



**US Army Corps
of Engineers®**

Kansas City District

Blue River Channel Stakeholders Meeting

February 7, 2008



Strategic Value Solutions, Inc.

Blue River Channel Modification Project Stakeholder Meeting

Definitions

ADR	Alternate Dispute Resolution
BMP	Best Management Practice
BPB	Blue Parkway Bridge
BNR	Burlington Northern Railroad
BFIP	Byram's Ford Industrial Park
BVA	Blue Valley Association
cfs	Flow Rate measured as Cubic Feet per Second (1 cfs = 373.7 gpm)
City	City of Kansas City, Missouri
CLOMR	Conditional Letter of Map Revision
COE	US Army Corps of Engineers
CFR	Code of Federal Regulations
CWRT	Civil War Roundtable
DM	Design Memorandum
DDR	Design Documentation Report
DHS	Department of Homeland Security
DoD	Department of Defense
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FDM	Features Design Memorandum
FS	Feasibility Study
Gradient	Change in elevation over a distance (ft/foot)
GRR	General Reevaluation Report
gpm	Flow rate measured as Gallons per Minute (1 gpm = 0.00268 cfs)
GCS	Grade Control Structure
GDM	General Design Memorandum
GRR	General Reevaluation Report
HSI	Habitat Suitability Index
Hydrology	Calculates expected flows
Hydraulics	Calculates water elevations for a flow rate
HTRW	Hazardous, Toxic, and Radioactive Waste
KCD	Kansas City District, U.S. Army Corps of Engineers
KCMO	City of Kansas City, Missouri
KCS	Kansas City Southern Railroad
KCIC	Kansas City Industrial Council
KCT	Kansas City Terminal
Left Bank	Orientation is facing downstream, bank on left side of river
LOMR	Letter of Map Revision (FEMA Flood Map)
LERRD	Lands, Easements, Rights-of-Way, Relocations, and Disposal
NWK	Kansas City District, US Army Corps of Engineers
MOA	Memorandum of Agreement

MRD	Missouri River Division (now Northwestern Division (NWD))
NWD	Northwestern Division, US Army Corps of Engineers
Right Bank	Orientation is facing downstream, bank on right side of river
ROW	Right-of-Way
Sta	Station – Baseline measurement along project centerline in feet (05+22 = 522 feet from start, 12+99 = 1,299 feet from starting point)
PIAC	Public Improvements Advisory Council
PW	Public Works Department, City of Kansas City, Missouri
PR	Parks and Recreation Department, City of Kansas City, Missouri
UPRR	Union Pacific Railroad
USACE	US Army Corps of Engineers
USEPA	Environmental Protection Agency
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
VE	Value Engineering
WSD	Water Services Department, City of Kansas City, Missouri

SECTION 1

MINUTES



Memorandum

Date: March 28, 2008
To: John Holm
US Army Corps of Engineers, Kansas City
601 E 12th Street
Kansas City, MO 64106
cc: File
From: John Robinson **Email:** john@strategicvaluesolutions.com
Subject: Meeting Minutes, Stakeholders Meeting, February 7, 2008

Stakeholders for the Blue River Channel Modification Project convened on February 7, 2008 at the Kansas City, Missouri Water Services Department Building. A list of attendees is attached to these minutes.

Lynda Hoffman, representing the City of Kansas City, Missouri, welcomed the assembly and presented a brief status of the project. She closed her introductory remarks by reiterating that the purpose of the meeting was to not only present the status but to seek direction, comments, and suggestions from the stakeholders.

John Robinson of Strategic Value Solutions introduced himself as the moderator and presented the agenda. The stakeholders then introduced themselves including their affiliation. John then presented the ground rules for the discussions to follow.

John Holm of the US Army Corps of Engineers, Kansas City District (COE) set the stage for the discussions by presenting the project background. Mr. Holm's presentation included the size and location of the Blue River watershed and a brief history including the historical flood events that led to the current COE project. He defined terminology that would be used later in the day emphasizing the difference between hydrology and hydraulics. Mr. Holm clarified that hydrology is used to calculate the probability and quantity of peak flows and that hydraulics is used to calculate the expected elevation of any flow at any point in the watershed.

The original project authorized in 1970 provided flood protection from a 100-year flow or more properly a 1% probability of flooding in any one year. The 1970 project included four reservoirs in Johnson County, Kansas that would reduce the flows in the lower part of the watershed to 35,000 cubic feet per second (cfs). This is equivalent to the 3.3% probability of flooding or the 30-year flow as calculated using hydrology. Due to conflicts with the Johnson County development plans the lakes were removed from the project in 1975. This resulted in the current project that consists of modifications to 12.5 miles of channel designed to contain 35,000 cfs. This became known as the 30-year Channel. The proposed project lowers flood elevation for the 1% probability flow by approximately 6 feet and reduces the floodplain by 1,300 acres within the 12.5-mile authorized reach. Mr. Holm added that normal flow is approximately 1,000 cfs.

BLUE RIVER STAKEHOLDER'S MEETING NOTES

Mr. Holm continued his presentation by presenting the detailed status of the project and compared the accomplishments of the project to the Wet Weather Goals. Of the six goals presented the project had successfully minimized loss of life and injury, reduced property damage due to flooding and had optimized infrastructure investments. The project had mixed results to date on improving water quality, maximizing economic, social and environmental benefits, and enhancing the environment. There are programs in place or being developed that are expected to improve the rating of these factors such as a mitigation plan being developed and the implementation of green solutions.

Mr. Holm then explained some of the budgeting and contracting constraints of the project and how the project had been subdivided. After presenting the completed parts of the project, he presented the scope of the last portions of the project including the grade control structure and mentioned that the value engineering study had presented alternatives to the design. Mr. Holm explained that federal funding was available in fiscal year 2007 to construct the project from Brush Creek to 53rd Street. He explained that 53rd street was a logical termination for this subsection of the project based on hydraulics, channel alignment and topography.

Mr. Holm explained that in order to take advantage of available funding it was decided to complete this portion of the project as design-build. He then explained the design-build concept and how the work was awarded. He also explained the scope of the design – build project followed by the remaining work on the project.

The presentation was followed by discussions and a question and answer session.

There was a question about the replacement of the Lower Blue Parkway Bridge and the schedule for the replacement. The bridge will be replaced. A contract was awarded to Olsson Associates through the Capital Improvements Management Office (CIMO) for design, and construction is planned to begin in 2009 for the new bridge to be located at Colorado Avenue. Work on the intersection design of Blue Parkway at Hardesty is also underway through Waterways Division of KCMO.

Mr. Holm was asked if the COE was aware of other projects along the Blue River. He stated that the COE is aware of the Blue River Trail on the east side of River. KCMO responded that the Blue River Watershed Study is complete and work has begun on a management plan and that an Upper Blue River Alliance had been formed with Jackson and Johnson Counties working on watershed issues.

There was a general discussion on environmental enhancement projects and urban renewal including the grocery store west of Blue Parkway Bridge that is calculated to be out of 100-year floodplain; however the Floodplain map has not yet been revised for this area. Areas removed from the floodplain per the May 2004 LOMR for the completed portions of the Blue River from the confluence with the Missouri River to the Leeds Industrial Park as well as areas for the remaining work were pointed to on maps. There were several questions concerning the hydrologic and hydraulic models. Both the flood flows from early 1990's and the predicted future build-out flows are included in the model. It was acknowledged that it is good to have watershed based cooperation that acknowledges ongoing studies. As part of this discussion it was noted that the historic

BLUE RIVER STAKEHOLDER'S MEETING NOTES

floods were less than the designed capacity of the channel and that those flows would be contained within the channel.

A discussion of the Value Engineering process and the results of the study were deferred until after lunch however it was stated that the COE had posted the report online and had copies available which document the results of the study.

A question was asked concerning the availability of early studies and reports. No documents earlier than the 1972 Environmental Site Assessment (ESA) have been located; however the ESA summarizes the earlier information.

As part of the discussion it was stated that the COE since the 1986 Water Resources Development Act, has been given authority to consider more than flood control in project development.

Mitigation and Environmental Enhancement were presented by Scott Gard of the COE.

Mr. Gard presented the initial process that was used to determine mitigation requirements and the resulting mitigation areas and their status. He then presented the mitigation plan update. Mr. Gard presented the status of the Centropolis Loop Mitigation and the opportunities to enhance the functionality of the mitigation as part of the General Reevaluation Report (GRR). He also presented aerial photographs showing hard points installed at I-70 to improve aquatic habitat and a meander cut-off at Coal Mine Road. These projects were coordinated with the Missouri Department of Natural Resources.

The presentation was followed by discussions, along with a question and answer session.

A great deal of discussion centered on eco-restoration and reforestation. The views expressed varied greatly from trees are counterproductive in that they retard flood flows to trees naturally grow on riverbanks and should be accommodated in the designs. Mr. Gard stated that trees would primarily be planted on the overbanks and that tree planting could begin since the proposed trail alignments have been identified by the City. The guiding principle for eco-restoration projects in the Blue River floodplain is that the establishment of trees or vegetation would not impact the authorized channel's 100-year floodplain elevations. Tree planting has been deferred to date in coordination with the City so that newly planted trees would not be destroyed during trail construction.

This discussion led to questions and concerns about the long term maintenance of the flood channel and if there were Best Management Practices (BMP's) to suppress tree establishment on the riverbanks. Mr. Gard stated that as a result of the currently authorized project the channel has grassed slopes and trees that grow in the channel would be removed. A discussion on the long-term management plan was deferred.

Tom Kimes of HDR then presented the environmental enhancement plan for the river reach from Brush Creek to 53rd Street. Mr. Kimes used overlays on aerial photographs to present the enhancements. These include limiting the amount of clearing on the site to preserving existing woodland areas especially near the trails. Additional in-stream structures such as j-hooks were presented. J-hooks are a type of groin or jetty constructed of rock that project into the river. Several water quality improvement BMP's were presented.

BLUE RIVER STAKEHOLDER'S MEETING NOTES

An interactive discussion was part of the presentation.

Concern was expressed that the river is washing out the west bank south of the Blue Parkway Bridge and that debris from a salvage yard is being exposed. It was noted that the river alignment is being shifted eastward at that location by the channel project and the banks in that area will be reworked. Debris will be removed as it is encountered in the bank. The Contractor has a contingency plan if any toxic or hazardous materials are encountered. Monitoring is part of the contingency plan. The COE has tested and found low-levels of PCB's. The levels are below actionable thresholds.

This discussion was followed by suggestions for additional BMP's including placing a BMP structure between the salvage yard located south of the bridge and the river. The response was that there is not enough space and the acquisition of additional space is not within the contract or the authorized project. Ms. Hoffman stated the City would consider the possibility.

The discussion returned to details of bank treatment including wetland locations, grassed areas, riprap and trees. Mr. Kimes stated that the banks will be grassed, that riprap will be limited to areas of higher flow velocities and that the trail system must be coordinated with tree planting areas. He also stated that the wetlands will be located at tributaries. Mr. Kimes stated that there was no opportunity for water quality BMP's associated with stormwater outfall because of space and slope limitations as currently defined in the contract documents. Subsequent to the stakeholder meeting, the COE and the City have concurred that additional real estate could be provided if potential BMP's are identified. .

Lunch break 11:52- reconvene 12:30

Informal discussion of the project continued during lunch followed by a presentation by John Grothaus of US Army Corps of Engineers, Kansas City Planning Division.

Mr. Grothaus emphasized that the COE is no longer a single mission agency and that the additional benefits for flood projects including environmental, recreational, habitat improvement and water quality improvement are part of project development. This expansion of responsibilities led to the General Reevaluation Report (GRR). Based on the results of the Katrina flooding, due diligence and maintenance of flood control projects is included with additional emphasis on economics and environmental effects.

Scott Gard (COE) followed Mr. Grothaus' comments by presenting the current GRR. Mr. Gard presented the components and purpose of the GRR. He stated the GRR is justified by the changing conditions and the expansion of citizens and Corps concerns beyond just flood reduction. Mr. Gard then presented the processes used for the GRR followed by the baseline used for this project. He presented examples of physical assets that were considered. This was followed by examples of both structural and nonstructural measures for flood reduction. Ecosystem restoration measures and recreation enhancement were also presented including the incorporation of the top three goals of the Blue River Summit. These goals are to improve water quality, reduce flood damage, and protect wildlife habitat. The results of the environmental baseline inventory were presented. He concluded his presentation with a status report. The presentation was followed by discussions and a question and answer session.

BLUE RIVER STAKEHOLDER'S MEETING NOTES

Several questions were about how the economic benefit is calculated. There is concern that the Corps is not capturing the current value of the land in their economic models since the area that floods has decreased over time. The Corps response is that the COE concentrates on physical structural damages not land value. If a development project was "on the books" it can be added to the evaluation. The discussion continued concerning dollars expended versus life expectancy. The Corps uses a time period for the evaluation but the life of the project is forever.

The discussion continued concentrating on sustainability, environmental benefits and cultural features. Since the project was originally authorized as a flood prevention project, the GRR has some limitations. It is difficult to link the economic benefits in Johnson County to the work performed downstream. There is hope for the future. Language is being proposed in an agreement to coordinate with Johnson County and others on a watershed basis. As part of this discussion Mr. Gard clarified that the Habitat Suitability Index (HSI) that were reported applied to the conditions observed at the time and are not a prediction for post-project.

The commitment to environmental stewardship is demonstrated by the addition of environmental and cultural features in the economic analysis and by the Conservation Opportunity Areas that were extended to Brush Creek by the Missouri Department of Conservation and other stakeholders. Environmental features are not the lowest cost alternative but the best value. Value determination includes input at public meetings and can include additional items not originally scoped. Protecting cultural features such as Byram's Ford are another example. There will be opportunities for public involvement in the GRR process. There will probably be public meetings next year with a completion of the GRR in a two year time horizon.

The Corps explained that its mission has expanded over the years and that it is moving toward restoration. The Corps is working toward more environmentally sustainable systems that are included in the economics of projects but they must first protect what is there. They are working with other agencies like the City that is proposing a stream setback ordinance.

Mr. Gard closed with a brief discussion that the existing project will not be delayed by the GRR. The current project should be concurrent with study but it is linked to funding and authorization.

John Holm opened the discussion on the 53rd Street to 63rd Street reach with a brief history of Byram's Ford and the reasons to preserve this historic Civil War site. The site was the largest land engagement west of the Mississippi. There were a total of 1500 casualties from the battle. Both sides suffered equally. Preserving the site was not part of the originally authorized flood project. In 1981 it was determined that there would be "No Adverse Effect" on the site because of the project since it was determined that the ford no longer existed. In 1983 the Civil War Round Table (CWRT) demonstrated that the ford still existed. In 1985 the District committed to protect the site. By October of 1989 the site was listed on the National Register of Historic Places. Negotiations occurred from 1987 to 1992 resulting in an Alternate Dispute Resolution (ADR) in September 1992. This led to a Memorandum of Agreement (MOA) that revised the project to include a levee, relocating the grade control structure to 59th Street and other items. The MOA resulted in two important technical decisions; re-establish the stream rating curve at the grade control structure and return the upstream velocities to within

BLUE RIVER STAKEHOLDER'S MEETING NOTES

5% of pre-project condition. These decisions led to a complex structure for the grade control since the structure now had to control flow. The structure was physically modeled. Mr. Holm presented an artistic rendering of the structure and with the use of graphs of the water surface versus distance along the river explained how the structure would function. Mr. Holm stressed that the result of these decisions is to raise the water levels upstream of the structure to pre-project conditions, which are higher than current conditions. The presentation led to a discussion concerning specific structures in the area. It was confirmed that if the grade control is constructed, the flood plain elevations of the soccer fields and pool structures upstream would be raised approximately 6 to 8 feet back to pre-project conditions and if frequent flooding had occurred in these areas pre-project, frequent flooding would once again be experienced.

Mr. Holm completed his presentation by explaining that additional modeling was performed by the US Geological Survey (USGS) to confirm the physical model.

Mr. Rick Huizinga of USGS presented the analyses performed by the USGS. The USGS had previously developed a 2-dimensional model between Blue Parkway and 63rd Street. The model was adapted to analyze the effects of the grade control. The viability of the existing conditions model was validated by comparing the predicted flood elevations to those measured during the May 19, 2004 and May 15, 1990 floods. The 1990 flood at 31,800 cfs was slightly less than the design flood of 35,000 cfs. The model was then revised to include the proposed changes and rerun. The results for different flood scenarios were presented by projecting the flood limits on aerial photographs. The graphics included a representation of predicted depth and velocity by variation in color.

From the model, the USGS was able to conclude; that the current channel modifications downstream of Brush Creek are affecting the elevation and velocity in the natural channel upstream as far as 63rd Street. The elevation is lowered while the velocities are higher, that the proposed channel modifications will convey the design flood and most of the 50-year flood as well, and that the proposed grade control and berm will provide protection to Byram's Ford Industrial Park and create conditions in the channel upstream of the structure similar to those that existed prior to the start of channel modifications based on the 1990 flood data. Mr. Huizinga concluded his presentation by presenting the citing for the report (<http://pubs.usgs.gov/sir/2007/5098/>) on the results of the model and a discussion with questions and answers.

Mr. Huizinga clarified that the model continues upstream to Swope Park and that the model could be rerun with the 1990 flood and the proposed grade control in place but without the berm. He speculated that the results would indicate that the berm was important. He revisited the results of the model to clarify where areas of high velocity occur. The model predicted that during the 1990 flood the velocity was 22 fps near the transition of the completed work to the proposed work. The Corps confirmed that the transition originally constructed as a temporary feature has essentially failed but the Corps is requiring a more robust transition in the new contract reach.

There was a brief discussion on predicted flooding at 63rd Street. The discussion was deferred to later.

Quality Industrial Finishes was identified as the new owner of the former DuPont Building in Byram's Ford.

BLUE RIVER STAKEHOLDER'S MEETING NOTES

John Holm of the Corps presented a brief introduction of the results of the Value Engineering Study conducted in April of 2007. The discussion centered on a recommendation to eliminate the grade control structure and replace it with a natural channel design.

Mr. Robert Prager of Intuition & Logic presented the natural channel design alternative. Mr. Prager set the stage by reiterating that the purpose of the grade control is the management of the energy in the river. The alternative includes a series a smaller rock grade controls and the lowering and widening of the channel wall on the inside of some of the meander bends to create overflow benches. The channel banks would be planted with small trees and shrubs. The benches could be planted with a combination of herbaceous and woody vegetation. The purpose of these structures and plantings is to disperse the management of the energy over the entire river reach rather than concentrating the energy at the single point of the grade control. He explained that the rock grade controls are designed as the naturally occurring riffles that create a sequence of pools and riffles in a river or stream. The benches simulate the naturally occurring internal floodplain of a river. A discussion and a question and answer session followed the presentation.

A similar project exists on the Little Blue River but the grade control structures still need to be tweaked as they currently are almost dams that cause local scour and are an impediment to recreation. Mr. Prager sketched the plan and section of the rock grade controls. He stated that the design was originally used by Dr. Newbury for fish passage and can be easily crossed by a canoe depending on river stage. Mr. Prager explained that over the past 10 to 15 years the design of grade controls has become more sophisticated.

The discussion became more technical. Mr. Prager confirmed that as part of the Value Engineering Study a one dimensional (1-D) model was run to determine that generally the velocities are manageable and the water levels are pretty much where they are now. Mr. Pete Jarchow of HNTB who participated in the Value Engineering study clarified that the predicted velocities from the prior presentations will not be there any more with this recommendation. Mr. Holm explained that the Corps would perform their own 1-D model to begin with and then go to 2D modeling if needed and if the time frame allows. Mr. Prager explained that there was not a danger of increased erosion due to higher velocities as a result of smaller structures. He explained that in the proposed concept there is an interaction between the water surface elevation and the vegetated stream banks that manages and dissipates energy and controls velocity.

The discussion continued to include the limits of the proposed alternative and the effects of the current design – build contract. The Corps clarified that the decision to continue from the project to 53rd Street was driven by available funds plus alignment and topography. The proposed alternative is still viable from 53rd Street to the proposed location of the concrete grade control. Details of the rock grade controls may need to be modified but the concept remains the same.

It was clarified that the large concrete grade control would be replaced by the alternative and the southern boundary of the alternative is near 59th Street and would not disrupt the Byram's Ford area. The berm through the battlefield will no longer be necessary. There was a brief discussion concerning adding rock grade controls upstream of the Byram's Ford area since the proposed project reach is shorter.

BLUE RIVER STAKEHOLDER'S MEETING NOTES

It will be necessary to transition from the enormous downstream cross-section to this section but except for excavation in some meander bends the river would stay in current alignment downstream of Byram's Ford. The benches would be excavated to within about 5 feet of the normal water level. The new riverbank would be excavated at 3 horizontal to 1 vertical. The slopes of the benches would be planted with riparian trees and shrubs, the benches with rushes and sedges.

The discussion shifted to more general themes. Mr. Prager confirmed that these types of structures have been constructed in similar sized rivers successfully. A comparison of the maintenance of the concrete grade control to the rock grade controls followed. Mr. Prager clarified that the large concrete structure was not maintenance free and that there could be some maintenance of the rock structures. It has been his experience over the last 15 years that the maintenance is low and is often accomplished by labor crews clearing debris or shifting rocks with pry bars.

It was noted that there are a lot of environmental benefits with the alternative and that there is significant cost savings, a reduction from \$42 million to \$7million, a \$35 million savings. The Corps stated that further evaluation would be necessary.

The possible downsides were discussed. It was generally understood that a full evaluation is needed if the stakeholders agreed to pursue the change. The vast majority of the stakeholders support the proposed concept recognizing that it will be evaluated further. It was commented that even at the same cost the environmental benefits of the alternative makes it worth pursuing.

The only concern expressed was that the protection of Byram's Ford remains equal to or greater than what they have with the concrete grade control structure and berm. This led to a question if the proposed alternative incorporated the berm in the industrial park would there be 50-year flood protection. This scenario has not been analyzed.

A general discussion about the overall project continued. There were other alternatives developed in the value engineering study. Most of those were related to optimizing the concrete grade control structure. The discussion moved to more holistic environmental approaches such as improving water quality and developing a riparian corridor as an amenity. The trail system is a recreational component and trees will be planted soon. Byram's Ford Battlefield is a cultural component. The City is beginning a combined sewer overflow stormwater treatment project. The stakeholders requested that the environmental work be extended beyond the current reach from Brush Creek to 53rd Street. The Corps commented that they have constraints, but noted that the project plans are not set in stone and environmental issues can be included in the GRR. New project authorizations are up to Congress and available funds. It was reiterated that many industries have moved out but if there is flood control there would be more value.

The meeting closed with acknowledgement and thanks.

BLUE RIVER STAKEHOLDER'S MEETING NOTES

Blue River Stakeholder's Meeting

2/7/2008

Attendance Sheet

	<u>Name/Sign or Initial</u>	<u>Organization</u>	<u>E-mail</u>	<u>Phone Number</u>
1	Elizabeth Anderson	Property Owner	effortless@hotmail.com	816-761-5928
2	Neil Bass	COE	neil.bass@usace.army.mil	816-389-3667
3	Dawn Bennett	Strategic Value Solutions	dawn@strategicvaluesolutions.com	816-224-3955
4	Dale Blevins	USGS	dblevins@usgs.gov	816-525-8348
5	Ron Borst	Blue Valley Assn/ Clay and Bailey	rborst@claybailey.com	816-924-3900
6	John Brooks	CWRT		913-648-1517
7	Scott Cahail	WSD	scott_cahail@kcmo.org	816-513-0385
8	Stephen Conard	Property Owner		816-924-8874
9	Larry Joe Cox	Property Owner		816-924-2345
10	Richard DeHart	KCMO/P&R	richard_dehart@kcmo.org	816-531-7538
11	Kate Delehunt	BRWA	kdelehunt@brwa.net	816-309-0980
12	Joyce Eckenroed	Property Owner		816-921-0399
13	Lloyd Eckenroed	Property Owner		816-921-0399
14	Betty Ergovich	Monnett Battle of Westport		
15	Scott Gard	COE	Scott.W.Gard@nwk02.usace.army.mil	816-389-3100
16	John Grothaus	COE	john.j.grothaus@usace.army.mil	816-389-3110
17	Ray Hines	BV Holdings	rhines2@kc.rr.com	816-5-600-6011
18	John Holm	COE	John.D.Holm@nwk02.usace.army.mil	816-389-3111
19	Lynda Hoffman	KCMO/WSD	lynda_hoffman@kcmo.org	816-513-0489
20	Rick Huizinga	USGS	huizinga@usgs.gov	573-308-3570
21	Donald Jackson	BV Holdings		

Blue River Stakeholder's Meeting

2/7/2008

Attendance Sheet

	<u>Name/Sign or Initial</u>	<u>Organization</u>	<u>E-mail</u>	<u>Phone Number</u>
22	Tom Jacobs	MARC	tjacobs@marc.org	816-474-4240
23	Pete Jarchow	HNTB	pjarchow@hntb.com	816-527-2248
24	Marci Jones	KCMO-P&R	marci_jones@kcmo.org	816-513-7530
25	Lee Kellenberger	JoCo Stormwater	Lee.Kellenberger@jocogov.org	913-715-8310
26	Bob Kessler	KCT		
27	Jim Kerske	Byram's Ford,BVA,O'Brien	jkerske@yahoo.com	816-524-6057
28	Tom Kimes	HDR	tkimes@hdrinc.com	816-360-2737
29	Gordan Lance	HNTB	grlance@hntb.com	
30	Marsha Leffert	HDR	marsha.leffert@hdrinc.com	816-360-2763
31	Joesph Lenz	Lenz Investment Company		816-738-3306
32	Ginny Moore	MARC	gmoore@marc.org	816-701-8252
33	Jeanne Musgrave	COE	jeanne.w.musgrave@usace.army.mil	816-389-3103
34	Larry O'Donnell	Little Blue River Watershed	turtle5@aol.com	816-356-4040
35	Manish Patel	EDC	mpatel@edckc.com	816-691-2117
36	Rober Prager	Intuition & Logic	robert@ilicworld.com	904-261-5555
37	Vicki Richmond	Blue River Rescue	vic@kc.rr.com	816-812-5166
38	Amelia Robinson	Property Owner		816-921-3417
39	John Robinson	Strategic Value Solutions	john@strategicvaluesolutions.com	816-228-6160
40	Robert Robinson	Property Owner		816-921-3417
41	Ann Ruifinger	Property Owner		816-966-1704
42	Wendy Sangster	MDC	wendy.sangster@mdc.mo.gov	816-759-7305 x2234

Blue River Stakeholder's Meeting

2/7/2008

Attendance Sheet

	<u>Name/Sign or Initial</u>	<u>Organization</u>	<u>E-mail</u>	<u>Phone Number</u>
43	Scott Schulte	PBA	sschulte@pbassociates.com	816-756-5690 x3039
44	Raymond Schleg	BRWA		573-581-2346
45	Mike Swenson	HDR	michael.swenson@hdrinc.com	816-360-2763
46	Thomas Topi	COE	thomas.topi@usacearmy.mil	816-389-3061
47	Tim Vance	Vance Brothers	tvance@vancebrothers.com	816-923-4325
48	Matt Vandenberg	COE	matthew.d.vandenberg@usace.army.mil	816-389-3746
49	Claus Wawrzinek	Sierra Club	clausw@att.net	816-517-5244
50	Scott Watson	NWS	scott.watson@noaa.gov	
51	Don Wilkinson	USGS	wilkison@usgs.gov	816-525-7543
52	David Wilson	Property Owner		816-924-5987
53	Terry Winbush	KCMO	terry_winbush@kcmo.org	816-513-0495
54	Whitney Wolf	COE	Whitney.K.Wolf@usace.army.mil	816-389-3315
55	Theodore Woods	Four Star Construction		816-921-9661
56	Mark Young	HNTB	mayoung@hntb.com	816-719-1070
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Blue River Stakeholder's Meeting

2/7/2008

Attendance Sheet

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SECTION 2

PRESENTATION SLIDES

Blue River Channel
STAKEHOLDER MEETING

7 February 2008

Hosted By:
U.S. Army Corps of Engineers,
Kansas City District
City of Kansas City, Missouri

Agenda

Blue River Channel

- Greeting
 - Lynda Hoffman
 - John Holm
- Facilitator Introduction
- Stakeholder Introductions
- Ground Rules

Meeting Ground Rules

- Speak loudly – speak to the person furthest from you; air handlers are a little noisy
- If you are having trouble hearing give me a sign
- If you have a question or comment, raise your hand to be recognized
- You may want to write some comments down for now – we will have time at the end

Meeting Ground Rules

- Managing Comments and Discussions
 - Speakers will entertain comments throughout the presentation
 - Time is reserved at the end of each section for additional comments
 - Time is also reserved at the end of the meeting for additional comments
 - To keep us on track, some comments may be temporarily “tabled” or “parked” until the end of the meeting

Meeting Ground Rules

- Be respectful of other people
 - Don't talk when other people are talking
 - Please don't carry on side conversations while the presenter or others are talking; take conversations outside
 - Turn off ringers on mobile phones
 - Recognize that not everyone shares your perspective; value other perspectives; build on the differences to achieve the best solution

Meeting Logistics

- Coffee & Refreshments
- Breaks – 15 minutes
- Lunch Break – 30 minutes
- Restrooms

Agenda

Blue River Channel

- **Project Background**
- Mitigation
- General Reevaluation Report
- Lunch
- Byram's Ford Area
- Discussion
- Closing

Blue River Channel ***STAKEHOLDER MEETING***

Project Background

John D. Holm

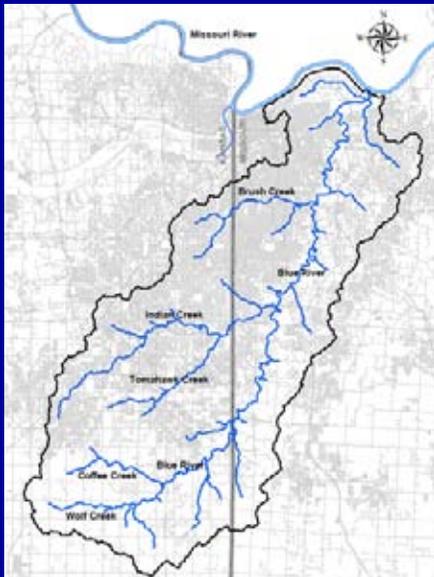
Project Background

Blue River Channel

- General background information
- Authorized project description
- Project status
- Remaining work

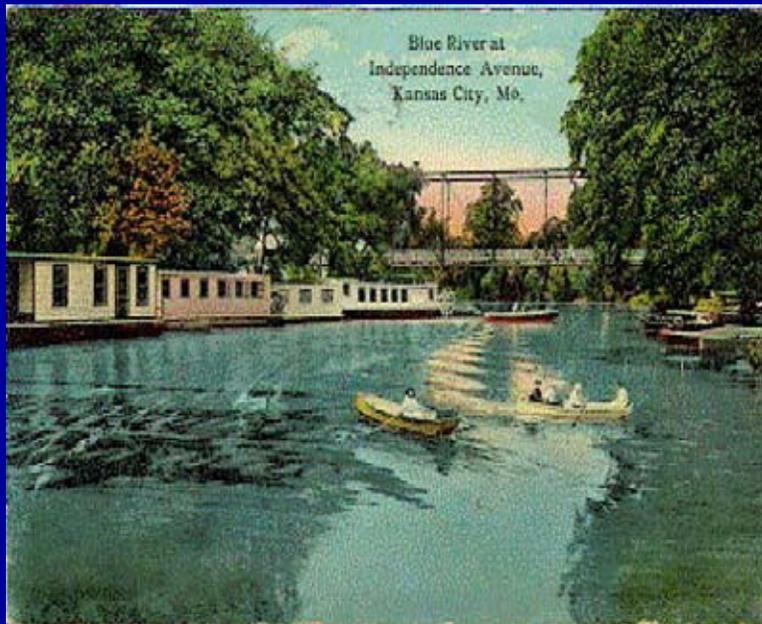
Project Background

Blue River Channel



Watershed Information

- Area: 236 sq. miles
- Located within portions of
 - Two states
 - Three counties
 - 14+ city boundaries
- Much of the watershed is highly urbanized



Project Background

Blue River Channel

Historical Flood Events

DATE	RAINFALL (inches)	BANNISTER GAGE CREST	PEAK FLOW (cfs)
17 November 1928	5.7	~39	n/a
21-22 April 1944	6.19	35.88	26,400
9-11 July 1951		38.2	31,100
31 July 1958		37.8	21,700
September 1961	7	44.46	41,000
15 May 1990		40.64	31,800

NWS Flood Stage is 21.0 for these events

Project Background

Blue River Channel

Previous Reports

DATE	TITLE	AGENCY
April 1932	"Report on Flood Control Big Blue River" by Black & Veatch	KCMO Public Works Department
1933	"308 Report", House Document No. 238, 73rd Congress (1933)	Kansas City District
1943	House Document No. 324, 78th Congress	Kansas City District
1962	Jackson County Park Plan	Jackson County
January 1967	"Report on Flood Plain Information, Blue River Within Kansas City, Missouri" by Kansas City District	City of Kansas City, Missouri (Resolution 26935)
1968	"Review Report on Blue River", proposed 12 miles of channel modification and 4 reservoirs	Kansas City District
1970	"Report on Flood Plain Information, Blue River and tributaries in Johnson County, Kansas" by Kansas City District	City of Kansas City, Missouri

Project Background

Blue River Channel

- Hydrology – Calculates expected peak flows
 - Rainfall intensity
 - Rainfall distribution
 - Rainfall duration
 - Ground saturation
 - Imperviousness (paving, roofs, etc.)
 - Future conditions (build-out)
- Hydraulics – Calculates expected water elevations
 - Channel characteristics
 - Inflow timing
 - Boundary conditions (such as the Missouri River stage)

Project Background

Blue River Channel

Design Flow Rates

Probability (%)	Interval (yrs)	Discharge (cfs)
50	2	13,200
20	5	20,300
10	10	26,320
5	20	34,000
3.3	30	35,000
2	50	44,500
1	100	53,700
0.2	500	80,000

Project Background

Blue River Channel

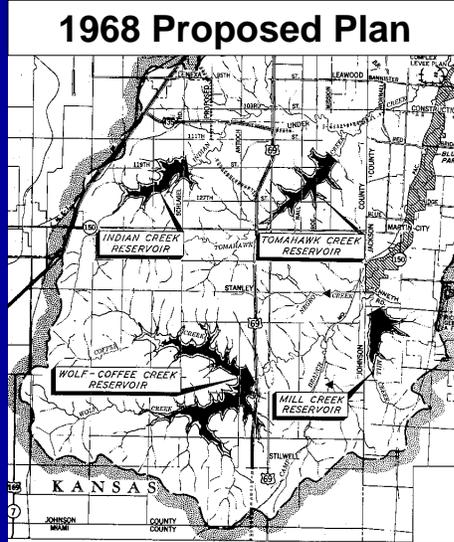
1970 Authorized Project

- Provided a 100-Year level of protection from the Missouri River to 63rd Street
- Included Channel Modifications to 12.5 Miles of Channel from the Missouri River to 63rd Street to carry 35,000 cfs
- Included “Grade Control” located upstream of the 63rd Street Bridge
- Included.....

Project Background

Blue River Channel

- Four upstream lakes, primarily in Johnson County, Kansas
- With the lakes, 35,000 cfs \approx 100-yr
- Lakes were removed from project in 1975 due to:
 - Lack of local support
 - Conflicts with Jo Co's development plans



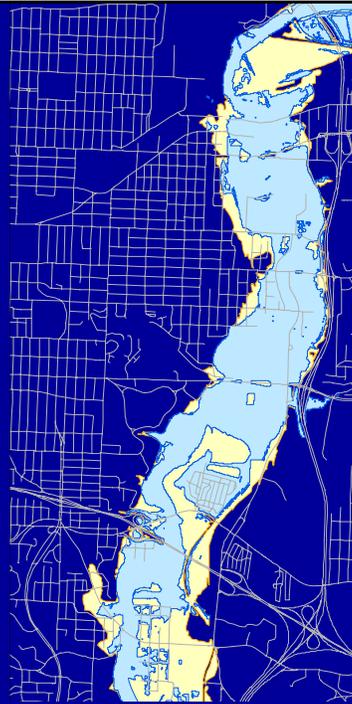
Project Background

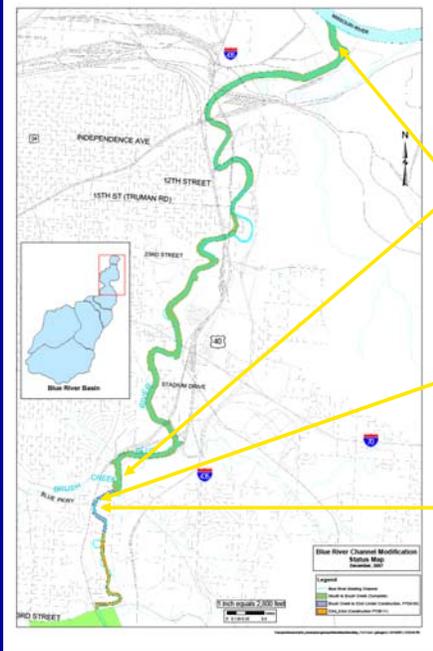
Blue River Channel

Current Project

- Consists of modifications to 12.5 miles of channel.
- Designed to contain 35,000 cfs, referred to as "30-yr channel."
- Lowers 100-yr flood elevations by approximately 6 feet.
- Reduces floodplain area by approximately 1,300 acres

100-yr Floodplain	
	Before Channel Project
	After Channel Project





Project Background

Blue River Channel Status

- 10.5 miles of channel modifications have been completed (up to Brush Creek) at a federal cost of \$200M
- Utility relocation and removal of the lower Blue Parkway Bridge occurred in 2006
- The City is currently replacing the upper Blue Parkway Bridge

Project Background

Blue River Channel



Project Background

Blue River Channel



Project Background

Blue River Channel



Project Background

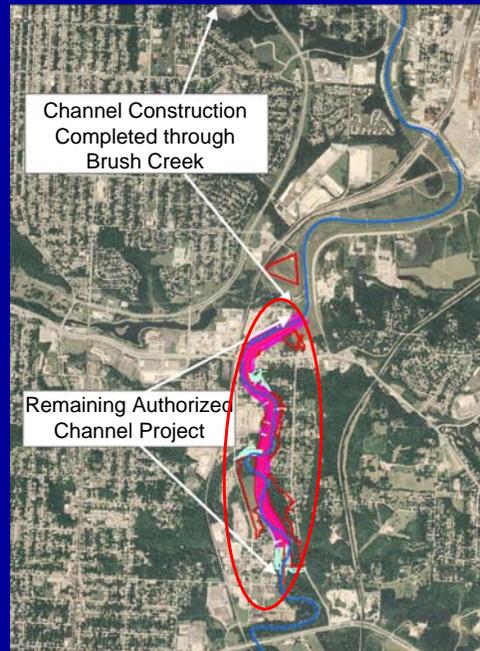
Blue River Channel

Wet Weather Goals	Accomplished	Description
Minimize loss of life and injury	Yes	Contains 35,000 cfs flows. Lowers 100-yr water elev by 6 to 8 feet
Reduce property damage due to flooding	Yes	Approximately 600 acres, 200 structures, and 8 miles of roadway were removed from the 100-year floodplain along the completed channel.
Improve water quality	Mixed	Numerous junkyards and polluted soils removed. Capped landfills.
Maximize economic, social, and environmental benefits	Mixed	Greenways increase property values. Approximately 600 acres, 200 structures, and 8 miles of roadway removed from floodplain. Reduced blighted areas.
Optimize infrastructure investment	Yes	Project has resulted in major improvements to 21 bridges and related utilities.
Enhance natural habitats	Mixed	Project footprint is minimized, but has altered greenway corridor.

Project Background

Blue River Channel

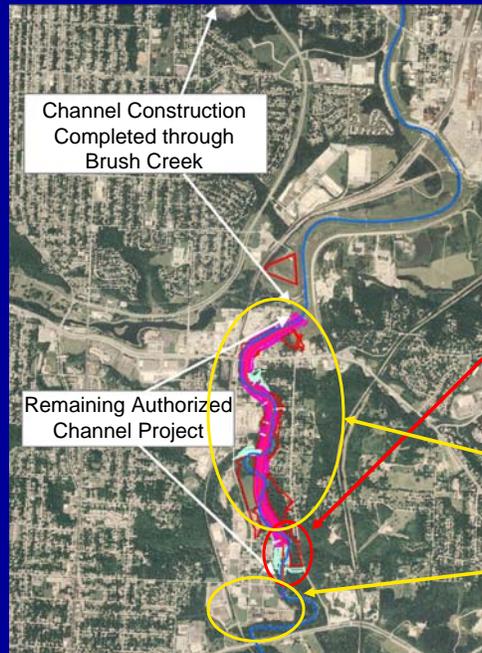
- Remaining Work
 - Channel work to 59th
 - Grade Control at 59th
 - Berm around Byram's Ford Industrial Park
- Original plan was to award as one large contract



Project Background

Blue River Channel

- Contracting Approach Change
 - Upper Blue Parkway Bridge replacement had to precede channel work beneath the bridge
 - Grade Control Structure plans were at a 95% level of completion
 - Congress was restricting use of “Continuing Contract” clause
 - Contract size more closely tied to available funding



Project Background

Blue River Channel

- Contracting approach was modified in 2004
- Two contracts
 - First Contract:
 - Grade Control Structure at 59th Street
 - Second Contract:
 - Channel Modifications from Brush Creek to 59th
 - Byram's Ford Park Berm

Project Background

Blue River Channel

- In early 2007 the Corps moved forward with finalizing the Grade Control Structure contract documents with the goal of awarding a construction contract with FY07 funding
- A Value Engineering (VE) study was performed in March 2007
 - Significant time and effort to analyze and incorporate the alternatives precluded moving forward with a FY07 Award
- The Corps and KCMO made a joint decision to change direction and proceed with channel modifications between Brush Creek and 53rd Street with the available FY07 funding

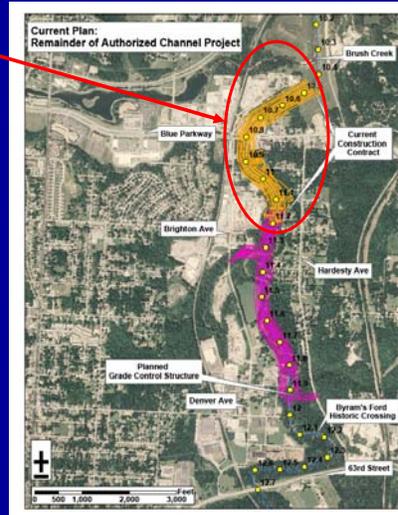
Project Background

Blue River Channel

- Why proceed with Brush Creek to 53rd Street now?
 - FY07 Federal funding of \$8M was available
 - The Blue Parkway Bridge replacement now under way made channel work feasible at the lower end of the reach
 - Channel modifications in the vicinity of the Blue Parkway Bridge needed to proceed regardless of any VE alternatives
- What factors were considered in the decision?
 - The new Blue Parkway Bridge was designed on the basis of the relocated channel
 - Development along the Blue Parkway has occurred based upon the planned Blue River Channel modifications
 - The channel design was at a 65% design stage, thereby making use of a Design-Build contract vehicle possible
 - Incorporation of additional mitigation was a high priority for the City
 - Termination at 53rd Street was a technical decision based on hydraulics, channel alignment and topography

Project Background Blue River Channel

- Brush Creek to 53rd Street
 - Design-Build type contract
 - 3,700 linear feet of channel
 - Incrementally funded
 - Relocation of 36-inch waterline
 - Environmental enhancements included
 - 730-day duration
- Awarded: 30 November 07
- Contractor: Environmental Specialists, Inc. (ESI)



Project Background Blue River Channel

- What is Design-Build?
 - Contractor assumes responsibility for the final design and the construction
 - Design is performed by the contractor (or subcontractors, such as an AE)
- How is this different?
 - Historical process is design-bid-build
 - Complete design prepared by Government
 - Contractor builds as designed

Project Background

Blue River Channel

- Selection Process
 - Request for Proposal
 - Contractors submitted proposals addressing:
 - Relevant Experience
 - Past Performance
 - Staffing Plan
 - Project Plan and Schedule
 - Mitigation
 - Cost
 - Selection process was a best-value process
 - Evaluation team included City and community advisors

Project Background

Blue River Channel

- Remaining Work
 - Channel modifications
 - Grade Control
 - Byram's Ford Area
- Will be discussed further this afternoon



Project Background

Blue River Channel

- In summary, we covered:
 - General background information
 - Authorized project description
 - Project status
 - Remaining work

Project Background

Blue River Channel

Discussion and Questions

Agenda

Blue River Channel

- Project Background
- **Mitigation**
- General Reevaluation Report
- Lunch
- Byram's Ford Area
- Discussion
- Closing

Blue River Channel ***STAKEHOLDER MEETING***

Mitigation and Environmental Enhancement

Scott W. Gard

U.S. Army Corps of Engineers, Kansas City
District

Mitigation and Environmental Enhancement Blue River Channel

Topics

- Mitigation for Authorized Flood Protection Project - 1980 USFWS Letter Agreement
- Mitigation resulting from the Centropolis Loop Cutoff
- Addition of Hard Point Structures for Aquatic Habitat Enhancement
- Brush Creek to 53rd Street Environmental Enhancement Plan

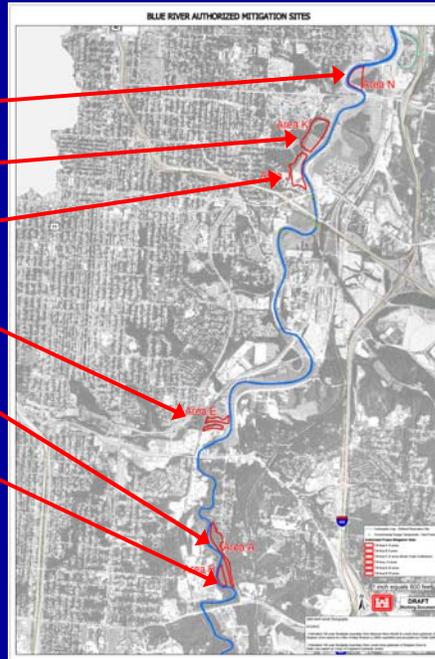
Mitigation and Environmental Enhancement Blue River Channel

Original Mitigation Requirements

- Establishment of methodology
 - EPA and U.S. Fish and Wildlife Service (USFWS)
 - Use of Habitat Evaluation Procedures (HEP) for baseline analysis (June 27, 1978)
- HEP baseline analysis conducted August 1978
 - 370 Habitat Units lost from construction of authorized project
- U.S. Fish & Wildlife Service letter (March 18, 1980) to the Corps outlined specific mitigation for wildlife habitat losses.
 - These measures were estimated to produce 470 HU's for mitigation purposes.

Mitigation and Environmental Enhancement
Blue River Channel

- Fill Area N (18 ac.) – Managed Naturally
- Fill Area K (24 ac.) – Trees & Shrubs
- Fill Area J (9 ac.) – Historic/Natural
- Brush Creek-Mouth Area E (22 ac.) – Trees & Shrubs
- Fill Area A (18 ac.) – Trees & Shrubs
- Fill Area B (8 ac.) – Trees & Shrubs
- Permanent Channel Right of Way (330 ac.)
 - Native Grass (315 ac.)
 - Trees & Shrubs (15 ac.)



Mitigation and Environmental Enhancement
Blue River Channel

Mitigation Requirement Summary
U.S. Fish and Wildlife Service Letter (March 18, 1980)

Mitigation Fill Areas	Total Acres	Trees & Shrubs	Baseball & Playground	Native Grasses
Fill Area A	18	18		
Fill Area B	8	8		
Mouth of Brush Creek Area E	22	22		
Fill Area J	9	9		
Fill Area K	24	18	6	
Fill Area N	18	9	9	
Permanent ROW	330	15		315
Totals	429	99	15	315

Mitigation and Environmental Enhancement Blue River Channel

Status of Required Mitigation

- Natural Grasses
 - Planted approximately 240 of required 315 acres
 - Limited success in establishing viable stands
 - Mowing restrictions/maintenance of natural grasses pose challenges for City
- Tree and Shrub Planting
 - None planted
 - Coordinating with City trails efforts
- Some fill areas designated for mitigation are no longer available, viable or desirable

Mitigation and Environmental Enhancement Blue River Channel



Mitigation and Environmental Enhancement Blue River Channel

Mitigation Plan Update

- Reviewing original mitigation sites in 1980 USFWS agreement
 - Availability
 - Suitability
- Identify replacement sites for 1980 sites, as required, and prioritize for mitigation development
- Conduct property survey for sites
- Determine site compatibility with other plans

Mitigation and Environmental Enhancement Blue River Channel

Mitigation Plan Update

- Develop scope, schedule and budget for mitigation implementation
- Coordinate monitoring and maintenance of mitigation sites with Channel Maintenance
- Identify agencies responsible for site monitoring and maintenance

Mitigation and Environmental Enhancement Blue River Channel

Centropolis Loop Mitigation

- Centropolis Loop cut-off was a value-engineering product resulting in cost savings for the project
 - Eliminated approximately 3,000 feet of channel modifications and cut-off approximately 4,800 feet of the Blue River
 - Eliminated the Guinotte Dam
- Mitigation was required for:
 - Loss of wetlands and the filling of open-water (404 Compliance)
 - Mitigation included construction of a 7-acre open water/wetland complex
 - Centropolis Plan did not include revegetation for non-jurisdictional riparian forest impacted by filling Centropolis Loop



Mitigation and Environmental Enhancement Blue River Channel

Centropolis Loop Mitigation Functionality

- Adjacent property owners' concerns
 - Site appearance
 - Changes in land use
 - Mosquito population
- Site inspection conducted December 2001 to determine functionality of Centropolis Loop Mitigation
 - 2001 inspection indicated site was functioning as designed based on the mitigation plan's two primary criteria for success
 - Impounding and detaining run-off and sediment in wetland cells
 - Maintenance of semi-permanently flooded wetlands

Mitigation and Environmental Enhancement Blue River Channel

Centropolis Loop Enhancement Opportunities

- Eliminate standing water in cell 3 with fill and revegetation
- Create vegetation barrier between cell 3 and adjacent business
- Use Centropolis Loop as revegetation area for riparian forest
- Enforce city codes for recycle business encroachment and unauthorized use of the site
- Ideas will be evaluated as part of the GRR

Mitigation and Environmental Enhancement Blue River Channel

Channel Design Modification for Aquatic Habitat Enhancements

- Corps guidelines encourage design modifications for environmental enhancement
- Hard points (riprap dikes) were added to improve aquatic habitat (ripples and slack water)
 - Coordinated with MDNR on sizing and configuration
 - To be included in remaining channel
- Cut-off meander
 - Coordinated with MDNR





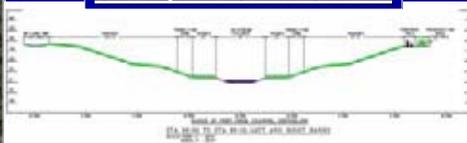
***Brush Creek to 53rd Street
Environmental Enhancements***



Environmental Goals

- Create habitats compatible with flood control
- Incorporate green solutions into design
- Develop sustainable water quality enhancements
- Incorporate future plans for trail development
- Meet or exceed USACE mitigation commitments

Conceptual Cross Section



Environmental Enhancements



Preservation Areas
Avoidance of tree clearing impacts where possible to preserve existing riparian habitat



Native Grasses
Native grass and forb species vegetation along the slopes of the channel and floodplain



Wetland BMPs
Wetland BMPs would provide habitat diversity and water quality benefits



In-Stream Structures
In-stream habitat structures could be used to create habitat for fisheries and other aquatic life



Vegetated Bioswale
Bioswales would serve to collect and filter storm water runoff while providing necessary flow conveyance

Mitigation and Environmental Enhancement Blue River Channel

Questions and Discussion

Agenda

Blue River Channel

- Project Background
- Mitigation
- **General Reevaluation Report**
- Lunch
- Byram's Ford Area
- Discussion
- Closing

Blue River Channel
STAKEHOLDER MEETING

General Reevaluation

Scott W. Gard

U.S. Army Corps of Engineers, Kansas City District

General Reevaluation
Blue River Channel

Topics

- What is a General Reevaluation Report (GRR)?
- GRR Process
- GRR Status
- GRR Going Forward
- Culminates in Report to Congress

General Reevaluation

Blue River Channel

GRR Components

- Watershed Inventory & Forecast
 - Water Resources and Environment
 - Socioeconomic & Land Use Characteristics
 - Incorporate Other Studies and Plans
- Problem & Opportunity Identification
- Formulate Alternative Plans
- Evaluate Alternative Plans
- Develop Recommended Plan
- Environmental Assessment or Impact Statement

General Reevaluation

Blue River Channel

Purpose

- The GRR is a re-analysis of the 1970 Authorized Flood Damage Reduction Plan
- GRR will identify additional options for:
 - Reducing recurring flood damages
 - Restoring environmental resources
 - Developing recreational resources
- Goal is to develop a multipurpose plan
 - Business development
 - Environmental enhancement
 - Recreational development

General Reevaluation

Blue River Channel

GRR Justification

- Changing conditions
- Increase public interest in environmental issues
- Water Resources Development Act of 1996
 - Ecosystem Restoration equal to other Corps missions of Flood Control, Navigation and other purposes
- Corps Environmental Operating Principles
 - Adoption in 2000
 - Sustainability focus

General Reevaluation

Blue River Channel

GRR Process

- Inventory and data collection
- Identify problems and opportunities
- Identify potential individual and multipurpose flood reduction, ecorestoration, and recreation projects
- Obtain public input and suggestions for additional projects
- Screen and select multipurpose plan for funding

General Reevaluation

Blue River Channel

GRR Focus

- GRR will be watershed based and multipurpose in focus
 - Flood Damage Reduction
 - Ecosystem Restoration and Recreation

General Reevaluation

Blue River Channel

Flood Damage Reduction Enhancement

- Conduct Baseline Survey of Structures and Assets in the Floodplain
- Identified Potential Flood Damage Reduction Study Areas
- Evaluate Both Structural and Non-Structural Measures
- Conduct Benefit/Cost Analysis to Develop Recommended Plan

General Reevaluation Blue River Channel

Flood Damage Reduction Enhancement Baseline

- 100/500 year floodplain boundaries
 - Developed using FEMA and Corps models
 - Approximately 2,000 acres remain in floodplain (mouth to 63rd reach)
- Assets
 - Conducted survey of approximately 630 structures/groups of structures (\$1.1 B) in the 500-yr floodplain mouth to 63rd street
 - Mouth to 23rd: \$462 M 100 structures
 - 23rd to Brush Creek: \$500 M 350 structures
 - Brush Creek to 63rd : \$93 M 180 structures
 - Total \$1.1 B 630 structures
- 100-yr flood event damage to building structures estimated at \$320 M





MANCHESTER BUSINESS CENTER
2100 Manchester Trafficway

BUILDING 1	BUILDING 2	BUILDING 3	BUILDING 4
One	200 Wash Pro	300	400 Imperial Dis
Enterprises	201 2M Manufacturing LLP		
Finishing Serv.	202		
Inc.			
BUILDING 5	BUILDING 6	BUILDING 7	BUILDING 8
500	600 Conmaco	700	
Coring Const. Inc.	501 World Finishing	601	

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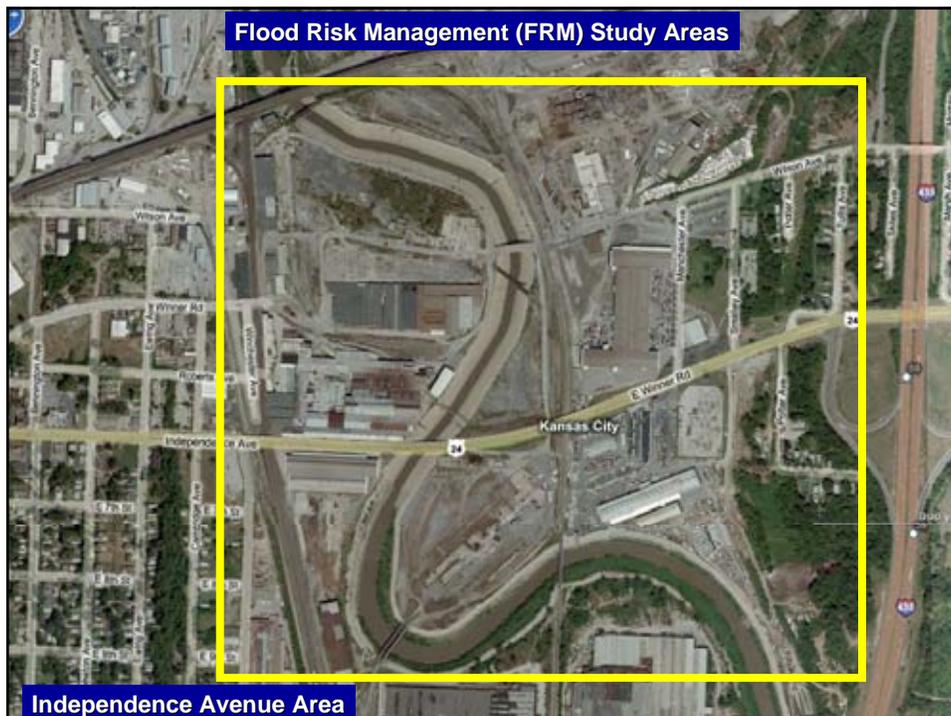


General Reevaluation

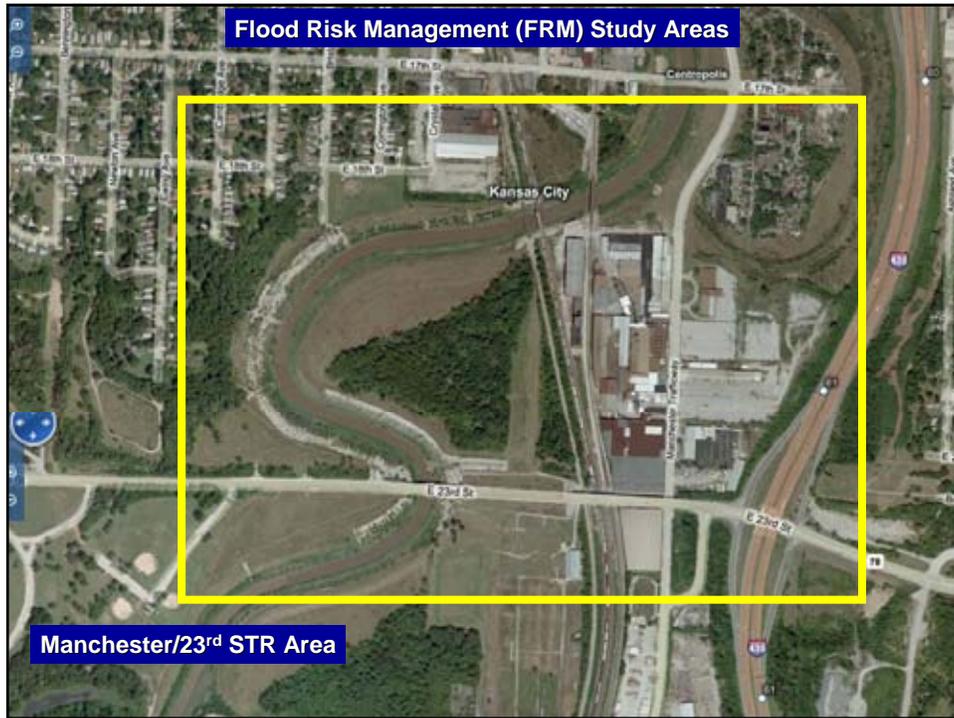
Blue River Channel

Asset Identification

- Identified concentrations of structures/assets in mouth to 63rd reach as potential project areas
- Potential Enhanced Flood Damage Reduction Areas
 - Independence Avenue Area
 - 12th Street Area
 - Truman Road Area
 - Manchester/23rd Area
 - Leeds Area
 - 40 Highway Area







Flood Risk Management (FRM) Study Areas



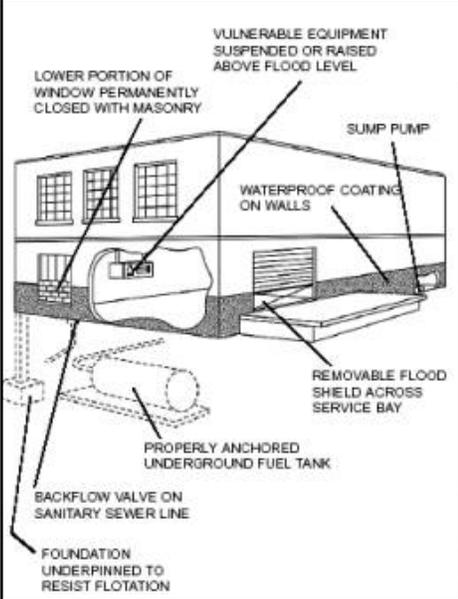
General Reevaluation

Blue River Channel

Flood Damage Reduction Enhancement Alternatives

- Non-Structural Measures
 - Floodplain management
 - Flood warning systems
 - Flood proofing
 - Floodplain acquisition
- Structural Measures
 - Detention measures
 - Diversion
 - Levees and floodwalls
 - Channel modification

Non-Structural Measures



Non-Structural Measures





General Reevaluation

Blue River Channel

Flood Damage Reduction Enhancement Assessment

- Identify alternatives and costs for study area options
- Analyze annual benefits and costs for screening alternatives in developing a recommended plan

General Reevaluation

Blue River Channel

Ecosystem Restoration Measures and Recreation Enhancement

- Incorporating goals from previous planning studies
- Conducting environmental survey of watershed
- Developing terrestrial and aquatic habitat suitability index baseline
- Identifying potential ecosystem restoration/recreation sites
- Evaluating/screening sites

General Reevaluation

Blue River Channel

Ecosystem Restoration Measures and Recreation Enhancement

- Incorporated Blue River Summit Top 3 Goals:
 - Improve water quality
 - Reduce flood damage
 - Protect wildlife habitat
- Conducted Environmental and Structural Inventory of Blue River mouth to State Line
 - Riparian Habitat
 - Steambank conditions
 - Outfalls/physical features
 - Wildlife characteristics
 - Adjacent land uses
 - Other environmental characteristics

General Reevaluation

Blue River Channel

Terrestrial Baseline Inventory

- Conducted baseline inventory to evaluate the environmental value of future projects
- Terrestrial – Wildlife Habitat Appraisal Guide - WHAG
(Grassland, Bottomland Hardwoods, Nonforested Wetland)
(Percent, Species, Adjacent Habitat, Distance, Maintenance)

Baseline Inventory (Habitat Suitability Index -HSI)

Mouth	0.50
Lined	0.10
Upper	0.30
Stadium	0.10
Brush	0.40
Byram's	0.40
63 rd	0.60

HSI .10 = poor to 1.0 excellent

General Reevaluation

Blue River Channel

Aquatic Baseline Inventory

- Aquatic – Qualitative Habitat Evaluation Index – QHEI
(Substrate, Instream Cover, Channel Morphology, Erosion, Pool-Riffle, Gradient)

Baseline Inventory (Habitat Suitability Index -HSI)

Mouth to 23 rd	0.30
23 rd to Stadium Dr	0.20
Stadium to Brush Cr	0.20
Brush Cr to Byram's	0.30
Byram's to Blue Ridge	0.80
Blue Ridge to State Line	0.70

HSI .10 = poor to 1.0 excellent

General Reevaluation

Blue River Channel

Ecosystem Restoration/Recreation Site Identification

- Evaluate Blue River Greenway Study Restoration Site Plans for GRR
 - Greenway Study conducted for KCMO dated January 2005
- Identified additional ecosystem restoration sites/projects
 - Greenway Study and other sites located primarily in 100-year floodplain
 - Riparian Corridor from Missouri River Mouth to Swope Park
 - Protection for smaller 1st, 2nd, and 3rd order streams in upper reaches
 - Invasive species eradication
 - Streambank restoration
 - In-stream aquatic restoration measures

General Reevaluation

Blue River Channel

Ecosystem Restoration Site Evaluation

- Corps' Institute for Water Resources (IWR) model identifies alternatives and combinations of plans that are the most cost-effective \$/HU
- Identification of the Best Buy Plans
 - Determines the most cost-effective plan with the greatest increase in HU output for the least increase in cost
 - Additional best buy plans may be identified to meet planning objectives

General Reevaluation

Blue River Channel

General Reevaluation Status

- Inventory and Data Collection - Draft
- Problem/Opportunity Identification - Draft
- Formulate Alternative Plans – In Process
- Evaluate/Recommend Plans – In Process
- Public Meeting/Input – To Be Scheduled
- Environmental Assessment or Impact Statement – In Process

General Reevaluation Report

Blue River Channel

Discussion and Questions

Agenda

Blue River Channel

- Project Background
- Mitigation
- General Reevaluation Report
- Lunch
- **Byram's Ford Area**
- Discussion
- Closing

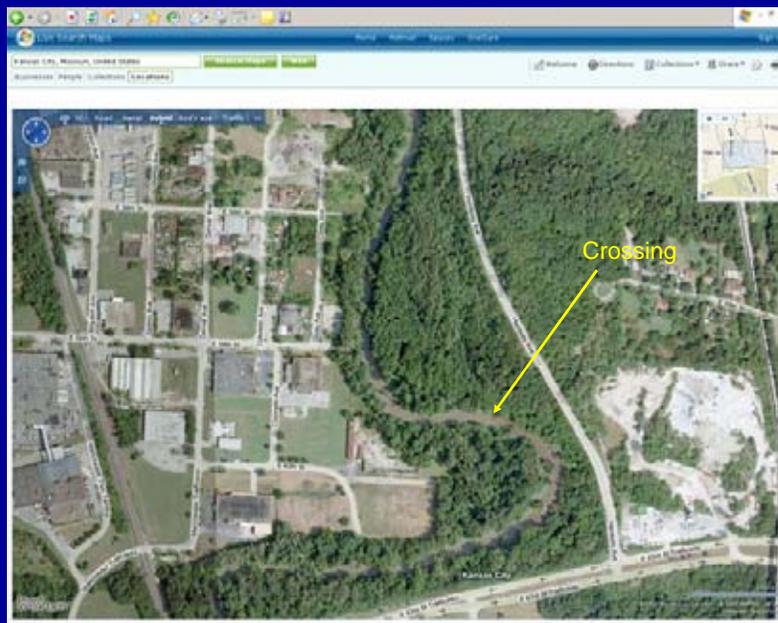
Blue River Channel ***STAKEHOLDER MEETING***

53rd to 63rd Street
including
Byram's Ford

John D. Holm

53rd to 63rd Street Blue River Channel

- Byram's Ford History Lesson
- Grade Control Structure Information
- Challenge



53rd to 63rd Street

Blue River Channel

- Byram's Ford Crossing
 - Major crossing for Independence-Westport Road
- Battle of Westport
 - Largest land engagement west of the Mississippi
 - Battle at Byram's Ford (Battle of the Big Blue)
 - Two engagements - October 22 and 23, 1864
 - Reported total of 9,000 Union-Confederate Soldiers
 - 200 Union Casualties
 - Helped bring about defeat of Confederate forces in the Battle of Westport

53rd to 63rd Street

Blue River Channel

What Led Us to this Point?

- Authorized Project Requirements
- Alternate Dispute Resolution (ADR)
- Hydraulic Requirements
- Technical Decisions

53rd to 63rd Street

Blue River Channel

- Authorizing Language
 - Flood Control Act of 1970 (P.L. 91-611)
- Original Project Concept:
 - Channel improvements to 63rd Street
 - Grade control located upstream of 63rd Street

53rd to 63rd Street

Blue River Channel

Timeline

- 1981 “No Adverse Effect” determination
- 1983 CWRT demonstrated “ford still existed”
- 1985 NWK commits to protecting area
- October 1989 - listed on NRHP
- 1987-1992 Negotiations
- September 1992 – Alternate Dispute Resolution (ADR)

53rd to 63rd Street

Blue River Channel

- Federal Commitments from ADR
 - Build a 4 to 6-foot-high levee on specific alignment
 - Construct a grade control structure between 58th and 59th Streets
 - Government to take lead on MOA for historic properties

53rd to 63rd Street

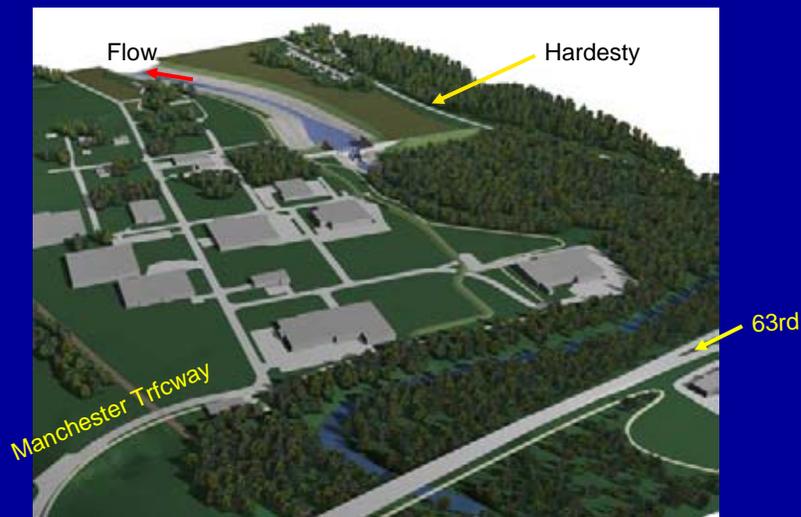
Blue River Channel

- City Commitments in ADR
 - Arrange for construction of two parking turn-offs
 - City to acquire required real estate
 - City to demolish specific structures
 - City agrees to re-align levee if DuPont Building is purchased by the Monnett Fund
 - City to maintain levee to Parks & Rec's standards

53rd to 63rd Street Blue River Channel

- Original Project Concept:
 - Channel Improvements to 63rd
 - Grade Control Upstream of 63rd
- Current Plan (circa 1990):
 - Channel improvements to 59th
 - Grade Control Structure at 59th
 - Berm from Grade Control Structure ties to RR Embankment at Manchester Trafficway

53rd to 63rd Street Blue River Channel



53rd to 63rd Street Blue River Channel

- Technical Decisions
 - Re-establish stream rating curve at GCS location
 - Technical decision to return upstream velocities to within 5% of pre-project conditions
 - Due to hydraulic complexity a physical model study was determined necessary

53rd to 63rd Street Blue River Channel

- Waterways Experiment Station (WES – now ERDC)
Physical Model Study
 - WES is an internationally recognized leader in hydraulic modeling
 - Physical modelling performed 1993-1996
 - Technical Report HL-96-15, April 1996
 - Model scale 1:36
 - 25 weir configurations tested
 - Model recommendations
 - 3 stage weir (Type 25)
 - Stilling basin dimensions
 - Riprap sizing and locations

53rd to 63rd Street

Blue River Channel

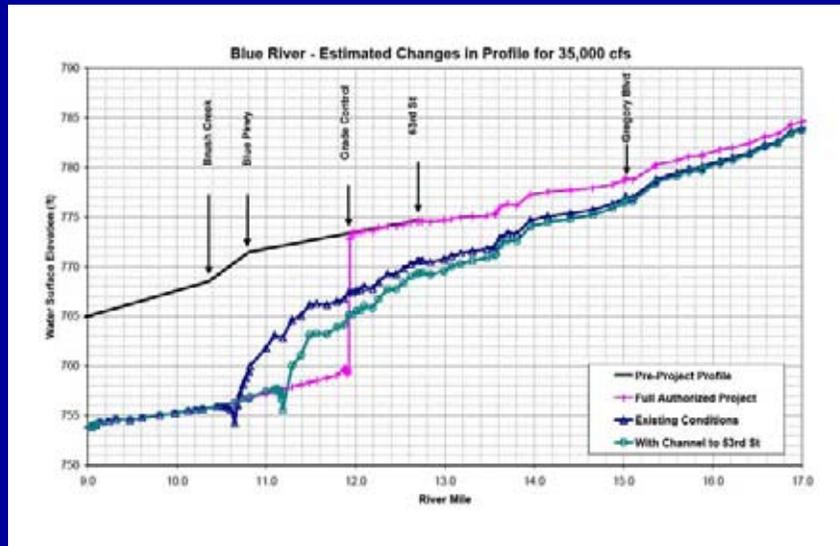
- What is the purpose of the Grade Control Structure (GCS)?
 - Grade control (prevent “unravelling” upstream)
 - Energy dissipation (change in water surface)
 - Re-establish pre-project flow conditions upstream of GCS (velocity)
 - More appropriately called a Flow and Grade Control Structure
- How does it work
 - 3-Stage weir – controls flow & provides grade control
 - Stilling basin – dissipates hydraulic energy

53rd to 63rd Street

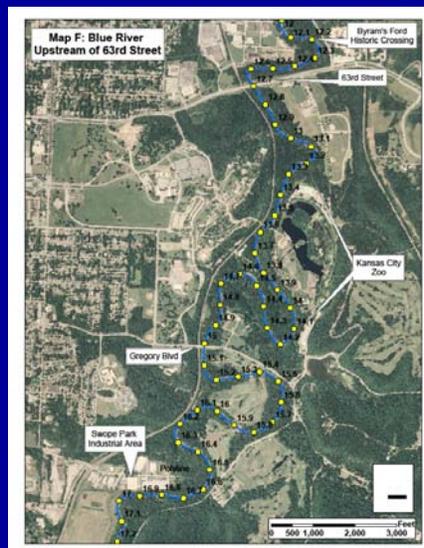
Blue River Channel



53rd to 63rd Street Blue River Channel

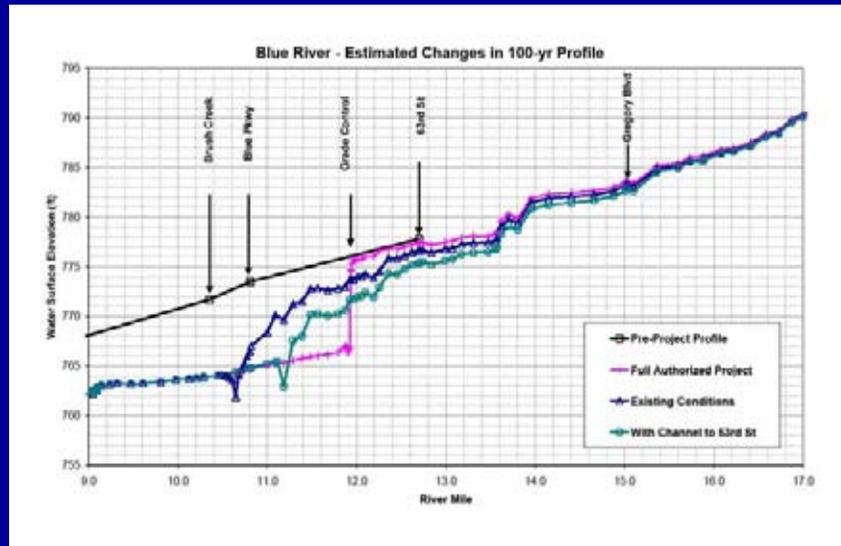


53rd to 63rd Street Blue River Channel



- Lowered water surface extends several miles upstream
- Byram's Ford Industrial Park and the soccer complex benefit from lowered water surface
- Lowered water surface equates to an increase in stream velocity

53rd to 63rd Street Blue River Channel



53rd to 63rd Street Blue River Channel

- Key points for consideration
 - The structure “controls” flow
 - That “control” mimics the pre-project channel conditions
 - This results in water levels upstream of the structure being returned to pre-project conditions, which are higher than current conditions

53rd to 63rd Street

Blue River Channel

- USGS asked to conduct a hydraulic 2-D computer model of the channel from Brush Creek to 63rd Street
- The purpose was to have an independent look at the hydraulics utilizing a different computer modelling program
- This builds on inundation mapping work that the City has had USGS performing

53rd to 63rd Street

Blue River Channel

USGS Presentation and Findings

By

Richard Huizinga

USGS

<http://pubs.usgs.gov/sir/2007/5098/>

53rd to 63rd Street Blue River Channel

- VE Study
 - Performed March 2007
 - 140 ideas generated
 - 13 value alternatives developed
 - 9 alternatives dealt with structure modifications
 - 1 alternative utilized natural stream design techniques as an alternate to a structure
 - 3 dealt with other issues

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Table 4-4
Summary of Value Alternatives

Alt. No.	Description	Capital Cost (\$/ft)	Decision
4-10	Reduce BOD with series of grade control structures and bank protection in Short Creek	\$32,002,000	F
4-11	Reduce bank width with earth reinforcement	\$5,402,000	R
4-12	Replace large concrete walls with rock walls	\$6,504,000	F
4-13	Match filling basin outlet geometry to hydraulic profile	\$107,000	R
4-14	Eliminate streambank armoring	\$1,713,000	A
4-15	Lower the entry structure with the ability to extend up to 100 year	\$16,715,000	F
4-16	Clear away the foundations for the rock walls	\$99,000	A
4-17	Move the structure downstream to approximately Sta. 52+00, build in the dry	\$104,000	A
4-18	Minimize fill and use existing channel for access	\$10,000	A
4-19	Use a series of flat pipe piles and vertical piles instead of gabion	(\$116,000)	F

Legend: F = Feasible, R = Recommended, A = Alternative

Summary of Design Suggestions

Alt. No.	Description	Decision
4-15	Eliminate entry section of existing structure to community	A
4-17	Use corrugated PVC pipe instead of BOD	R
4-20	Use a separate contract to maintain parkings	A

14 BlueRiver Services

53rd to 63rd Street Blue River Channel

- Grade control
 - Large structure vs. other methods
- Upstream erosion considerations
 - Flow control, velocity, bed shear
- Channel capacity
 - 35,000 cfs authorized
- Benefits
 - Lowered water surface upstream

53rd to 63rd Street

Blue River Channel

We are at a unique point in this project where we need to examine the remainder of the project and evaluate the best way to finish this project

53rd to 63rd Street

Blue River Channel

Discussion and Questions

Agenda

Blue River Channel

- Project Background
- Mitigation
- General Reevaluation Report
- Lunch
- Byram's Ford Area
- Discussion
- Closing