



STUDY STAKEHOLDER GROUP (SSG) MEETING NOTES

Tuesday, December 9, 2008 from 3 - 5 p.m.
HCFCF Offices, 9900 Northwest Freeway, RM 100
Version 1/5/2009

Introductions and Welcome

After a short break between the 2 p.m. and 3 p.m. meetings, Study Manager Jennifer Dyke reconvened both the new and existing members of the Study Stakeholder Group. All were asked to introduce themselves. Following introductions, short remarks were given by Senior Study Manager Wayne Crull.

Without Project Conditions Presentation & Discussion

Patty Matthews of AECOM (formerly TCB) and Darrell Kelsoe of Civil Tech Engineering presented the Without Project Conditions report. The information gathered during the Without Project Conditions data collection will be used in the next study phase, Component Identification and Evaluation, to evaluate flood damage reduction and ecosystem restoration components.

Several exhibits (listed at the end of the notes) were displayed around the room displaying some of the Without Project Conditions information that was collected.

Patty gave an overview of Hydrology & Hydraulics, Real Estate, Environmental and Ecosystem Restoration.

Highlights included:

- The engineering teams developed study specific models using dynamic routing based on FEMA-effective HEC-HMS and HEC-RAS. Models were also used from the White Oak Bayou Federal Flood Control Project for Lower White Oak Bayou.
- The models were calibrated to two historical events: Tropical Storm Frances, Sept. 10-14, 1998 and an Unnamed Storm, March 3-6, 1992.
- Peak flow and runoff volumes were calculated for the 1998 and 1992 events and hydrographs were developed. The hydrographs show good calibration results.
- AECOM investigated real estate within the 500-year floodplain of Buffalo and Lower White Oak Bayous. Real estate is documented by HCFCF right-of-way type (fee, interest, license & permission) and property type, such as residential, commercial and industrial.
- Real estate ownership in the study area is dominated by single-family homes (61% of all properties). Less than 6% of the 500-year floodplain is developable vacant land.
- In its observations of Buffalo and Lower White Oak Bayou, AECOM observed many areas of erosion along Buffalo Bayou.
- Natural areas were also identified and located and several native, invasive and protected species were documented.
- Within the 500-year floodplain: 44% of the population is considered minority; 15% low income; and 16% with limited English proficiency.
- Ecosystem Restoration (ER) aims to restore habitat to increase the quantity and/or quality of ecosystem resources and restore degraded ecosystem structure, function and dynamic processes to a less degraded more natural condition.

- ER aims to restore resources to previous levels of productivity but not to a level higher than would have existed under natural conditions, in the absence of human activity or disturbance. Projects should be as sustainable as possible and are typically measured in non-monetary units by the number of habitat units restored.
- A significant resource must be identified in order to develop an ER plan.
- Resource significance is determined by institutional, technical, and/or public sources and can be from the national, regional, state or local perspective. Examples of Significance Sources: Endangered Species Act, Migratory Bird Conservation Act, university research
- 32 ER candidates were identified, ranked and scored.
- The highest scoring significant resources were wetland ecosystems, migratory birds and riparian forest habitat.
- As HCFCD's mission is flood damage reduction, it must seek a partner to cost share an ecosystem restoration project. The cost share for ecosystem restoration is 65% federal and 35% local.

Question: Were herons identified in the research?

Answer: The study will not target one specific bird but will instead look at groupings like migratory birds in order to have multiple benefits. In addition, significant ecosystems, such as wetlands, could be resourced and provide habitat for multiple species, such as Herons.

Question: Did you look at all mammals? Why weren't mammals like raccoons and coyotes listed?

Answer: The study did look and document mammals currently living in the study area. These mammals are documented separately than the 32 significant resources. The 32 identified significant resources are being targeted due to their significance to identify the best candidates to increase the likelihood of receiving federal funding for an ER project.

Darrell Kelsoe presented the Economics section of the Without Project Conditions.

Highlights included:

- Overall, the Buffalo Bayou watershed (which includes the 500-year or 0.2% floodplain) comprises 102 miles for a total of 65,000 acres. The estimated population is 91,766 people within an average household median income of \$64,932.
- The Lower White Oak Bayou watershed comprises 11.7 square miles for a total of 7,457 acres.
- Economic information was collected specifically for the 500-year (0.2%) floodplain.
- Buffalo Bayou was broken into 18 economic reaches and Lower White Oak Bayou into 5 economic reaches.
- Land uses in the study areas were documented as residential, commercial, public, roads, vacant and "no damage." The totals number of each type of structure was discussed. There are two main tunnel systems.
- In summary, the total capital investment within the 500-year floodplain is over \$17.7 billion and includes major downtown structures with multi-stories, the River Oaks area, Memorial and other affluent areas.

A partnership between the Harris County Flood Control District and the U.S. Army Corps of Engineers



- Draft tables were provided showing the number of structures within the floodplain by reach and the damages within each annual exceedance probability event. Several of the draft figures are noted below.
- The Without Project Conditions Single Occurrence Damages – by annual exceedance probability event is: 10 year (10%) - \$8.0 million; 25 year (4%) - \$41.6 million; and 100 year (1%) - \$602.6 million.
- Expected Annual Damages: Without With Uncertainty: \$43.0 Million
- In the Downtown area, economic reaches 5 and 6, the capital investment is \$1.5 billion and includes buildings such as the University of Houston, Harris County Courthouse and the Wortham Theater.
- The flood damage profiles for Buffalo Bayou and Lower White Oak Bayou were shown and three high damage reaches were discussed:
 - Downtown Houston
 - Buffalo Bayou west of IH 610 to Chimney Rock
 - Lower White Oak Bayou from IH-610 to around Eleventh Street
- A table was presented with draft conclusions discussing the percent total damages reduced (50, 75, 90 and 100), the benefit cost ratio (1, 2 and 3) and the total estimated maximum project cost.

Question: To receive federal funding, what benefit ratio are you looking for?

Answer: The higher the benefit cost ratio, the better. Around a 3.0 benefit cost ratio is good.

Question: In the first slide you said the acreage was 65,000. Is that right?

Answer: The entire Buffalo Bayou watershed is 65,000 acres. The economic data collection focused on the 500-year floodplain, which is smaller.

Question: Is the Without Project Conditions report available on the web site?

Answer: No. The report will not be posted until it is finalized and approved by the USACE. The report has not been through USACE technical review yet. Because the report is draft, the report and appendix is available for anyone to review by appointment at HCFCD. Please contact Jennifer Dyke.

Component Overview and Evaluation Process

Patty Matthews gave the Component Identification and Evaluation presentation for the study.

Highlights included:

- There are several steps in the federal study process. This study is currently entering Component Identification and Evaluation phase
- During this time, flood damage reduction and ecosystem restoration components will be identified and evaluated
- A component is a feature or activity that can be implemented at a specific site to address one or more study objectives.

- Generally, components can be structural or non-structural. Examples of structural flood damage reduction components are channel modifications, storm water detention basins, and bridge modifications. Examples of non-structural components are flood proofing, buyouts and flood warning systems.
- Several components will be identified for the study area.
- It was discussed that after components are identified, screened, evaluated and anchor components identified, alternatives are formulated. Alternatives are a set(s) of structural and/or nonstructural components formulated to best achieve study objectives, subject to constraints. An example of an alternative is channel widening in specific location plus a detention basin at a specific location.
- This study is at the beginning of the plan formulation process.
- First components will be identified by considering study goals and objectives and previous studies.
- Component identification may include analyzing a component that may not necessarily be desirable.
- The identified components are then screened and may be eliminated due to technical or economic feasibility or practicality.
- Components are evaluated by running H&H models for each, economic damage models, developing cost estimates, evaluating environmental and socioeconomic impacts. They must also achieve the study objectives.
- After components are evaluated, anchor component(s), components that perform substantially above the rest, will be identified. Anchor components will be used in the next phase as foundations on which to build alternatives.
- During this process, HCFCD will meet with stakeholders to present components and solicit feedback. Stakeholders may also contact Jennifer Dyke with an idea they wish to be considered.
- Component identification for Ecosystem Restoration (ER) is similar with some exceptions. The steps are similar but the analysis is different. ER value is measured in non-monetary units, such as habitat units.
- This also differs from flood damage reduction as modeling is less standardized.
- ER component examples include wetland restoration, riparian forest restoration and aquatic in-stream structures.

Questions & Comments

Question: Do federal rules “trump” local ordinances in the component identification and evaluation process?

Answer: A plan – local or federal – will not proceed without public approval. A component will usually be eliminated in the screening process if it does not have public approval or if it cannot be implemented due to local laws.

Question: Don't you have to pick the most economic plan?

Answer: The National Economic Development Plan (NED) plan, the plan that reasonable maximizes economic benefits, must be identified, but HCFCD can also identify a Locally Preferred Plan (LPP).

Question: Is HCFCD ready to step up and sponsor ecosystem restoration?

Answer: HCFCD is the partner with the USACE for flood damage reduction. HCFCD could potentially sponsor an ecosystem restoration project if it is directly connected to flood damage reduction. One example of a flood damage reduction and ecosystem restoration component could be the reconnection of an oxbow that could help the flow of floodwaters and also provide habitat for aquatic species. HCFCD will be looking for an ER sponsor as components are identified and evaluated.

Question: How long is the process to identify and evaluate components?

Answer: Because both flood damage reduction and ecosystem restoration components are being identified, the process may take one to two years, depending on the number and type of components identified and evaluated.

Comment: Clear Creek looked at ecosystem restoration but couldn't identify a partner so the ecosystem restoration portion of the plan will not be constructed. An ER project will not be constructed if there is not a partner to back it.

Comment: One stakeholder encourages HCFCD to engage potential sponsors now so that options are not taken off the table unknowingly. Please contact the City of Houston to assist in this search for an ecosystem restoration partner.

Comment: Another stakeholder feels strongly that HCFCD needs to focus on components that help flooding and the environment.

Question: Removing the concrete from the floodplain (such as abandoned building pad sites) might enhance land around bayou. Is HCFCD interested in that?

Answer: This would require buyout which is something that is considered during the component identification and evaluation process. (Note – removal of an old building pad alone would not be expected to be considered an effective or strong ER component.)

Buffalo Bayou Flow Evaluation Presentation

Richard Long from the USACE presented information about the Buffalo Bayou Flow Evaluation currently being conducted. This project is separate from the Buffalo Bayou and Lower White Oak Bayou Federal Flood Damage Reduction and Ecosystem Restoration Study, but it is helpful for both parties to be aware of the work underway.

The evaluation is very informal and intended for internal purposes only. It entails evaluating the Addicks and Barker reservoirs, which are currently releasing at around 2,000 cubic feet/second (cfs). As there is a large population growth within the dam's service area, there is run-off that ultimately ends up being released into Buffalo Bayou.

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The reservoirs were constructed to help protect downtown Houston from flooding by holding back floodwaters. However, there are currently homes developed within the reservoirs that could be flooded if the reservoirs reach capacity. The USACE is looking at what (above 2,000 cfs) is a safe release from the reservoirs into Buffalo Bayou) and evaluating the structures that would be impacted if the release rate is increased.

The USACE will release information to the public and media as it is available.

In response to a question, it was discussed that the USACE is looking at restoring native prairie ecosystems within the reservoirs but that this will require partnerships and funding.

In response to a question, it was discussed that the final gates on the reservoirs were installed in 1961 when it was determined that additional channel modification below the reservoirs (to hold higher releases) was not going to occur. The importance of storm water detention within the watershed was also discussed.

Federal Study Status

The study team is in the process of incorporating USACE-Galveston and HCFCD Engineering Board Review comments into the Without Project Conditions Report. Internal paperwork is currently in progress to obtain approval to move forward to the next phase of the study, Component Identification and Evaluation.

Wrap Up & Next Meeting

Dyke explained the long agenda as topics requested by members of the study. Feedback from the stakeholders is always welcome.

In addition, updates to the study web site (www.hcfcd.org/buffalolowerwhiteoak) have been made including the addition of transcripts from the November 2007 public meetings and past stakeholder meeting agendas and meeting notes.

She explained that the HCFCD conference room may no longer large enough to accommodate the SSG group, so future meetings may be held at an alternate location, such as the AECOM office located at 5757 Woodway.

The SSG group meets two to four times per year. The next meeting is expected to be held during the first quarter of 2009. More details to come.

Handouts and Exhibits

Handouts distributed at the meeting:

- Agenda
- SSG Contact list
- PowerPoint slides for WOP Conditions presentation
- Economic Reaches Exhibit
- Draft Economic Damages Tables from the WOP Conditions Economic Appendix (tables 1, 4, 5, 6 & 8)
- Draft Flood Damage Profiles for Buffalo Bayou and Lower White Oak Bayou
- PowerPoint slides for Component Identification/Evaluation presentation

Exhibits on display at the meeting:

- WOP Conditions Economic Damage Information by Reach (4 panels)
- WOP Conditions Economic Damage Information by Color
- WOP Conditions Habitats (4 panels)
- WOP Conditions Real Estate Type (4 panels)
- WOP Conditions Vacant Land (4 panels)
- WOP Conditions Utilities and Infrastructure (strip maps for both bayous)
- Floodplains & Hazardous Material Sites