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Green Plan-IT

Technical Advisory Committee Meeting

Friday February 19, 2016

A US EPA Region 9 WQIF Funded Project

In Attendance: Caitlin Sweeney (SFEP), Kristin Hathaway (City of Oakland), Keith Lichten (Regional Board), Jill Bicknell (EOA/SCVURPPP), Josh Bradt (SFEP), John Rozum (NOAA), Chris Sommers (EOA/SCVURPPP), Brian Rowley (Caltrans), Mark Shorett (ABAG), Joanne Le (City of Richmond), Luisa Valiela (US EPA), John Steere (Contra Costa County), Steve Carter (Paradigm Environmental), Jocelyn Walker (City of San Mateo), Jeff Sinclair (City of San Jose), Christy Lafell (ABAG)

Item 1 Welcome and Introduction

Lester McKee welcomed everyone to the meeting and gave a brief introduction to the project and GI guidance over the next 5 yrs through the MRP. National effort trying to solve our water quality and hydrology issues with GI - we are not alone - lots of great brains and lots of national success stories. Challenges are increasing population with ever-increasing density and greater amount of impervious surfaces and 21st century pollutants that are going to be in play in the future.

Item 2 Regulatory Framework

Luisa Valiela- EPA

The Water Quality Improvement Fund (WQIF) has been providing funding since 2008 for restoring wetlands and water quality improvement; annual appropriation around $5 million/year. There have been 33 grants since 2008 with multiple sub-projects within these projects. Green Infrastructure projects are small representation of the WQIF projects. All projects need to show outcomes – and GI have a high bar to meet for these outcomes. Outcomes can often occur in longer time frames. Existing projects include the San Pablo Spine GI implementation which is poised to do a better job in showing GI water quality improvements. There are GI funding challenges in CA that other regions don't have. At some point, the EPA would like to see GreenPlan-IT up on the EPA GI web page.

Questions:

Is the region developing specific, local recommendations for WQ improvements from GI?

- There has been monitoring of small pilot scale projects by CalTrans (Baybridge toll plaza), SFEI through grants, and BASMAA agencies through grants and in relation to permit requirements. Results look promising and it's important to note that, in relation to wastewater treatment, a performance of 50-90% capture for bioretention is not too

bad; CASQA is developing a page for LID (portal that links to other resources https://www.casqa.org/resources/california-lid-portal); CASQA also identifying barriers to implementing LID including funding barriers and standards.

Keith Lichten-Regional Board

PCB reduction via GI is a driver in the MRP. Municipal GI plans are due within a 5-year period. The goal is to reduce PCBs by 3 kg/year through GI (meet by 2040). Provision C.3.j of the MRP, calls for a transition from gray to green stormwater infrastructure over time and to map and track GI implementation including a RAA analysis that TMDL wasteload allocations will be met. These requirements can be fulfilled by both public and private GI implementation. Approaches should include creating crosswalks to other municipal planning efforts for broader GI and implementation. The goal is to implement GI plans over the next 25 years.

Item 3 Project Summary

Lester Mckee provided an overview of the GreenPlan-IT project. GreenPlan-IT is part of the Urban Greening Bay Area WQIF project. The primary use of the tool is to help municipalities and other planning entities move from opportunistic to programmatic GI implementation with the goal of incorporating GI into city planning documents. The tool can be used by municipal agencies to locate and determine cost-effective, watershed-scale GI implementation scenarios and track progress towards TMDL goals. BASMAA is working on GI inclusion in transportation projects – beyond Complete Streets. The larger project will include GI intersections implemented in Sunnyvale and San Mateo and a large scale GI implementation in San Jose (Chynoweth Avenue). The toolkit currently has 3 modules: site locator tool, hydrology and pollutant model, and an optimizer that identifies the most cost effective GI scenarios. SFEI will be working with Sunnyvale, Oakland, San Jose, Richmond/Contra Costa County, and ABAG to run the tools and produce map and tabular outputs for planning documents. In addition, with this round of funding, we will be developing a GI Tracker tool, working with a pilot city to design and implement its tracking and reporting functions.

Comments:

By June 2018, cities want to be well positioned to apply for Prop 1 funds for GI implementation. To meet this goal, cities will have to have a GI framework (July 2017) which summarizes how GI plans will be developed and what tool they will use to create the plans. In order to apply for Prop 1 funds, priority GI sites need to be identified. Prop 1 grants require stormwater resource plans and prioritized GI projects with an analysis of benefits of the project based on certain metrics. Cross check with requirements of a stormwater resource guideline requirements. This also ties into the multi-benefits from GI and how this gets quantified. ***Consider a sub-group to discuss these requirements.***

Item 4 Site Locator Tool

Pete Kauhanen presented a brief summary of how this tool functions, tool outputs, GI features included in the tool, and how tool outputs connect to other modules in the Toolkit. There was also discussion of

outputs designating public and private ownership. This output could also be used in the ranking process.

Question:

- Are there private regional data available? Yes but the data are very coarse or not fully inclusive. **ABAG can try to get a regional data layer if it would be helpful.** Municipal agencies have more access to these data.

Proposed enhancements to the Site Locator Tool were also presented. Enhancements include:

1. Additional information on ranked locations. The user could click on a location to determine the ranking factors included at that location. If this would be a useful feature, should the information be at a data layer level or the factor level? The tool would produce a table showing factors and GIS data layers and how they contribute to the rank. We would have to redo the analysis with polygons rather than rasters to make this analysis work.

   Comments/questions

   - It might be helpful, at a factor level, and on a percentage basis to show why the location was ranked.
   - GIS level of info might be helpful to an engineer especially as they get closer to planning GI
   - Could add both levels of information. Could the drill down function be optional so the user is not overwhelmed by too much information?
   - What would the table look like?
   - How can we minimize the unranked locations in outputs? It's more about using the output to highlight these areas and to remind the user that unranked areas should still be considered during the planning process.
   - Important to have the right level input data when basic categories of data/attributes might get you to a similar solution.
   - Are there good areas that aren't showing up in the analysis due to too many data attributes? Should we look into this?
   - Develop field forms that can be feed back into the optimization process with information such as volume captured

   Outcomes

   - Yes clicking on the polygon and seeing what makes up the factor
   - Drilling into the information is important for different levels of planning
   - Users could consider running the toolkit for 2 different purposes at 2 different levels. The 1st level is coarser and intended for GI planning and a 2nd level could be more detailed with more data and used for GI implementation

2. Additional GI feature types: Should we add additional GI features to the toolkit and if so which features?

   Comments/Questions

- Adding stormwater detention tree wells, flow through planters, and BASMAA intersection design would be beneficial since these feature types are less expensive. It is unclear if the BASMAA intersection design will be available in time to add to the toolkit.
- Many municipalities want to install trees so implementing tree well feature type will be very helpful. How are these new feature types different from "general" bioretention? Would need to define these feature types explicitly.
- Wetlands and swales will not be features implemented by cities to comply with the MRP.
- Consider developing a bioretention feature type with and without infiltration
- Would need to come up with costs for these feature types which would be part of the differentiation of the GI types even if they have a similar physics
- LA had 4 GI categories: linear with and without drains, onsite rain gardens with and without drains
- It is important to distinguish between drain and under-drain feature types
- How resolute is the soil data layer we use to ID if site needs underdrain? Not great but there's not a lot of soil variation in the region.

Outcomes

- Add stormwater detention tree wells, flow through planters, bio retention with and without under drain, and BASMAA intersection design (if time permits)
- Define each feature type to include information about under drains

3. Additional outputs: Would additional output types be beneficial for planning documents?
    - Yes provide both PDF and PNG file type as outputs

4. Use ARC-earth instead of/in addition to Google Earth?

    Comments/Questions

    - What about a web based map? Great for discussions with politicians

    Outcomes

    - Yes develop ARC-earth output but keep Google Earth functionality as well
5. Streamline process and code
    - yes
6. Adjust user interface defaults to reflect desired use of base analysis layer
    - yes
7. Review ranking algorithm by select TAC members for new situations
    - Yes

Item 4 Modeling and Optimization

Jing Wu provided a brief summary of the modeling and optimization tools

of the toolkit, the information each tool requires , and the outputs as well as proposing new features to these tools .

Comments/Questions

- Are the axes in the optimization output changeable e.g. load vs runoff reduction or infiltration? No the axes are hardwired.
- How do we show the uncertainty of the model in terms of cost and reduction? This information can be an output if you have ranges as input variables. Also the comparisons of output scenarios are relative and should only be interpreted from the relative perspective.

Proposed enhancements to the Modeling/Optimization Tools were also presented. Enhancements include:

1. Addition of new GI feature types including stormwater wetlands, vegetated swale/buffer strip, stormwater detention tree wells, and flow through planters

   Comments/questions
   - "No" on stormwater wetlands.
     Are their cost differences between bioretention and flow through planters? If they aren't very different then don't need to add in flow through planters. More unsure about tree wells in terms of their different costs. Jennifer Walker may be able to help with answering this question.
   - Caltrans tends to put in linear bioretention swales and buffer strips in their right of way. Yes, it would be helpful for Caltrans to add these features. How does the model perform for veg swales vs bioretention?
   - What about trash? Still undecided on which GI features can retain trash. Can do some post processing to estimate other benefits such as trash capture by reducing costs to account for the additional benefits. Could add a trash hot spot data layer to estimate how much trash was captured. Could also have a different design to GI feature if the function was also trash capture – this could increase costs. Could this also be done in the Tracker tool? Don't want to optimize the tool for trash. It's a post-processing step.
   - Is vegetated swale with non-engineered soil MRP-compliant? Yes on buffer strips since they do have some PCB reduction benefits.
   - BASMAA soil spec and Caltrans spec (based on CCC spec). BASMAA will also be developing tree and vegetation spec for dry climates.

   Outcome

   - Yes, include tree wells, veg swales/buffer strips, flow through planters (?)

2. Addition of regional facilities to the model including enlarged bioretention, detention basin, constructed wetland, or intermediate underground storage.

Comments/Questions

- These facilities would have fixed performance that is put into the model. It will be in the optimization process but at a predetermined location and with a predetermined design . .
- There's also the issue of proposing these above ground facilities when there are better options for infiltrative designs.

Outcome

- Yes, include this feature but keep it simple and flexible and focus on on storage and infiltration.

3. Incorporate design BASMAA intersection GI design into the model?
   Comments/Questions

   - These designs won't be quite ready in time to incorporate in model runs completed during 2016. Both design spec and cost associated with the design will need to be included in the model/optimization tools..
   - Could run a comparison when this is ready with one of the partner cities

4. Improve the cost functions in the model?
   Comments/questions

   - Costs are currently user defined in the model and include O&M, design and construction. Include other costs?
     - No, current categories are sufficient and no need for additional categories.
     - Need some way to scale cost function over time to account for increases
     - Is there a way for cost info from end users to get back to the tool?
     - Most important aspect is that relative costs of GI feature types are correct
     - Using a range of costs would be important only to get at the right order of magnitude of costs
   - How can the model take into account batch design/implementation
     - Batching cost is difficult to implement and will actually add more uncertainty to optimization results, due to lack of a credible approach and reliable cost information. Therefore, batching will NOT be considered in the tools.
     - Tree wells and intersection design are examples of batch features
     - Don't want to undersell the real costs
     - Mixing site costs with city plan level costs is not beneficial at the planning stage or for the tool
     - Batch design costs will be built in as city's move from planning stages to design and implementation stages
     - Could include GI with private redevelopment that has no cost. Estimate how much is captured with no cost to the municipality based on private

redevelopment lands. This is not an item for the toolkit since we are focusing on public parcels.

- Caltrans has lots of info on costs (soils, O&M, construction). Caltrans costs could be higher or lower depending on constraints. Recommendation to explore the database.
- Could include a range of costs (low, median, high) with assumptions as long as the assumptions are stated
- NYC has developed a model to quantify multi benefit; Portland has done a lot of work on cost development

Item 5 GI Tracker

Tracker Functions

- SFEI will develop a tool to track and report outputs and outcomes from GI implementation
- Development will balance versatility vs standards: create a database that allows for comparison across scales and set a minimum set of data variables
- The tool will also develop GI effectiveness reporting

Comments/Questions

- There is a standard set of data that municipalities are required to maintain for GI; then some municipalities will have additional data
- Are there any plans to get input from the end users (municipalities) since they will be the ones to maintain the info
- There also needs to be a better understanding of what is required for RAA – this will translate to what the tool needs to do.
- What does the RB want?
- The MRP does put forth PCB reduction tracking requirements (in the fact sheet). How much of these requirements should be incorporated into the tool?
- Being at a pilot scale is a good first step and then coming back to the larger region to see how this will work
- RAA requirements will be determined by the end of 2017.
- C.3.j requirements are known
- Staying with specifics about the GI projects to start. LA calculates volume and load reductions for each watershed.
- Municipalities will get credit for GI installed since 2002. Municipalities will have to go through older records. Data since 2009 are more standardized.
- Need to figure out what data attributes are required to get credit for GI installation.
- What about funding for updating the database? Where do the resources come from?
- Getting municipal input on the front end is important.
- GI assessment/effectiveness is an entirely different level for design. This conversation still needs to happen.
- Also need to collect drainage areas? Delineation or acreage?
- Need to also consider scales of accuracy and what is needed.

- Phase I: Collect basic attributes such as location, type, area treated, ownership and a subset of other attributes
- Phase II: O&M would be a next phase – need to find the lowest common denominator between municipalities. Start with existing O&M GI database attributes
- Drainage area: could also provide area by land use and imperviousness
- Need to also consider the scale of the calculation e.g. feature scale vs watershed scale
- Need to have options for drainage area – GIS delineation or by acreage or by parcel. The tool would need to provide guidance
- Need to have consistency in these attributes
- The ultimate goal (per Tom Mumley) is a state-maintained tracker database
- Demonstration is a good avenue to get other municipalities to see the benefits
- **Decision:** need to have a subgroup to work through questions based on functional and technical requirements