7th Avenue Creek Master Plan Development Project
City of St. Charles, IL

IAFSM CONFERENCE
March 14, 2018
7th Avenue Creek Master Plan Development | ST. CHARLES, IL
2008 RAIN EVENT

RESIDENTIAL STRUCTURE FLOODING

COMMERCIAL STRUCTURE FLOODING
2008 RAIN EVENT

ROADWAY OVERTOPPING

ROADWAY CLOSURES

COMMERCIAL CORRIDOR FLOODING ALONG MAIN STREET
RAINFALL SUMMARY & FIS

- 2008 Rainfall Event
  - Exceeds Regulatory FEMA Floodplain Limits
- Revised Flood Insurance Study – Completed 2009
- 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>
TWO CONCURRENT & PARALLEL PATHS

FEMA

City of St. Charles
PROJECT OBJECTIVES

FEMA

- Flood Risk Mapping (FEMA)

CITY – Concept Plan & Master Plan Development

- Flood Mitigation (reduce to or below regulatory floodplain)
- Improve Stream Aesthetics
- Improve Water Quality
- Funding
- Consider City’s Comprehensive Plan
- Consider Economic Development Opportunities
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
- Hydrologic and Hydraulic Modeling
- City Department Heads Meetings
- Public Meetings

- Regulatory Coordination Meetings
- Option Analysis
- Development of Objective and Subjective Criteria in Selection of Preferred Option
- Project Costs and Benefit/Cost Analysis
- Phasing and Implementation Plan
STAKEHOLDERS & COMMUNICATION

KEY STAKEHOLDERS
• Community Members & Property Owners
• City Administration & Elected Officials
• Community Development Department
• Consultants - HR Green, Inter-Fluve and Houseal Lavigne
• 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
EXISTING VS. FEMA PROPOSED FLOODPLAIN

7th Avenue Creek Master Plan Development | ST. CHARLES, IL
SURVEYS & ELEVATION CERTIFICATES

7th Avenue Creek Improvements

Legend
- Properties for Survey
- Proposed 100Yr Floodplain
- City Owned Parcels
- Parcels
- Stream Centerline

City of St. Charles, IL

1 inch = 300 feet

Data Source: Kane County, St. Charles, 2009.

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ST. CHARLES, IL

7th Avenue Creek Master Plan Development
REGIONAL BIKE PATH PLAN

Chapter 7 Transportation Plan

Pedestrian Mobility & Transit Plan
St. Charles places a high value on its trail system and should continue to be proactive in establishing and expanding its trails and bike facilities. Alternative modes of transportation are important in reducing vehicular traffic as well as providing recreational opportunities for residents and tourists alike. bicycling and walking are encouraged, and the City is proactive in providing the infrastructure for active transportation which consists of a robust network of trails and off-road shared-use paths, as well as on-street bikeways and sidewalks.

Trail/Bike Route Legend
- Existing Trail or Route
- Proposed or Planned Bike Route
- Existing On-Street Bike Route

Pace Bus Route Legend
- Pace 600
- Pace 300
- Future BRT Corridor
- Pace Call-On-Hand

Map Legend
- St. Charles Corporate Limits
- Roadway
- Park/Open Space
- River/Waterbody
- Creek/Stream
CONCEPT PLAN OPTIONS

4 OPTIONS WERE EVALUATED

• Do Nothing
• No-Build – Buy all impacted structures
• Engineered Section
• Greenway Section
CONCEPT PLAN – ENGINEERED OPTION

7th Avenue Creek Improvements

Channelized Floodplain Option
Middle Segment
Exhibit 3 of 5

City of St. Charles, IL

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

Legend
- Culvert Removal or Replacement
- Culvert Replacement
- Vacant Property Acquisition
- Minimum Trapezoidal Channel Topwidth
- Tier 2 Acquisition
- Tier 1 Acquisition
- Easement
- Proposed 100Yr Floodplain
- City Owned Parcels
- Parcels
- Stream Centerlines

CONCEPT PLAN – ENGINEERED OPTION

Easement

Channelized Stream

Culvert Replacement

Tier 1 Acquisition

Tier 2 Acquisition

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

7th Avenue Creek Master Plan Development | ST. CHARLES, IL
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
- Greenway
- Stream
- Vacant Property Acquisition
- Mandering within Greenway
- Max Potential Greenway
- Proposed 100yr Floodplain
- City Owned Parcels
- Parcels
- Stream Centerline

Proposed Improvements
- Culvert Replacement
- Greenway & Stream Restoration
- Land Acquisition

Greenway & Stream Restoration
Land Acquisition
Culvert Replacement
Option #1 – Engineered
Channel Excavation and Culvert Replacement

Option #2 – Greenway
Greenway and Stream Restoration with Culvert Replacement
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)
# 7th Avenue Project Rating Criteria

## Engineered Versus Greenway Option by Reach

<table>
<thead>
<tr>
<th>Assessment Factors</th>
<th>Assessment Factor Scoring Scale</th>
<th>Score</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Reach is severely eroded and provides minimal buffer to adjacent properties</strong></td>
<td>Negligible to low erosion</td>
<td>0</td>
<td>Severe erosion channel, minimal to no buffer to existing property, potential structures at risk</td>
</tr>
<tr>
<td>2. Reach contributes significantly to water quality impairment?</td>
<td>N/A to minimal water quality impact</td>
<td>1</td>
<td>Moderate water quality impact</td>
</tr>
<tr>
<td>3. Bank stabilization, creek meandering and floodplain enhancement; in this reach would rank well for water quality</td>
<td>N/A or would be considered a low priority project by EPA</td>
<td>2</td>
<td>High or would be considered a high priority project by EPA</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.</td>
<td>3</td>
<td>Reach has required extensive maintenance. Is a bottleneck and accumulates sediments</td>
</tr>
<tr>
<td>5. Reach has historically required significant maintenance.</td>
<td>N/A. Reach has not required significant maintenance.</td>
<td>4</td>
<td>Reach would require minimal to moderate transitions from u/s to d/s</td>
</tr>
<tr>
<td>6. Reach has difficult access for maintenance?</td>
<td>Easy access</td>
<td>5</td>
<td>Great connectivity: U/s improvements need to be carried through this reach for benefit to w/s reaches</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</td>
<td>6</td>
<td>Moderate to low maintenance, similar to other reaches</td>
</tr>
</tbody>
</table>

### Reach Condition, Water Quality, Grants Opportunity
<table>
<thead>
<tr>
<th>ASSESSMENT FACTORS</th>
<th>ASSESSMENT FACTOR SCORING SCALE</th>
<th>SCORE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.</strong> Reach is in an area that level of improvements selected between an engineered option and greenway option would have an impact on future development opportunity.</td>
<td>High impacts to economic development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9.</strong> Reach improvements need to be aligned with City Comprehensive plan?</td>
<td>N/A. Minimal to insignificant synergy between the reach versus the City Comp. Plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10.</strong> Reach improvements need to be aligned with City Strategic Plan?</td>
<td>N/A. Minimal to insignificant synergy between the reach versus the City Strategic Plan.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>11.</strong> Reach is located in an area where desired ROW is currently available or can be acquired.</td>
<td>ROW acquisition is generally feasible.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>12.</strong> Reach is generally unsafe with close proximity of the channel to homes and/or high velocities in the channel. Improvements shall consider safety in design.</td>
<td>N/A. Improvements have minimal impacts to safety.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>13.</strong> Engineered versus Greenway option Benefit Costs are significant higher.</td>
<td>Engineered option has a significantly high BCR than a greenway option (2.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>14.</strong> Reach improvements have minimal impacts to utilities and will not require relocation of utilities.</td>
<td>High impacts to utility. Will require significant relocation or lowering of utilities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moderate impacts to utilities. Some conflicts but will not require major relocation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No impacts to utilities.</td>
<td></td>
<td></td>
</tr>
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</table>

**TOTAL SCORE:** 0
### PROJECT DEVELOPMENT PLAN: APPLICATION OF OBJECTIVE AND SUBJECTIVE CRITERIA

#### PROJECTIONS 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>

7th Avenue Creek Master Plan Development | ST. CHARLES, IL
Will businesses be acquired or significantly impacted for a greenway corridor implementation

Yes

Engineered Option

No

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

No

Yes

Greenway Option

Yes

Grant Eligibility High

No

Yes

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

No
1. Relocate channel south and realign using analog geometry from S. Br. Norton Creek. Widen floodway modifying toe of bank and floodplain surface. Increase floodplain storage.

2. All overbank vegetation shall be removed and replanted with native vegetation. Grade floodplain where feasible to increase floodplain storage volume.

3. Remove existing abandoned railroad spur berms to eliminate flow restrictions and increase floodplain storage.


5. Re-grade back lot areas above 100-year floodplain to maximize parking areas; Sa: Naturalize existing stormwater basin; Sb: Permeable paving in regraded parking area.

6. Modify existing storm outfalls for water quality improvement.

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

7. Transform abandoned pit to natural wetland feature.

8. Improve stormwater filtration and habitat opportunities within the existing stormwater basin.

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.

October 19, 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 structures.
10. Skewed culvert, Refer to Reach 1 drawings.

Reaches 2 Through 5 - 7th Avenue Creek
Floodplain Improvements

October 19, 2016

Cedar Ave.

Reach 4

WALNUT AVE

REACH 5

ILLINOIS AVE.

Neighborhood Mixed Use Commercial

Neighborhood Residential

 Existing Industrial

E. MAIN ST.

Reach 3

Reach 2

INDIANA AVE.

S. TAP Ave.

S. 18 Ave.

S. 8 Ave.

October 19, 2016

27
7th Avenue Creek
Reach 6 – Sta. 59+26, Proposed Section Looking Upstream
7th Avenue Creek
Reach 2 – Sta. 74+90 Proposed Section Looking Upstream
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>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
<td>Engineered</td>
<td>Greenway</td>
</tr>
<tr>
<td>EOPC</td>
<td>$26.5M</td>
<td>$12.6M</td>
<td>$21.7M</td>
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<tr>
<td>Commercial</td>
<td>13</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Acquisition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>50</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>Acquisition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacant Parcel</td>
<td>0</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Acquisition</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Excludes property already acquired by the City i.e. 811 Illinois, 115 9th and 904 South*
# 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*
QUESTIONS FROM THE AUDIENCE

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