**Stormwater Conversations: Lessons in Green Infrastructure**

RI Green Infrastructure Coalition and Providence Parks Department

September 27, 2018 from 9 AM – 1 PM

Roger Williams Park Casino

**SUMMARY**

Workshop participants included engineers, landscape architects, planners, and representatives from state and local government and NGOs.

Presentations framed the workshop discussion with two presentations from municipal staff responsible for implementing and maintaining green stormwater infrastructure. Scott Wheeler, City of Newport Department of Public Services, Building & Grounds Supervisor/Tree Warden shared his experiences with green Infrastructure installations at the Newport Gateway Center and along Newport’s Broadway near City Hall. Andrew Silvia, City of Pawtucket Department of Public Works, Chief of Project Development then shared his experience developing green infrastructure for on-site infiltration at Pawtucket Spray Park. Alicia Lehrer, Executive Director of the Woonasquatucket River Watershed Council described the partnership with the RI Department of Transportation and the project under development at the Citizens Bank parking lot in Olneyville Square. Sara Churgin, Director of the Eastern RI Conservation District described work underway on Aquidneck Island to engage residential property owners with stormwater solutions using green infrastructure. She also described strategies under development for maintaining projects through partnerships with local organizations.

Participants then broke into 4 groups to talk about successes and challenges with green stormwater projects. The conversations reflected on the presentations but also brought in the broad experience of the workshop participants. The transcript of the notes from each group is included in this report. Some of the take-aways from the breakout conversations include:

Successes:

* The enforcement actions that EPA and RIDEM have taken with MS4 permit holders like the RI Department of Transportation (RI DOT) has significantly changed the landscape for stormwater management. RI DOT is investing in stormwater management and municipalities are spurred to action even if they have not been the subject of enforcement action. Municipal leaders are recognizing that the stormwater problem is real and they realize they will be held to account for the pollution they are producing.
* There are small green infrastructure projects, including tree plantings, throughout the state. Many of these projects reflect the work of partnerships between government and non-profit organizations and projects are publicized with tours and signage which is beginning to build public understanding of green stormwater solutions.
* It was encouraging to hear how the work we have done together to highlight the importance of maintenance, encourage conversations with maintenance staff at the beginning of projects, develop easy to use maintenance checklists and plant identification tools is being applied.

Challenges:

* Designing and implementing projects with maintenance in mind is a best practice but not universally adopted.
* Project funding takes projects to the ribbon cutting, but not through the first several years of operation and maintenance which are critical to the project’s effectiveness.
* We often highlight the multiple co-benefits of green infrastructure, but we were cautioned not to oversell. We need to build an appreciation for wilder landscapes – a rain garden it not an English garden. We need to focus on the “spongy earth” benefits.
* DEM’s stormwater permitting is difficult – perhaps unnecessarily so. It is also difficult to accommodate lessons learned within the existing (non-flexible) regulations.

Next steps:

The Green Infrastructure Coalition will continue the shared learning with future workshops. We hope to convene at least 2 workshops a year and appreciate the on-going partnership with the City of Providence.

Roger Williams Park is becoming a stormwater research facility. There are 6 existing stormwater BMPs installed and more under way. [This map](https://pvdgis.maps.arcgis.com/apps/MapTour/index.html?appid=dacfb27f4db540d2bcd7145818960af8) provides a virtual tour of the sites and includes information on maintenance requirements for each site.

**Red group 9/27/19 (Bob and Sara)**

**Successes**

Municipal staff champions – bring staff into the loop

System design – cigarette butts, sunlight, erosion control

Timing of system maintenance

Buy-in/partnerships

Schools – principles and maintenance staff

Citizens – large # partners

Reproducing success

Flood parks – things we value

Make it desirable and increase property values

Reduce heat island

Include engineers and maintenance early

**Challenges**

$$

Case studies for developers

Change norms for community – stormwater districts

In PA, storm bills work to inspire action

Tunnel design based on past/current conditions – not future development (and future changes in rainfall)

Current problems with grease from residential units in the combined system

Involve contractors and economic development folks in these conversations

**Future opportunities**

Capitalize on the Infrastructure Bank

Require if state/municipal money is invested, then require stormwater (Seattle Green Factor Worksheet)

Requirements for no additional runoff

Development problems include new schools – the building is the foot print

Multi-use – if you can have multiple uses you have opportunities

Redevelopment projects – clearly define/incentivize stormwater solutions

RISD – green walls? Green roofs? Etc.

Limited understanding – municipal organizations and private sector

Need to broaden focus on economic development – development can be spurred by green inf.

Need instructions for existing buildings with green infrastructure

Community gardens

Volume challenges for retrofits

Ned community solutions to existing impermeable sites (Portland OR)

Current small residential successes are hard to maintain

Opportunities to respond to “We didn’t have to do this before!” – retrofit permits

Messaging – cost savings

Cost of maintaining conventional systems

Avoid sewer hook up and costs and regulatory requirements

**Green group 9/27/18 (Brian and Sheila)**

**Successes**

Multiple interventions create success

Monitoring for effectiveness

Proper engineering design/proper construction and installation

Provide life cycle planning and documentation

Teaming/process – “stakeholders” included at the beginning with buy – in from all

**Issues**

Maintenance (access, variable climate wet/dry)

Plant selection

Canada Geese – buffer plantings vs grass lawn

Educational signage to reduce objections

Time – forgetting what the BMP is

Need regulations update re: definition of “established vegetation” (like RIDOT)

River rock filled with sediment – how to clean out

Difficulty waiving “the rules” to accommodate lessons learned

Funding for maintenance

Funding for judging effectiveness over 5 – 10 years

Need maintenance manuals

Provide maintenance guidance at the start vs the end of projects

Private roads (buy-in) & cost of design

Know available tools for maintenance at start of design

Know WHO will perform maintenance

How do we evaluate that the design works (field testing/redesign)

Need warrantee agreement

There are time limits with grant money – but projects require additional money over time

Tuning kids into stormwater

green roof on red shed – requires zero maintenance – it is working great

How do we measure success with water quality monitoring?

Get installers involved at this level – seminars and discussion

Need to understand the location

Stormwater quality is not “sexy” for government decision makers – vs new roads/sidewalks

Trying to create a legacy – carrying on whats been created

Outside classrooms

Sell the value beyond stormwater -- pollinators

I-naturalist app – really good for plant ID

**Yellow group 9/27/18 - Lorraine**

What has worked well?

**Starting small and using trees:**

Municipalities should start small - with tree filter, linear planting

Trees need adequate soil volume for roots. Some proprietary systems are just a box and restrict root growth.

Massing trees together in linear fashion allows shared root space and better tree health and longevity.

Put trash box up front, at entry to linear planting.

Silva cells and Cornell structural soils provide soil volume and structural support for sidewalk above roots but are expensive. Can use other methods to support the sidewalk so weight is not on roots.

**RI MS4s need simple low cost solutions**

DOT should provide guidance for non-proprietary tree filters with adequate soil volume in Linear Manual.

Still need to follow design critera to get treatment credit?

Need flexibility to meet treatment goal – simpler the better, mimic nature.

Keep BMPS simple and function visible, without complex subsurface components.

**Porous materials**

Vac equipment is very expensive; blows out the fill between pavers, eventually clogs. Does not seem cost effective long term. Natural systems less costly.

**Appearance and maintenance**

Design: owner and end user must understand the final appearance and maintenance needs at project start. Avoid surprise of “unkempt grass” Public perception is Weeds! Rats! Ticks!

**Need close coordination between desig n engineer / landscape architect / installer:**

Must specifically call out details in design, materials and assembly that are different from the standard non-GI project. Speciality materials include specified soil mix (not just loam), filter fabrics, fine grading, etc. Flag these in design specs, details, pre-bid docs, pre-construction meetings. Identify Key issues and function, importance of slope and grading – standard grading give or take 3 inches does not work with GI!. Provide this as training for contractors submitting bids.

Need to change the bidding process. Public bidding is challenging since no one company is responsible – falls between cracks in design / landscape / install. Change system to have pre-qualfiied contractors not low bid.

Try design/build contracts so designer and builder are on same team.

Design /build not well accepted but GI is a very different product than usual paving.

Small problems left unfixed such as minor grade changes, become big problems by the end

Even with some problems, overall GI project should still work.

DOT now looking to manage stormwater on all sites but install does not always follow design. Quality control is difficult with very large contractors and low bid. Work with WRWC and small landscapers one option to address this.

Grass establishment is critical! Bare soil generates more sediment to clog systems.

Reseeding or replanting may not be done by the city because it’still on contractor’s punchlist. (municipalities usually hold funds in escrow for certain projects such as subdivision roads – this could be used to by town to complete the work?)

**Municipalities need stormwater champions to push for GI.**  CT NEMO study found that was the key factor in towns adopting LID and GI.

Need closer communication between municipal design and maintenance responsibilities.

**Parking lots and impervious**

Parking lot reconstruction - Should have a phase out date for repaving without LID /GI! Currently can keep on repaving without any improvements if not going down to bare ground.

Need stormwater utility to create incentives for reduced pavement

New development near wetlands often results in rain gardens and other GI built in wetland buffer – destroying natural filtering and pollutant removal!! Need to reduce bldg. footprint and impervious instead.

BLUE GROUP NOTES

**What’s Working?**

* Public education: signage to let people know what it is and why it helps
* Tours of GI locally; case studies and examples
* GIC-type workshops
* ENFORCEMENT!!!
* Projects that are partnerships: especially non-profits; conservation commissions
* Designing with maintenance in mind
* Finding the ways to emphasize benefits

Maintenance Tips:

* Don’t mow onto streets and blow into storm drains
* Knowing mowing widths when designing
* Understanding maintenance when (river) rock is used

**What’s Difficult?**

* Conversations regarding budgets, factoring in long-term costs/benefits
* Convincing folks to think about the maintenance that should have been done for grey infrastructure all along and how that is what should be compared to maintenance of GI
* Have we oversold the aesthetics of GI systems? Should we be striving for “spongy earth” rather than English gardens?
* When/how to educate and get people to accept more “wild” looks
* PERMITTING!!! State versus municipal
* DEM stormwater permitting is very difficult:
  + Too many levels/not clear.
  + When do you need a new application?
  + Restoration team has no authority.
  + Stormwater retrofit permit?