



Elmhurst Stormwater Drainage Solution Recommendations

**Presented by: Jackie Fisher
Stormwater System Public
Infrastructure Sub-Committee**

**Elmhurst City Council
August 20, 2012**

Stormwater Problems in Elmhurst



Stormwater System Public Infrastructure Sub-Committee focused on the most pressing problems faced by a significant of homes in all parts of Elmhurst. We addressed over-foundation flooding for stormwater.



- Major factors:
- Ground elevations and drainage patterns,
 - Capacity of the stormwater management infrastructure,
 - Land development, and
 - Others.



Courtesy of Elmhurst.Patch.com/Morrow Family
Map of 10 Study Areas, April 2012 CBBE Report


Stormwater Sub-Committee Goal



Goal: To evaluate the CBBE reports and to **identify opportunities to reduce the risk** and impacts of over-foundation flooding in the City, focusing on **maximization of the benefits to the largest number of residences possible while balancing the ease of implementation** of the solutions.



Courtesy of Elmhurst.Patch.com



Stormwater Sub-Committee Process

Stormwater Sub-Committee Process



Background Review

- Reviewed background information related to stormwater issues
- Stormwater Websites, CBBE Materials, Previous Elmhurst Studies

Report Merit

- Evaluated the scientific merit and thoroughness of the CBBE Report
- Assessed the overall report goals and compared it to CBBE's overall approach, methodology and resulting recommendations.

Follow Up

- Collected additional modeling and other information from CBBE
- Met with City management and staff to have questions addressed

Stormwater Sub-Committee Process



Tabulated Data

- A master table was compiled for each Study Area that compared the modeling results with both drainage & waterproofing solutions

Evaluated Solutions


- Critically evaluated the proposed drainage alternative(s) for each Study Area, considering multiple factors.

Established Tiers

- A tiered approach was developed to help prioritize the selection of potential alternatives; this hierarchy is directly based on severity of the problem, value of alternative, and feasibility of implementation.



**Evaluation of the scientific merit and
thoroughness of the CBBE Report**



Stormwater Sub-Committee: CBBE Report Analysis



Modeling Approach

- Sufficiently detailed to adequately represent the system for the intended purposes of this study.

Cost Estimates

- Concept-level cost estimates were within the norm
- Caveat: costs did not include third party land acquisition or usage costs

Drainage Improvement Alternative

- Appropriate options were presented to mitigate flooding flood. Caveat: Alternatives could have been more innovative or “out of the box”

Report Utilization

- Report should be used as a starting point for making decisions but final decisions and planning of capitol improvement projects will require additional effort by the City

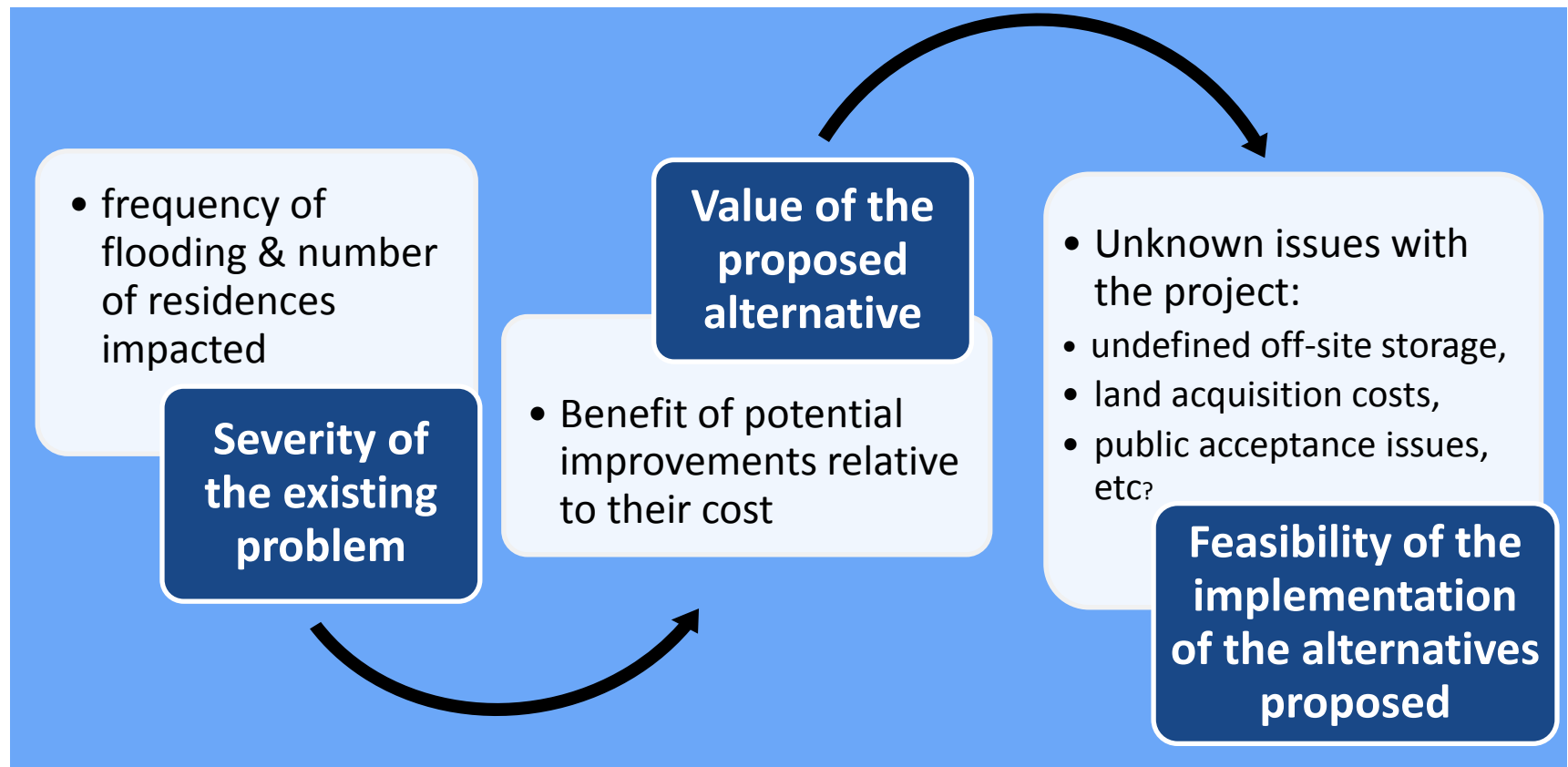


Critical Evaluation of the Drainage Improvement Alternatives

Stormwater Sub-Committee: Analysis of Proposed Drainage Improvement Alternatives



Critically evaluated each drainage alternative in each Study Area, looking at a number of factors:



Example Evaluation of Drainage Improvement Alternative :



20% chance in a given year that they will be flooded

Severity of the Problem

Problem Area Location	Number of Homes Flooded Per Flood Frequency						Homes Eligible for Flood Proofing	Homes Ineligible for Floodproofing
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year		
A. Spring Rd & Harrison St	0	0	13	13	15	17	4	13
B. Saylor Ave & Jackson Ave	0	0	4	11	47	10	67	37
C. Vallette St & Swain Ave	0	5	7	55	80	33	79	15
D. Washington St	0	0	13	30	53	33	31	32
E. Crescent Ave & Cambridge Ave	0	0	0	3	10	38	36	2
Subtotal	0	5	37	109	195	278	217	99

Drainage Solution Evaluation Value of Alternative

Alternative ID	# of Homes Removed	Cost *	Cost per structure	Proposed Level of Protection
Southwest #1 (Areas B, D, E)	162	\$6,910,000	\$43,000	10-through 100-Year
Southwest #2 (Areas B, D, E)	215	\$26,100,000	\$121,000 (effectively \$362,000)	100-Year
Southwest #3 (Area A)	17	\$3,730,000	\$219,000	100-Year
Southwest #4 (Area C)	87	\$11,530,000	\$133,000	100-Year

* Assumes above ground storage and no allowance for acquisition costs.

Feasibility of Alternative

Drainage Improvement Tiers

Tiers were developed to help prioritize potential alternatives; this hierarchy is directly based on severity of the problem, value of alternative, and feasibility of implementation.

Drainage Improvement Solutions Tiers:

Tier #1	Tier #2	Tier #3*
<p>Positively impacts the largest number of homes by cost effectively reducing over-foundation flooding.</p>	<p>Positively impacts a number of homes that are routinely flooded during smaller rain events by cost effectively reducing over-foundation flooding.</p>	<p>Positively impact a number of homes. However, the alternatives were perceived to be infeasible because :</p> <ol style="list-style-type: none">1) Non-preferred variants of Tier 1 or Tier 2 alternatives,2) Were cost prohibitive or3) Other less costly options were available such as flood-proofing.

*Note: If a drainage improvement alternative isn't considered to be feasible for a given study area, then the sub-committee recommends that other alternatives be evaluated and pursued by the City.

Stormwater Sub-Committee: Tier 1 Drainage Improvements



Drainage Improvement Solution	Alternative ID	# of Homes Removed	Cost *	Cost per structure	Proposed Level of Protection
Tier 1	Southwest #1 (Areas B, D, E)	162	\$6,910,000	\$43,000	10-through 100-Year
	Pine Street #1**	16	\$1,650,000	\$103,000	50-Year
	Southwest #4 (Area C)***	87	\$11,530,000	\$133,000	100-Year
	Southwest #3 (Area A)	17	\$3,730,000	\$219,000	100-Year
		Total Cost:	\$23,820,000		

- Assumes above ground storage and no allowance for acquisition costs.
- **The city installed high capacity inlets were and open grates were added to some storm sewer manholes on Pine Street to improve drainage during rain events.
- ***Additional inlets were added at the low point of Spring Road between McKinley and Crescent.
- Church windows were removed from all inlets in problem areas (Parkside, Pine, Washington, etc.).

Stormwater Sub-Committee: Tier 2 Drainage Improvements



Drainage Improvement Solution	Alternative ID	# of Homes Removed	Cost *	Cost per structure	Proposed Level of Protection
Tier 2	Yorkfield #1	11	\$710,000	\$65,000**	100-Year
	Seminole #2***	4	\$350,000	\$88,000	100-Year
	Geneva Ave #1	8	\$1,300,000	\$163,000	100-Year
		Total Cost:	\$2,360,000		

*Assumes above ground storage and no allowance for acquisition costs.

**Requires private property acquisition.

*** High capacity inlets were installed on Cottage Hill south of St. Charles to increase the amount of water entering the storm sewer system instead of sheet flowing to the intersection of Cottage Hill and Seminole. Church windows were cut of inlets at the intersection.

Stormwater Sub-Committee: Tier 3 Drainage Improvements



Drainage Improvement Solution	Alternative ID	# of Homes Removed	Cost *	Cost per structure	Proposed Level of Protection
Tier 3	Southwest #2 (Areas B, D, E)	215	\$26,100,000	\$121,000 (effectively \$362,000)	100-Year
	Pine Street #2	20	\$2,560,000	\$128,000 (effectively \$228,000)	100-Year
	Yorkfield #2	11	\$1,880,000	\$171,000	100-Year
	Seminole #1	4	\$810,000	\$203,000	100-Year
	Brynhaven #1	22	\$3,450,000	\$157,000 (effectively \$445,000)	100-Year
	Brynhaven #2	2	\$1,670,000	\$835,000	100-Year
	Larch#1	3	\$1,800,000	\$600,000	100-Year
	Pick #1	1	\$3,010,000	\$3,010,000	100-Year
	Pick #2	0	\$1,570,000	-	10-Year
	Pick #3	1	\$2,340,000	\$2,340,000	100-Year
	York St/I-290#1	0	\$670,000	-	100-Year
		Total Cost:	\$45,860,000		

* Assumes above ground storage and no allowance for acquisition costs.

Stormwater Sub-Committee: Drainage Improvement Solution Next Steps



Next Steps: City should utilize CBBE Report as a starting point in the decision making process

City should coordinate with key property owners and stakeholders to ascertain the potential costs for the acquisition of properties needed for stormwater storage

City should determine public acceptance of altering neighborhood parks or open spaces that would be used for stormwater storage

With this information, the City should be able to:

- **Choose and prioritize solutions**



Stormwater Sub-Committee

Additional Recommendations to City Council

Stormwater Sub-Committee: City Recommendations



The Stormwater Sub-Committee Supports the recommendations in the CBBE Report that relate to the following areas:

- **Backup Power**
- **Redeveloped Properties and Ordinances**
- **Elevation of New Structures**

Stormwater Sub-Committee: Flood Proofing



In addition to or in some cases in lieu of larger scale drainage alternatives the Sub-committee recommends evaluating flood proofing solutions.

Flood proofing measures can include:

- **Installation of glass block windows**
- **Raising window wells**
- **Installation of waterproof window well covers**
- **Re-grading of sidewalks/driveways**
- **Retaining walls**

Stormwater Sub-Committee: City Recommendations



Retrofitting Original and Redeveloped Properties:

We recommend to the City to develop an incentive program encouraging all current owners of redeveloped properties to disconnect their stormwater downspouts from the stormwater sewers to minimize stormwater input during peak flow conditions

We recommend to the City to develop an incentive program encouraging stormwater management retrofit solutions for all properties that could minimize stormwater entering into stormwater system including, such as adding infiltration trenches, rain gardens, rain barrels

Stormwater Sub-Committee: City Recommendation



Reverse-Sloped Driveways:

- We recognize that properties with **reverse sloped driveways** are **most at-risk for stormwater damage** from over-foundation flooding.
- We encourage the **City to evaluate flooding conditions at each of these properties** to identify potential flood-proofing solutions.
- The City should not require homeowners to disconnect their reversed-sloped driveways from the sanitary sewer system until a sufficient stormwater drainage solution has been implemented.

Stormwater Sub-Committee: City Recommendation 6



Cost-sharing Programs:

- The Stormwater Sub-Committee encourages any and all actions that will mitigate stormwater flooding.
- We encourage the City to consider and/or continue cost-sharing programs that minimize off-site stormwater discharge and that prevent over-foundation flooding
- List of programs that could be considered for cost-sharing include, but not limited to:
 - Annual rain garden grant program
 - Annual rain barrel grant program
 - Dry-proofing flood prone structures



In Summary...

Stormwater Sub-Committee: Summary



- The Stormwater Sub-Committee encourages the City to follow our tiered recommendations as a starting point for making decisions that will positively impact all residents in our community.
- We strongly encourage the City to take action to protect homeowners from over-foundation flooding by utilizing the additional recommendations made by this sub-committee.

Stormwater Sub-Committee: Summary



- The Stormwater Sub-Committee believes it is the City's responsibility to provide an infrastructure that will reasonably protect homes from stormwater damage during most rain events.
- The problems that the Stormwater Sub-Committee addressed are not new and developed over many decades.
- Correspondingly, solutions will require a sustained, long-term effort, public investment and the will of policy makers to make difficult decisions for the collective good of the community.

Acknowledgments



- Sub-Committee Members
- Elmhurst City Council
- Public Works Department
- Mayor DiCianni
- City Manager, Jim Garbowski
- Elmhurst Community
- CBBE



Questions?

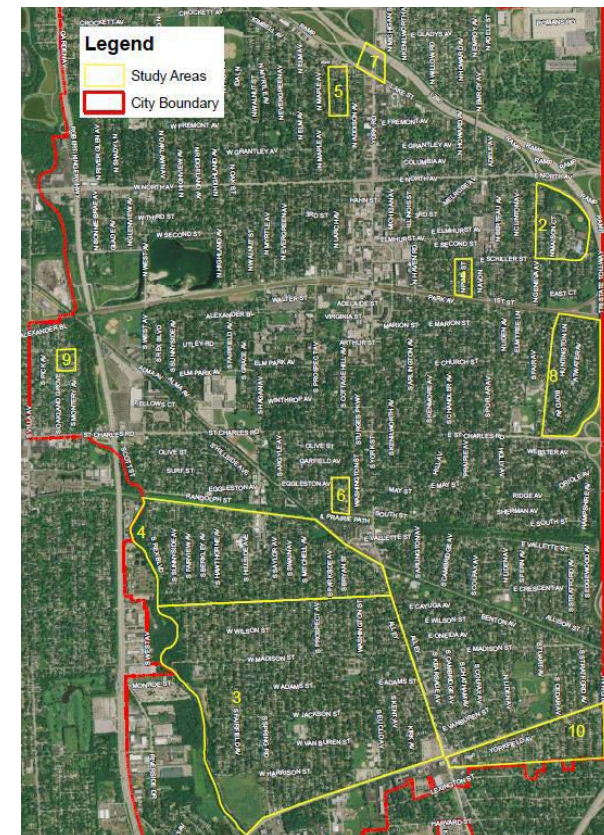
Extra Slides



Stormwater Problems in Elmhurst



Scope of Problem:
Hundreds of private properties in all sections of the city face some form of flooding during moderate intensity (or higher) rainfall events



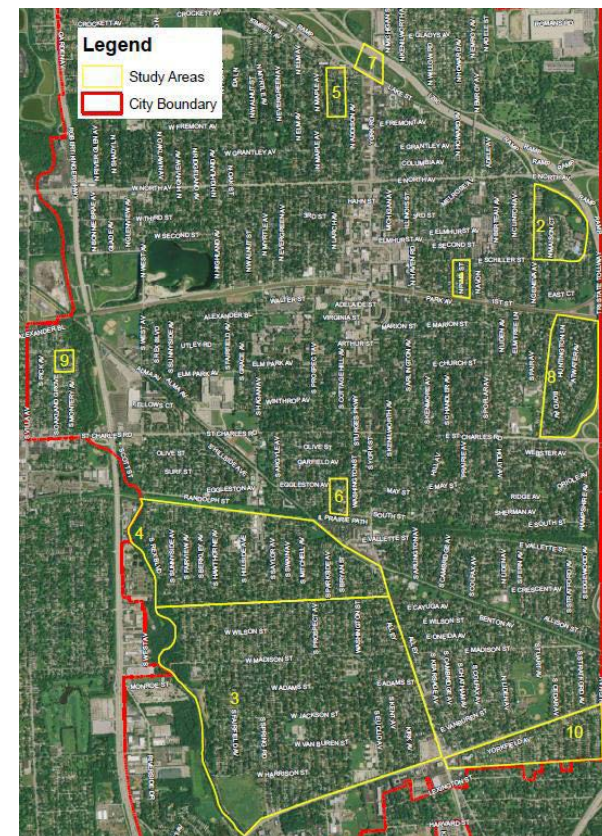
Map of 10 Study Areas, April 2012 CBBE Report

Stormwater Problems in Elmhurst



Contributing Factors:

- Ground surface elevations and drainage patterns,
- Capacity of the stormwater management infrastructure,
- Land development with impervious surfaces, and
- Others.



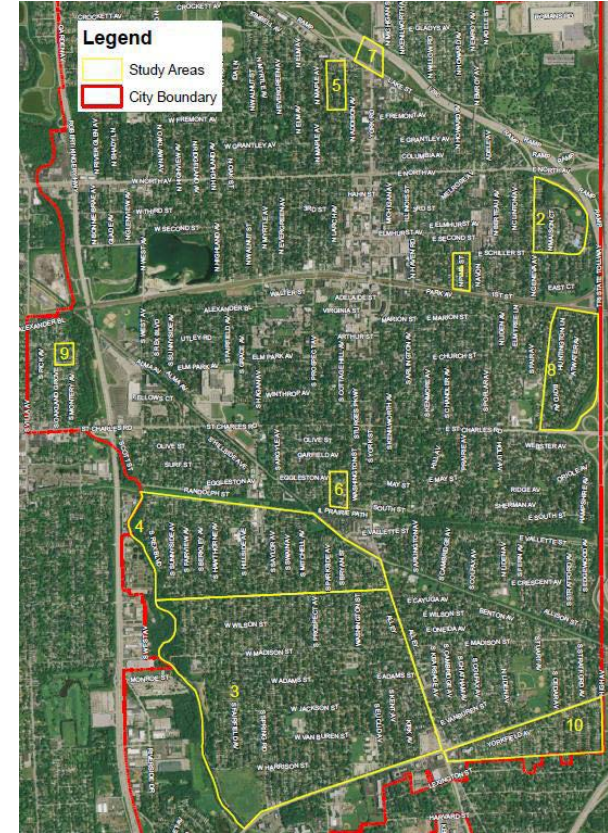
Map of 10 Study Areas, April 2012 CBBE Report

Stormwater Problems in Elmhurst



Stormwater System Public Infrastructure Sub-Committee

focused on the **most pressing problems** faced by **HUNDREDS** of homes in all parts of Elmhurst. The Sub-Committee focused on **over-foundation flooding**.



Map of 10 Study Areas, April 2012 CBBE Report