Bee Branch Restoration Alignment Study

Bee Branch Citizen Advisory Committee (BBCAC)

Meeting # 3 – January 29, 2004

Meeting Agenda

- Introduction
- Review and Screening of Expanded Options
- Elimination of Infeasible or Unacceptable Options
- Formulation of Preliminary Alternatives
- Possible Open Channel Alignments
- Confirmation of Evaluation Criteria
- Evaluation Criteria Measuring Scales

Meeting Objectives

- Eliminate infeasible or unacceptable options through discussion of the option fact sheets
- Formulate preliminary alternatives from the feasible options
- Conduct exercise to explore potential open channel alignments
- Confirm prioritized evaluation criteria
- Discuss measuring scales for each of the evaluation criteria (if time permits)

Review and Screening of Expanded Options

- Review Options from Meeting 2
- Review and discuss fact sheets
- Discuss Screening Criteria (Boards)

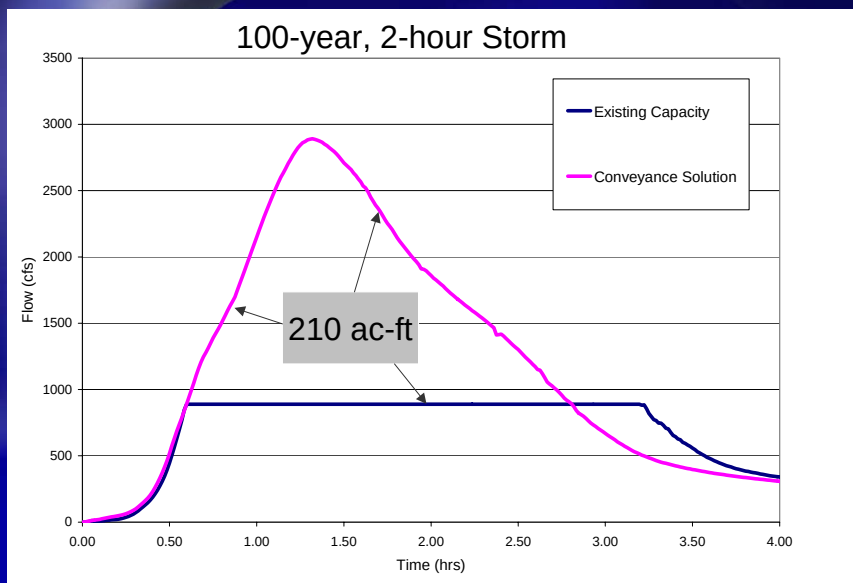
Options “Kept” in Meeting 2

Storage/Infiltration
- Local Storage
- Regional Storage
- Stormwater Reduction Practices

Conveyance
- Open Channel
- Relief Pipe

Mechanical
- Pumping
- Pipe Efficiency Improvements

Conveyance versus Storage



Local Storage

- Storage facilities constructed adjacent to the channel
- Would require at least 210 acre-feet of storage
- 7 blocks of acquisitions (approx. 170 homes)
- Approximately $40 million

Local Storage

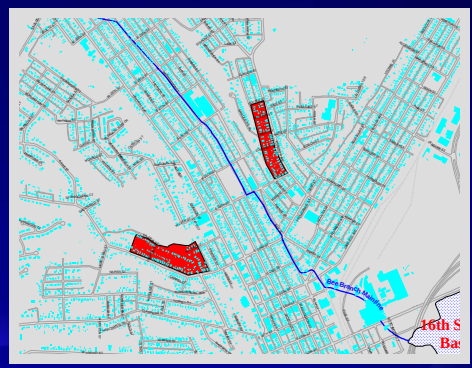
Summary:

Storage that would be provided adjacent to the channel would require the acquisition of 7 blocks of property. The project would be expected to cost approximately to $40 million.

Local storage is infeasible due to the high number acquisitions (170 homes) and high cost.

Regional Storage

- Storage facilities constructed in the subwatershed areas
- Would require 210 acre-feet of storage or more depending on location
- Limited, if any, suitable sites
- 21 acres of acquisition (130 homes)
- $30 million



Regional Storage

Summary:

Limited suitable and available property would result in the need to acquire at least 21 acres (130 homes) to provide the required storage. Depending on storage method, construction cost of at least $30 million.

Moderately high cost and high acquisitions make this option infeasible.

Stormwater Reduction Practices

- Practices include:
  - Rain Barrels
  - Cisterns
  - Rain Gardens
  - Porous Pavement
- Limited impact on 100-year event
- A modest rain garden on every residential property would provide less than 8% of the required storage

Stormwater Reduction Practices

Summary:

Stormwater reduction practices are effective at controlling runoff from small rainfall events and at improving the water quality of stormwater runoff. However, they could not significantly impact or improve the Bee Branch flooding problems.

Stormwater reduction practices are infeasible because they could not solve the Bee Branch flooding problem.

Open Channel

- Remove and replace Bee Branch with an open channel below 24th St.
- Channel top width of will be 150 to 170 feet.
- Requires approximately 70 acquisitions subject to the development of an alignment
- Most affordable solution

Open Channel

Summary:

The open channel option could solve the Bee Branch flooding problems. A relatively moderate amount of acquisitions would be required. Various opportunities exist to create amenities as part of this option. The estimated cost is $17 million.

The open channel option is rated good or fair for the four screening criteria and warrants further consideration.

Relief Pipe

- Construct additional pipes to expand the capacity of the existing Bee Branch
- Conveyance improvements range from 7 feet by 30 feet near 25th Street to 12 feet by 90 feet at the outlet (provided in number of pipes).
- Reduces property acquisitions (50 homes)
- Costs are approximately $50 million

Relief Pipe

Summary:

The relief pipe option could solve the Bee Branch flooding problems. Acquisitions are minimized and the changes to the neighborhood will be limited, however the costs are approximately $50 million.

The relief pipe option is rated good for all the screening criteria except for cost. The relief pipe option may be viable as a project component to limit acquisitions or improve neighborhood connectivity.

Pumping

- Construct two pump stations to pump water through new conveyance structures to the outlet
- Pump stations are very large and construction cost estimated to be $60 million

Pumping

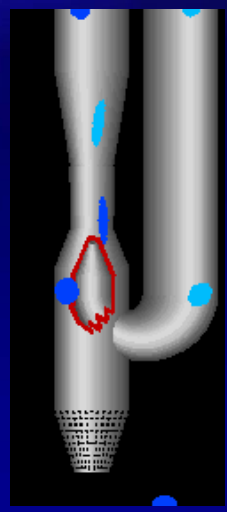
Summary:

The pumping option could solve the Bee Branch flooding problems. There will be a modest amount of acquisitions and some neighborhood impacts. The project costs are estimated at $60 million.

The pumping option has a high cost. Other screening criteria are rated good or fair.

Pipe Efficiency Improvements

- Use Bernoulli principle to improve pipe efficiency (essentially a jet pump)
- Uses pumps to create the jet, less efficient than direct pumping of the stormwater



Source: Russell Hoffman

Pipe Efficiency Improvements

Summary:

The pipe efficiency improvements is essentially a version of the pumping option. Using a "jet pump" would be less efficient than traditional pumps to move the stormwater runoff at the required rate.

This option is a less feasible (technically more difficult and more costly) version of the pumping option.

Review and Consensus on Viable Options

Formulation of Preliminary Alternatives

- Feasible options (or combinations of options) will become project alternatives
- Agree on preliminary alternatives that will be presented and evaluated in Meeting 4
- Develop (for Meeting 4):
  - Required components
  - Alignments
  - Costs

Confirmation of Evaluation Criteria

- Criteria Weighting Exercise Results
- Evaluation Criteria Scales

BBCAC Evaluation Criteria

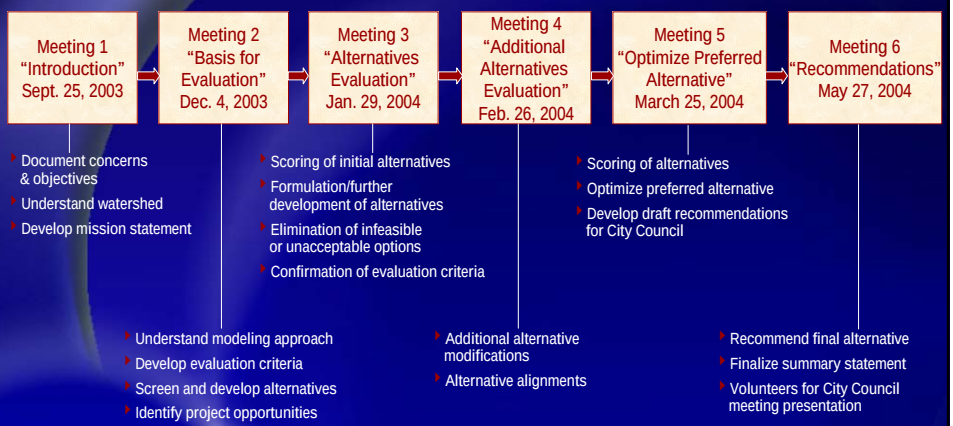
Evaluation Criteria	Performance Measure	Score	Weight
Preserve commercial/ non-commercial Services	Number of services lost through business relocation	53	2.4
Minimize residential property acquisitions	Number of residences that must be acquired	46	2.1
Minimize cost	Estimated project cost	40	1.8
Preserve neighborhood access/connectivity	Number of streets that are obstructed by the project	31	1.4
Minimize health and safety risk	Number of safety issues identified	31	1.4
Enhance quality of life	Relative score of whether alternative adds value or lowers value of the neighborhood	29	1.3
Protect environment	Number of environmental parameters that are adversely impacted	22	1.0

Possible Open Channel Alignments

Develop open channel alignments in groups (15 minute exercise)

1. **Use tape to mark possible alignment on map**
2. **Identify the advantages and disadvantages of your alignment**
3. **Summarize your approach to the BBCAC**

Planning Process



Next Meeting

- "Alternatives Evaluation 2"
  - Evaluate Alternatives
  - Additional Alternative Modifications including Alternative Alignments
  - Revise/Update Evaluation Criteria and/or Measuring Scales
- Confirm next meeting date