Debrief: Group Feedback and Discussion
Practical Maintenance of Green Stormwater Infrastructure at Roger Williams Park on 10/10/17

Maintenance issues and lessons learned at field sites

- Maintenance concerns should be addressed and incorporated into plan from beginning, need rapport among owner/end user, designer, contractor, and maintenance staff. Consider equipment and staff available.

- RIDOT: design with input from maintenance workers:
  - Sand filter must consider truck weight
  - Being aware of gaps/limitations in skills

- BMPs especially bioretention don’t always function as designed: Owners of BMPs contribute to designs
  - Be collaborative to lead to better innovation

- Everyone is learning – all hands on deck. It’s good to gather and observe what works or doesn’t. Getting input from everyone is beneficial

- Designs evolve – goal is to replicate nature (not an exact science) for example, goldenrod at site 17_18 not planted but beneficial.

- How to get interdisciplinary feedback?:
  - Bringing 1) engineer, 2) contractor and 3) maintenance worker together.
  - Preconstruction meeting helps to build relationships.
  - Dialogue/feedback is needed throughout design and in post-construction to learn what works or doesn’t
  - Need to share feedback /lessons learned beyond city boundaries with others doing this work – like this training.

- Plant ID is an important issue
  - Gap between designer/field staff
  - Simplifying planting plans, can you use 2 or 3 types of plants instead of 7 or 8?
    - Rain garden scale up, with its ornamental plants, isn’t always appropriate for a municipal BMP. Natural grassy meadows should be the inspiration for large areas.
    - In response: Hydrology drives plant community -- it is more efficient to plant wetland plants/try to manufacture a healthy ecology than to wait for those plants to show up once water has been diverted to an area
    - Regulators:
      1. Not keeping up / Not good at adapting to feedback
      2. New BMPs vs retrofits – more guidance is needed (Wenley: current stormwater manual not cutting it – as a result, folks are creating BMPs that are hard to maintain.)
• RIDOT → developing their own stormwater “linear” manual w/ collaboration from DEM and EPA
  o Suggests using catch basins and vac truck for sediment
  o Suggests knowing maintenance ability before designing – for example, weeding every 4 months not feasible, using a vac truck is.
• Gravity-based systems will always require maintenance for sediment/weeding
  o Funding for ongoing maintenance is key
  o Designer/user dialogue in planning
  o Know capabilities
• Seed mixes can be valuable – they exist to fill a variety of needs. Need more info on the best options available.
• Know the site and design to the site:
  o Circular relationship among:
    regulatory/design construction/maintenance
  o Communication matters -- was information clearly conveyed to and from each of those four parts (was a functional dialogue begun?)
  o Suggestion of brief (2 minute) YouTube videos on site-by-site basis – give maintenance workers a run-down of how the individual BMP functions, problems/plants to look out for, etc.
  o Owner/municipality → needs to be explicit in RFP to design with maintenance in mind. (Related comment from field discussion: Need to specify as-built plans with elevations, etc. to aid maintenance. Prov Parks now requiring as a condition of final approval).
  o Educating the public as well – signage, web presence.
• Simple checklist vs. a long O&M manual which often goes ignored
  o Image or visual may be better
  o Contractor needs feedback,
  o Capability for animated designs superimposed on plans, showing flow direction and related infrastructure

• How to design for maintenance
  o A BMP is successful if it is simple, it requires little maintenance, has very little failure
    - There’s a cutoff point at which very little maintenance becomes no maintenance, which leads to issues
  o Time/effort is key - how to prioritize for field staff – commitment for funding
  o Are maintenance workers always going to understand how system works (hydrology etc)? If not, problems with troubleshooting etc.

• Pam, to city of Providence employees: After today, how would you ask designers to change BMPs? Response:
o Training is key, YouTube videos mentioned again
o Ease of maintenance depends on tools and sometimes knowledge, so considering individual municipality’s resources
o Interaction/dialogue with management
o Expectation of problem solving is perhaps not realistic
o Standardized specs -- regular exposure to aspects of BMP that will be standardized for all similar BMPs within the park.

*Asset management software to support workers in field*
  - RIDOT: Recognizing who is responsible for what – giving workers a lot of direction, partly by developing workflows.

**Materials and information needed for inspection and maintenance**
- **Jennifer Stout:**
  - Include O&M design plan with numbers to correspond to O&M checklist
  - Include photos of drainage features
  - Arranging O&M checklist top to bottom of BMP so there is less walking back and forth in the field
  - Keep questions very short – 5 words or less. Keep answers to Y or N, and include more space to write
- **Others:**
  - Some photos were grainy – bigger photos (like in weed guide) more helpful.
  - Briefing of sites before going out to them was very helpful.
  - Video good to set the stage, if not conveying any new info.
  - Appreciated that some tricks of the trade were shared.

**Making change from grey to green infrastructure**
- **Brian:** Education of general public is key. Signage will help public understand function; and can list maintenance tasks for crews, too.
- Younger people are especially receptive to hearing about green infrastructure – seem to have a foundation for thinking about sustainability
- Involve local groups from beginning
- It’s not only green stormwater infrastructure – BMPs to restore water quality include: controlling geese, street sweeping, public education, etc.
  - With feeding geese – RWP trying to take a positive approach, signs recommending feeding seeds etc.
  - Site 17_18 is an example of an effective solution because no more geese hang out there. It was previously a spot where people threw them bread from car windows.