Building Blue Cities:

Low Impact Development and Green Infrastructure Case Studies

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Charles River Watershed Association

Building Blue Cities

- Identifying the problem
- The Blue Cities approach
- Implementing the approach
- Case studies
- Opportunities and challenges

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Impacts of Urbanization on Rivers

- Water quality
- Sediments
- Floods and low flows
- Groundwater
- Ecosystem and habitat
- Algal blooms

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Standard Urban Development

- Pave
- Pipe
- Pump

Standard Urban Problems

- Floods
- Water table changes
- Degraded rivers and streams
- Hot, noisy urban canyons

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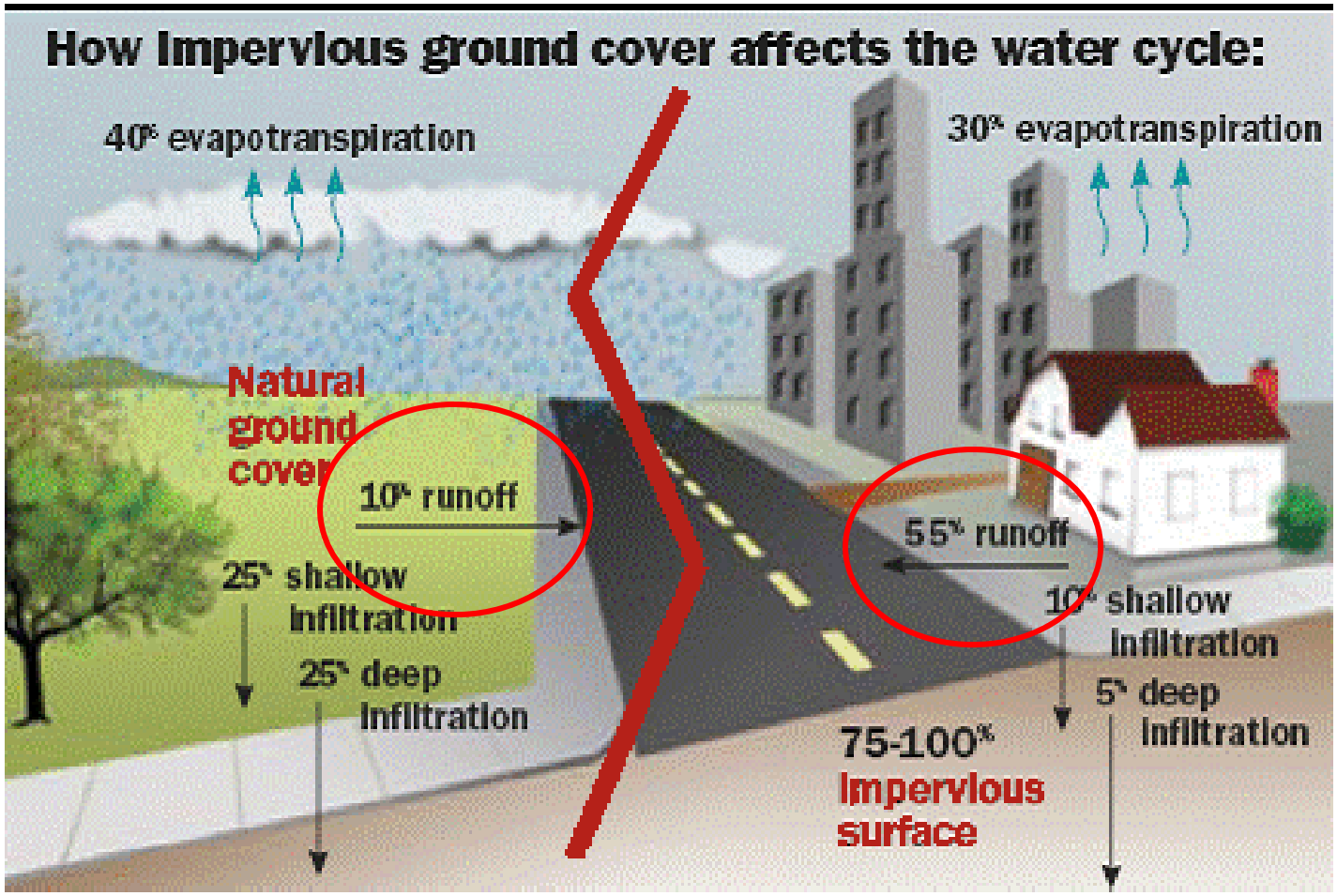
Impacts of Urbanization on Natural Water Cycle



In Massachusetts, average annual ***runoff increases*** from 4.2” to 23” and groundwater ***recharge decreases*** from 21” to 6.3”.

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Blue Cities Initiative

Blue Cities is a water-oriented approach to urban development and redevelopment that promote designs for the built environment that engages with every stage of the water cycle. Going beyond “green” building, “blue cities” embraces green infrastructure design with the aim of restoring the natural water cycle in the built environment

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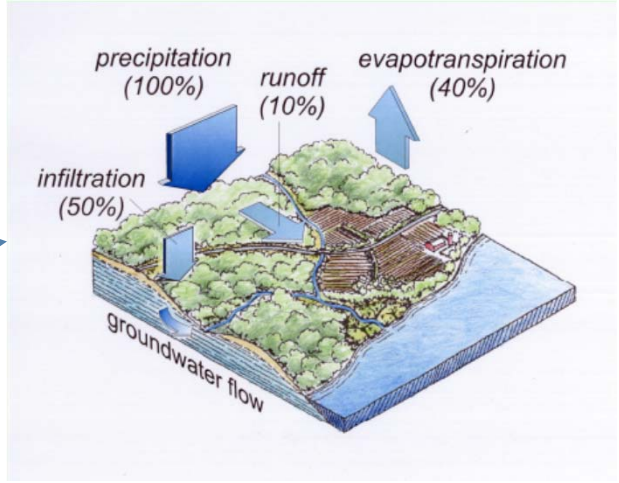
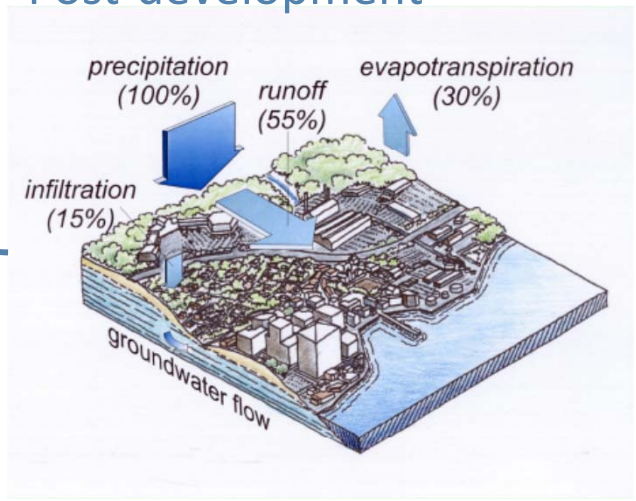
Blue Cities Initiative

- Water centric planning and urban design
- Mimic natural water cycle and restore hydrologic integrity
- Retrofit sites to incorporate “green infrastructure”
- Build on links to open space, public health and public realm needs

Pre-development



Post-development



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Blue Cities Initiative

Try to make this…

…function like this!

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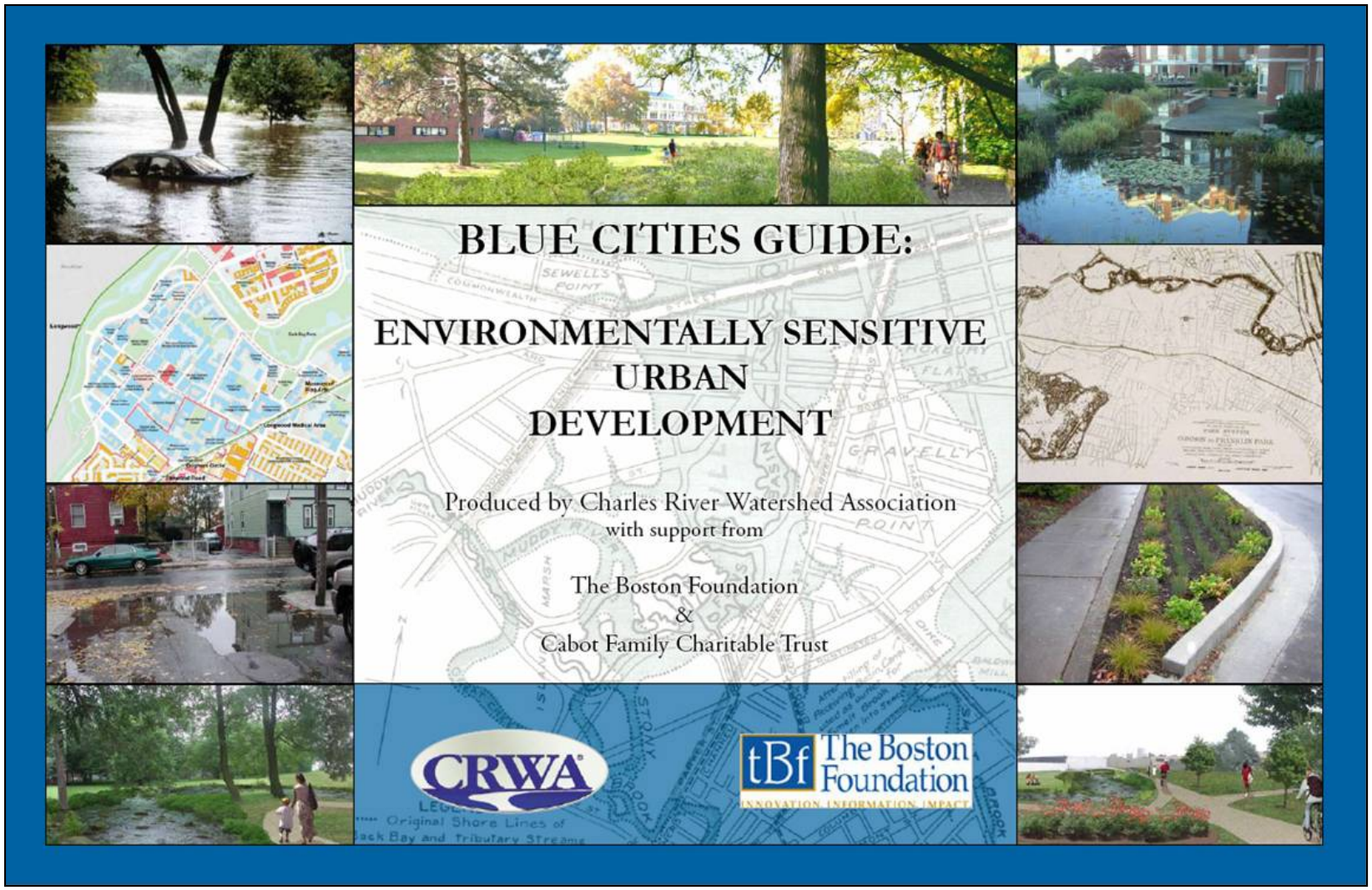
Blue Cities Guide



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Public realm/neighborhood scale approaches

- Green streets and Greenways
- Integrate stormwater management with existing open space
- Stream daylighting
- Regional treatment systems

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Large site scale approaches

- Parking lot retrofits
- Courtyard retrofits
- Permeable pavement
- Constructed wetlands and other retention and detention systems

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Residential/ small site scale approaches

- Cisterns/ rainbarrels
- Rain gardens
- Stormwater planters

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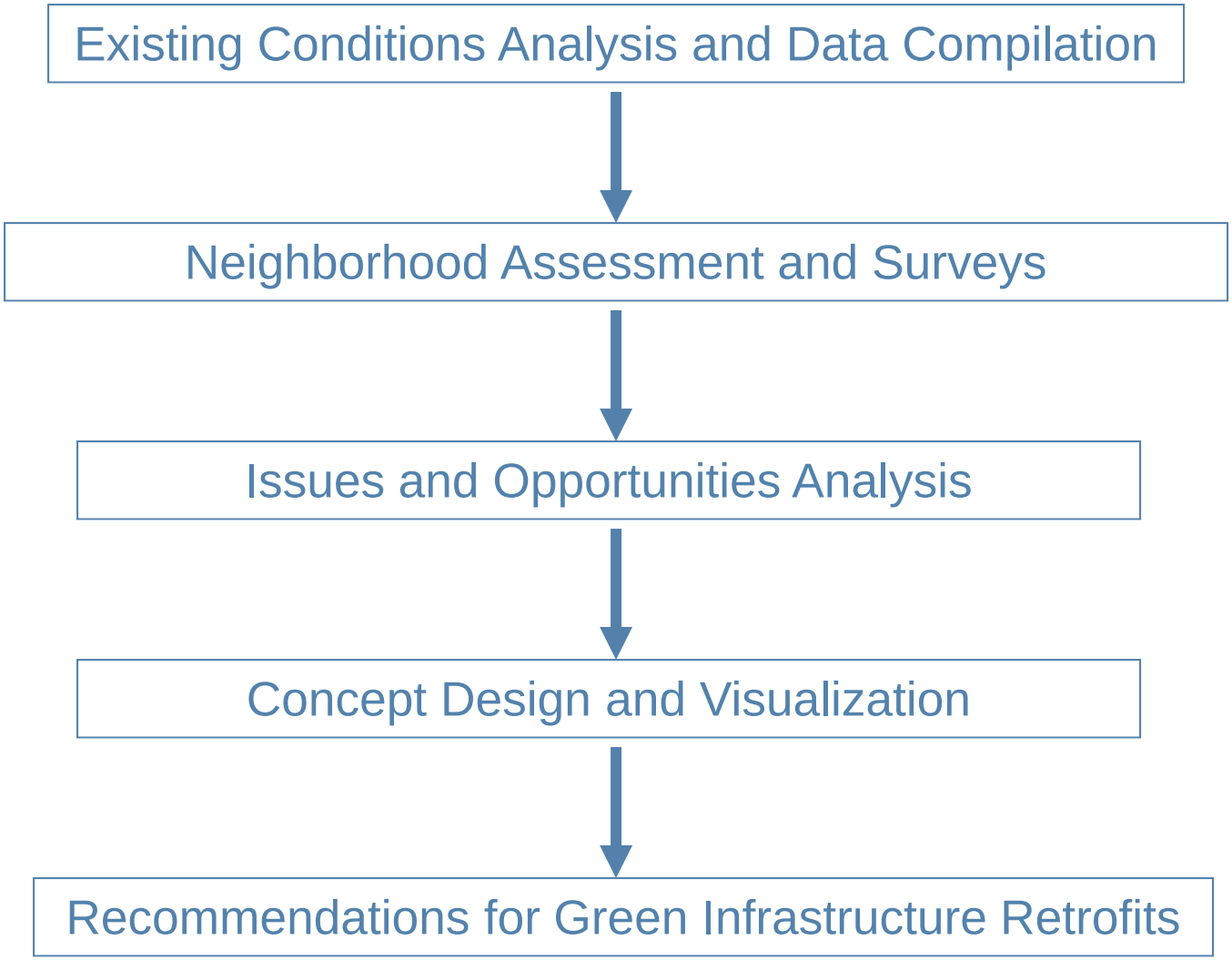
Blue Cities Analysis and Design Process



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Implementing Blue Cities

- Creating Partnerships
  - Engaging cities, towns, state, universities / institutions
  - Grassroots advocacy and work with community groups
- Public Education, Site Visits, Workshops
  - Public charettes and forums
  - Target audience workshops
  - Site visits to University of New Hampshire Stormwater Center
- Developing Sub-watershed Restoration Plans
  - Green infrastructure assessment and planning in urban and sub-urban contexts
- Building and Monitoring Demonstration Projects

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Blue Cities Projects

- Site Scale Demonstration Projects
  - Everett Street Pilot, Allston
  - Peabody Square, Dorchester
  - Waltham Watch Factory, Waltham
  - Crescent Ave / Mace Apartments, Chelsea
  - Porous Alley Retrofit , Boston

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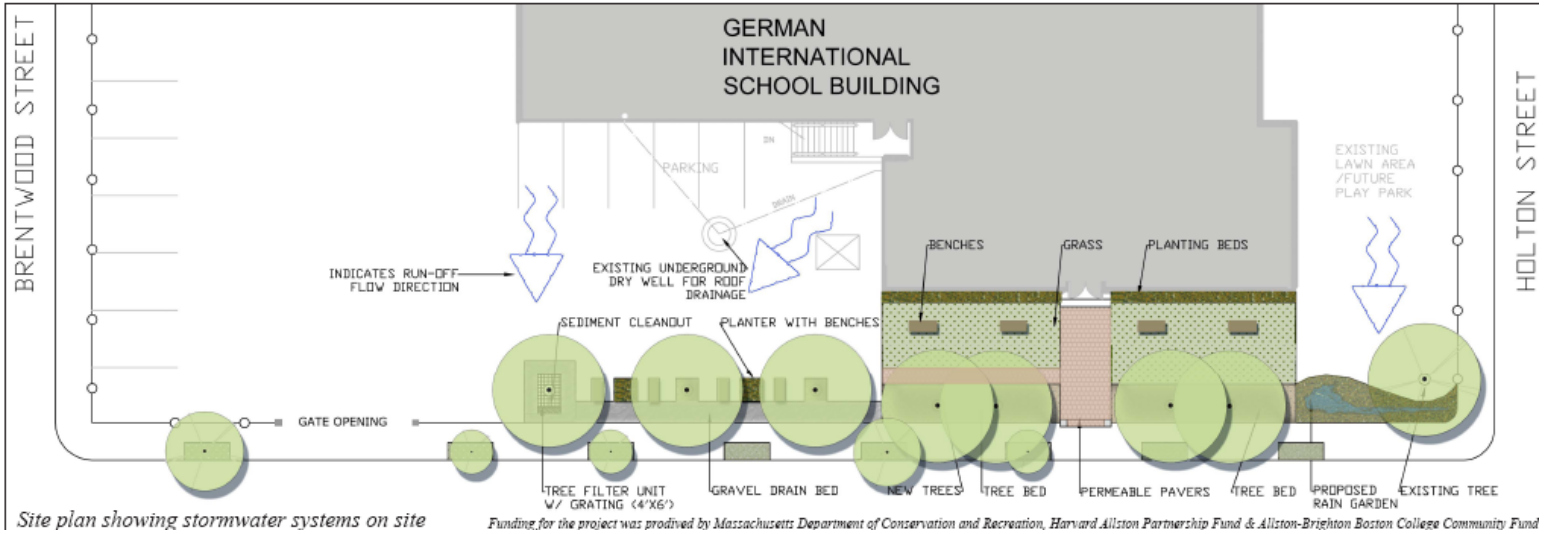
Everett Street Pilot

Site before project implementation

Site after project implementation



Site plan showing stormwater systems on site

Funding for the project was prodived by Massachusetts Department of Conservation and Recreation, Harvard Allston Partnership Fund & Allston-Brighton Boston College Community Fund

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Everett Street Pilot

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Peabody Square

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Waltham Watch Factory

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Crescent Ave / Mace Apartment Retrofit

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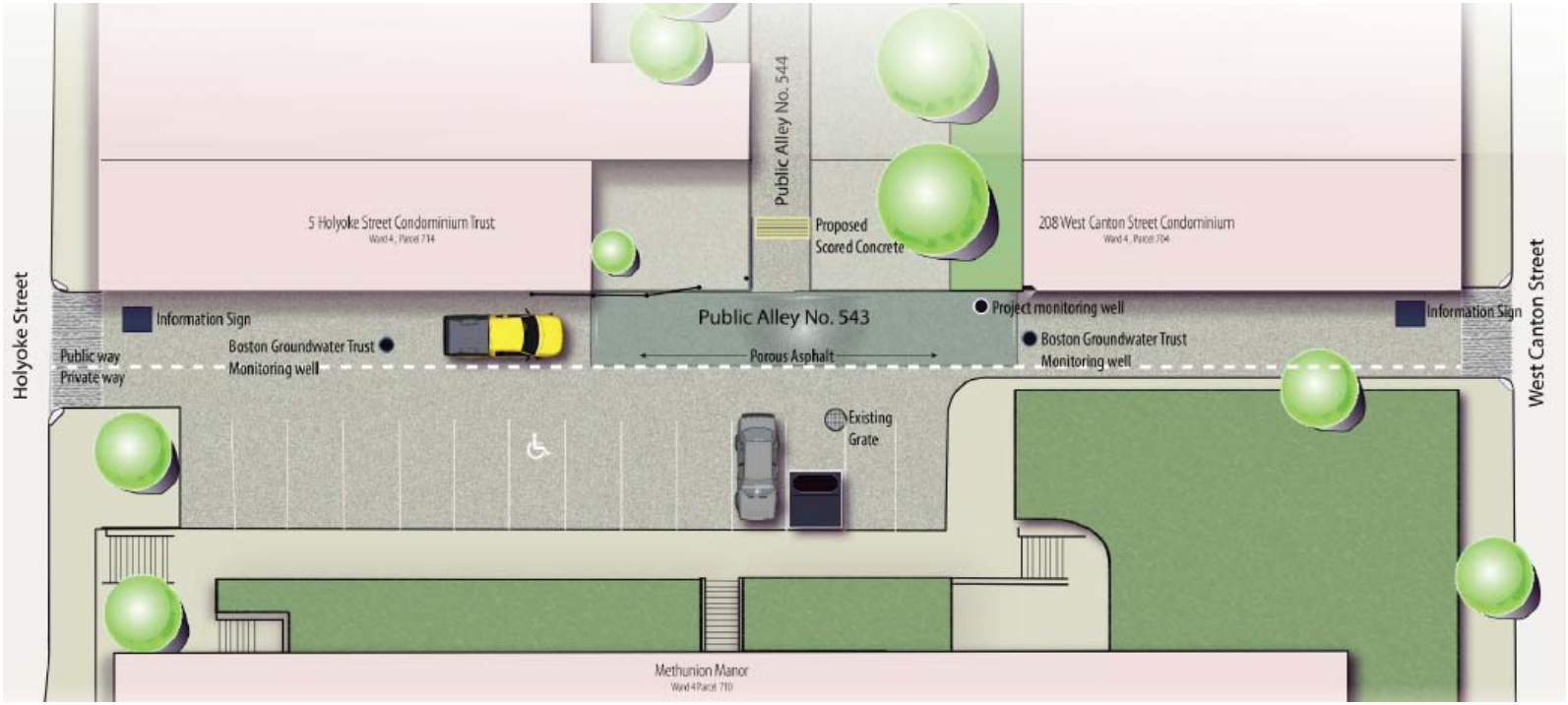
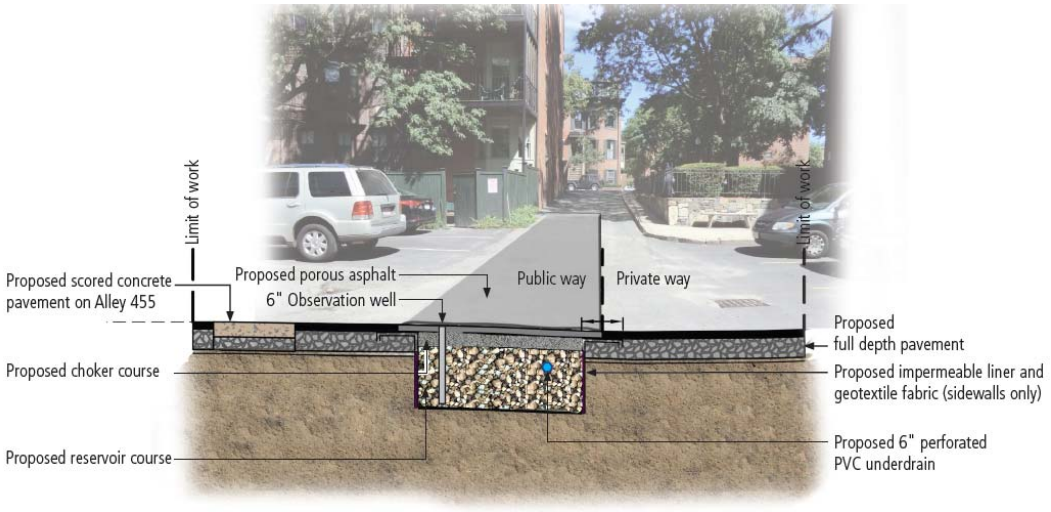
Porous Alley Retrofit





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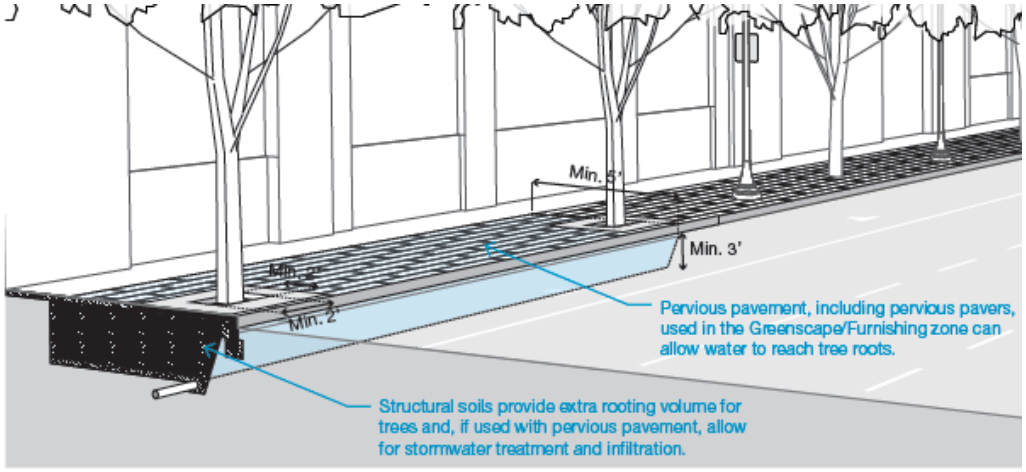
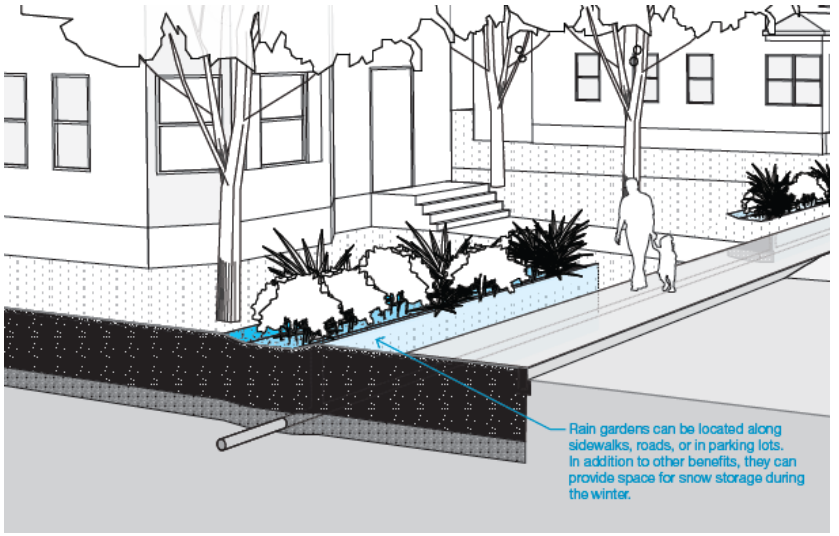
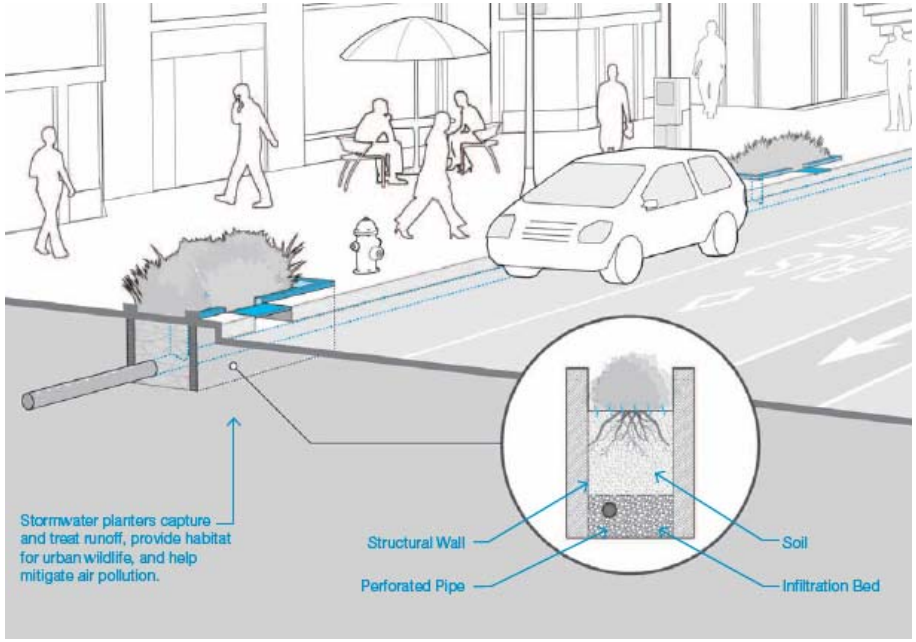
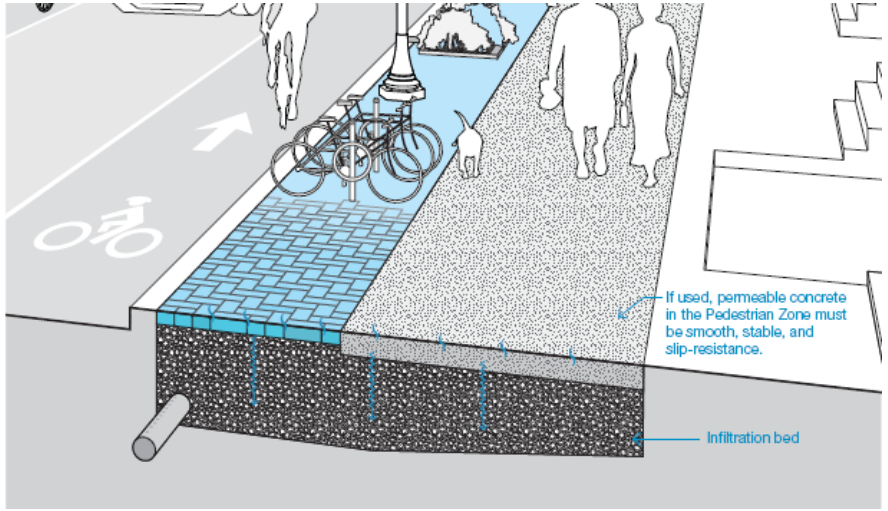
Boston's Complete Streets









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Opportunities and Challenges

Opportunities

- Improved water quality in receiving waters (TMDL & MS4 permit compliance)
- Reduced flooding and increased recharge (GCOD areas)
- Reduced 'heat island' effect in urban areas with increased vegetation
- Aesthetic, pedestrian and public realm improvements
- Public support for neighborhood greening

Challenges

- Coordination between traditionally silo' d agencies
- Construction supervision and oversight
- Post construction monitoring and maintenance of GI
- Scaling up beyond demonstration projects
- Funding for planning, design, implementation, monitoring, public outreach and education

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Questions!

For more information

Visit http://www.crwa.org/blue-cities