

Table 4: Sewer Project Descriptions

ID	Description	Justification
102	Replacement of existing 18" sewer with new 30" sewer on Roosevelt Rd from Wesley Ave to Scoville Ave. New 30" and 24" relief sewer on Fillmore St from East Ave to Ridgeland Ave. Replacement of existing 12" sewer with new 15" and 18" sewers on Clarence Ave from Harvard St to Roosevelt Rd.	Project increases conveyance capacity to East Ave and Ridgeland Ave trunks, replaces undersized sewers on Clarence Ave.
103	Replacement of small diameter sewers with 24" and 18" sewers on Garfield St and East Ave. New 36" and 30" relief sewer on Harvard St from East Ave to Ridgeland Ave.	Project increases conveyance capacity to East Ave and Ridgeland trunks, replaces undersized sewers on Garfield Ave.
104	Replacement of existing 12" sewer on Clinton Ave from Harvard St to Roosevelt Rd with new 15" and 18" sewers.	Project replaces undersized 12" sewer.
105	Replacement of existing 12" sewer on Kenilworth Ave from Harvard St to Roosevelt Rd with new 15" and 18" sewers.	Project replaces undersized 12" sewer.
106	Replacement of existing sewers with new 36" - 24" sewers on Jackson Blvd from Austin Blvd to Lombard Ave.	Project replaces undersized collector sewer, increases conveyance to Lombard interceptor.
107	New 42" and 36" relief sewer on LeMoyne Pkwy from Edmer to East Ave.	Project relieves undersized sewers on Fair Oaks Ave, Elmwood Ave, Rossell Ave, and Edmer Ave. Functions as underground storage in surcharged trunk conditions.
108	New 30" and 24" relief sewer on Van Buren St from Scoville Ave to Ridgeland Ave.	Project relieves three 12" undersized sewers.
109	Replacement of existing 12" sewer on Belleforte Ave from Augusta St to Chicago Ave with a new 15" and 18" sewers.	Project replaces undersized 12" sewer.
110	Replacement of existing 12" sewer on Woodbine Ave from Augusta St to Chicago Ave with new 15" and 18" sewers.	Project replaces undersized 12" sewer.
111	Replacement of existing 12" sewer on Kenilworth Ave from Augusta St to Chicago Ave with new 15" and 18" sewers.	Project replaces undersized 12" sewer.
112	Replacement of existing sewers on Augusta St, Forest Ave, and Chicago Ave with new relief sewer discharging to existing junction chamber.	Project increases conveyance to Chicago Ave interceptor.
113	Replacement of existing trunk sewer on Lombard Ave from Greenfield St to Erie St.	Project increases conveyance to Lombard Ave interceptor.
114	Replacement of upstream section of East Ave trunk sewer from LeMoyne Pkwy to Chicago Ave.	Project increases upstream conveyance of East Ave trunk sewer and reduces pressurization during intense events.
115	Replacement of undersized sewer on Columbian Ave from Berkshire St to Division St.	Project replaces undersized 12" sewer.

Table 5: Sewer Project Cost Summary

ID	Length (ft)	Size (in)	Pipe/Manhole Cost	Restoration Cost	Estimated Total Construction Cost
102	40	36	\$ 1,149,000	\$ 746,000	\$ 1,927,000
	1340	30			
	1010	24			
	660	18			
	660	15			
103	1010	24	\$ 1,008,000	\$ 603,000	\$ 1,643,000
	560	18			
	1000	36			
	320	30			
104	660	18	\$ 374,000	\$ 245,000	\$ 619,000
	660	15			
105	660	18	\$ 374,000	\$ 245,000	\$ 619,000
	660	15			
106	360	36	\$ 677,000	\$ 413,000	\$ 1,106,000
	660	30			
	310	24			
	690	18			
107	810	42	\$ 657,000	\$ 345,000	\$ 1,018,000
	710	36			
108	670	30	\$ 344,000	\$ 212,000	\$ 556,000
	335	24			
109	660	18	\$ 375,000	\$ 245,000	\$ 620,000
	660	15			
110	660	18	\$ 375,000	\$ 245,000	\$ 620,000
	660	15			
111	660	18	\$ 375,000	\$ 245,000	\$ 620,000
	660	15			
112	80	36	\$ 727,000	\$ 449,000	\$ 1,176,000
	670	30			
	720	27			
	670	24			
113	5190	72	\$ 5,100,000	\$ 1,469,000	\$ 6,569,000
114	4620	84	\$ 5,324,040	\$ 1,396,000	\$ 6,721,000

Scoring

Benefit scores given to local and relief projects are shown in Table 6. Local and relief projects presented in this report are ranked in two ways; with a cost efficiency score and with a benefit score. Projects can first be evaluated and prioritized by their cost efficiency score. The cost efficiency score is shown as the Cost per Building Improved and is the total project cost shown divided by the number of buildings within all the subcatchments improved by that project. The number of buildings improved does not consider proposed level of protection, which varies from 5-year to 10-year.

Projects which have similar and acceptable cost efficiency scores can then be prioritized by their benefit score, which considers not only the final level of protection, but also the severity of existing flood risk improved upon.

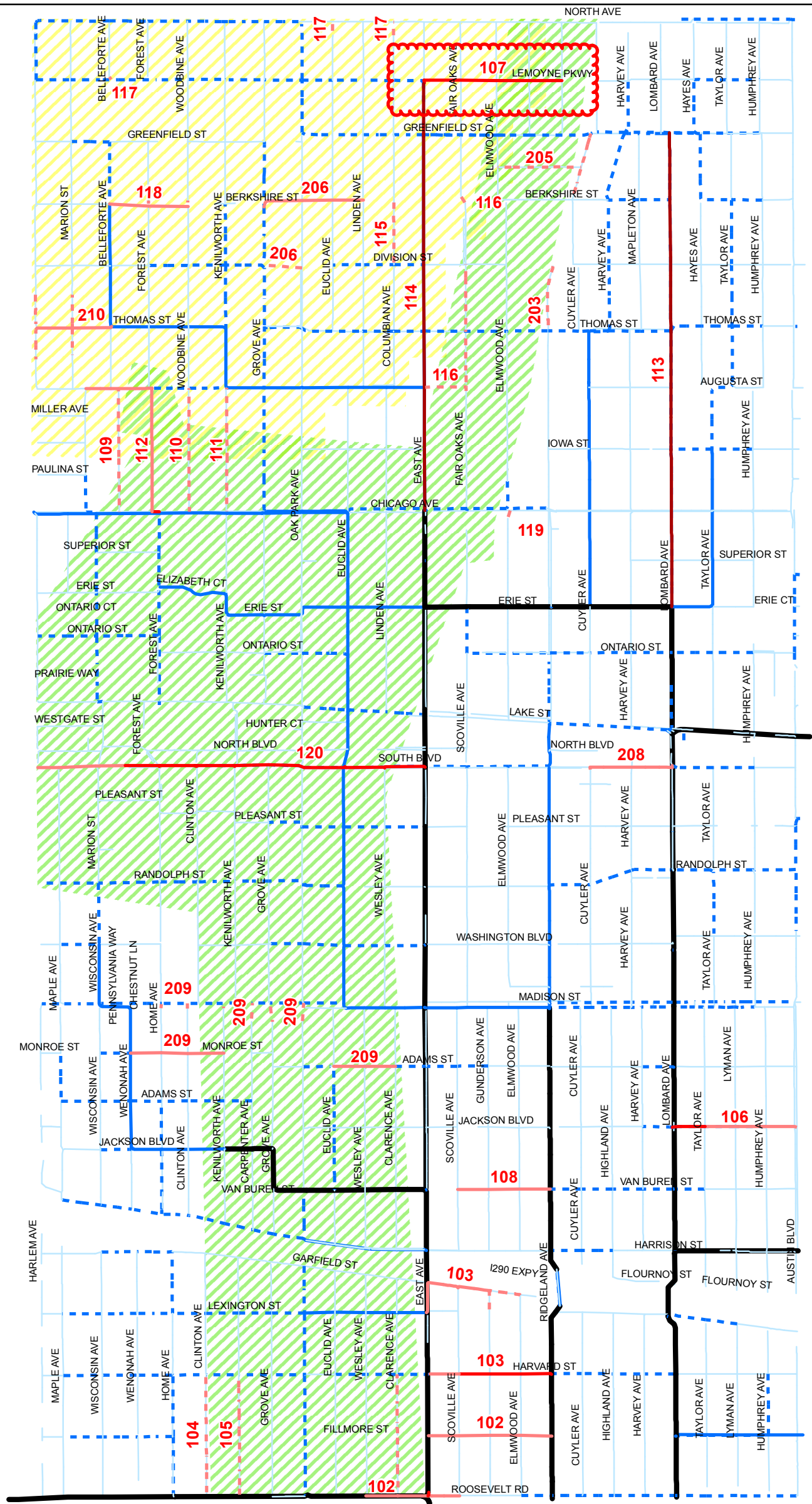
The benefit score for each project is based on the improved basement flood risk for each impacted catchment. The score for each project is calculated as the average score of the catchments impacted by an improvement, weighted by the number of buildings in each catchment. For example, the score for Project 109 is a weighted average of a score of 7 for improving 26 buildings from a 2 year risk to a 10 year risk, and a score of 5 for improving 20 buildings from a 5 year risk to a 10 year risk, resulting in a final benefit score of 6.1. Table 6 summarizes benefit score assignment used in this analysis.

Table 6: Benefit score values assigned to each area improved

Existing Protection	Proposed Protection	Score
<1 year	10 year	10
<1 year	5 year	9
1 year	10 year	8
1 year	5 year	7
2 year	10 year	6
2 year	5 year	5
5 year	10 year	4

Table 7: Sewer Project Scoring Summary



ID	Existing Risk	Proposed Risk	Buildings	Benefit Score	Cost/Bldg Improved
102	2	5	90	7.2	\$ 4,000
	5	>10	120		
	10	>10	30		
	1	>10	80		
	1	5	39		
	1	10	18		
	2	>10	100		
103	2	5	52	7.1	\$ 7,200
	5	>10	48		
	2	>10	129		
104	5	10	65	5.0	\$ 9,500
105	5	10	65	5.0	\$ 9,500
106	5	>10	34	4.5	\$ 7,400
	10	>10	116		
107	2	10	24	5.3	\$ 3,700
	2	>10	29		
	5	10	1		
	5	>10	82		
	10	>10	140		
108	5	>10	96	5.3	\$ 3,800
	10	>10	50		
109	2	10	26	6.1	\$23,846
	5	10	20		
110	5	10	46	5.0	\$13,478
111	5	10	30	5.0	\$20,667
112+210	2	5	74	5.7	\$23,500
	5	10	31		
113	2	10	26	4.5	\$ 5,400
	5	10	166		
	5	>10	195		
	10	>10	832		
114+206+115	2	10	88	5.4	\$16,600
	5	10	406		




Legend

Recommended Projects

Diameter

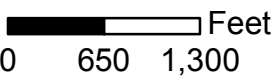
- 12 - 18 in.
 24 - 30 in.
 36 - 48 in.
 72 - 84 in.

 10% Impervious Reduction Inlet Control Area

Existing Sewer

Diameter

- 6 - 22 in.
 - - - 24 - 48 in.
 — 50 - 82 in.
 — 84 - 180 in.



ID	Benefit Score	Cost/Bldg Improved	Estimated Total Cost	ID	Benefit Score	Cost/Bldg Improved	Estimated Total Cost
119	7.0	\$ 2,200	\$ 64,000	105	5.0	\$ 9,500	\$ 619,000
107	5.3	\$ 3,700	\$ 1,018,000	118	7.0	\$ 11,400	\$ 613,000
108	5.3	\$ 3,600	\$ 558,000	110	5.0	\$ 13,500	\$ 620,000
102	7.2	\$ 4,000	\$ 1,927,000	114+206	5.1	\$ 13,600	\$ 7,814,000
209	7.6	\$ 5,300	\$ 1,554,000	116	6.6	\$ 13,700	\$ 1,072,000
113	4.5	\$ 5,400	\$ 6,569,000	120	4.7	\$ 14,700	\$ 3,197,000
113+203	4.6	\$ 5,700	\$ 6,976,000	114+206+117	5.3	\$ 15,400	\$ 8,027,000
113+205	4.5	\$ 6,100	\$ 7,510,000	114+206+115	5.4	\$ 16,600	\$ 8,209,000
103	7.1	\$ 7,200	\$ 1,643,000	210	7.0	\$ 17,900	\$ 1,290,000
106	4.5	\$ 7,400	\$ 1,106,000	111	5.0	\$ 20,700	\$ 620,000
208	6.0	\$ 8,400	\$ 610,000	112+210	5.7	\$ 23,500	\$ 2,466,000
104	5.0	\$ 9,500	\$ 619,000	109	6.1	\$ 23,800	\$ 620,000

To:	Bill McKenna, PE	From:	Nicholas Stepina, PE, CFM
	Village of Oak Park Public Works		Chicago-N. Orleans St.
File:	mem_lemoyne_local_analysis.docx	Date:	June 24, 2019

Reference: LeMoyne Parkway Local Sewer Analysis

The *Combined Sewer System Master Plan Report* prepared for the Village of Oak Park by MWH (now Stantec) in February 2014 identified specific capital improvement projects that would result in a reduction in the risk of basement flooding within the community. Figure 22 from the report (attached) shows the location of these recommended projects. As the Village proceeds with their capital improvement program, they are now considering the construction of Project 107.

As described in the Master Plan Report, Project 107 includes the construction of about 1,500-feet of new 42-inch and 36-inch diameter combined sewer along LeMoyne Parkway from Edmer Avenue to East Avenue. The project would reduce the risk of basement flooding for over 40 buildings from a 2-year to a 10-year (or greater) level, and over 220 buildings from a 5-year to a 10-year (or greater) level. Project 107 was evaluated independent of any other improvements presented within the Master Plan Report.

The outlet of Project 107 is a drop manhole structure constructed as part of the 1937 East Avenue improvements. This structure may require replacement depending on whether the new connection can be made without compromising the structure. The benefit of connecting to this manhole is that the outlet is over 30-feet deep, which provides flexibility to construct the new sewer deep enough to avoid utility conflict.

Since the Master Plan Report was completed in 2014, the Village has continued with implementation of inlet control. A total of six new inlet restrictors have been installed within the drainage area contributing to Project 107. Given the new hydrologic conditions, Project 107 as presented in the Master Plan Report was further evaluated to confirm that it should still be considered a recommended project.

To confirm performance, the combined sewer system model was updated to include inlet restriction. Head-discharge curves representing inlet restrictors were added at subcatchment loading nodes. To avoid over-estimating the extent of inlet restriction, larger subcatchments were split into smaller pieces. In total, 31 subcatchments averaging 7.1-acres in the northeast part of the Village were split into 96 subcatchments averaging 2.3-acres. The greater resolution allowed simulation of inlet restriction on each block where it is installed.

Simulations were performed with 5-year and 10-year rainfall events, each event with full and baseflow boundary conditions as described in the Master Plan Report for a total of four scenarios. Two model networks with Project 107 were compared, one with inlet restriction and one without.

After hydrologic updates, it was confirmed that Project 107 performs equally well under current conditions.

Furthermore, after additional model testing it was found that Project 107 can perform as described in the Master Plan Report with reduced pipe diameters. There is no difference in flood risk results after reducing the 36-inch pipe to 30-inch diameter from Edmer Avenue to Elmwood Avenue, and reducing the 42-inch pipe to 36-inch diameter from Elmwood Avenue to East Avenue.

June 24, 2019

Bill McKenna

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Reference: LeMoynes Parkway Local Sewer Analysis

It is recommended that the Village proceed with the design of the 36-inch and 30-inch diameter configuration. We hope that this information is useful to the Village as it continues implementation of the combined sewer capital improvement program.

Stantec Consulting Services, Inc.

A handwritten signature in black ink that reads "Nicholas Stepina". The signature is written in a cursive, flowing style.

Nicholas Stepina, PE, CFM

Senior Hydraulic Engineer

Phone: 312-831-3090

Attachment: Oak Park Sewer Master Plan Report Figure 22.pdf

c. Thera Novotny, PE, PMP

