumberland St. (Reference Strategies: 2A , 6B , 7D , 7F)
- Increase allowable density above floodplain as incentive to dedicate a larger portion of the parcel to the riparian edge. (Reference Strategies: 4A)
- Employ topography to direct stormwater to mitigation areas along green streets with continuous tree trenches. (Reference Strategies: 1A , 1B)
- To ensure efficient energy usage, use tilted street grid as justification for rigorous solar envelope guidelines within individual parcel development. (Reference Strategies: 3A , 3B)

Festival Pier

- Capture, treat, and convey all stormwater from Festival Pier development through a series of rain gardens. (Reference Strategies: 1A , 2D)

- Employ existing inlet as opportunity for terraced tidal wetlands. (Reference Strategies: 1A , 2B , 2D)

- CSOs located on either side of site at former creeks: Pegg Run to the south and Cohocksink Creek to the north. Channelize CSO outfalls farther out into river in order to allow the creation of adjacent tidal wetlands. (Reference Strategies: 1A , 8A-F)

- Where hard-edged bulkheads exist, create softer edge with back-filled riprap planted with appropriate riparian vegetation. (Reference Strategies: 1A, 8C-F)

- Allow extension of riverfront trail onto Festival Pier and across waterfront boardwalks. Preserve open views to water from Spring Garden Street. (Reference Strategies: 2A)

Penn's Landing

- If a continuous riparian edge is not possible in the central district, move the eco-services inland to Delaware Blvd. to create the greenest of all boulevards. (Reference Strategies: 2A, 2B)

- Employ high-tech methods of renewable power generation, emissions filtration, water impoundment, and water recycling along the boulevard. Make these methods visible to inform the public of the significance of sustainability. (Reference Strategies: 5A , 5B , 7D)

- Development on the I-95 cap must not be allowed to become yet another barrier to the waterfront. Extend and multiply the instances of "green wedges" on the southern portion of each parcel to allow access to the river. The subtle alteration to the parcel structure also creates the ideal solar angle for daylighting and passive heating. (Reference Strategies: 2A , 2C , 2D , 3A)

- Planting on Dock Street should reflect the fact that this used to be a historic streambed. (Reference Strategies: 1A , 2C , 6A)

- Topography of Penn's Landing site encourage the creation of gravity-fed rain gardens that collect, mitigate, filter, and convey stormwater from north to south. (Reference Strategies: 1A , 2D)

Walmart - Pier 70

- 300' Riparian buffer at south end of site should reflect the full range of plant communities native to this region: submerged and emergent wetlands, wet-meadow shrub swamp, upland floodplain forest with sycamore, river-birch, cottonwood as keystone species. (Reference Strategies: 1A , 1C , 2D , 4A)

- Create habitat islands from existing piers. Jump-start habitat initiation with topographic modification, soil amendment, and seeding. Connect islands with sturdy piers to allow limited human access. (Reference Strategies: 8A-G)

- Connect inland with green streets that convey stormwater to mitigation areas within larger waterfront park. (Reference Strategies: 2A , 2B , 2D)

- Retrofit existing piers near residential development to become fishing piers. Locally based commerce on piers should be encouraged.
(Reference Strategies: 6A , 7B , 7D)

- To ensure efficient energy usage, use tilted street grid as justification for rigorous solar envelope guidelines within individual parcel development.
(Reference Strategies: 1B , 3A , 3B)

- Multi-use trail should pass through diverse river scenarios and include educational material at regular intervals: on the water island hopping, wetlands, meadows, floodplain forest, urban edge.
(Reference Strategies: 2C , 7C , 7D)

- Three sunken ships near south end of site are an opportunity for public education, interpretation, and/or adaptive reuse. This is an opportunity to relate the large scale 21st Century Pier to the large scale of natural processes. (Reference Strategies: 6A , 6D)

MANAGEMENT GUIDELINES

1. Developing on the Waterfront is a privilege.

- All development needs to contribute substantially to the public realm.
- Mitigate public costs of building in the floodplain with wetland creation and enhancements in same tidal zone.
- Sustainability overlay district along the riverfront may mitigate some public costs by reducing impacts.
- Tax credits mitigate the cost burden of sustainable construction. example: Battery Park

2. River edge management entity can be conducted as a public utility

- Treat river edge as green infrastructure subject to utility charges. example: Metro Greenspaces in Portland, OR
- Utilize same model as Center City District for landscape maintenance – public/private partnership.

3. Ensure that river edge management is adequately funded through multi-agency initiatives.

- Draw on mix of funding from federal and state agencies.
- Consider funding through PADCNR, EPA, NOAA Tidal Delaware River Restoration Project.
- Establish working relationship with multi-state agencies – DVRBC, DVRPA
- Coordinate with DRCC, PCPC, PWD local initiatives.

4. Train landscape managers in the art and science of working with living systems.

- Rivers are dynamic and management must adapt to constant change.
- Accurate field observation based on natural sciences training is as important as horticultural knowledge.
- Management actions need to be evaluated through continuous feedback systems – monitoring predetermined targets such as soil biota, invertebrate populations, moisture levels.

5. Quantify environmental, social and economic goals with specific objectives

- This is an iterative process, without quantifiable measures it is hard to determine successes, failures or how to modify and reshape tasks.
- Baseline data is important in order to measure change.
- Track ecological performance against benchmarks - water quality, wildlife migrations, invasive plant trends, et cetera.
- Partner with science institutions to track performance and trends.
- Investigate cost/benefit methodologies to measure economic performance of ecosystem services.
- Conduct social capital community benchmark surveys to measure civic engagement and levels of connectedness. Example: Saguaro Seminar http://sparky.harvard.edu/saguaro/
- Set schedules for evaluation.
- Make findings accessible through publications and web-based media.

6. Educate

- Ecological education is especially meaningful along urban rivers because so much of the original ecosystem has been erased.[19]
- Hands on learning is a powerful tool for science and nature education.
- Educating the public helps to generate a sense of stewardship and a connection to place which can insure the health of the waterfront for future generations.

SUMMARY

The Delaware River Waterfront represents an opportunity for Philadelphia to put into practice techniques for sustainable design at an unprecedented scale. The thinking behind the analysis and strategies for truly sustainable design rely upon the three pillars of sustainability: environmental responsibility, social responsibility, and economic responsibility. Sustainability in action requires a vision over the long term for each of these three pillars. Plans for the Delaware Waterfront have the potential to be highly ecological, highly equitable, and highly profitable, but only when the planning process looks beyond the benefits of short-term thinking that has come to drive current development.

Many of the design strategies presented in this report attempt to unite all three goals, and to achieve them requires bold moves. Reclamation of a wide, continuous riparian edge for diverse habitat and recreational use is essential to any attempt at ecological planning along Philadelphia's stretch of the Delaware River. It must also be stated that the cumulative effects of smaller design moves throughout the city contribute immensely to the success of the riparian edge.

By making ecological planning central to the waterfront planning process, Philadelphia is positioning itself to harness the power of ecosystem services. Much of the challenge in the process is to reveal how much ecological design methods stand to benefit everything from habitat and open space to real estate values, neighborhood desirability, and public health.

FOOTNOTES

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