City of Park Ridge


February 12, 2018

Stormwater Master Plan
Final Summary Presentation

Purpose of Tonight's Presentation

- Summarize Prior Presentations
- Stormwater Utility Rate Recommendation
- Project Prioritization
- Final SMP Report

Prior SMP Presentations

Presentation #1 (1/9/17): Update on flood questionnaires, etc.

Presentation #2 (6/12/17): Discussion on Level of Protection

- Decided to set different LOP standards for basement backup and overland flooding
- Demonstrated that private flood control systems were most cost effective approach to achieve desirable LOP

Presentation #3 (9/11/17): Discussion on Overland Flooding

- Presented concept projects to achieve overland flooding protection for various LOP's
- Decided to move forward with 100-year LOP for overland flooding
- Presented $106 Million in projects to achieve 100-year LOP

Stormwater Utility – Rate Setting

Stormwater Utility (SWU) Review:

- ERU – ***Equivalent Residential Unit*** is a unit of measure of impervious surfaces on a property. 1 ERU was defined to be 2,800 sf of impervious area.
- The SWU analysis recommended a fee of **$11/month** per ERU
    - Based upon assumed program cost of $40 million over 20 years
- Need to reconsider rate setting recommendation based upon current **Stormwater Master Plan**

Stormwater Utility – Rate Setting

- Guidance from Council was to base ERU rate setting on 100-yr LOP ($106 million) assuming two 20-year programs (40 years).

Challenges with SWU Rate Setting:

1. Extrapolation of Funding Assumptions over 40 years
    - Interest Rates, Escalation of Construction Costs, Etc. – Difficult to Predict
2. Project Uncertainties (Property Acquisition and/or Agency Agreements)

Stormwater Utility – Rate Setting

Recommendation: **Keep rate of 1 ERU = $11/month**

Rationale:

1. Uncertainties with projects could easily change total program cost
2. Confidence that $11/ERU could fund approximately $40 million in projects over first 20 years
3. ERU rate will likely be adjusted over time anyway as SMP projects are added/deleted and as borrowing costs are analyzed

Project Prioritization

From 9/11/17 Presentation

- Eight projects or groups of projects totaling $106 million
- Need to prioritize list to help with implementing projects

Project	Estimated Cost		
	25-yr LOP	50-yr LOP	100-yr LOP
Northeast Park Area	$5.7 million	$7.2 million	$8.8 million
Northwest Park Area	$15.7 million* (100yr LOP)	$15.7 million* (100yr LOP)	$15.7 million (100yr LOP)
Crescent Avenue	$7.8 million	$9.8 million	$12.3 million
Sibley Ave. Storm Sewer	$12.0 million* (LOP n/a)	$12.0 million* (LOP n/a)	$12.0 million* (LOP n/a)
Cherry Street	$3.9 million	$4.7 million	$5.7 million
Milton/Irwin/Babetta	$2.2 million	$2.2 million	$2.3 million
PRCC Storage	$24.6 million	$29.8 million	$35.9 million
Delphia/Laverne/Lahon	$1.9 million	$1.9 million	$1.9 million
Austin Street	$0.5 million	$0.5 million	$0.6 million
Hastings Street	$1.3 million	$1.5 million	$1.5 million
Marvin Parkway	$1.7 million	$2.3 million	$2.3 million*(50yr LOP)
Southwest Park Area	$3.1 million	$3.8 million	$4.5 million
Mayfield	$2.5 million* (100yr LOP)	$2.5 million* (100yr LOP)	$2.5 million
TOTAL	**$83 million**	**$94 million**	**$106 million**

Project Prioritization

- Prioritization based ***only*** upon flooding benefits and estimated costs
    - Other factors could be considered – property acquisition, financing method, time to implement, etc.
- Two steps in determining flooding benefits – **overland flooding** and **sewer backup** benefits

STEP 1: Benefit-Cost Analysis (BCA) was completed for the 8 projects/groups

Project Prioritization

Benefit-Cost Analysis:

Input Parameter	Data Source or Assumptions
Assessed Property Value	Used Median Property Value for all Properties
Water Surface (Flooding) Elevation	Determined for each property for various storms by XP-SWMM modeling
Structure Type	Assumed all properties were 2 story with basement
Low Entry Elevation	Reviewed surface topography to find lowest elevation adjacent to home (Lowest Adjacent Grade), assumed to be equal to Low Entry Elevation
First Floor Elevation	Assumed Lowest Adjacent Grade +1’

- Developed database for all parcels with:
  - Existing/proposed 10-, 25-, 50-, and 100-year flood elevations
  - Low Entry/First Floor Elevation data

Project Prioritization

Benefit-Cost Analysis:

- Database was used to calculate expected flood damages for with- and without-project conditions
    - Based upon ***Flood Depth vs. Damage Curves*** established by the US Army Corps of Engineers
    - Flood damages were totaled for each project area
    - Difference between without- and with-project damages is considered to be the ***Project Benefit***
- Project Benefit / Project Cost = **Benefit-Cost Ratio (BCR)**

Project Prioritization

Notes on BCR Calculation:

- BCR is typically used to determine cost-effectiveness of project, i.e. whether the benefits outweigh the costs.

- Because general assumptions had to be made (low entry elevations, etc.), ***the BCR should be used for comparing projects*** and not necessarily for determining cost-effectiveness

Project Prioritization

Project Ranking Based on Overland Flooding (Step 1):

Project	Computed BCR	Rank
Mayfield	5.2	1
West Sibley Corridor	1.7	2
Marvin Parkway	1.0	3
Northwest Park	0.89	4
East Sibley Corridor	0.80	5
Crescent Avenue	0.72	6
Northeast Park	0.68	7
Southwest Park	0.5	8

Project Prioritization

Step 2: Determining Sewer Backup Benefits

- Even though projects are intended to address overland flooding, there will be ancillary benefits to the system that reduce the number of homes experiencing sewer backup
- For each project, the 10-year event was simulated and any homes that were eliminated from being "at-risk" were considered to be a benefit.
- The benefitting homes were quantified, and the project cost was divided by number of homes to establish a cost per property, which was ranked between the projects.

Project Prioritization

Project Ranking Based on Sewer Backup (Step 2):

Project	Computed Cost Per Property Protected from Basement Backup (10-yr Event)	Rank
Northwest Park	$32,914	1
Northeast Park	$34,363	2
Southwest Park	$38,136	3
Marvin Parkway	$92,000	4
West Sibley Corridor	$153,846	5
Crescent Avenue	$267,391	6
East Sibley Corridor	$293,382	7
Mayfield	n/a	8

Project Prioritization

Final Prioritization Based on a Weighted Average of Overland and Sewer Backup Rankings:

- Weighted 75% for Overland, 25% for Sewer Backup

Example:

Overland Rank = 3

Backup Rank = 4

Project Score = (.75 x 3) + (.25 x 4) = 3.25

- Lowest project score is the highest ranking project

Project Prioritization

Recommended Project Prioritization:

Project	Overland Rank	Basement Backup Rank	Score	Rank
Mayfield	1	8	2.8	1
West Sibley Corridor	2	5	2.8	2
Marvin Parkway	3	4	3.3	3
Northwest Park	4	1	3.3	4
Northeast Park	6	2	5.0	5
East Sibley Corridor	5	7	5.5	6
Crescent Avenue	7	6	6.8	7
Southwest Park	8	3	6.8	8

Final SMP Report

- Final SMP Report is complete and on City's website

Questions?