2008 RAIN EVENT

- 2008 Significant Flooding Throughout the Community
- 7TH Avenue Creek Impacts to Both Residential and Commercial
- Flood Event Estimated to be a 25-50 Year Event.
- Flood Limits Far Exceeded Mapped FEMA 100-year floodplain
2008 RAIN EVENT

- COMMERCIAL CORRIDOR FLOODING
- STRUCTURE FLOODING
- STREET AND YARD FLOODING
- ROADWAY OVERTOPPING
- ROADWAY CLOSURES
RAINFALL SUMMARY

• Other Significant Rainfall Events Occurred Since 2008

<table>
<thead>
<tr>
<th>Flood Event</th>
<th>Overall Rainfall Precipitation</th>
<th>Overall Duration</th>
<th>Storm Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2008</td>
<td>8.74 Inches</td>
<td>51 Hours</td>
<td>&gt;25 Yr &lt; 50 Yr</td>
</tr>
<tr>
<td>July 2010</td>
<td>5.45 Inches</td>
<td>15 Hours</td>
<td>&gt;25 Yr &lt; 50 Yr</td>
</tr>
<tr>
<td>April 2013</td>
<td>3.40 Inches</td>
<td>20 Hours</td>
<td>&gt;2 Yr &lt; 5 Yr</td>
</tr>
<tr>
<td>June 2015</td>
<td>3.16 Inches</td>
<td>15 Hours</td>
<td>&gt;2 Yr &lt; 5 Yr</td>
</tr>
</tbody>
</table>

• Resulted in Significant Impact to 7th Ave Creek Properties
• All Events Less than 100 Year Event
FLOOD INSURANCE STUDY

• Revised Flood Insurance Study – Completed 2009

• Calibrated to the 2008 Flood Event

• Revised Hydrology – Increased Flows 200%-250%

• Revised Hydraulic Model – Flood Elevations 3’ Higher
TWO CONCURRENT & PARALLEL PATHS

FEMA

City of St. Charles
MASTER PLAN DEVELOPMENT PROCESS

• Development of Project Goals and Objectives
• Review of City’s Comprehensive Plan and Other Relevant Studies
• Property Owner Questionnaire
• Stream Assessments
• Elevation Certificates
• Hydraulic Modeling
• Workshop Meetings with City Department Heads
• Public Meetings
• Regulatory Coordination Meetings
• Alternative Analysis
• Project Costs and Benefit/Cost Analysis
• Phasing and Implementation Plan
• Funding grant applications
STAKEHOLDERS & COMMUNICATION

KEY STAKEHOLDERS

• Community Members & Property Owners
• City Administration & Elected Officials
• Community Development
• Fire & Police Department
• Public Works Department
• Special Interest Groups

COMMUNICATIONS

• Letters, Public Meetings, Questionnaires & Project Website
EXISTING VS. FEMA PROPOSED FLOODPLAIN

- Approx. 118 properties impacted
- 65 total structures in floodplain
  - 50 residential structures
  - 15 commercial structures
  - 49 structures newly mapped
  - Others with floodplain on property
STREAM ASSESSMENT

7th Avenue Creek Improvements
Existing vs Proposed Floodplain

City of St. Charles, IL

Legend
- Proposed 100Y Floodplain
- Parcels
- Stream Centerline
- Currently Regulatory 100Y Floodplain
- Current Regulatory Floodway

Data Source: Kane County, IL, 2018
Prepared by: [Preparation Team]
1 inch = 300 feet

7th Avenue Creek Master Plan Development | ST. CHARLES, IL
CITY COMPREHENSIVE PLAN GOALS

Existing and Recommended Improvements

- Existing Traffic Signal. Traffic controls currently in place to manage flow, provide opportunities for entry from intersecting streets, and control vehicle speed.
- Roadway Connection. New street segments to create greater access and/or alleviate traffic volumes and congestion.
- IDOT Capital Improvement Area. Roadways identified by IDOT to undergo widening, signalization improvements, and sidewalk enhancements, etc.
- Roadway Widening (Under Construction). On going roadway widening to either five or six lanes as part of IDOT’s capital improvement program.
- Curbs/Curb Reduction/Consolidation. Removal of excessive curb cuts to minimize conflict points.
- Proposed Cross-Access. Cross-access between adjacent parking areas to enhance on-site circulation.
- Sidewalk Infill. New sidewalk segments for a safe and well-connected pedestrian network.
- On-site Pedestrian Connection. Pedestrian connections or pedestrianises for safe and direct access through parking or landscaped areas.
- Enhanced Pedestrian Crossing. Improvements to crosswalks including striping, curbs and countdown signals, lighting, push-button phasing, etc.
- Existing/Future Trail or Bikeway. Trail segments to provide access to regional trails, key destinations, or sidewalks and bike parts.
- Parking Lot/Site Screening. Decorative landscaping and/or fencing to enhance the character of the corridor and mitigate the negative impacts of large parking areas or unsightly activities.
- Transit Activity Node. Specific areas that should receive special attention to transit access to be capitallize on their intensity and proximity to Main Street.
CONCEPT PLAN OPTIONS

4 OPTIONS WERE EVALUATED

- Do Nothing
- No-Build – Buy all impacted structures
- Engineered Solution (Address the issue at minimal cost)
- Greenway Section (Holistic approach)
7th Avenue Creek Master Plan Development | ST. CHARLES, IL

CONCEPT PLAN – ENGINEERED OPTION

Proposed Improvements
- Culvert Replacement
- Channelized Floodplain
- Land Acquisition/Easements

Legend
- **Culvert Replacement**
- **Vacant Property Acquisition**
- **Minimum Trapezoidal Channel Topwidth**
- Tier 2 Acquisition
- Tier 1 Acquisition
- Easement
- Proposed 100YR Floodplain
- **City-Owned Parcels**
- **Parcels**
- Stream Centerline

7th Avenue Creek Improvements
Channelized Floodplain Option
Middle Segment
Exhibit 3 of 5
City of St. Charles, IL

Easement
Channelized Stream
Culvert Replacement
Tier 1 Acquisition
Tier 2 Acquisition
CONCEPT PLAN – GREENWAY OPTION

7th Avenue Creek Improvements

Greenway / Stream Restoration Option
Middle Segment Exhibit 3 of 5
City of St. Charles, IL

Legend
- Culvert Removal or Replacement
- Culvert Replacement
- Regrade, Parking
- Vacant Property Acquisition
- Mounding within Greenway
- Max Potential Greenway
- Proposed 100Y Floodplain
- City Owned Parcels
- Parcels
- Stream Centerline

Proposed Improvements
- Culvert Replacement
- Expanded Floodplain Section & Stream Restoration
- Land Acquisition

Culvert Replacement
Greenway & Stream Restoration
Land Acquisition
PREFERRED OPTION WAS IN-BETWEEN THE ENGINEERED AND GREENWAY

- Developed a Project Development Plan
  - Single Plan - Hybrid of Engineered and Greenway Option
  - Review for Feasibility and Constructability
  - Review for Utility Impacts
  - Opinion of Probable Costs
  - Phasing Plan
DEVELOPED A HYBRID PLAN (REACH BY REACH)
PROPOSED:
1. Relocate channel reach and realign using analog geometry from S. Br. Norton Creek. Widen floodway modifying toe of bank and floodplain surface. Increase floodplain storage.
2. Remove overbank vegetation, debris, and replace with native vegetation. Grade floodplain where feasible to increase floodplain storage volume.
3. Remove existing abandoned railroad spur trackage to eliminate flow restrictions and increase floodplain storage.
5. Regrade back lot areas above 100-year floodplain to maximize parking areas, i.e., Naturalize existing stormwater basins, 5b: Formable paving in realigned parking area.
6. Modify existing storm outfalls for water quality improvement.

OPTIONAL:
7. Transform abandoned pit to natural wetland feature.
8. Improve stormwater filtration and habitat opportunities within the existing stormwater basins.
9. Extend Production Drive along back side of businesses to provide truck access.
10. If Angel Transmission & Auto Repair acquired to address flooding and increase floodplain storage, realign channel to achieve more natural alignment near crossing.

Reach 1 - 7th Avenue Creek
Floodplain Improvement, Option B

October 19, 2016
7th Avenue Creek
Reach 1 – Sta. 89+14 Proposed Section, Option B, Looking Upstream

Draft: November 6, 2016
PROPOSED:

1. Acquire properties in the floodplain, restore natural channel geometries and floodplain connectivity and create a public green corridor open space system.
2. Property could be converted to Greenway. Refer to Reach 1 Option B drawings.
3. Replace existing culvert.
4. Expand floodplain storage opportunities in City-owned parcels.
5. Stormwater BMP retrofits to existing outfalls.
6. Remove roadway and culvert on 9th Avenue and expand floodplain park space.
7. 7th Ave. Creek Tributary
8. Grade control riffle.
10. Skewed culvert, Refer to Reach 1 drawings.

October 19, 2016

Reaches 2 Through 5 - 7th Avenue Creek
Floodplain Improvements
Reach 6 – Sta. 59+26, Proposed Section Looking Upstream
7th Avenue Creek
Reach 2 – Sta. 74+90 Proposed Section Looking Upstream

Draft: November 6, 2016
7th Avenue Creek
Reach 5 – Sta. 65+80, Proposed Section Looking Upstream

Draft: November 6, 2016
## CONCEPT AND MASTER PLAN
### PROJECT COST/PROPERTY ACQUISITION SUMMARY

<table>
<thead>
<tr>
<th></th>
<th>Concept Plan</th>
<th>Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
<td>Engineered</td>
</tr>
<tr>
<td><strong>EOPC</strong></td>
<td>$26.5M</td>
<td>$12.6M</td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td><strong>Acquisition</strong></td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td><strong>Vacant Parcel</strong></td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Acquisition</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Master Plan
## Project Benefits Summary

<table>
<thead>
<tr>
<th>Benefits Summary</th>
<th>Located in FEMA Preliminary Floodplain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Pre-Construction)</td>
</tr>
<tr>
<td>Total Number of Properties</td>
<td>118</td>
</tr>
<tr>
<td>Total Number of Commercial Structures</td>
<td>15</td>
</tr>
<tr>
<td>Total Number of Residential Structures</td>
<td>55</td>
</tr>
</tbody>
</table>

*Six structures remaining in floodplain due to Fox River, not 7th Avenue Creek*
FUNDING

- FEMA funded and is completing mapping revisions
- Obtained Riverboat Casino Grant to prepare Watershed Plan
- Obtained Section 319 Grant from Illinois EPA for eligible channel restoration work for Phase I
- Applied for IDNR Mitigation Funding (not successful)
- Applied for PDM grant from FEMA for property acquisition
- Will apply for Section 319 Grant for future phases
- Will continue to look for future funding opportunities
- Currently doing Phase I design (2021 construction)
QUESTIONS FROM THE AUDIENCE

Ajay Jain, P.E., CFM
Vice President, Water Resources Practice Leader
H.R. Green, Inc.
ajain@hrgreen.com
815-385-1778
FEDERAL EMERGENCY MANAGEMENT AGENCY

• Flood Risk Mapping (FEMA) – Updated Maps

• FEMA Process Underway & Appeal Process Complete

• 118 Properties Impacted by Proposed Maps

• Residential and Commercial Properties Impacted
Option #1 – Engineered
Channel Excavation and Culvert Replacement

Option #2 – Greenway
Greenway and Stream Restoration with Culvert Replacement
<table>
<thead>
<tr>
<th>ASSESSMENT FACTORS</th>
<th>ASSESSMENT FACTOR SCORING SCALE</th>
<th>SCORE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reach is severely eroded and provides minimal buffer to adjacent properties.</td>
<td>Negligible to low erosion • Moderate erosion of channel but no immediate impact to existing residents • Severely eroded channel, minimal to no buffer to existing property, potential structures at risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Reach contributes significantly to water quality impairment?</td>
<td>N/A to minimal water quality impact. • Moderate water quality impact. • High water quality impact.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Bank stabilization, creek meandering and floodplain enhancement in this reach would rank well for water quality grant.</td>
<td>N/A or would be considered a low priority project by EPA. • Moderate or would be considered a medium priority project by EPA. • High or would be considered a high priority project by EPA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Reach improvements are located in an area that would provide a visible and enjoyable asset to adjacent residents?</td>
<td>N/A. Reach has minimal adjacent residents. • Not an asset but has minimal view/accessibility to the channel. Only few residents impacted. • Would be a high asset as it will provide enhanced view/accessibility to the channel.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Reach has historically required significant maintenance.</td>
<td>N/A. Reach has not required significant maintenance. • Moderate. Reach requires periodic maintenance similar to other reaches. • Reach has required extensive maintenance. Is a bottleneck and accumulates sediments.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Reach has difficult access for maintenance?</td>
<td>Easy access • Access is available for maintenance but requires access through private property/easement. • Difficult to access without use of private property and/or easement. Low maintenance would be beneficial for long term cost effectiveness.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Reach connectivity to u/s or d/s improvement.</td>
<td>N/A. Reach is independent of what is done in u/s or d/s reaches. • Reach would require minimal to moderate transitions from u/s to d/s reaches • Great connectivity. U/s improvements need to be carried through this reach for benefit to u/s reaches.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASSESSMENT FACTORS</td>
<td>ASSESSMENT FACTOR SCORING SCALE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Reach is in an area that level of improvements selected between an engineered</td>
<td>High impacts to economic development. Moderate impacts to economic development. N/A Low impact to economic development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>option and greenway option would have an impact on future development opportunity.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Reach improvements needs to be aligned with City Comprehensive plan</td>
<td>N/A Minimal to insignificant synergy between the reach versus the City Comp. Plan. Moderate synergy between the reach versus the City Comp. Plan. High synergy between the reach versus the City Strategic Plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Reach improvements needs to be aligned with City Strategic Plan?</td>
<td>N/A Minimal to insignificant synergy between the reach versus the City Strategic Plan. Moderate synergy between the reach versus the City Strategic Plan. High synergy between the reach versus the City Strategic Plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Reach is located in an area where desired ROW is currently available or can be</td>
<td>ROW acquisition is questionable as property owners have not been contacted. ROW acquisition is generally feasible. ROW is either available or property owners are willing to sell their property. Many have approached the City for acquisition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>acquired.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Reach is generally unsafe with close proximity of the channel to homes and/or</td>
<td>N/A Improvements will have minimal impacts to safety. Improvements will have moderate impact to safety. Greenway Improvements will have significant impact to safety due to increased buffer, gently sloping section and reduced velocity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>high velocities in the channel. Improvements shall consider safety in design.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Engineered versus Greenway option Benefit Costs are significant higher.</td>
<td>Engineered option has a significantly high BCR than a greenway option (2.1) Engineered option has a moderately high BCR than a greenway option (1.5-1) Engineered option has similar BCR than a greenway option (1.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Reach improvements have minimal impacts to utilities and will not require</td>
<td>High impacts to utility. Will require significant relocation or lowering of utilities Moderate impacts to utilities. Some conflicts but will not require major relocation. No impacts to utilities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>relocation of utilities.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SCORE**: 0
# Project Development Plan: Application of Objective and Subjective Criteria

## Project Development Plan

<table>
<thead>
<tr>
<th>From Objective Criteria</th>
<th>From Subjective Criteria</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column A</td>
<td>Column B</td>
<td>Column C</td>
</tr>
<tr>
<td>Reach No.</td>
<td>Reach Scores</td>
<td>Reach Percentile</td>
</tr>
<tr>
<td>5</td>
<td>455</td>
<td>76%</td>
</tr>
<tr>
<td>6</td>
<td>370</td>
<td>62%</td>
</tr>
<tr>
<td>3</td>
<td>354</td>
<td>59%</td>
</tr>
<tr>
<td>1</td>
<td>309</td>
<td>52%</td>
</tr>
<tr>
<td>10</td>
<td>306</td>
<td>51%</td>
</tr>
<tr>
<td>2</td>
<td>285</td>
<td>48%</td>
</tr>
<tr>
<td>8</td>
<td>276</td>
<td>46%</td>
</tr>
<tr>
<td>7</td>
<td>272</td>
<td>45%</td>
</tr>
<tr>
<td>4</td>
<td>266</td>
<td>44%</td>
</tr>
<tr>
<td>11</td>
<td>265</td>
<td>44%</td>
</tr>
<tr>
<td>9</td>
<td>173</td>
<td>29%</td>
</tr>
</tbody>
</table>
Will businesses be acquired or significantly impacted for a greenway corridor implementation?

- Yes
- Engineered Option

No

- Greenway Option

In lieu of a wider greenway corridor, are there opportunities for economic redevelopment that should be a priority over greenway corridor?

- No
- Grant Eligibility High

Yes

Engineered Option will leave structures at risk adjacent to the new floodplain with minimal buffer

- No