On March 20, 2020, City Manager Gregory Rose declared a State of Emergency for the City of University City due to the COVID-19 Pandemic. Due to the ongoing efforts to limit the spread of the COVID-19 virus, the May 10, 2021 meeting will be conducted via videoconference.

STUDY SESSION
RIVER DES PERES UPDATE
VIA VIDEOCONFERENCE
May 10, 2021 - 5:30 p.m.

AGENDA

1. MEETING CALLED TO ORDER

At the Study Session of the City Council of University City held via videoconference, on Monday, May 10, 2021, Mayor Terry Crow called the meeting to order at 5:31 p.m.

In addition to the Mayor, the following members of Council were present:

Councilmember Stacy Clay
Councilmember Aleta Klein
Councilmember Steven McMahon
Councilmember Jeffrey Hales
Councilmember Tim Cusick
Councilmember Bwayne Smotherson; *(Audio Only)*

Also in attendance were City Manager, Gregory Rose; City Attorney, John F. Mulligan, Jr.; Janet Buchanan, Matt Jones, Shawn Sullivan, Joel Asunskis, and Jordan Lucas of the Army Corps of Engineers.

2. CHANGES TO REGULAR AGENDA

Mr. Rose requested that Item H-3; Army Corps – River Des Peres Study – Update & Funding Request, be moved to the City Manager's Report.

3. RIVER DES PERES UPDATE

Mr. Rose stated the Army Corps of Engineers continues to advance the River Des Peres Project, and tonight they are here to present an update on the progress they have made.

Ms. Buchanan stated she is the Plan Formulator on this study. Also on tonight's call are a few other technical experts; Matt Jones, Project Manager, Shawn Sullivan, Strategic Planning Coordinator, Joel Asunskis, Hydraulics and Hydrology Engineer, Jordon Lucas, Economist, and hopefully, Monique Savage, Senior Plan Formulator, who will assist her in providing the study's progress answering questions, identifying any concerns and risks, and determining the path forward as they reach their major (Tentatively Selected Plan); TSP milestone. She stated this is the plan that will be presented to the Corps' senior leadership and they will continue to move forward to formulate more details.

Since the last meeting with Council in March, the Corps has held several technical team meetings, which included the attendance of folks on the Stormwater Commission and MSD. Ms. Buchanan stated the Commission had several questions and identified some concerns when they viewed this presentation last Tuesday, and she will try to address those issues tonight.

GENERAL REEVALUATION REPORT
UPDATE ON TSP SELECTION

Purpose

- Achieve vertical team alignment and approval of **(Tentatively Selected Plan)** TSP selection
- Affirm Project Delivery Team (PDT) readiness to move forward with a clear path to the ADM milestone
- Acknowledge and accept identified study risks and the strategies to manage those risks

Overview

- Purpose: Reevaluate the flooding problems and potential plans to reduce flood risk and confirm the authorized project or identify a revised recommendation.
- Budget: $650,000 (contributed funds)
- Schedule: Funds became available on 29 April 2020; 3 years to completion
- Study Authority Limits
  - Limited to University City Branch watershed of upper River Des Peres
  - Flood Risk Management is the only authorized purpose
- Required Analysis and Modeling
  - Must reevaluate the authorized plan
  - Must evaluate life safety in addition to economics
  - Preparing an Environmental Assessment
  - Must complete a qualitative climate change analysis
- Period of Analysis
  - 50 years (roughly 2025 to 2075)

Goals & Objectives

Goal: Reduce life safety risk and economic damages due to flooding of the Upper River Des Peres, and increase recreational opportunities associated with FRM features over the period of analysis.

Objectives:

- Reduce life safety risk due to flooding, including inundation of structures & public infrastructure, in the Upper River Des Peres watershed over the period of analysis.
- Reduce economic damage due to flooding in Upper River Des Peres over the period of analysis.
- Increase recreational opportunities associated with FRM features over the period of analysis.

Study Schedule

• Start date (funding received)	April 29, 2020
• Alternatives Milestone Meeting	August 25, 2020
• Public Scoping Meeting	September 2020
• Tentatively Selected Plan Meeting	May 2021
• Draft Report Released to the Public	July 2021
• Public Meeting	July 2021
• Agency Decision Milestone	October 2021
• Final Report Submitted for Approval	September 2022
• Report Approval	April 2023

Formulation Process

How various measures to help address the flood risk were identified.

Measure Identification

- 15 identified from existing reports, subject matter expertise, planning charrette
- Structural, Non-Structural, Natural, and Nature-Based Solutions

Measure Screening

- Evaluated using professional judgment, 4 P&G criteria, existing data, cost/benefit, meets objectives
- 5 measures were screened

Alternative Formulation

- 10 alternatives developed
- 4 screened out

Final Array

- 6 alternatives

❖ *The Corps does not expect to be at a high level of design for any of these six alternatives since their planning process is designed to only reach a level of approximately 10 percent. There is a need to evenly compare all alternatives before heavily investing in anything that might not pan out or be the most cost-effective.*

Measures Explored

Structural

- Detention basins
- Levee/floodwall
- Channel & bridge modifications
- Modifying the Tubes
- Diversion

Non-Structural

- Floodproofing (wet & dry)
- Elevation of structures
- Relocation of structures
- Acquisition (buyouts)
- Flood warning system
- Risk communication/education
- Ordinances/regulations

Nature-Based

- Floodplain restoration
- Channel restoration
- Wetland restoration

❖ *The Corp reevaluated the recommendations in the 1988 Feasibility Report as a key part of this study and found that the channel and bridge modifications that were part of the U-12 measure for U City were not effective as a standalone measure. While they did increase flood impacts in the upstream area of the watershed they caused downstream impacts at the tubes and did not address induced flooding.*

Measures Developed Into Alternatives

These measures from the Final Array look at what can be added to make each alternative complete.

Structural

1. Detention basins
2. Levees/floodwalls
3. Channel and bridge modification

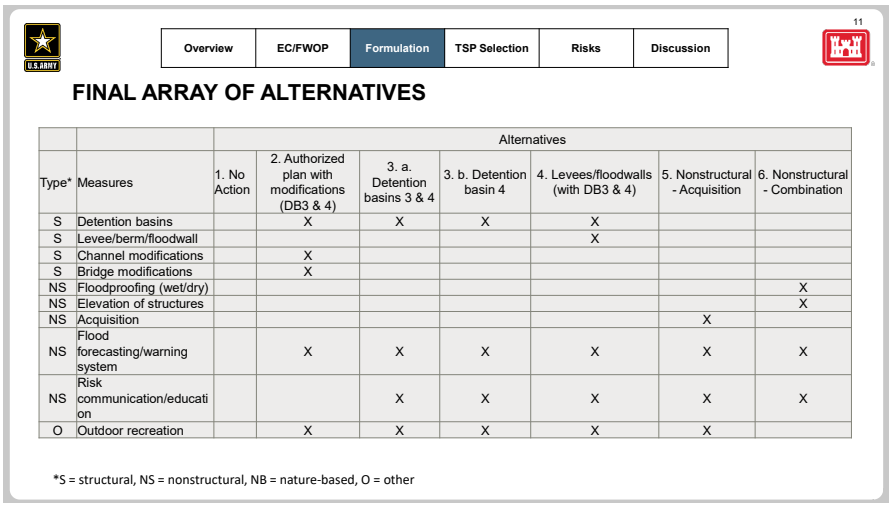
Non-Structural

4. Elevation of structures
5. Floodproofing
6. Acquisition (buyouts)

❖ *The flood warning system, risk communication/education, and natural/nature-based measures should be included in all six alternatives.*

Final Array Summary

- No Action = what all plans are compared against
- Authorized Plan With Modifications = the 1988 study featuring channel and bridge modifications
- Non-structural acquisition = only acquisition alternatives
- Non-structural Combination = no acquisitions included



Overview | EC/FWOP | Formulation | TSP Selection | Risks | Discussion

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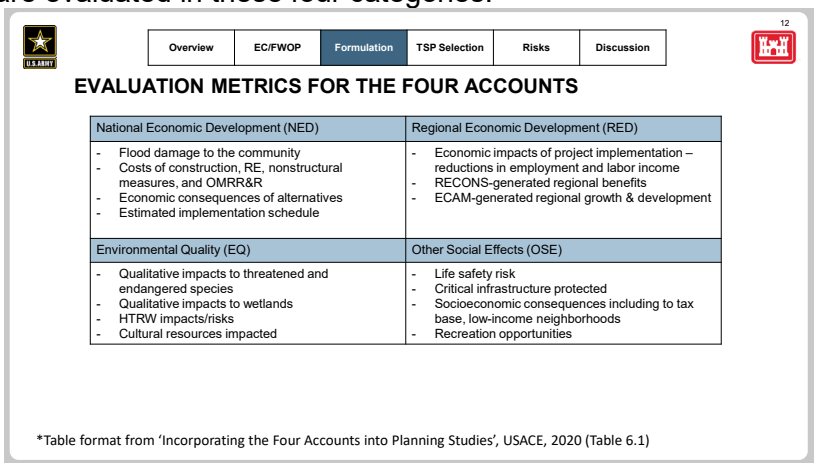
FINAL ARRAY OF ALTERNATIVES

		Alternatives						
Type*	Measures	1. No Action	2. Authorized plan with modifications (DB3 & 4)	3. a. Detention basins 3 & 4	3. b. Detention basin 4	4. Levees/floodwalls (with DB3 & 4)	5. Nonstructural - Acquisition	6. Nonstructural - Combination
S	Detention basins		X	X	X	X		
S	Levee/berm/floodwall					X		
S	Channel modifications		X					
S	Bridge modifications		X					
NS	Floodproofing (wet/dry)							X
NS	Elevation of structures							X
NS	Acquisition						X	
NS	Flood forecasting/warning system		X	X	X	X	X	X
NS	Risk communication/education			X	X	X	X	X
O	Outdoor recreation		X	X	X	X	X	

*S = structural, NS = nonstructural, NB = nature-based, O = other

- Alternatives are evaluated in these four categories.



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EVALUATION METRICS FOR THE FOUR ACCOUNTS

National Economic Development (NED)	Regional Economic Development (RED)
- Flood damage to the community - Costs of construction, RE, nonstructural measures, and OMRR&R - Economic consequences of alternatives - Estimated implementation schedule	- Economic impacts of project implementation – reductions in employment and labor income - RECONS-generated regional benefits - ECAM-generated regional growth & development
Environmental Quality (EQ)	**Other Social Effects (OSE)**
- Qualitative impacts to threatened and endangered species - Qualitative impacts to wetlands - HTRW impacts/risks - Cultural resources impacted	- Life safety risk - Critical infrastructure protected - Socioeconomic consequences including to tax base, low-income neighborhoods - Recreation opportunities

*Table format from 'Incorporating the Four Accounts into Planning Studies', USACE, 2020 (Table 6.1)

The Corps looks at three main costs and benefit numbers for each alternative; total costs, net annual benefits, and the Benefit-Cost Ratio (BCR).

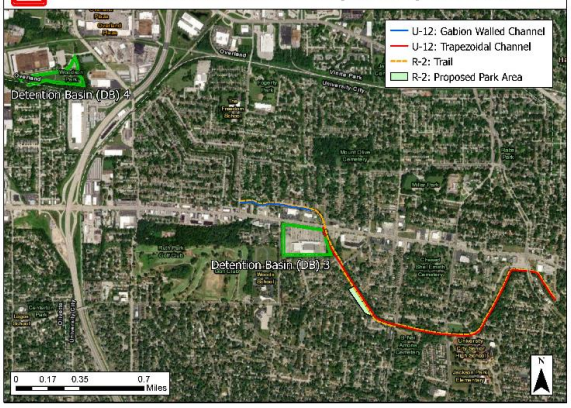
- Net annual benefits analyze the costs over the 50-year project period, then looks at the benefits; how much flood risk protection, and reduced damage to homes and structures. The benefits are subtracted from the costs to achieve the net annual benefits.
- BCR divides the benefits by the costs to determine if it is above or below one (1). The higher the ratio, the more benefit there is.

❖ *There are positive net annual benefits and a BCR of one (1), which means that while there could be a federal interest in exploring this further, it is not likely to be a Tentatively Selected Plan since other alternatives have a higher BCR.*

- Red and orange represents the channel modifications with bridge alterations
- Green represents the detention basins

2. AUTHORIZED PLAN WITH MODIFICATIONS

River Des Peres Authorized Plan (Modified) Alternative



Features:
- Channel and bridge modifications from measure U-12 in authorized plan
- Detention basins added to mitigate downstream impacts

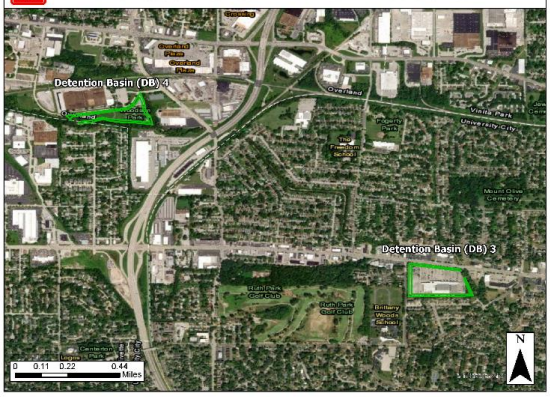
Total Cost: $61M
Net Annual Benefits: $20,000
BCR: 1.01

Risks/uncertainty:
- Channel modifications may impact FEMA HMGP parcels; coordination needed

- Detention Basin 3(a) had the third-highest Net Annual Benefit
- Detention Basin 3(b) had the second-highest Net Annual Benefit and the highest BCR

3. DETENTION BASINS

River Des Peres Detention Basin Alternative



Features:
- 5 examined, 2 determined hydraulically feasible
- Greater effect from removing volume higher upstream in the watershed
- Dry detention for maximum storage during storms
- Recreation & naturalized features TBD

3.a. DB3 and DB4
Total Cost: $45M
Net Annual Benefits: $724,000 (3rd highest)
BCR: 1.33

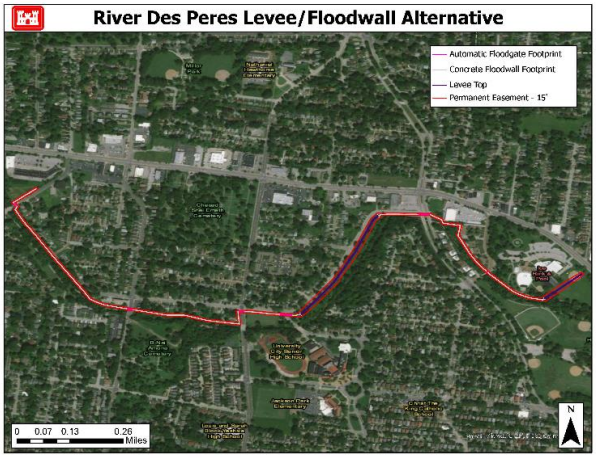
3.b. DB4 only
Total Cost: $9M
Net Annual Benefits: $1.2M (2nd highest)
BCR: 2.98

Risks/uncertainty:
- DB4 location in City of Overland; coordination needed; compatible recreation features

- The Levee/Floodwall had a Net Annual Benefit of minus 1 million dollars

4. LEVEE/FLOODWALL

River Des Peres Levee/Floodwall Alternative



Features:
- 6 reaches identified; 1 in final alternative
- Floodwall is major component
- Avoids floodway, ties into high ground, minimes road crossings
- Impacts FEMA HMGP lands
- Recreation TBD, eg trail on levee crown

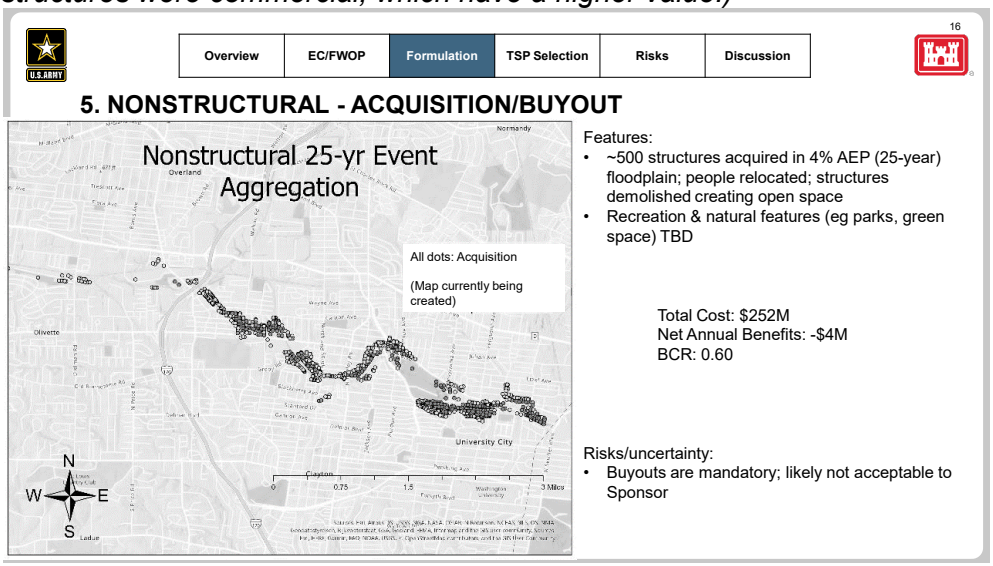
Total Cost: $89M
Net Annual Benefits: -$1M
BCR: 0.73

Risks/uncertainty:
- Channel modifications may impact FEMA HMGP parcels; coordination needed

❖ *The Economist looked at three sets of aggravations for structures, starting with three flood events; 25-year, 50-year, and 75-year. Based on information from the National Structure Inventory Database regarding the depth of flooding at these three events, he found that the 25-year aggravation had the most Net Annual Benefit.*

- The total Net Annual Benefit for Alternative No. 5 was minus 4 million, making acquisition the worst alternative.

Question from Commission: Why are the costs so high?
Answer: The cost per structure is $500,000, which includes relocation and other associated costs. *(Some of the structures were commercial, which have a higher value.)*

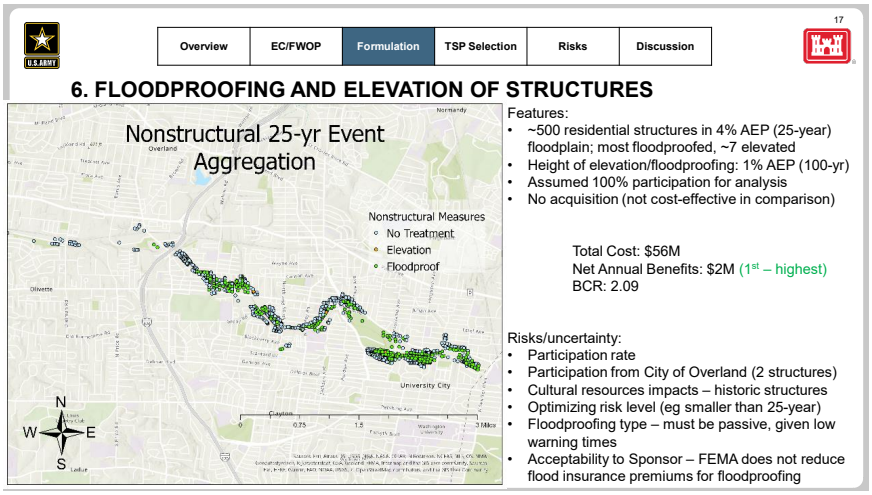


- Alternative No. 6 had the highest Net Annual Benefit
- Most of the 500 structures would be flood-proofed, and about 7 would be elevated
- The height of these elevations would be for 100-year flood events
- The Corps assumed that structures in the 25-year event area entailed 100 percent participation
- No acquisition was included in this alternative since the Economist viewed the cost to flood-proof or elevate each structure as less than the cost to acquire them

Risks:

- Cultural Resources Impacts - there is a cluster of historic structures in Subdivision No. 1 that will be impacted
- Optimizing Risk Level - this may be smaller than the 25-year event. Should the Corps decide to move forward on this alternative the Economist will look at storm events outside the 25, 50, and 75-year levels, and attempt to find an event that has the greatest net benefit.
- Floodproofing Type - at this stage it is not possible for the Corps to say which type of floodproofing will be used on each structure

❖ *The Corps recognizes that FEMA flood insurance premiums will be a key component to any decisions the City or its residents make for non-structural changes.*

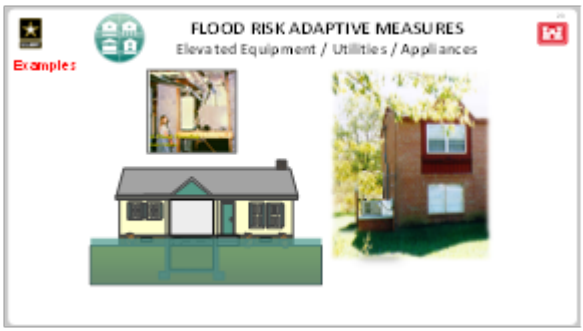


Dry Floodproofing

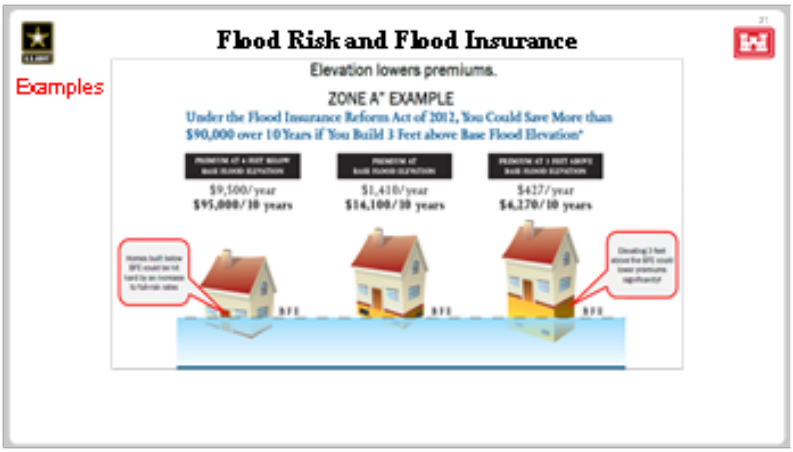
Any active measures that need to be put in place by hand will not be acceptable because of the low warning time.

- Example of a historic structure where a flood fence was installed in the wall to allow water into the lower level to equalize the hydrostatic pressure and make the structure safe during a flood.

- In buildings where there is wet floodproofing, the utilities will need to be raised and in most cases, basements will be filled or have a reduced use.



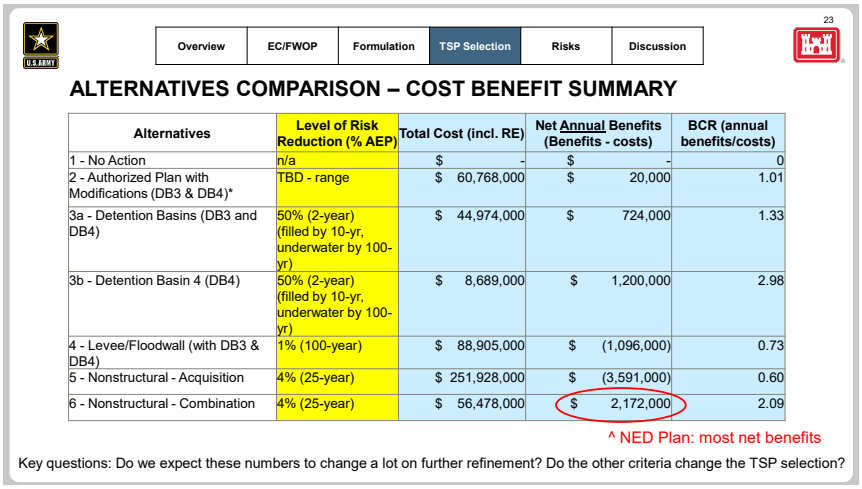
- The Corps was able to speak with a representative from the State Emergency Management Agency about flood insurance and was informed that the general rule is that elevation is the best way to reduce risks over the long term.



Flood Warning Systems: Included in all Alternatives

- Sponsor developing its own municipal system
- Expertise from Commission on Storm Water Issues
- Data available:
  - >20 years of 5-minute-interval data from USGS stream gage at Purdue Ave
  - >10 years of mostly 5-minute-interval data from 6 MSD rain gages in or proximal to the watershed
- Commission member Dr. Criss built an extensive database and developed statistical protocols for flood prediction based on the actual measurements
- Warning system components:
  - 3 NexSens G2-RAIN Alert Systems with solar power packs (2 already installed) in watershed
  - Gages are configured to report at 5-minute intervals at the onset of rainfall
  - Data is transmitted to the city's account at the NexSens WQDataLIVE cloud-based data center
  - Alarms will be issued when rainfall exceeds a predetermined threshold that is predictive of flooding
  - Public portal: https://www.wqdatalive.com/public/1473

- The alternatives do not address the same size of events
- The NED plan has the most net benefits
- The Corps does not expect these numbers to change



Overview | EC/FWOP | Formulation | TSP Selection | Risks | Discussion

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ALTERNATIVES COMPARISON – COST BENEFIT SUMMARY

Alternatives	Level of Risk Reduction (% AEP)	Total Cost (incl. RE)	Net Annual Benefits (Benefits - costs)	BCR (annual benefits/costs)
1 - No Action	n/a	$ -	$ -	0
2 - Authorized Plan with Modifications (DB3 & DB4)*	TBD - range	$ 60,768,000	$ 20,000	1.01
3a - Detention Basins (DB3 and DB4)	50% (2-year) (filled by 10-yr, underwater by 100-yr)	$ 44,974,000	$ 724,000	1.33
3b - Detention Basin 4 (DB4)	50% (2-year) (filled by 10-yr, underwater by 100-yr)	$ 8,689,000	$ 1,200,000	2.98
4 - Levee/Floodwall (with DB3 & DB4)	1% (100-year)	$ 88,905,000	$ (1,096,000)	0.73
5 - Nonstructural - Acquisition	4% (25-year)	$ 251,928,000	$ (3,591,000)	0.60
6 - Nonstructural - Combination	4% (25-year)	$ 56,478,000	$ 2,172,000	2.09

^ NED Plan: most net benefits

Key questions: Do we expect these numbers to change a lot on further refinement? Do the other criteria change the TSP selection?

TPS Selection, Sponsor, Viewpoint, Path Forward

The TSP selected is the NED Plan: Nonstructural – Combination alternative

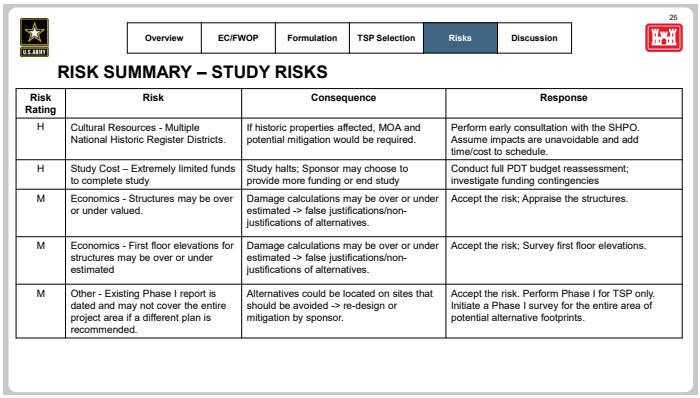
- Highest net benefits; 2nd highest BCR

❖ *Mr. Alpaslan or a representative from the City will be invited to speak to the Corps' leadership about the City's viewpoint of the study.*

Sponsor viewpoint

Path forward:

1. Refine TSP in feasibility-level design:
   - ➢ Optimize % AEP in the next phase (may be <4% / 25-year)
   - ➢ Look into combining with DBs if appropriate (currently not combinable)
     On their own, detention basins are a very positive measure. They have their own high net benefits and a high benefit to cost ratio. The Corps believes there is a high likelihood that the basins, in combination with some of the nonstructural measures may become the NED Plan.
   - ➢ Refine nonstructural measures in feasibility level design
     What floodproofing types will be applied to specific structures
   - ➢ Discuss key information and concerns about nonstructural measures with the Sponsor, City, and the public
- Confirm funding received from Sponsor for the second half of study
- Coordinate with City of Overland as needed
- DQC draft report
- Legal and technical editor review
- Public meeting and public review period
- Perform resource agency coordination; environmental effects analysis; ensure environmental compliance



Overview | EC/FWOP | Formulation | TSP Selection | Risks | Discussion

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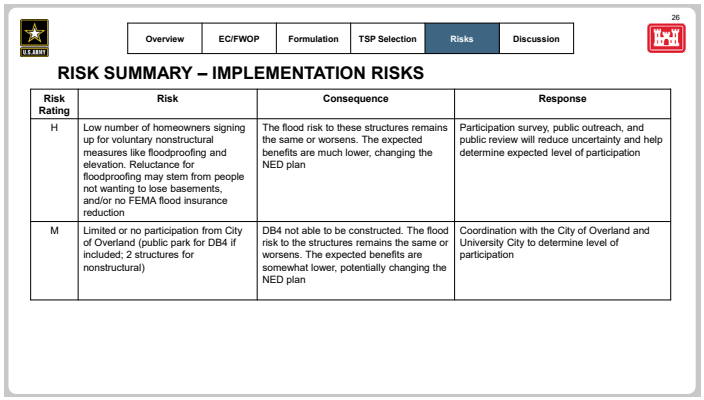
RISK SUMMARY – STUDY RISKS

Risk Rating	Risk	Consequence	Response
H	Cultural Resources - Multiple National Historic Register Districts.	If historic properties affected, MOA and potential mitigation would be required.	Perform early consultation with the SHPO. Assume impacts are unavoidable and add time/cost to schedule.
H	Study Cost – Extremely limited funds to complete study	Study halts; Sponsor may choose to provide more funding or end study	Conduct full PDT budget reassessment; investigate funding contingencies
M	Economics - Structures may be over or under valued.	Damage calculations may be over or under estimated -> false justifications/non-justifications of alternatives.	Accept the risk; Appraise the structures.
M	Economics - First floor elevations for structures may be over or under estimated	Damage calculations may be over or under estimated -> false justifications/non-justifications of alternatives.	Accept the risk; Survey first floor elevations.
M	Other - Existing Phase I report is dated and may not cover the entire project area if a different plan is recommended.	Alternatives could be located on sites that should be avoided -> re-design or mitigation by sponsor.	Accept the risk. Perform Phase I for TSP only. Initiate a Phase I survey for the entire area of potential alternative footprints.



Overview | EC/FWOP | Formulation | TSP Selection | Risks | Discussion

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RISK SUMMARY – IMPLEMENTATION RISKS

Risk Rating	Risk	Consequence	Response
H	Low number of homeowners signing up for voluntary nonstructural measures like floodproofing and elevation. Reluctance for floodproofing may stem from people not wanting to lose basements, and/or no FEMA flood insurance reduction	The flood risk to these structures remains the same or worsens. The expected benefits are much lower, changing the NED plan	Participation survey, public outreach, and public review will reduce uncertainty and help determine expected level of participation
M	Limited or no participation from City of Overland (public park for DB4 if included; 2 structures for nonstructural)	DB4 not able to be constructed. The flood risk to the structures remains the same or worsens. The expected benefits are somewhat lower, potentially changing the NED plan	Coordination with the City of Overland and University City to determine level of participation

Questions

Contact:
Mr. Matthew Jones, Project Manager
Matthew.a.jones@usace.army.mil
1222 Spruce Street
St. Louis, MO 63103

Public comments may be directed to:
ucityfloodrisk@usace.army.mil

Project website: https://www.mvs.usace.army.mil/Missions/Programs-Project-Management/River-Des-Peres-University-City-General-Reevaluation-Report/

Councilmember Cusick posed the following questions to Ms. Buchanan:

Q. What criterion was used to identify the 500 structures on page 17?

A. They are the structures that experienced flood damage in the 25-year floodplain.

Q. Were you able to compare those findings with the historical data from flood events that actually occurred in U City?

A. The methodology utilized by the Corps nationwide to model flood depths, risks, and determine historic damage, is based on the H & H modeling that takes historic storms into account at the calibration stage and applies that to the National Structure Inventory. In this instance, they also tried to look at any information FEMA had available and discovered that it is very unusual for FEMA to give out data because it is such an onerous process.

Q. Some of the 2008 inundation modeling presented to the Stormwater Commission indicates no flooding in areas like Mona, Groby, Hafner Court, and others, where the City's evidence reveals it did occur. So, is the Corps using this national modeling because they don't have the data on these historical flood events?

A. The Corps was not made aware of those discrepancies, but Mr. Alpaslan did mention that the Commission was in the process of obtaining photos of the maximum flood lines from that event. So, the sharing of that information is something the Corps would welcome.

Councilmember Cusick stated he had seen photos of the actual measurements taken by the Commission to show where flooding was in those areas.

Mr. Asunskis stated based on what he saw in the report, there was a lot of information provided about high watermarks on Mona, Wilson, and Shaftesbury because that's really where most of the flooding was with respect to the River Des Peres. So, while they could look at the Commission's information, most of the calibration for the model was based on U City's gauge at the footbridge in Heman Park. He stated he used two different storm events and matched the results of the observations, which is how predictive modeling is accomplished. From there, he assessed the damage at different levels, which is really at the 10 percent stage.

Councilmember Cusick posed the following questions to Mr. Asunskis:
Q. Will you be able to look at the results from the Commission?
A. Of course.

Q. Will enlarging the Vernon, Pennsylvania, and Mona bridges to handle an increased flow really impact anything downstream?
A. That's definitely a big question mark. But the one thing he can say is that widening the bridges will push more water downstream, which would not be in the best interest of MSD, since it has the potential to create new problems for them.

Q. The information seems to indicate that the tubes could handle that additional flow, so can this issue be explored further?
A. At this point, there are too many unknowns to provide a clear answer.

Councilmember Cusick asked if the 25-year assumption showed that some of the 500 structures included in the model had flooded above the 82nd Street mark? Ms. Buchanan stated although she is unable to provide a definite answer off the top of her head, she believes that there are about 30 structures upstream of 82nd and 1-170.

Mr. Lucas stated he was also unsure but could find the answer and get back to Councilmember Cusick.

Councilmember Cusick stated it would be interesting to talk with FEMA and MSD to find out if there have been any claims in that area. Because in talking with Councilmember Smotherson; who has lived in the area for several years, he could not recall there ever being a flood event affecting households above 82nd Street. Yet, the Corps inundation models show a significant overland flooding in those areas affecting numerous properties.

Ms. Buchanan stated with 25-year events there's a 4 percent likelihood of a flood happening in any given year. However, floods can come more frequently or less frequently than that, so they have to use the data available to structure the frequency. She stated it is interesting to hear that those structures do not appear to have flooded, so they will definitely reexamine the H & H and inundation modeling once they've been able to ascertain that information.

Mr. Sullivan asked Councilmember Cusick if 82nd Street was based on the 25-year flood event or mapped through the flood insurance rate maps? Councilmember Cusick stated the only thing he knows is that there are no records of this area flooding during the 2008 flood, nor in the Health Censure Report of '71, which he believes studied two major floods in 1957 and 1969.

Mr. Sullivan asked Mr. Asunskis if he could reference the 10-year flood event?

Mr. Asunskis stated the Corps' predictive modeling calibrates the models based on observed events and he uses the NexRAIN Precipitation Rain Model because in frequency events they look at forecasts and precipitation. It's a statistically identified likelihood of precipitation that when put into the model gives you the water surface. So, just because an area has not flooded before does not mean it does not have the potential to flood. He stated what they are showing is the 25-year level impact and the 2008 event was slightly below the 10-year level, so they are at a higher level than that. Mr. Asunskis stated they did use the Stormwater Commission's report, however, this is just the beginning stage, so if there is additional information like high watermarks, he would be willing to take that into account and take a closer look at it.

Councilmember Cusick stated there are a couple of things he would like the Corps to consider leaving on the table.

The Corps acquisition model budgeted $500,000 per structure, however, in the 2015 Wilson buyouts 26 structures were purchased at $160 to $180,000 per structure. So, he would like to see this alternative given more consideration because he thinks some of the 500 structures; especially those that have experienced repetitive losses, cannot be flood-proofed, and ultimately determined to be uninsurable by FEMA. So, their only option may be a buyout.

The dry floodproofing method which asks residents to give up their basements will have a drastic impact on their available living space, as well as the value of their property. He stated there is also a question about how much this type of floodproofing method will reduce FEMA's insurance rates.

Councilmember Smotherson stated a critical issue in the 3rd Ward is flood insurance. So, he is wondering why there were no insurance considerations mentioned under Alternative No. 3, Detention Basins; which he believes would be a benefit to homeowners?

Ms. Buchanan stated unfortunately, the National Flood Insurance Program is not considered a planning constraint in the Corps' planning process, which looks at flood damage and the overall benefits. Therefore, the level of premium changes residents may or may not experience is not something they look at. That said, the Corps is well aware that this issue will have an impact on their narrative and its ability to persuade someone to participate in the program. So, they will continue to look at the ramifications associated with these various floodproofing methods.

Addressing Councilmember Cusick's comments, Ms. Buchanan stated acquisition for structures that have experienced repetitive losses is still on the table. This presentation only represents a 10 percent level of the design that enables them to look at all of the alternatives and determine which ones are doing well, and which ones are not. So, all of the concerns expressed by Council will continue to be in the mix as they move forward, even though they are unable to make planning decisions based on the impact they might have on insurance premiums.

Councilmember Smotherson stated his only point was to emphasize the fact that flood insurance will be a critical aspect of this plan because whatever the Corps does will have an impact. He stated he lived in a floodplain for years, but something happened that minimized the risks and reduced his $2,000 a year premium. So, detention basins might be something to consider.

Councilmember Clay asked if there would be any compensatory space added for people who elected to lose their basement? Ms. Buchanan stated the short answer is that if a basement is no longer useable, then it won't be subject to any further damage, which provides the full level of benefits. But here again, this is something that still needs to be refined, because some structures may only need minor modifications, like the elevation of their utilities.

Mr. Lucas stated when it comes to nonstructural measures there are a lot of different things you can do to a structure; one of which requires you to fill the subfloor or basement. And in that case, there is no compensation.

Mr. Rose asked Ms. Buchanan if his understanding that the Corps is leaning towards a combination of detention basins and floodproofing, was accurate? Ms. Buchanan stated that is accurate. And the next phase will bring in detention basins as a combined alternative. Mr. Rose stated he noticed that no detention basin had been planned for U City and that approval is still needed from municipalities where they have been planned. So, is there a reason why the Corps did not look at U City for the construction of a basin? Ms. Buchanan stated one of the two basins is located within U City. Detention Basin 3 is located directly adjacent to Olive Blvd. and River Des Peres, and basin 4, is upstream of 1-170 in Overland. She stated the rationale for looking at these two sites is that they were the most hydraulically feasible and held the most water far enough upstream to benefit the flood levels downstream.

Mr. Rose questioned whether there would be an impact on the effectiveness of the system if the City of Overland decided they did not want this basin? Ms. Buchanan stated as they move forward, detention basins 3 and 4 will be merged with nonstructural alternatives in an attempt to find a combination that offers the greatest net benefit. However, if the City of Overland does not support the plan to construct basin 4, then basin 3 will remain because they know it can still provide benefits on its own. So, it would still be a piece of the puzzle.

Mayor Crow asked if the City of Overland was even engaged in the process at this point? Ms. Buchanan stated they were not because, until last week, they had no idea that the basins would even be number two on the list of preferred alternatives. But now that they have confirmed their interest in carrying this plan forward, coordination will definitely be the next step.

Mayor Crow asked if the City of Overland actually had the same problems associated with flooding that U City has? Ms. Buchanan stated she is not aware of whether they have flooding issues in the upper River Des Peres, but they might have flooding on the other side. And if that is the case, then their level of enthusiasm about participating may not be the same.

Councilmember McMahon asked if his understanding that the elimination of basements would result in a 2-million-dollar annual benefit, was correct? Ms. Buchanan stated Alternative No. 6 will include a variety of floodproofing methods. And while one of those methods is likely to include the loss of a basement, they have not reached the level of detail to know which structures they are. Councilmember McMahon stated this alternative is premised on 100 percent participation but if that cannot be achieved won't it reduce the benefits? Ms. Buchanan stated their approach in the next phase includes the fact that they do not expect to get 100 percent participation. So, this is just a tool for analysis based on the opinion of economists who believed that in general, the absence of 100 percent participation would not forgo this alternative's ability to have the most benefits. However, the next phase will include a participation survey to help them narrow down what the actual participation rate might be.

Mr. Lucas stated post-TSP they will also conduct a sensitivity analysis that examines 25, 50, and 75 percent participation rates. Once that is completed they will be able to drill down on the numbers and provide a better estimate of the net benefits for each category.

Councilmember McMahon stated that the explanation and combination of a detention basin seem to make a lot of sense because that would hedge their bets against participation and possibly lead to 1.2 million dollars in benefits.

Mr. Lucas stated that is absolutely right because the one thing that happens when you put the detention basin in is it lowers the stage of flooding for everybody. He stated the inclusion of nonstructural measures is actually less expensive and removes damage to structures at a lower cost.

4. <u>ADJOURNMENT</u>

Mayor Crow stated he and his colleagues look forward to working with Ms. Buchanan and her team and thanked them for their presentation. He then adjourned the Study Session at 6:32 p.m.

LaRette Reese
City Clerk