



TRINITY RIVER CORRIDOR PROJECT

Dallas Floodway Improvements

Refinement of the Balanced Vision Plan -
Update to the Trinity River Committee

01-March-2004

Status of the Urban Design Study

- As result of Mayor Laura Miller's initiative, a private study was conducted by Chan Krieger & Associates, Hargreaves & Associates, and TDA Inc. as managed by The Dallas Plan
- Oversight for the "Urban Design Study" was delivered by the Dallas Chapter of the American Institute of Architects and the Dallas Institute of Humanities and Culture
- The Trinity River Corridor Project Office and CDM worked in collaboration with the Urban Design Team
- The Urban Design Study, which was initiated in August 2002 and completed in December 2003, resulted in a final report, "A Balanced Vision Plan for the Trinity River Corridor"
- City Council adopted the final report in December 2003 as a modification to the 1999 Master Implementation Plan for the Dallas Floodway



Purpose of CDM Study

- **Provide guidance and advice to Urban Design Team on plan concepts**
 - Lake configurations and water source
 - Flood control, water quality, and habitat
 - Construction and operations implications
 - Capital and operations/maintenance costs
- **Refine Council-approved concept for transmittal to the U.S. Army Corps of Engineers (USACE) as the “Locally Preferred Plan” (LPP)**



Status of CDM Study

- Recommended off-channel lake options
- Developed strategies for lake water source
- Assessed preferred plan for compatibility with Federal and State requirements (flood control, water quality, and ecosystem restoration) and refined elements as appropriate
- Continued coordination with USACE
- Continued to coordinate with Urban Design Team subsequent to December 2003 as small refinements to the Dallas Floodway vision were necessary
- Are adhering to the schedule for turning the computer models over to the USACE by end of March 2004, such that the USACE plan formulation efforts can continue for the Dallas Floodway

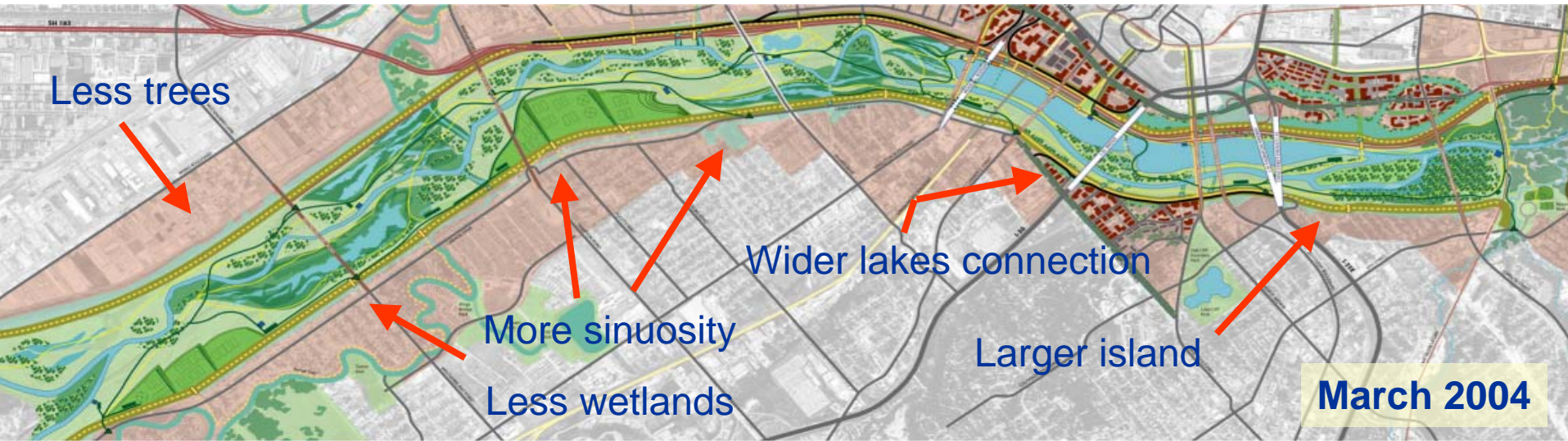


General Comparisons: Dec 03 and Mar 04

- The Island feature and the adjacent wetland feature is larger for the March 04 version to better convey flows and to better protect the western channel from debris flows
- River meanders are significantly enhanced with the March 04 version between the Urban Lake and the Elm Fork / West Fork confluence to increase environmental restoration
- Due to the desire of increasing river meanders, wetlands are decreased for the upstream half of the Dallas Floodway
- Restoring river meanders within the Dallas Floodway provides a stronger eco-system restoration benefit for riparian and aquatic habitat than adding additional wetlands to those that already exist
- In the upstream half of the Dallas Floodway, fewer trees are included in the March 04 version due to hydraulic considerations



General Comparisons: Dec 03 and Mar 04



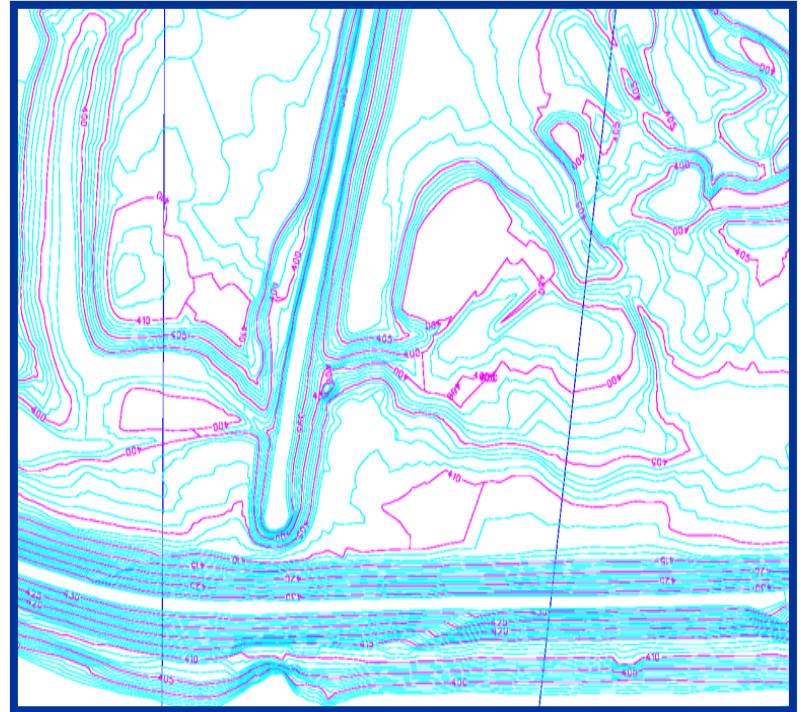
Determining Earthwork Associated With Floodway Improvements

- **Cost of improvements heavily dependent on amount earth moved within the floodway**
- **Proposed improvements are placed into a computer model called a Digital Terrain Model (DTM), which allows designers to provide the most aesthetically pleasing and hydraulically working grading plan for the landscaping improvements in the Dallas Foodway**
- **Adjustments to elevations translate into cut and fill amounts which allows us to ensure that cut and fill quantities are equal thereby producing the best cost efficiency**



Digital Terrain Model

- DTM created to support analyses
 - Based on 1991 topography
 - Includes 2003 USACE survey of levees and river channel
- Uses the topographic features of the Dallas Floodway to assist hydraulic modeling and cut/fill computations
- Will transfer to USACE for subsequent use



Hydraulic Models for the Dallas Floodway

(Hydraulic modeling requires the following conditions to be run)

- Existing Floodway Conditions – CDC HEC-RAS model circa Oct-01
 - Revised Existing Conditions
 - Existing hydraulics model with additional cross-sections and topography to better quantify changes that are proposed for the Dallas Floodway
 - Baseline
 - Parkway toll road plus required excavation that allows for project to hydraulically work as stand-alone project; no significant adverse impact of flood elevations within Dallas Floodway, upstream, or downstream
 - Baseline needed for USACE to incrementally measure flood control and environmental restoration benefits to establish their participation in the Dallas Floodway
 - Phase One Balanced Vision Improvements
 - Future Phase Improvements
- } Locally Preferred Plan



Delineation of Phases for Dallas Floodway

Future Phase



Phase One

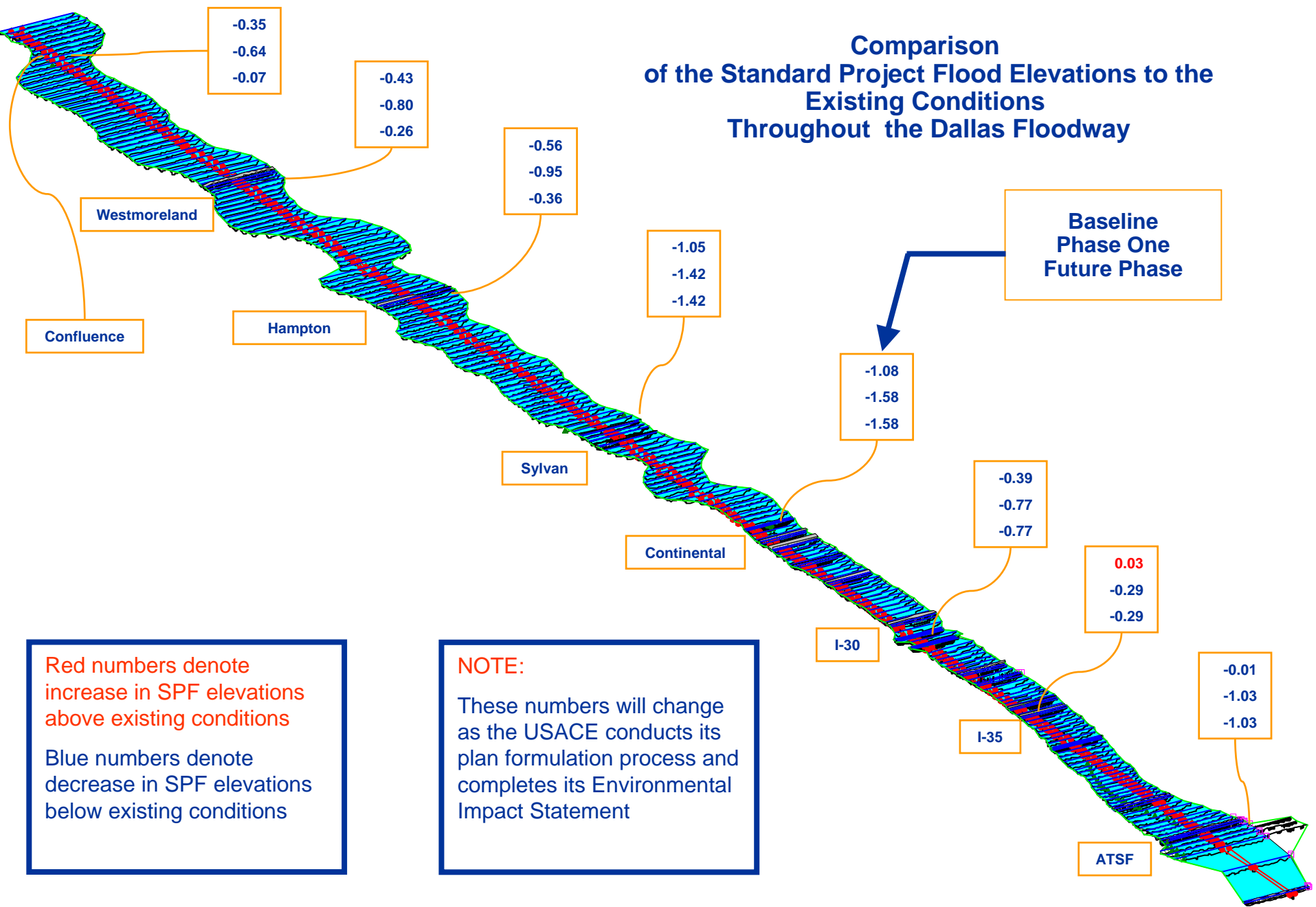


Objective of Hydrologic and Hydraulic Modeling of Floodway

- Flood conveyance for the Dallas Floodway is highest priority
 - Improvements must not cause higher flood elevations or erosive velocities within the floodway
 - Results indicate slight lowering of flood elevations within the floodway
- Improvements to the Dallas Floodway can have no significant adverse impacts either upstream or downstream
 - **This objective has been met** --- Results indicate no significant adverse impacts upstream or downstream for the Trinity Parkway, Phase One initiatives, and Future Phase initiatives

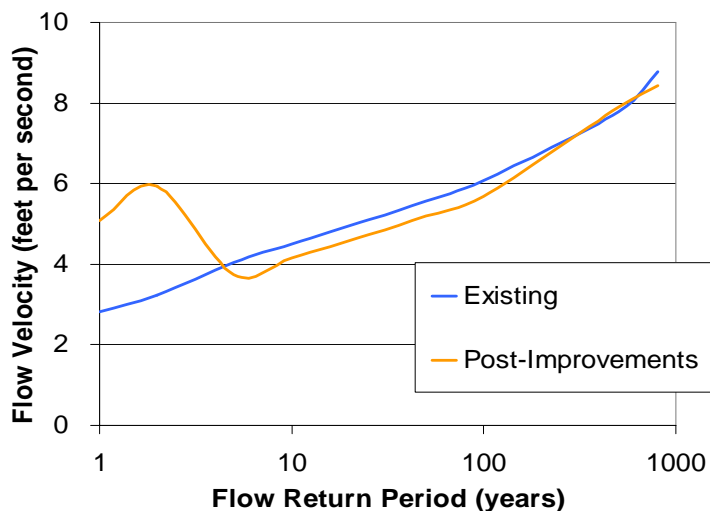


Comparison of the Standard Project Flood Elevations to the Existing Conditions Throughout the Dallas Floodway



Bridge Infrastructure Will Not Be Impacted By Erosive Velocities Due to Improvements Within the Dallas Floodway

Flow Velocity at Houston Viaduct Bridge



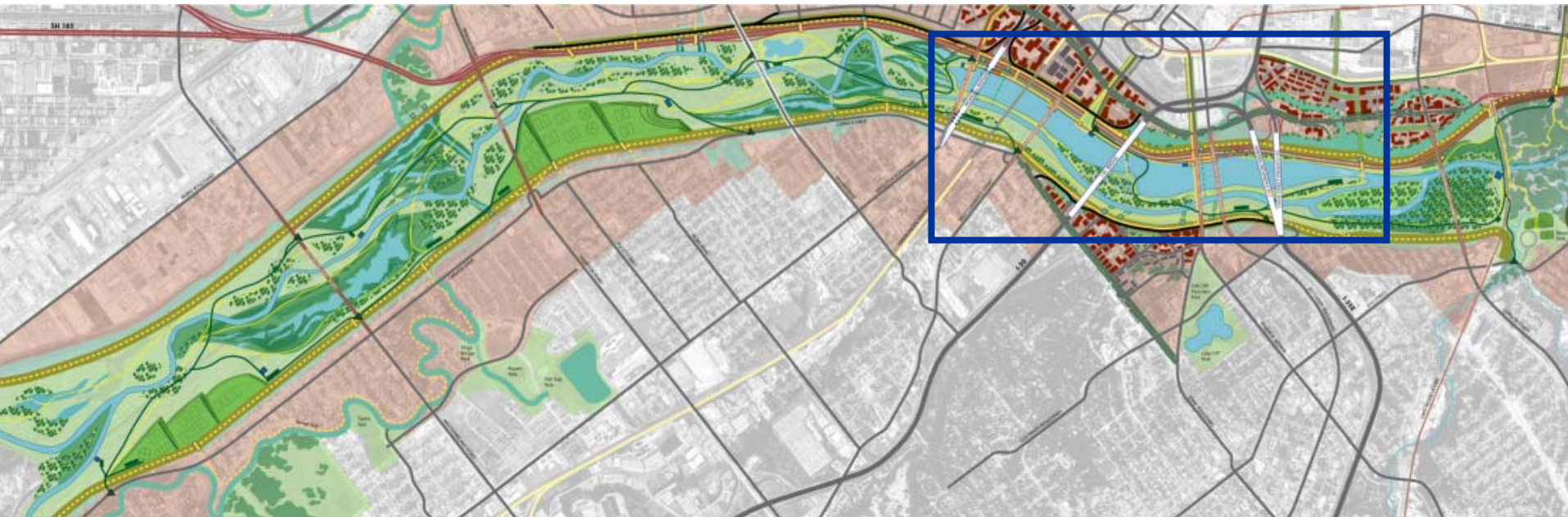
Note:

Velocities are higher than existing conditions at the Houston Viaduct Bridge for the frequent flood events due to the lake berm constriction. However, these higher velocities are too low to be erosive.



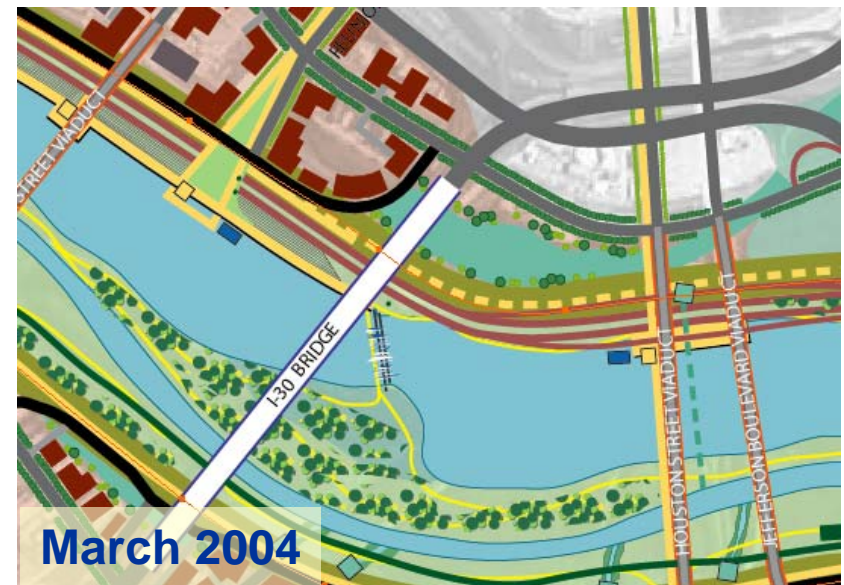
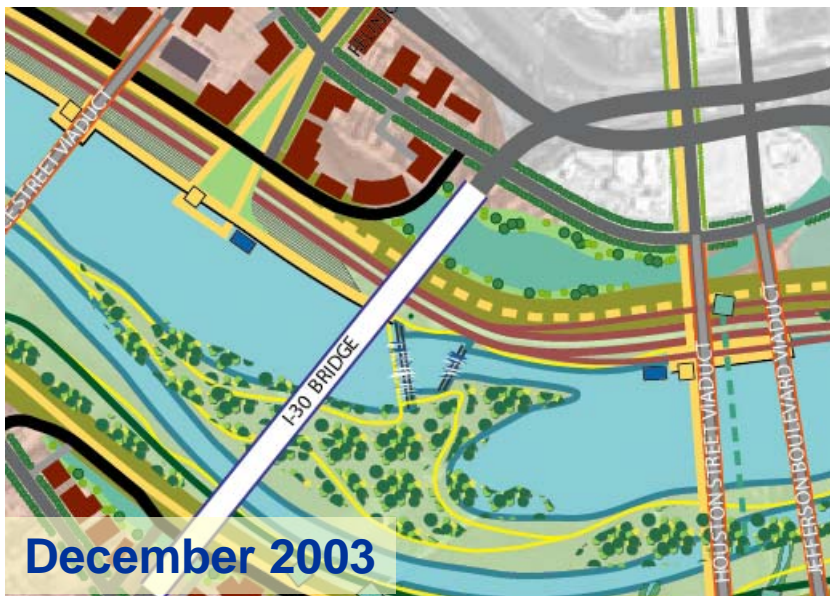
Floodway Lakes

- Two off-channel lakes next to downtown that drain to the river



Floodway Lakes

- Wider transition provides necessary flood conveyance within the Dallas Floodway
- Wider transition produces uniform flow for the Natural Lake that reduces algae potential



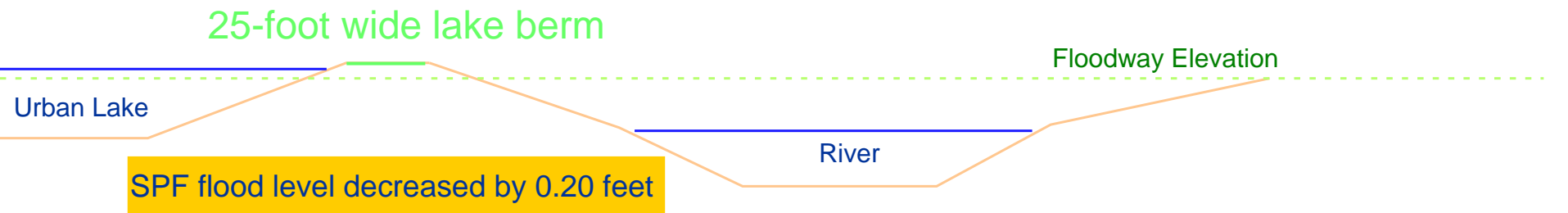
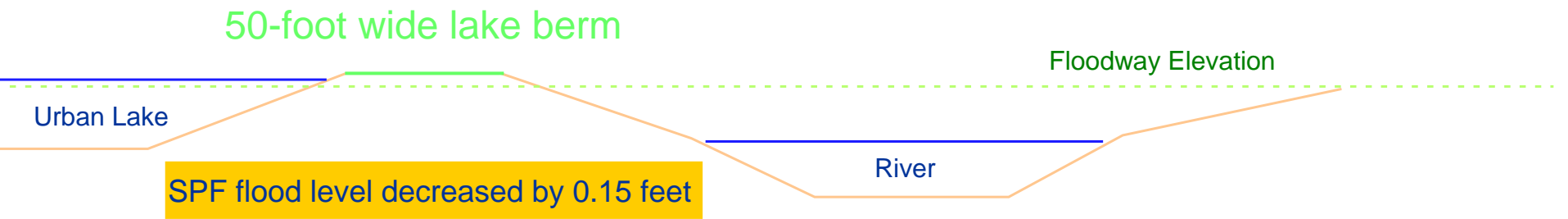
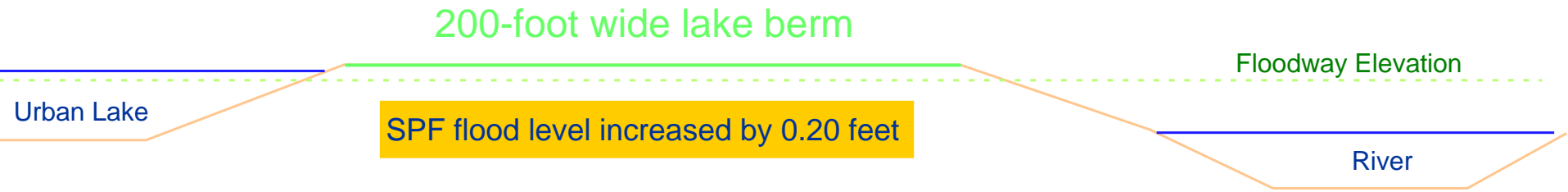
Key Factors in Floodway Hydraulic Performance

- The narrowest portion of the floodway experiences the greatest physical challenges
- Lakes increase flood conveyance capacity
- Roadway, berm around lakes, bridges, and trees hampers flow
- ATSF Bridge replacement provides big increase in flood conveyance

ATSF Bridge
Modifications

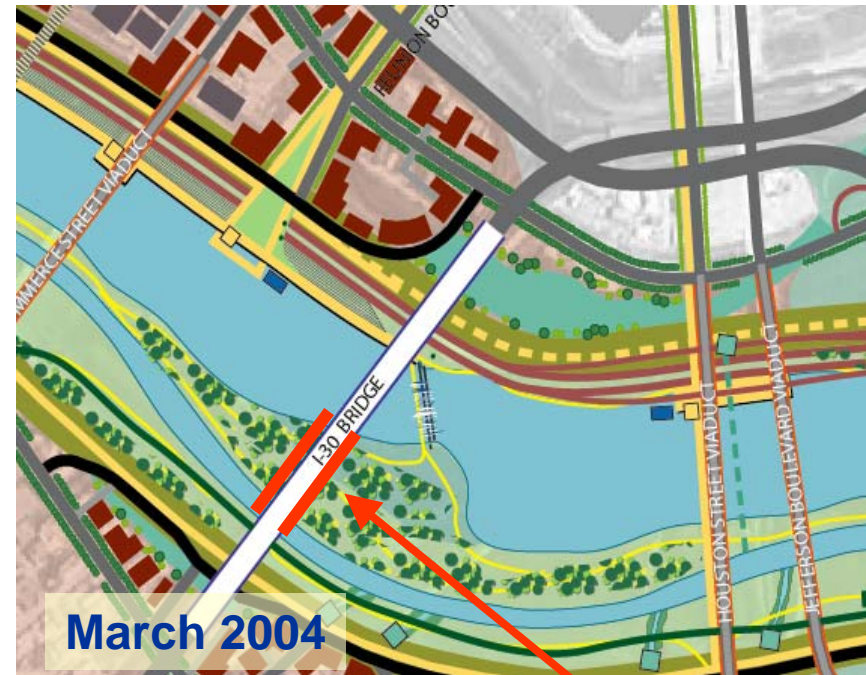


As an Example of Assessing Design Features: Sensitivity of Lake Berm Impacts to SPF Flood Levels Near Urban Lake



Urban Lake and I-30 Signature Bridge

- The location of the I-30 signature bridge span is an issue
- The proposed new ramping from downtown will not be able to line up in a manner to facilitate a signature bridge span until about halfway across the floodway, which will push the bridge span towards the west levee
- The Calatrava design team will try to keep the bridge span as far east as possible, but reshaping of the river/lake under the bridge span will likely be necessary and would be pursued with the USACE as part of their study



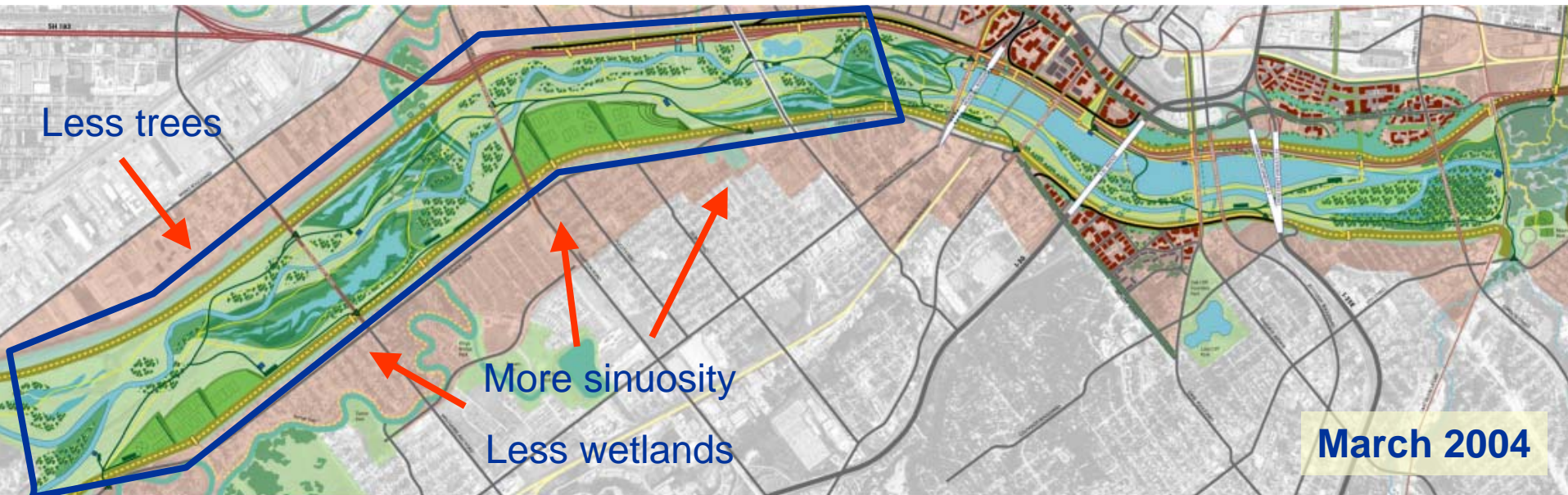
I-30 Signature Bridge

Comparisons for Upstream Half of Dallas Floodway

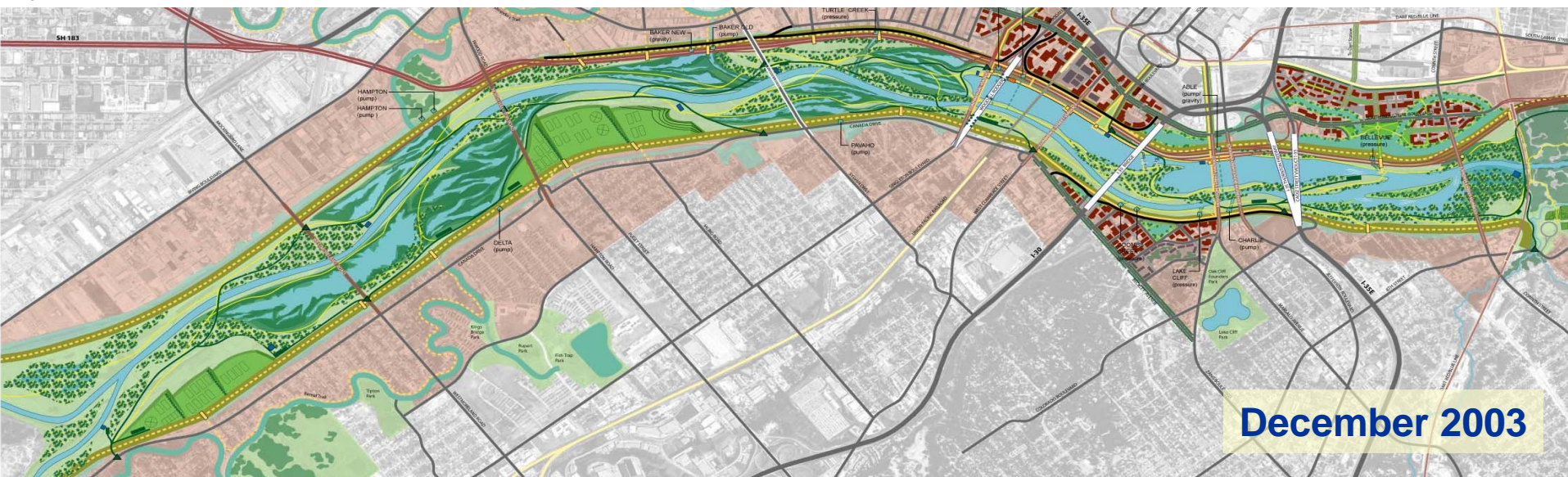
- **Approximately 40 percent fewer trees are included in the March 04 version due to hydraulic considerations for the upstream end of the Dallas Floodway**
- **River meanders are significantly enhanced with the March 04 version between the Urban Lake and the Elm Fork / West Fork confluence as a result of encouragement by the USACE for environmental restoration**
- **Wetlands are decreased for the upstream half of the Dallas Floodway in the March 04 version to make room for increased sinuosity for river meanders**



Comparisons for Upstream Half of Dallas Floodway



March 2004



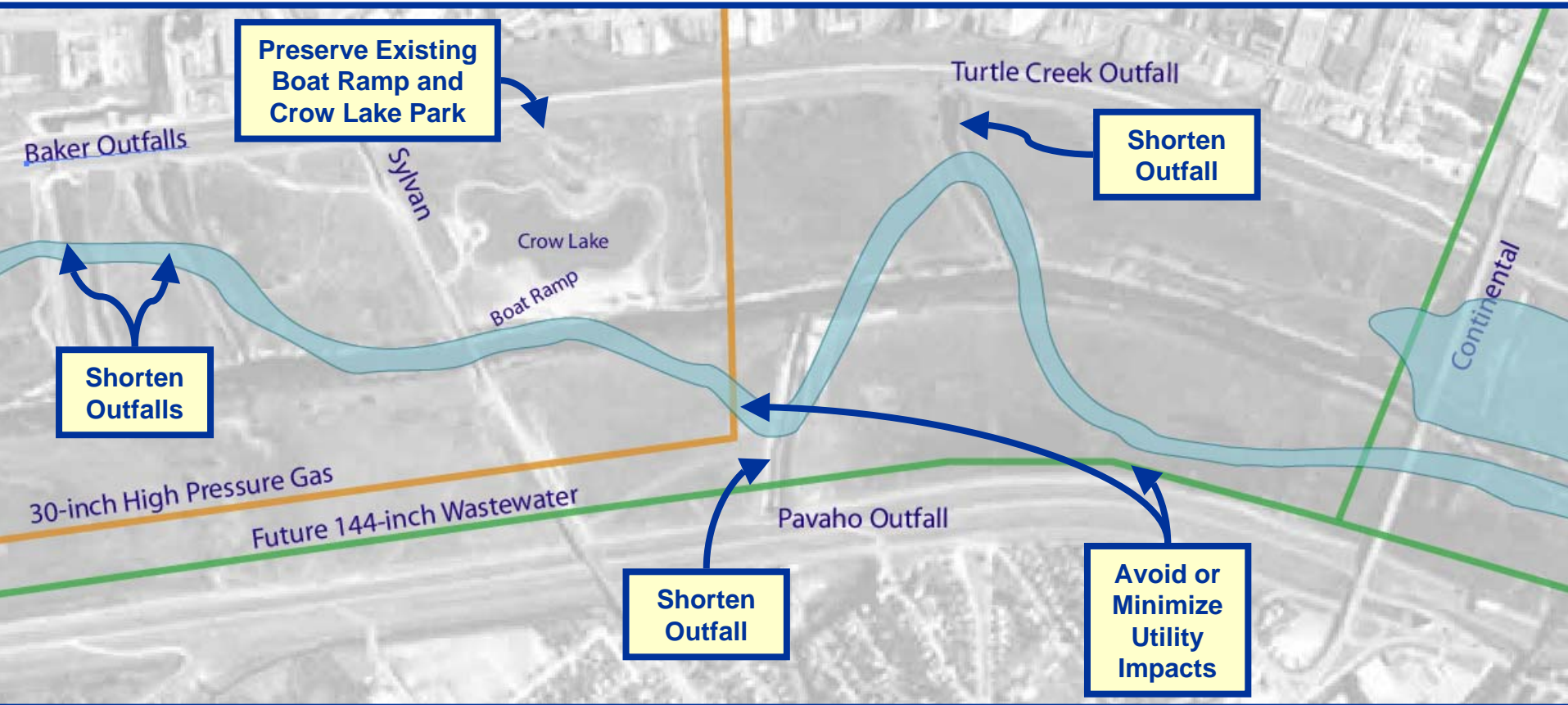
December 2003

Channel Considerations Through the Floodway

- Relocating river through bridges
- Providing river channel meandering for recreation and ecological restoration
- Providing bi-channel configurations (islands)
- Interior drainage considerations
- Ensuring river channel will not pose debris, sediment, or scour difficulties



River Meandering Involves Several Considerations



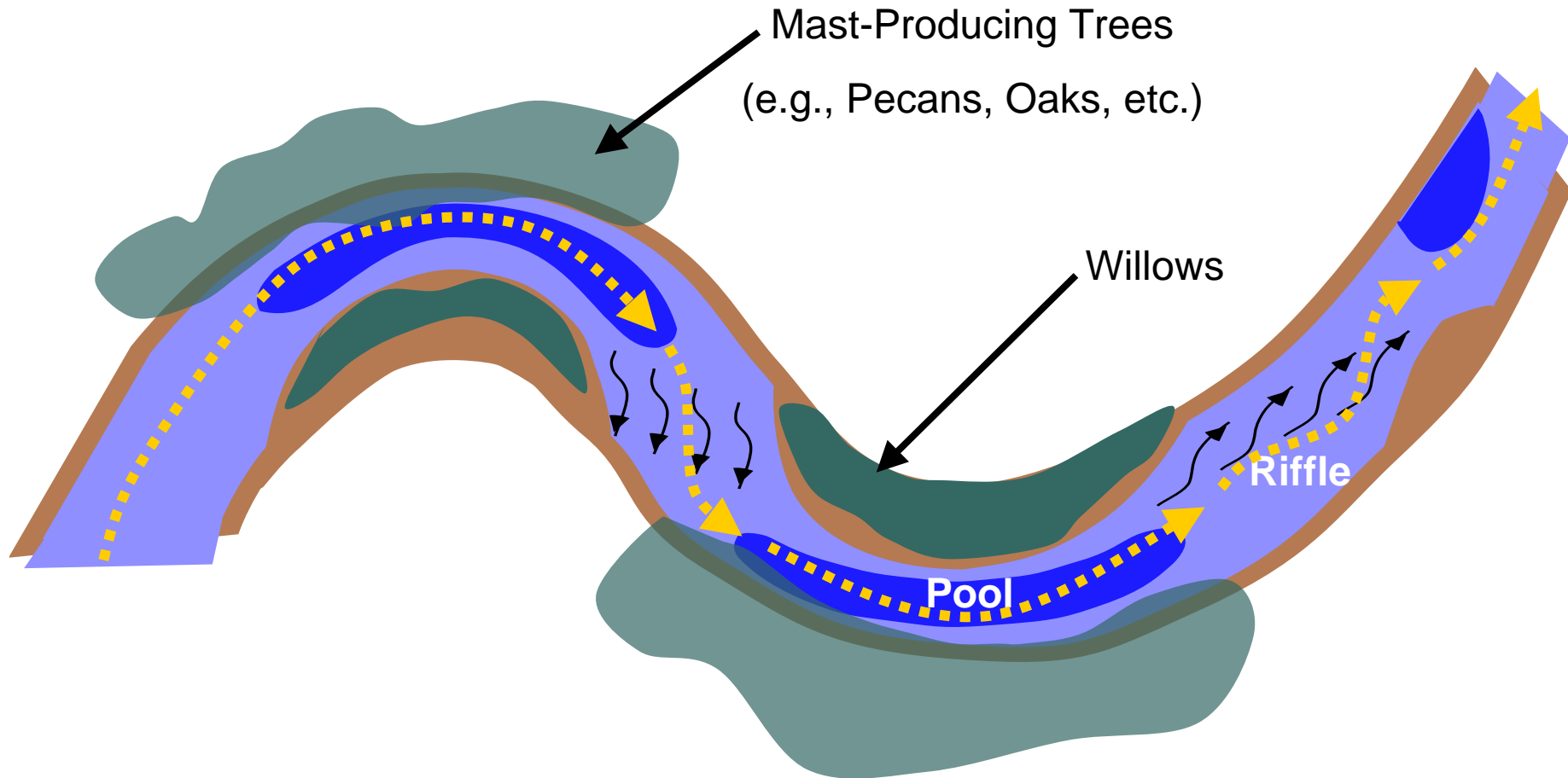
Adding River Sinuosity Provides for . . .



- Eco-system restoration
- Riffle pool sequences
- Higher water quality
- Additional length of riparian corridor
- Improved aesthetics
- Improved aquatic habitat



River Sinuosity and Habitat --- Prototype Schematic ---

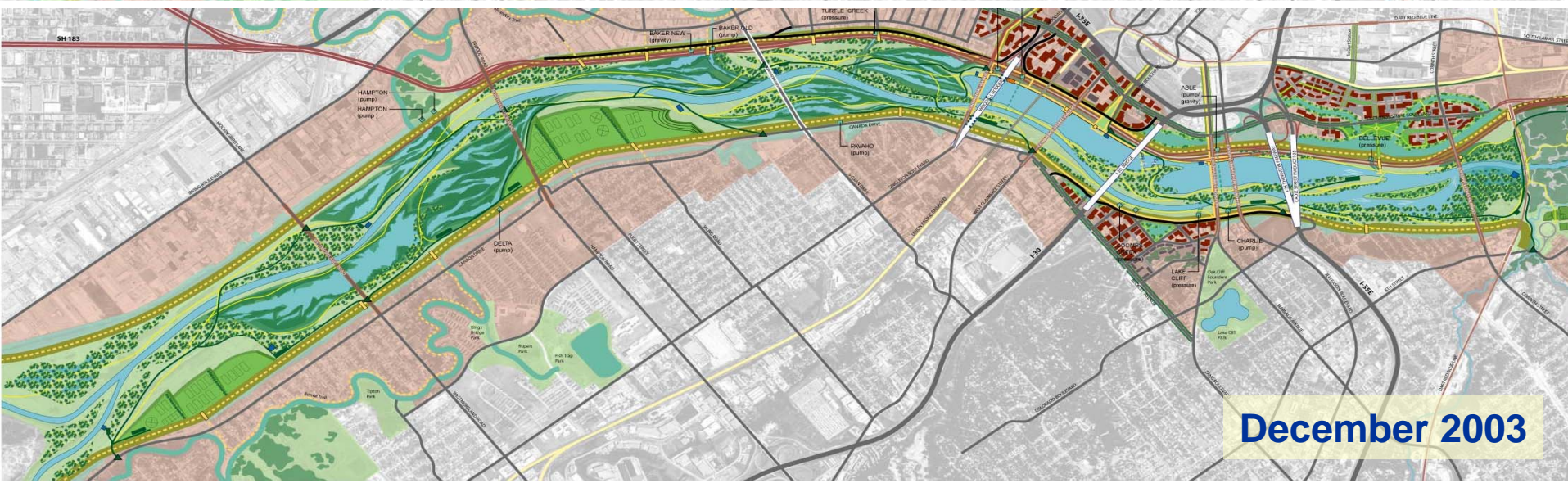
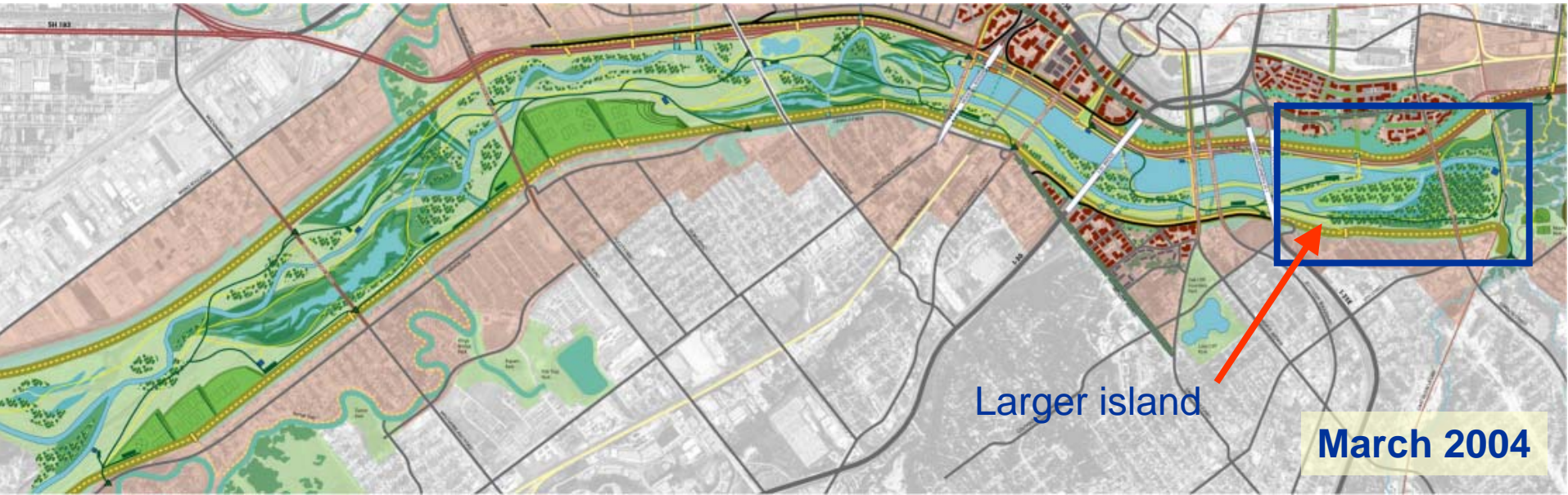


Channel Meandering and Trees

- Channel sinuosity added to enhance environmental restoration and increased USACE participation
- Tree plantings are 40 percent reduced in upper half of the Dallas Floodway with the March 2004 version due to hydraulic constraints

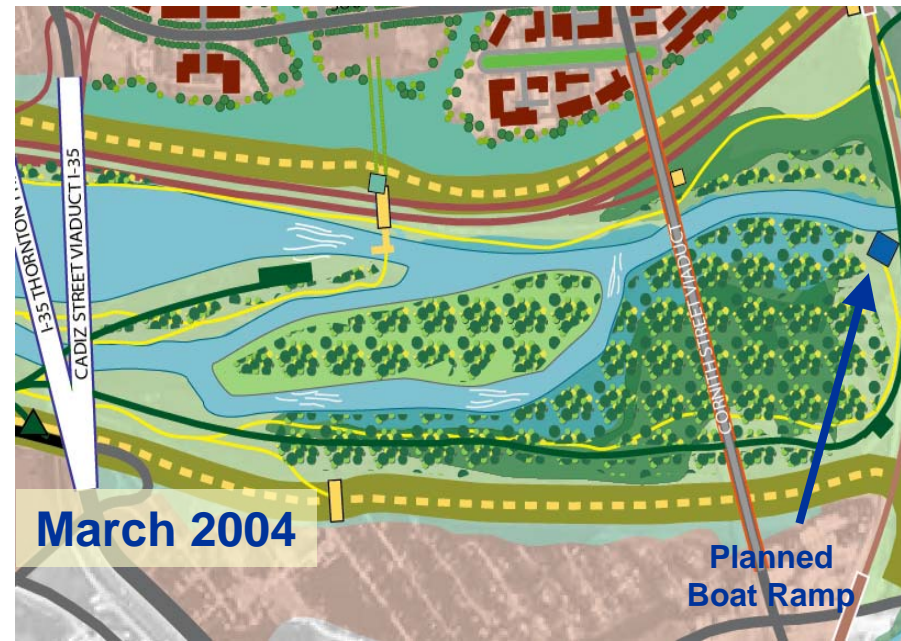
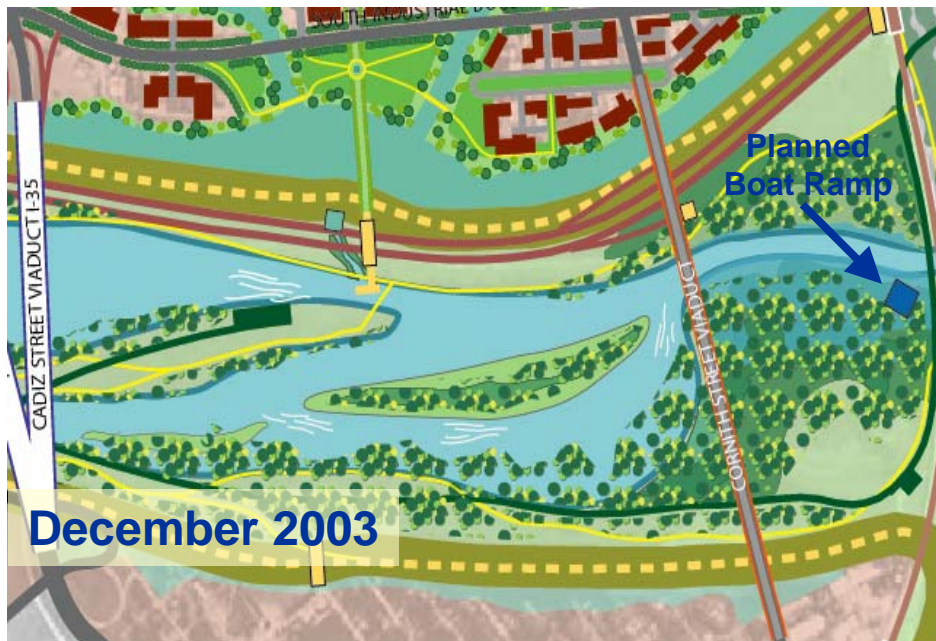


Island Feature Comparison: Dec 03 and Mar 04



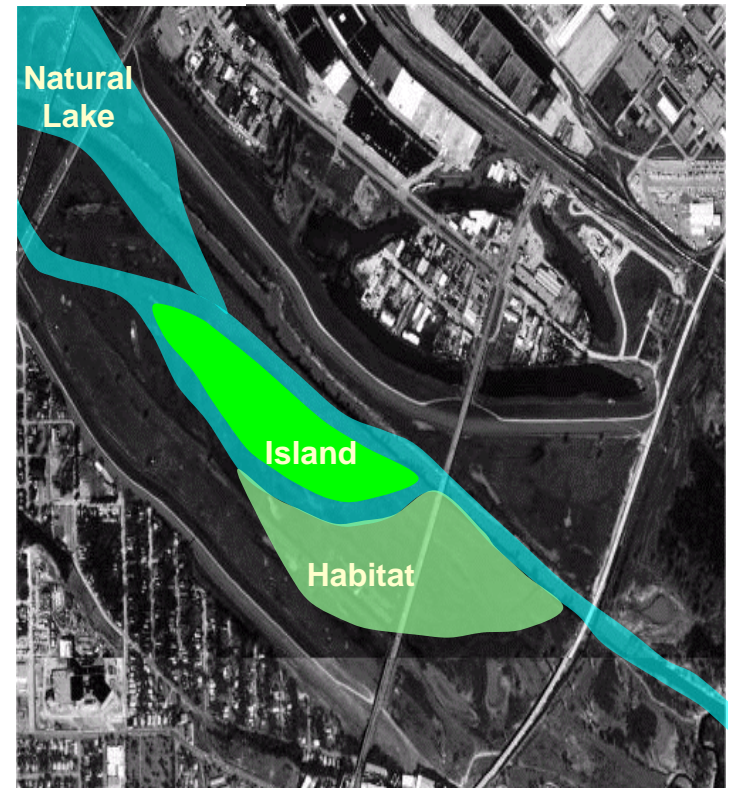
Island Feature Comparison

- Smaller channels needed to convey flow result in larger island
- The channel configuration allows for better protection for the western channel from debris flows
- Additional terracing downstream of island for wetland and riparian habitat
- Wetland area is pulled back from the ATSF Bridge to allow for the Moore Park boat ramp



Bi-channel / Island System

- Split channel around island for diversity of habitat and recreation
- A terraced area downstream of island would inundate frequently and provide wetland habitat

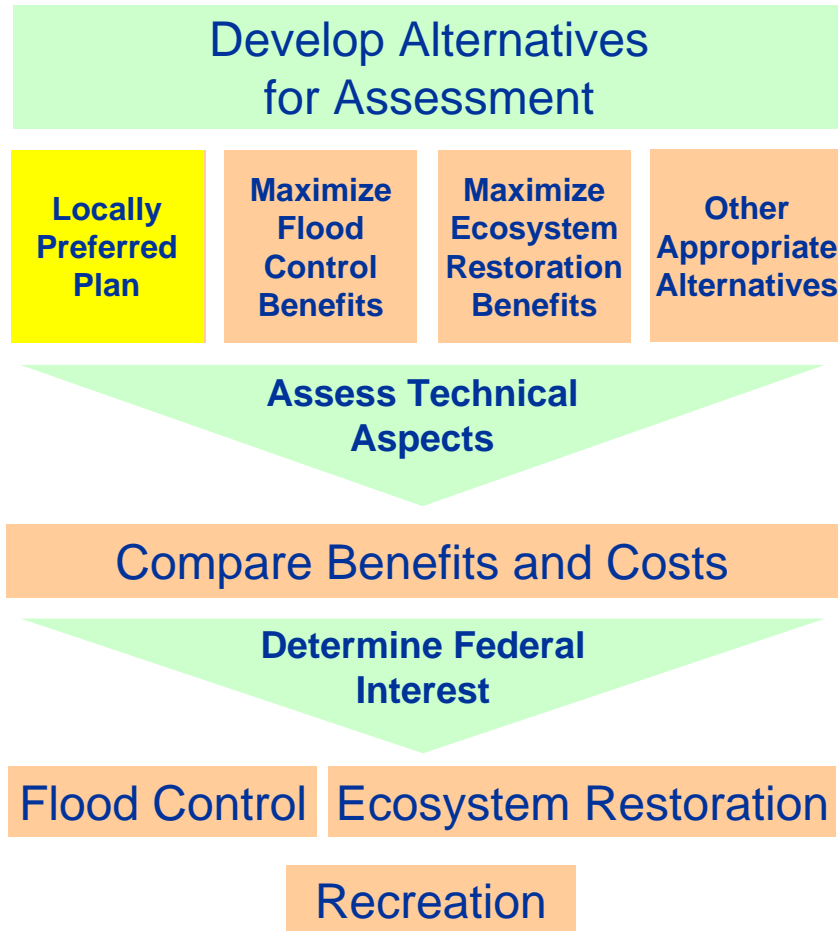


Next Steps

- **City staff recommends (with TRC support) that a briefing memo packet is provided to City Council for status update in March 2004**
- **Turn over hydraulic models and digital terrain model to the USACE by end of March 2004**
- **USACE will progress with plan formulation for the Dallas Floodway during 2004-2005, while continuing to receive City and Urban Design feedback**



Next Steps (continued)



- **USACE feasibility study and EIS process carries through 2004 - 2006**
- **Draft report due in late 2005**
- **Final EIS due in late 2006, which also includes the Trinity Parkway project**



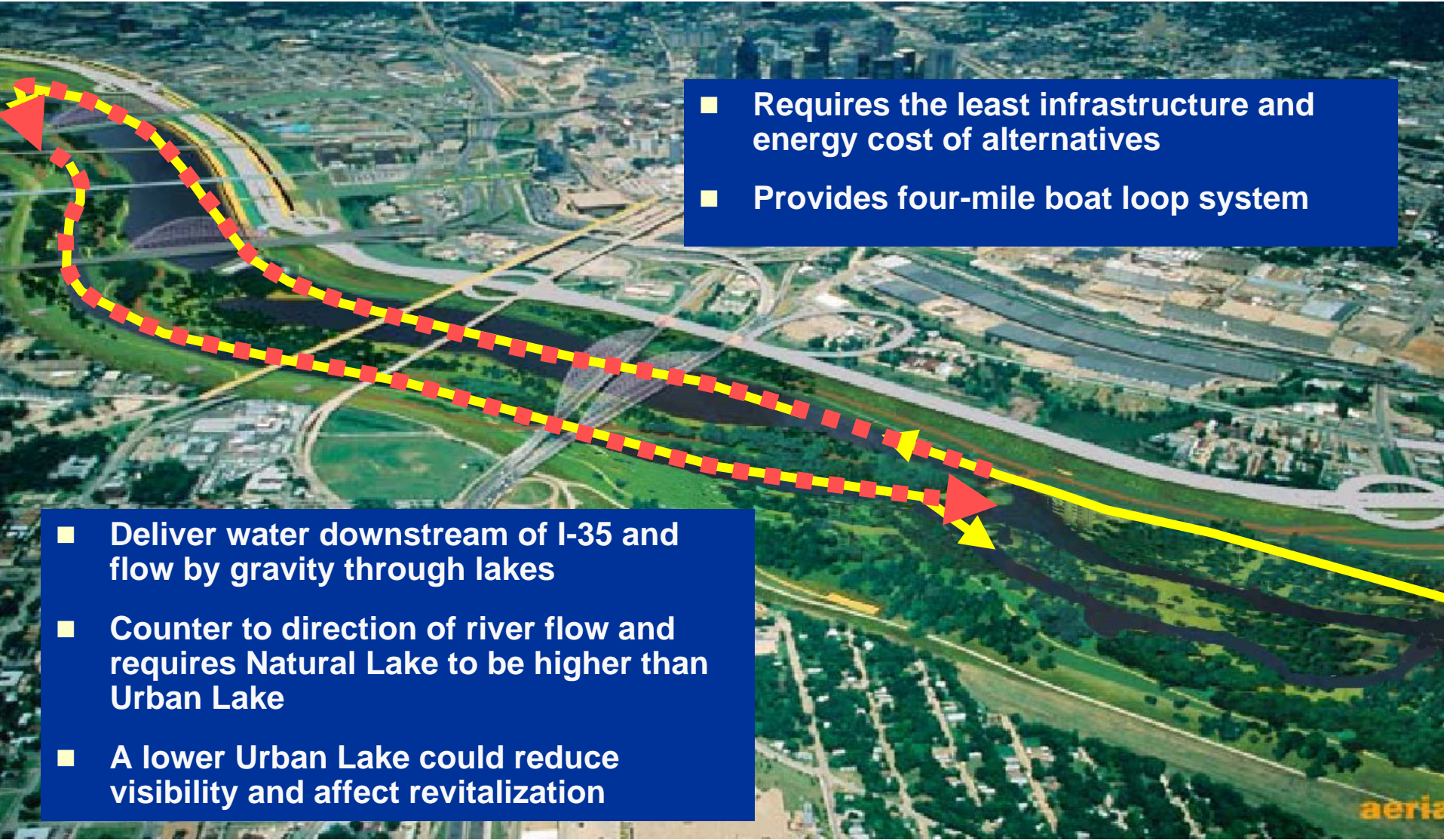
Next Steps (continued)

- **CDM will complete their work on water quality and environmental restoration this Spring**
- **USACE will produce a Supplemental Draft Environmental Impact Statement (EIS) report by late 2005 that will establish the extent of Federal participation for the Dallas Floodway initiatives**
- **The City will have a concurrent study initiated in 2005 with the Bureau of Reclamation for the lakes' water delivery system, if the City gets a Congressional earmark**
- **The City will pursue design of lakes and amenities for the Dallas Floodway during 2006, while USACE finalizes the EIS**





Reclaimed Water Delivery Alternative



- Requires the least infrastructure and energy cost of alternatives
- Provides four-mile boat loop system

- Deliver water downstream of I-35 and flow by gravity through lakes
- Counter to direction of river flow and requires Natural Lake to be higher than Urban Lake
- A lower Urban Lake could reduce visibility and affect revitalization

