Radnor Township Wide Assessment – Final Results

March 13, 2017

Summary of Potential Flood Mitigation Projects

Priority Problem Area	Watershed	# of Potential Projects Recommended for Modeling	# of Public Projects (Township, School District, PADOT)	# of Private Projects	# of Basin-Scale Projects	# of Green Street Projects (some contain multiple streets)	# of Conveyance or Stream Channel Projects
A	Ithan	4	3	1	3	0	1
B	Ithan	6	5	1	2	3	1
I	Gulph	7	6	1	5	2	0
J/K	Darby	4	3	1	4	0	0
T	Meadowbrook	6	4	2	2	4	0
U	Meadowbrook	5	0	5	5	0	0
Total	**---**	***32***	***21***	***11***	***21***	***9***	***2***

Rainfall Design Event for Analysis

- Focused on 10-year, 1-hour event
- Total rainfall depth = 2.03”
- Majority of conceptual solutions designed to capture 2” from impervious area
  - Wanted to account for full benefit of solutions

Limitations of Potential Flood Mitigation Projects

- The potential flood mitigation projects identified and modeled for this effort **will help to reduce flooding by varying extents in various locations** in each priority problem area
- These project are **conceptual in nature** and are likely to change upon more detailed analysis / investigation
- These projects **won't eliminate all flooding in priority problem areas**
- Going forward, it is still important that **new projects be considered** and that implementation on **private properties** (residential and commercial) be encouraged and even facilitated
- In addition, the Township must continue to **operate, maintain, and repair** its existing stormwater management and/or conveyance facilities

Prioritization Criteria Scoring and Weighting Approach

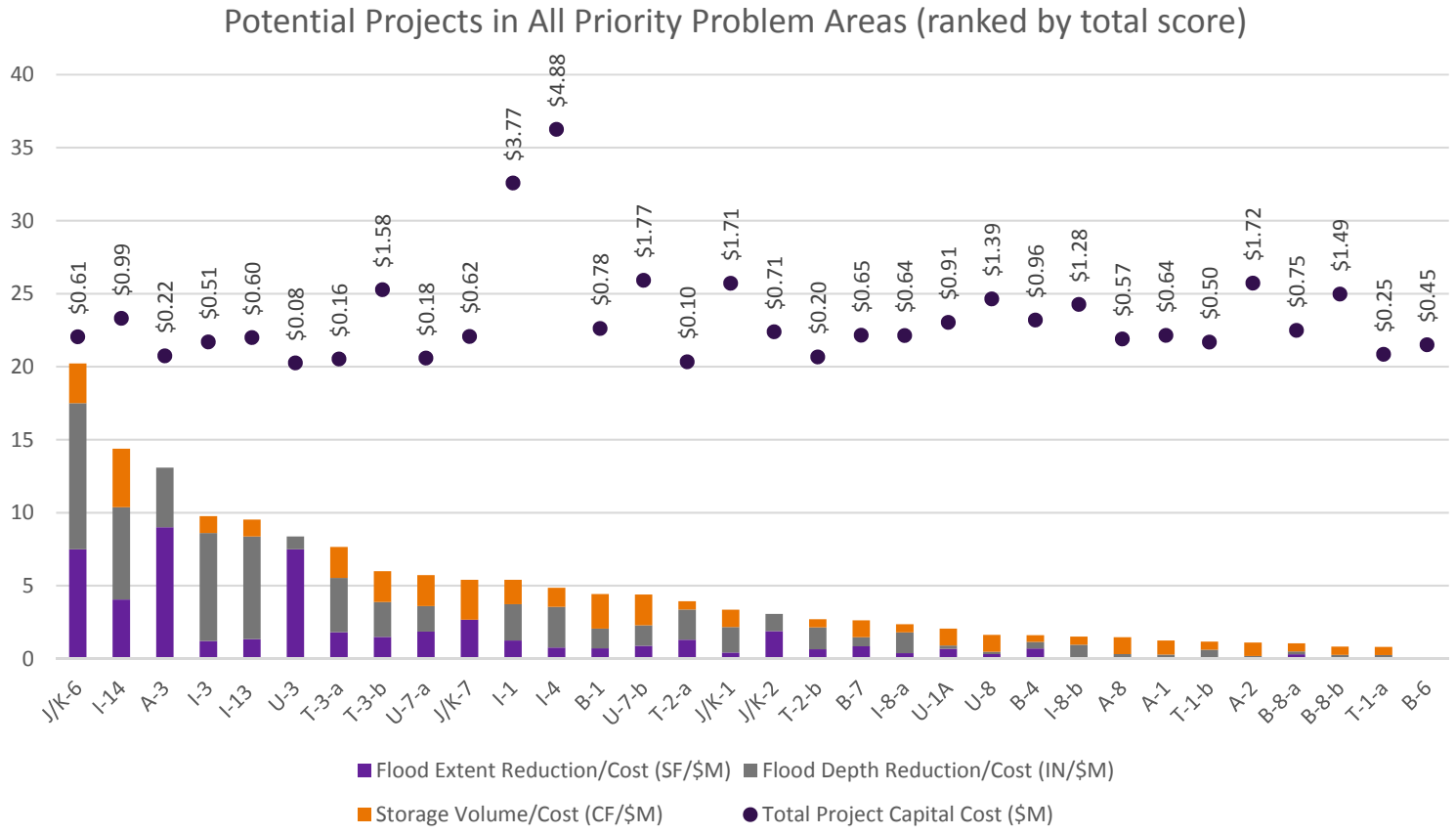
Criteria	Scoring Approach	Description	Assigned Weight
Flood Extent Reduction/Cost (SF/$M)	0-10 (Low to High)	Based on modeled reduction in flooded area divided by estimated cost; ranked either by individual priority problem area or by all priority problem areas combined	90%
Flood Depth Reduction/Cost (IN/$M)	0-10 (Low to High, by either individual priority problem area or overall)	Based on modeled reduction in flooded depth divided by estimated cost; ranked either by individual priority problem area or by all priority problem areas combined	100%
Storage Volume/Cost (CF/$M)	0-10 (Low to High, by either individual priority problem area or overall)	Based on assumed storage volume divided by estimated cost; ranked either by individual priority problem area or by all priority problem areas combined	40%
Ownership	0-10 (Low to High)	See ownership scoring table; preference is given to publicly owned sites	80%
Water Quality	High=10, Med=5, Low=0	Based on assumed pollution reduction capacity by project type (aligns with new MS4 permit requirements); For example, a bioretention facility would score higher than a new pipe project	70%
Cost Sharing and/or Partnership Opportunities	High=10, Med=5, Low=0	Projects scored higher if there is an apparent opportunity to share costs with an entity other than Radnor Township (PennDOT, commercial site owners, etc.)	20%
O&M Needs	Low=10, Med=5, High=0	Based on assumed O&M requirements, frequencies, and costs	40%
Public Amenity	High=10, Med=5, Neutral=0, Low=-5	Includes recreational value, aesthetics, enhancing community assets; For example, pipe upsizing would be scored lower than vegetated curb extensions	70%
Public Safety	High=10, Med=5, Low=0	Projects scored higher if they improve public safety conditions; For example, green street projects often have traffic calming and pedestrian safety benefits	20%
Constructability	Most Difficult=0, Med Difficult=5, Least Difficult=10	Potential impacts on local businesses, traffic, pedestrians, utilities, etc.; For example, a project in a park would score likely higher than a project along Rt 30	50%

Ownership Scoring Approach

Owner	Score
Township	10
School District	8
PADOT	7
Amtrak	7
SEPTA	7
Private - Commercial	6
Private - Educational	6
Private - Religious	5
Private - Residential	4
Tredyffrin Township	2

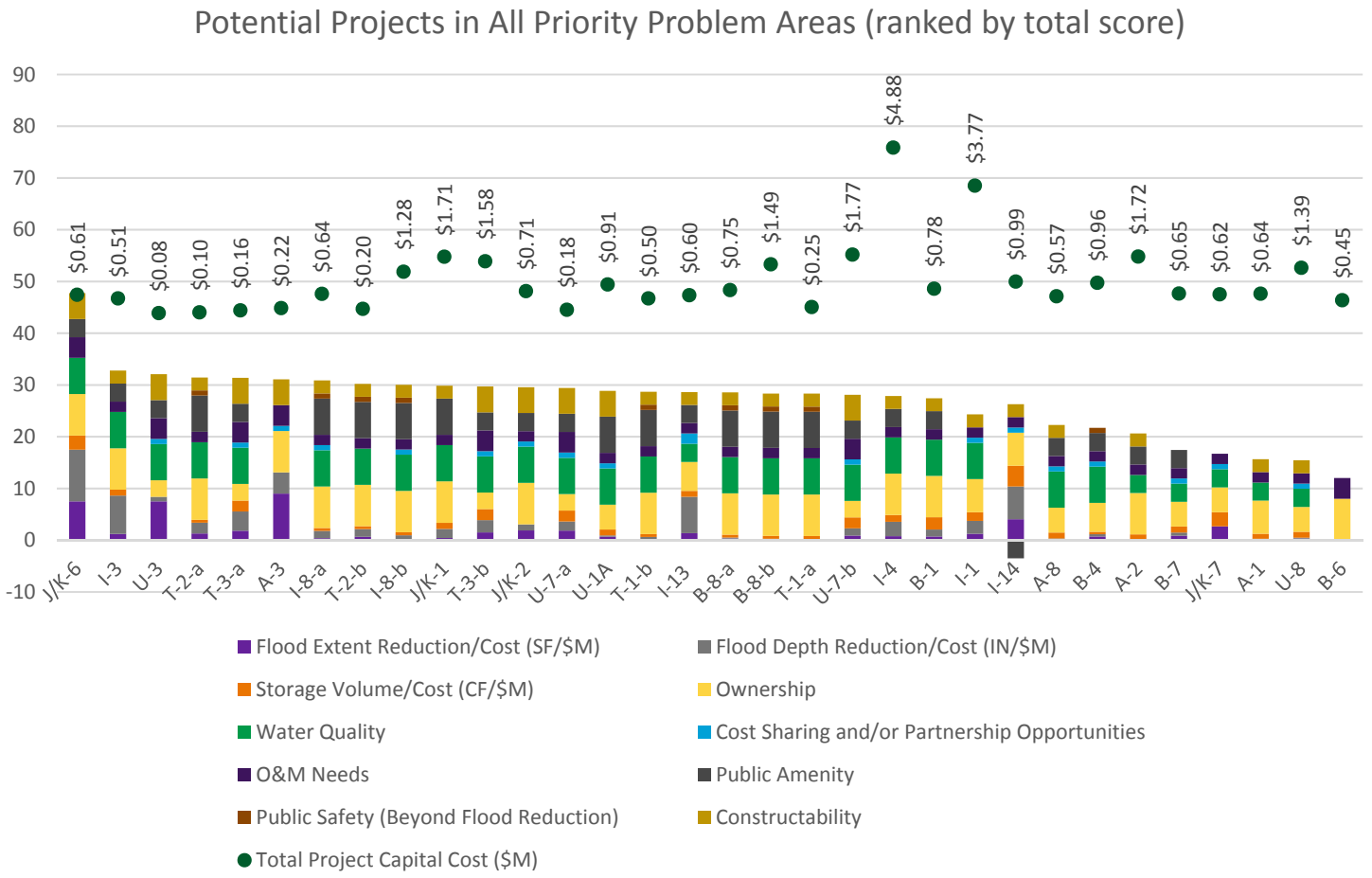
Results of Project Ranking by All Priority Problem Areas (Flood Reduction and Storage Volume Only)

ID #	Name/Location
J/K-6	Radnor Trail
I-14	N. Wayne Field - Option "E"
A-3	S. Wayne Ave Inlets/Pipes
I-3	West Ave Green Street
I-13	Wayne Train Station
U-3	Montrose Condominiums - Conestoga Road
T-3-a	Residential Parcels (10%)
T-3-b	Residential Parcels (100%)
U-7-a	Residential Parcels (10%)
J/K-7	Farmers Market

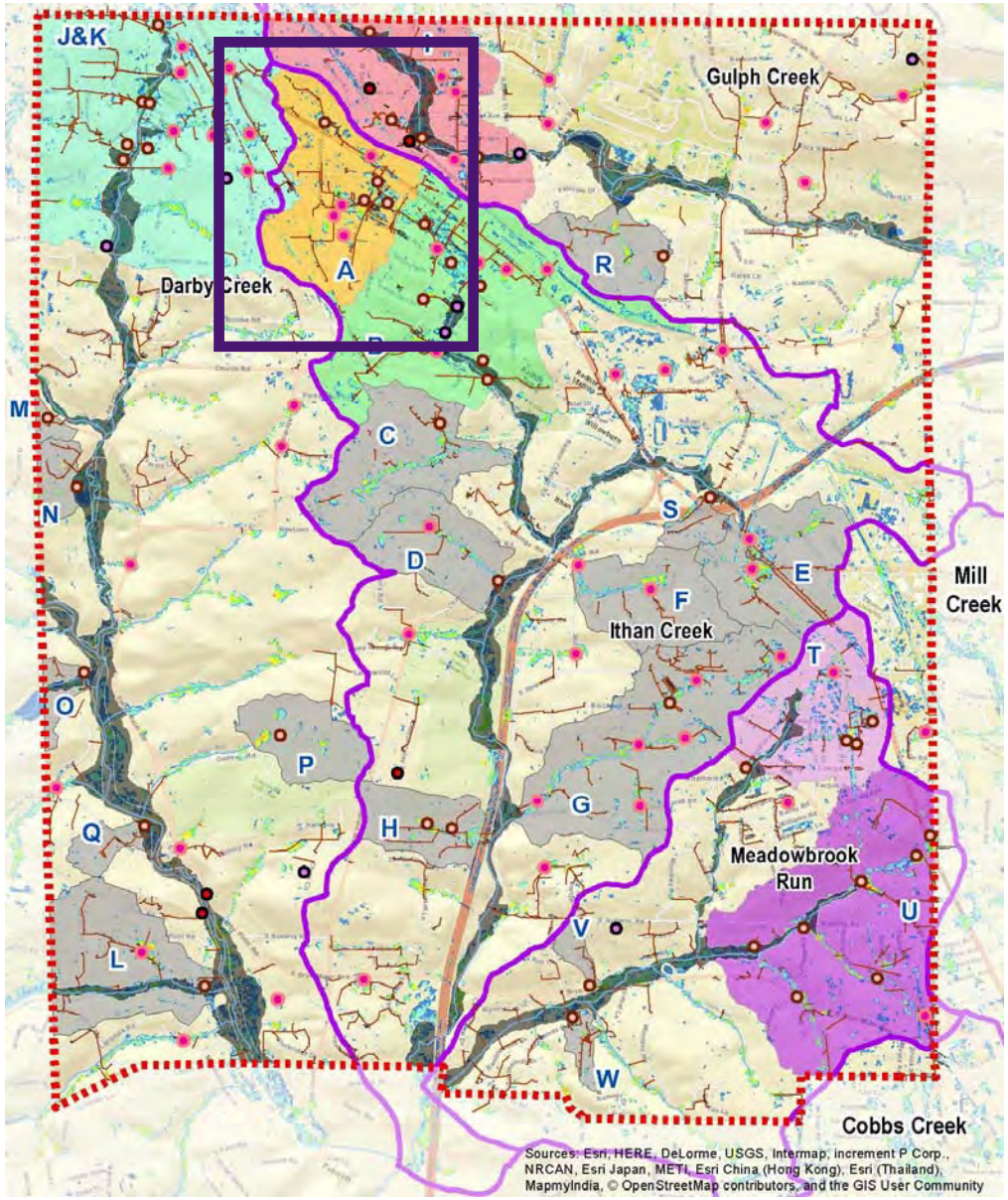


Results of Project Ranking by All Priority Problem Areas (All Prioritization Criteria)

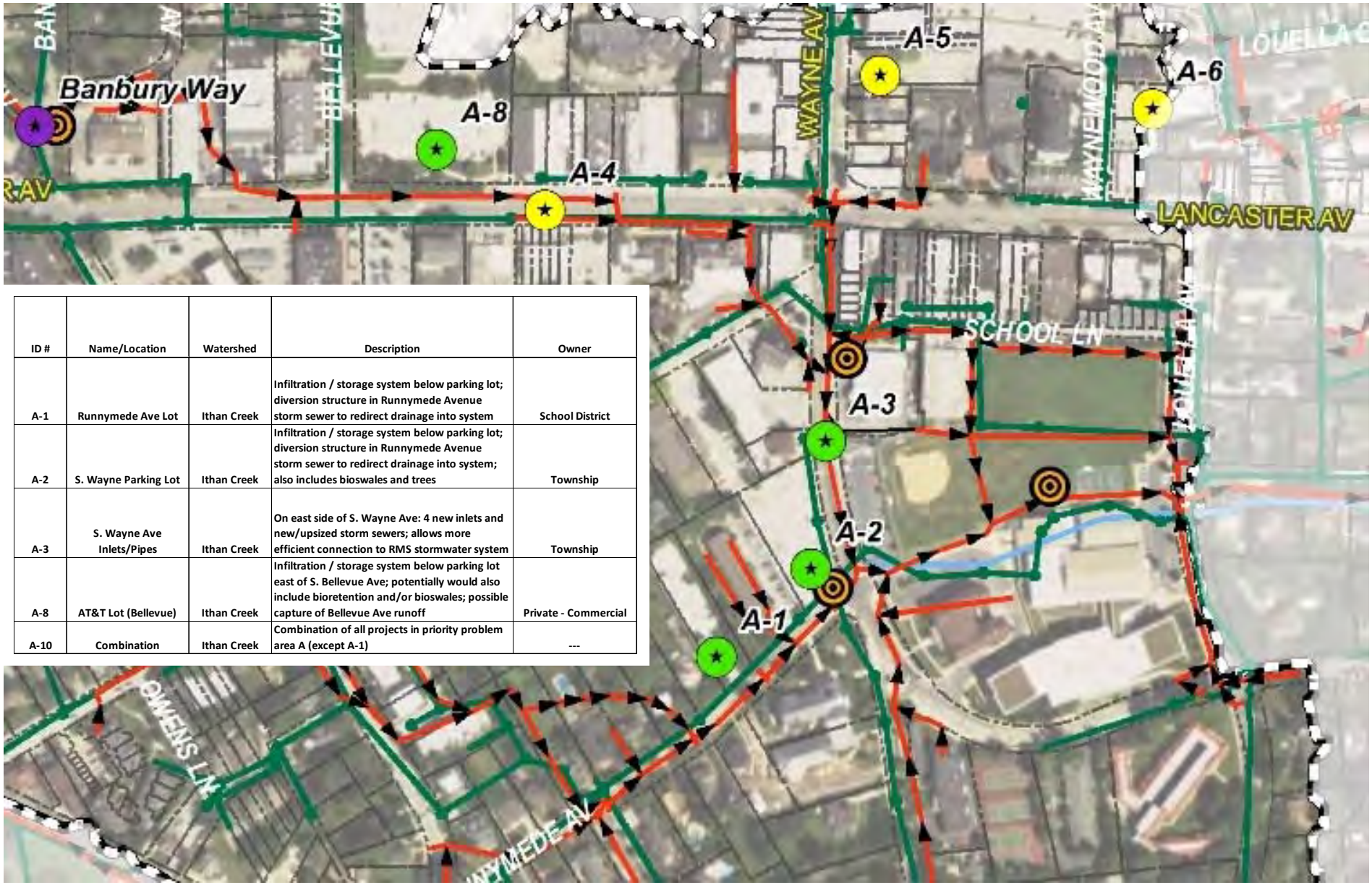
ID #	Name/Location
J/K-6	Radnor Trail
I-3	West Ave Green Street
U-3	Montrose Condominiums - Conestoga Road
T-2-a	Fairfax Road and Hickory Lane (50% ROW)
T-3-a	Residential Parcels (10%)
A-3	S. Wayne Ave Inlets/Pipes
I-8-a	Various Green Streets (50% ROW)
T-2-b	Fairfax Road and Hickory Lane
I-8-b	Various Green Streets (100% ROW)
J/K-1	Connor/Filipone Parks



Priority Problem Area A



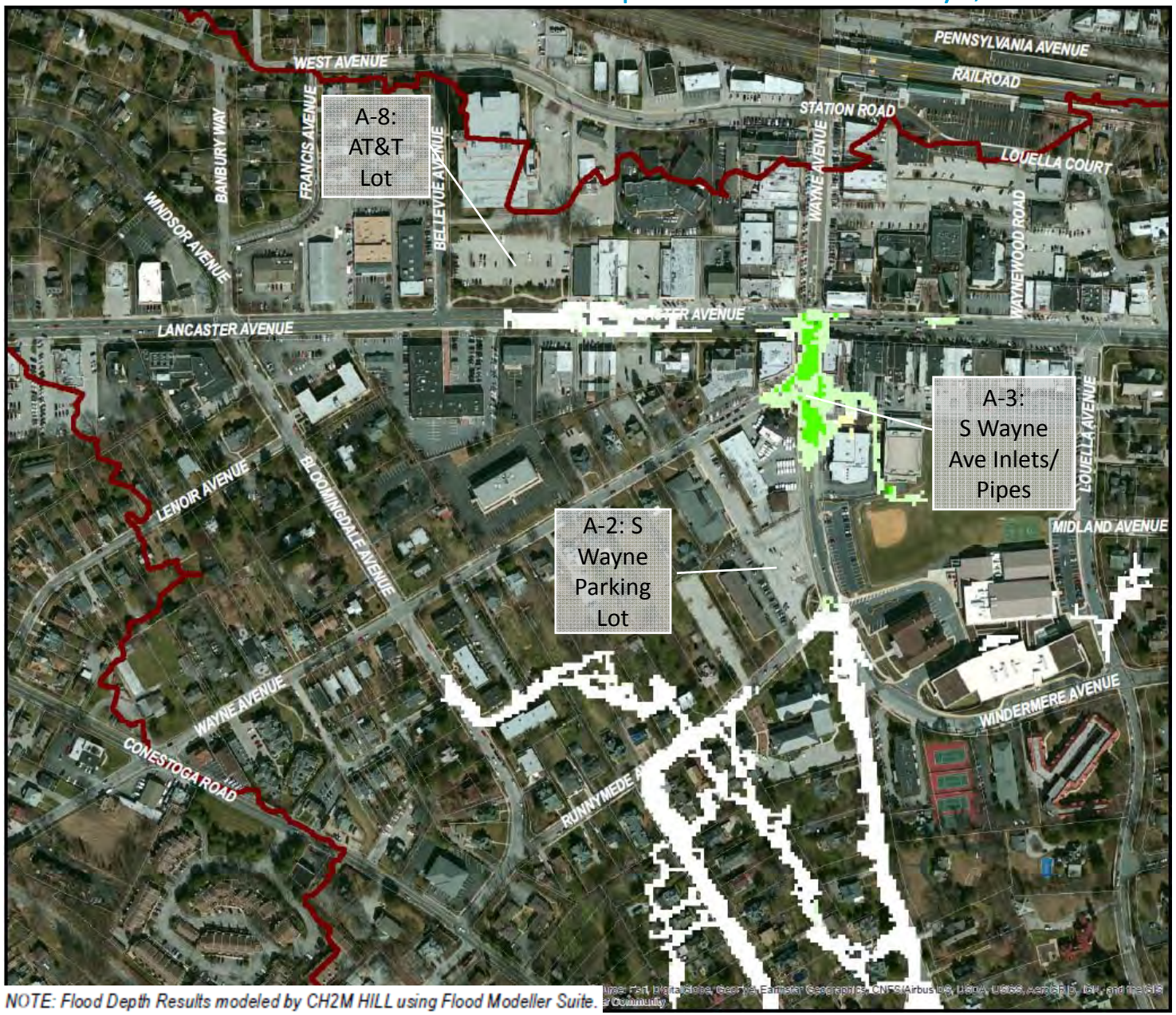
Potential Flood Mitigation Projects – Area A



ID #	Name/Location	Watershed	Description	Owner
A-1	Runnymede Ave Lot	Ithan Creek	Infiltration / storage system below parking lot; diversion structure in Runnymede Avenue storm sewer to redirect drainage into system	School District
A-2	S. Wayne Parking Lot	Ithan Creek	Infiltration / storage system below parking lot; diversion structure in Runnymede Avenue storm sewer to redirect drainage into system; also includes bioswales and trees	Township
A-3	S. Wayne Ave Inlets/Pipes	Ithan Creek	On east side of S. Wayne Ave: 4 new inlets and new/upsized storm sewers; allows more efficient connection to RMS stormwater system	Township
A-8	AT&T Lot (Bellevue)	Ithan Creek	Infiltration / storage system below parking lot east of S. Bellevue Ave; potentially would also include bioretention and/or bioswales; possible capture of Bellevue Ave runoff	Private - Commercial
A-10	Combination	Ithan Creek	Combination of all projects in priority problem area A (except A-1)	---

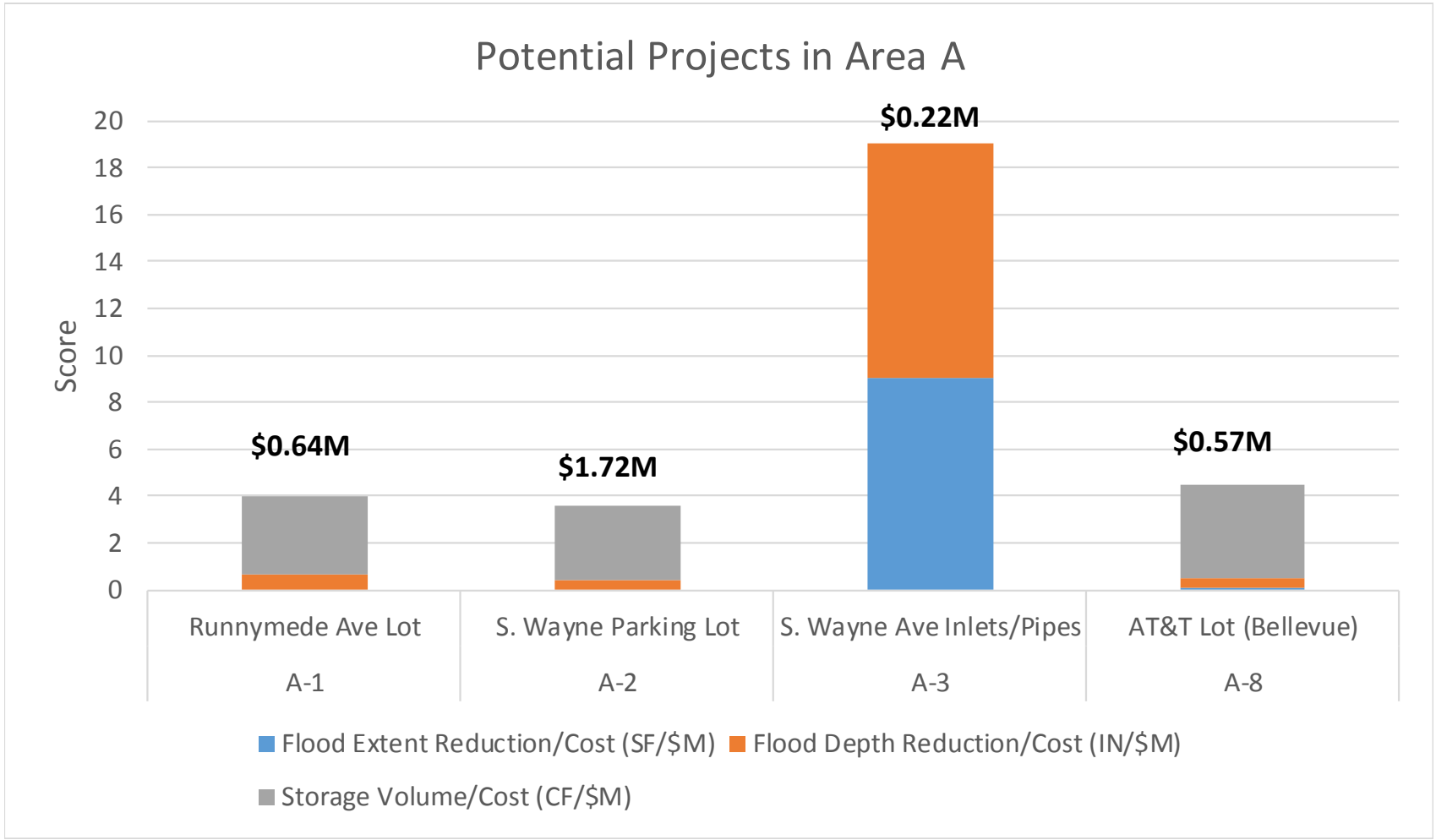
Ithan Creek Area A: A-10 Combination

Reduction in Max Flood Depth Results: 10-yr, 1-hr event



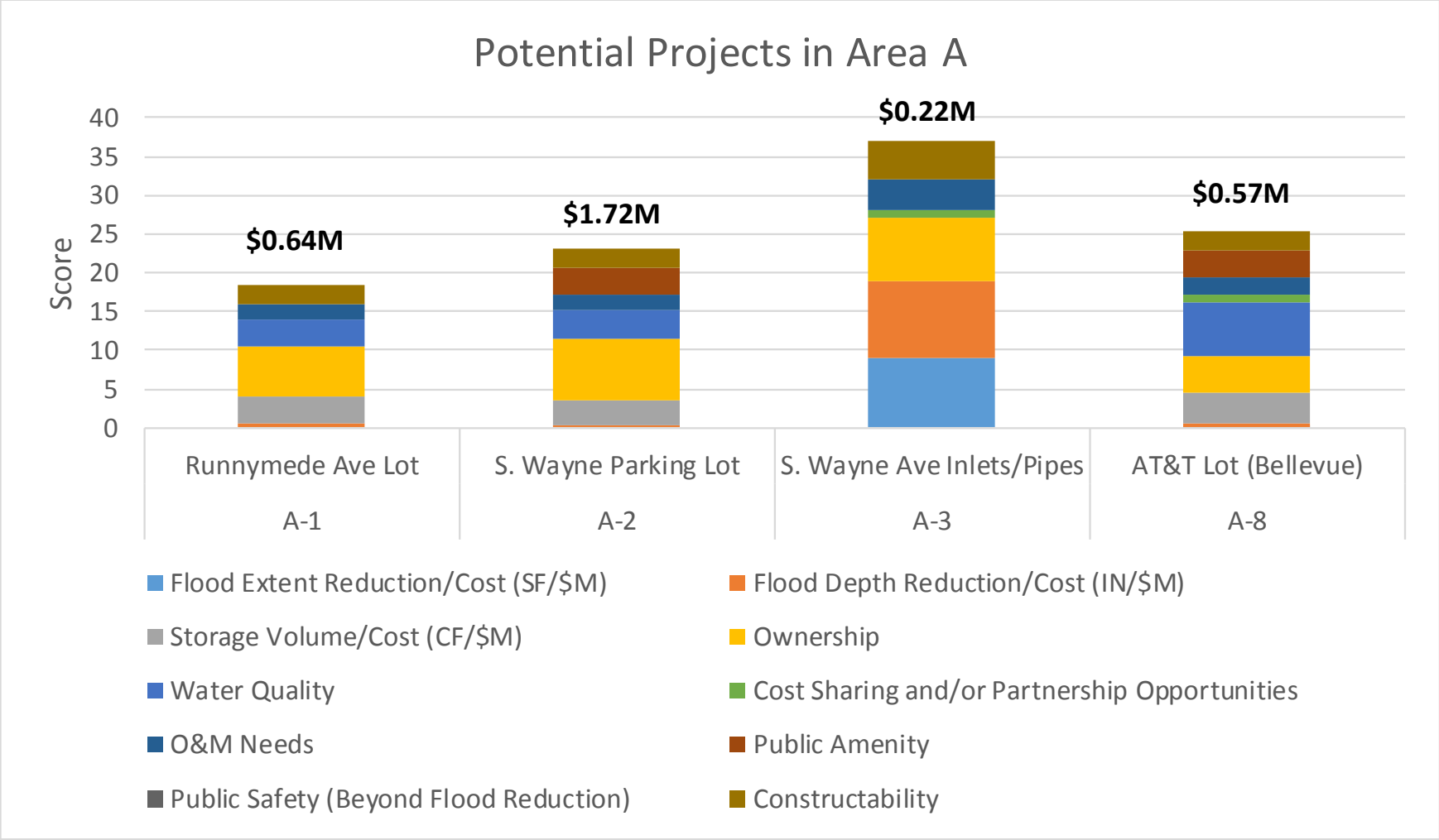
NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

Results of Project Ranking by Priority Problem Area (Flood Reduction and Storage Volume Only)



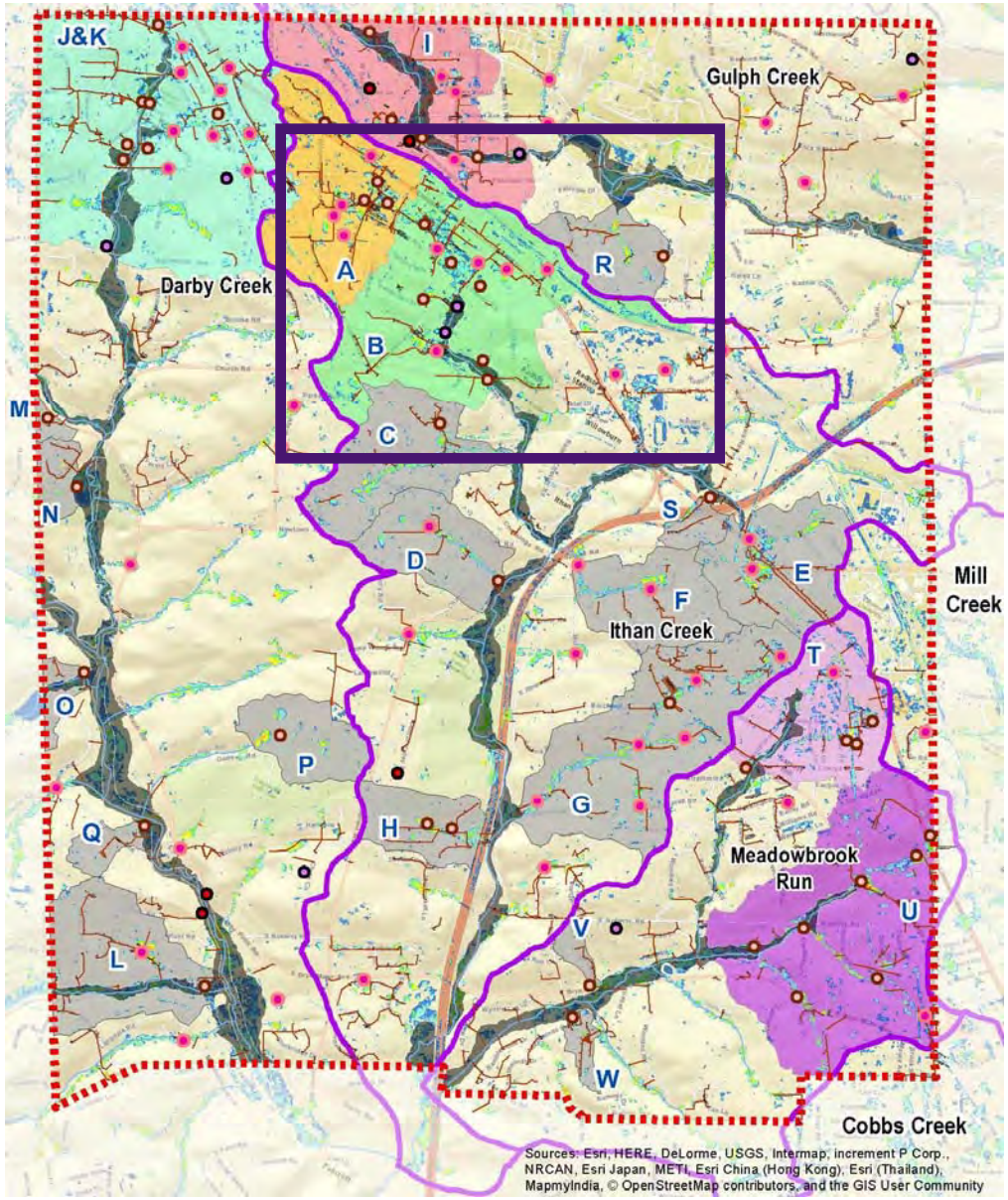
A-1 and A-2 could be made more effective by extending the new storm sewer further up Runnymede and beyond

Results of Project Ranking by Priority Problem Area (All Prioritization Criteria)



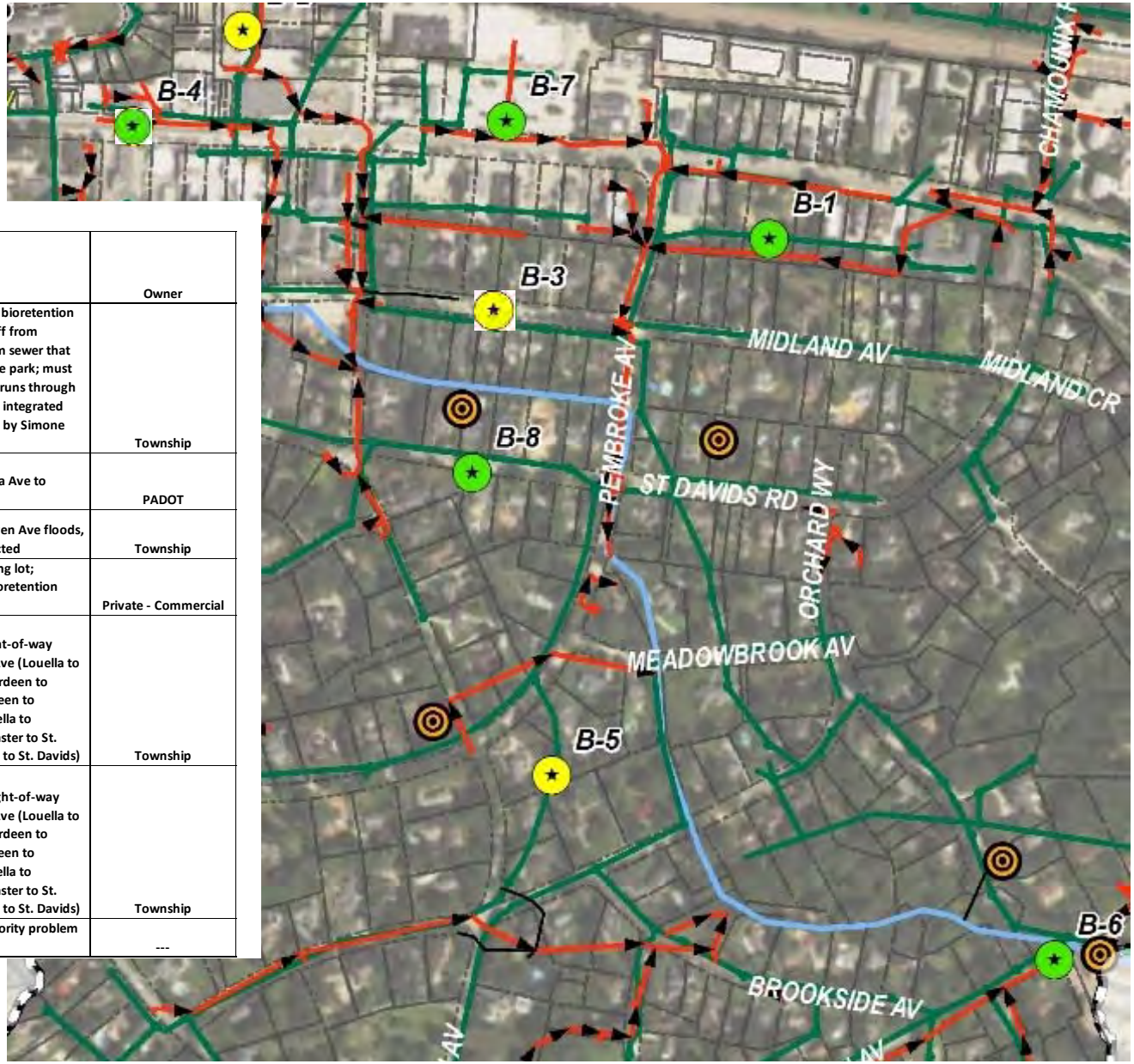
A-1 and A-2 could be made more effective by extending the new storm sewer further up Runnymede and beyond

Priority Problem Area B



Potential Flood Mitigation Projects – Area B

ID #	Name/Location	Watershed	Description	Owner
B-1	Veterans Park	Ithan Creek	Infiltration / storage system with bioretention in park; would also capture runoff from Lancaster Ave and from the storm sewer that runs through the south end of the park; must work around sanitary sewer that runs through park; potential solutions must be integrated with park master plan developed by Simone Collins	Township
B-4	Lancaster Ave Green Street (Louella to Aberdeen)	Ithan Creek	Green street project from (Louella Ave to Aberdeen Ave)	PADOT
B-6	Iven Ave Culverts	Ithan Creek	Enlarge existing culverts; when Iven Ave floods, emergency responders are impacted	Township
B-7	Wayne Square Lot	Ithan Creek	Infiltration / storage below parking lot; potentially would also include bioretention and/or bioswales	Private - Commercial
B-8-a	Various Green Streets (50% ROW)	Ithan Creek	Green street projects (50% of right-of-way impervious captured): Midland Ave (Louella to St. Davids), St. Davids Road (Aberdeen to Midland), Pembroke Ave (Aberdeen to Midland), Windermere Ave (Louella to Aberdeen), Aberdeen Ave (Lancaster to St. Davids), Orchard Way (Aberdeen to St. Davids)	Township
B-8-b	Various Green Streets (100% ROW)	Ithan Creek	Green street projects (100% of right-of-way impervious captured): Midland Ave (Louella to St. Davids), St. Davids Road (Aberdeen to Midland), Pembroke Ave (Aberdeen to Midland), Windermere Ave (Louella to Aberdeen), Aberdeen Ave (Lancaster to St. Davids), Orchard Way (Aberdeen to St. Davids)	Township
B-9	Combination	Ithan Creek	Combination of all projects in priority problem area B (except B-8-a)	---



Ithan Creek Area B: B-9 Combination

Reduction in Max Flood Depth Results: 10-yr, 1-hr event

Model Extents

100-year FEMA Flood Zone

Radnor Township Parcels

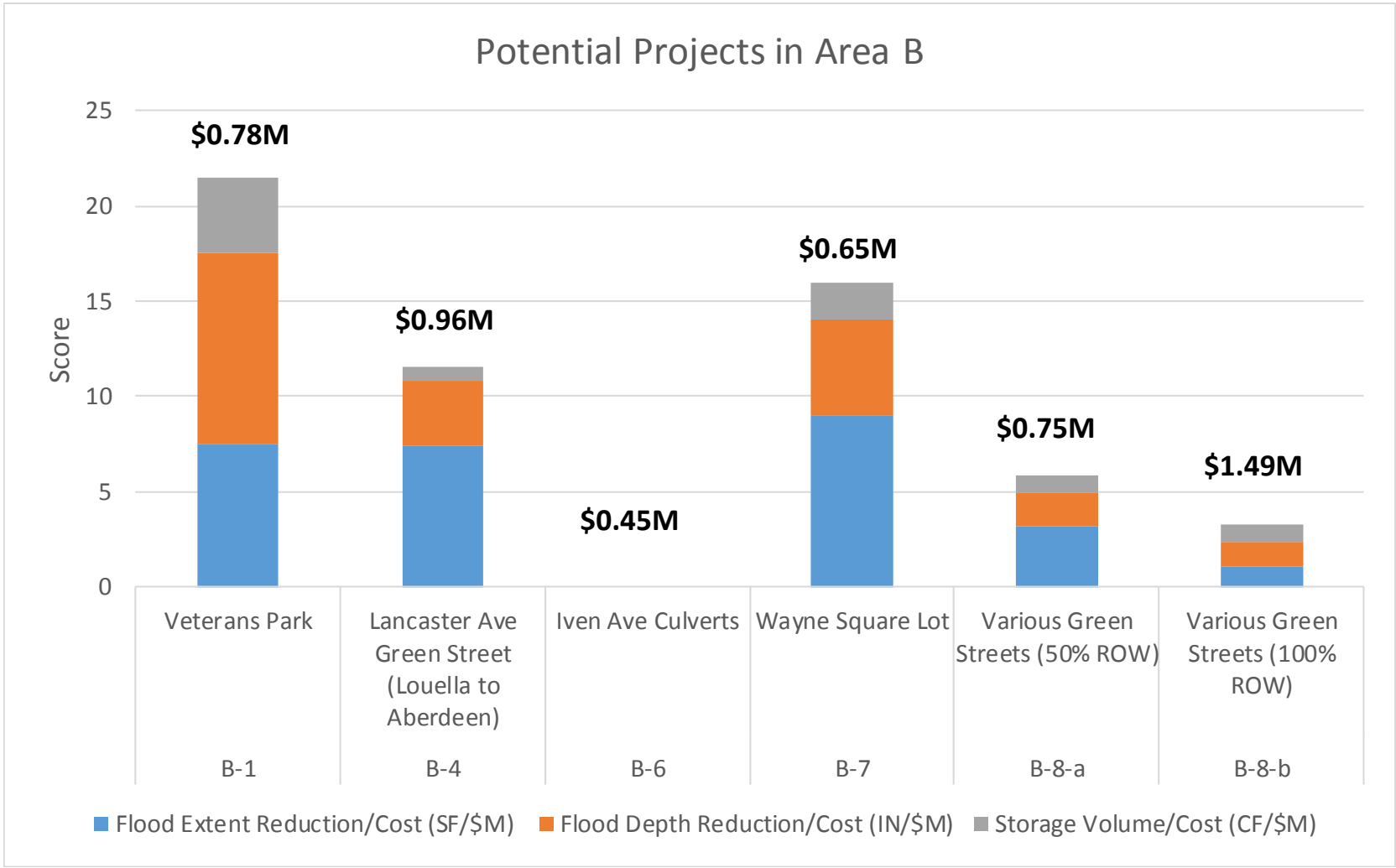
Reduction in Max Flood Depth

- < -1 ft
- -1 ft to -0.1 ft
- -0.1 ft to 0.1 ft
- 0.1 ft to 0.5 ft
- 0.5 ft to 1 ft
- 1 ft to 2 ft
- > 2 ft

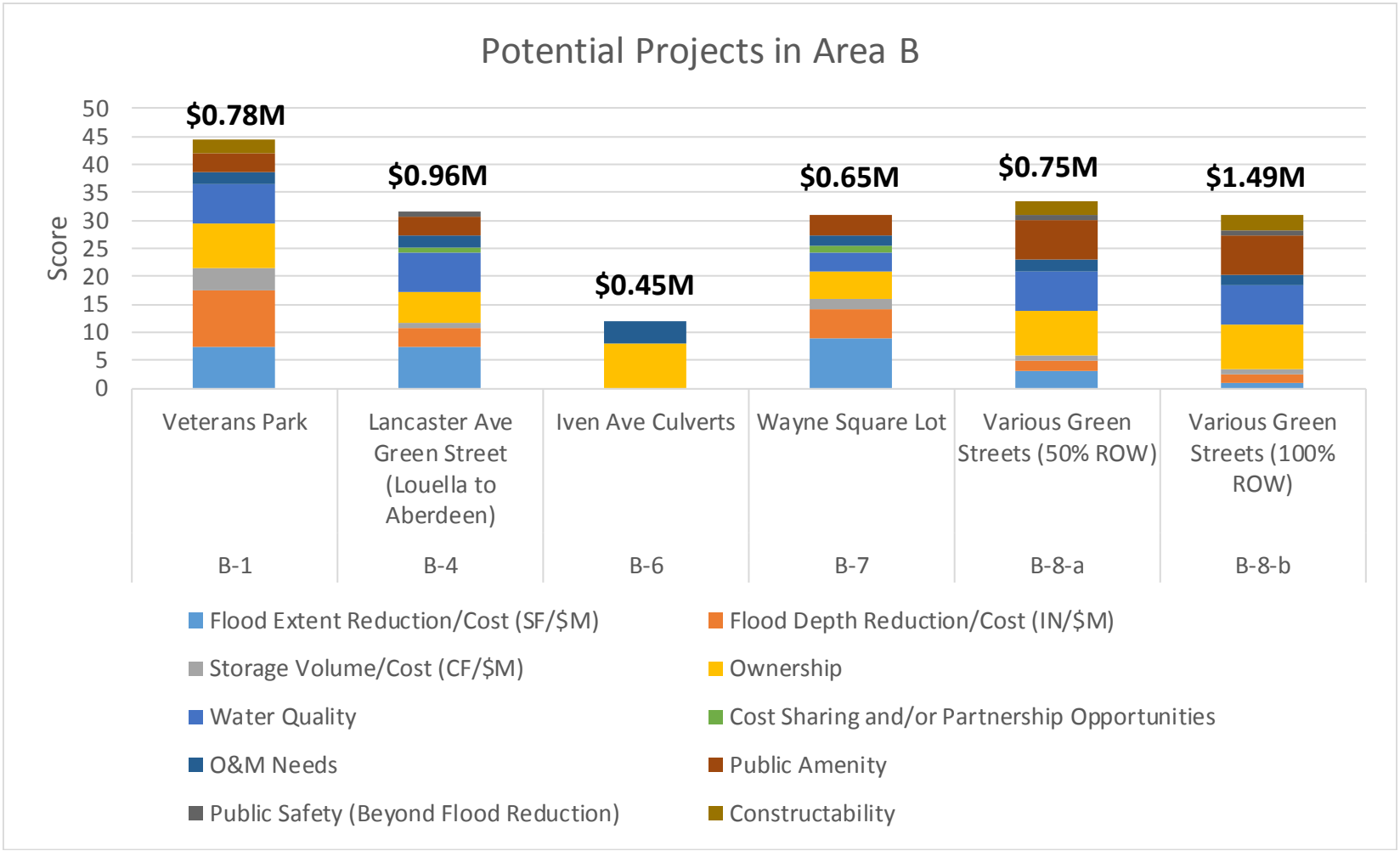
N

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

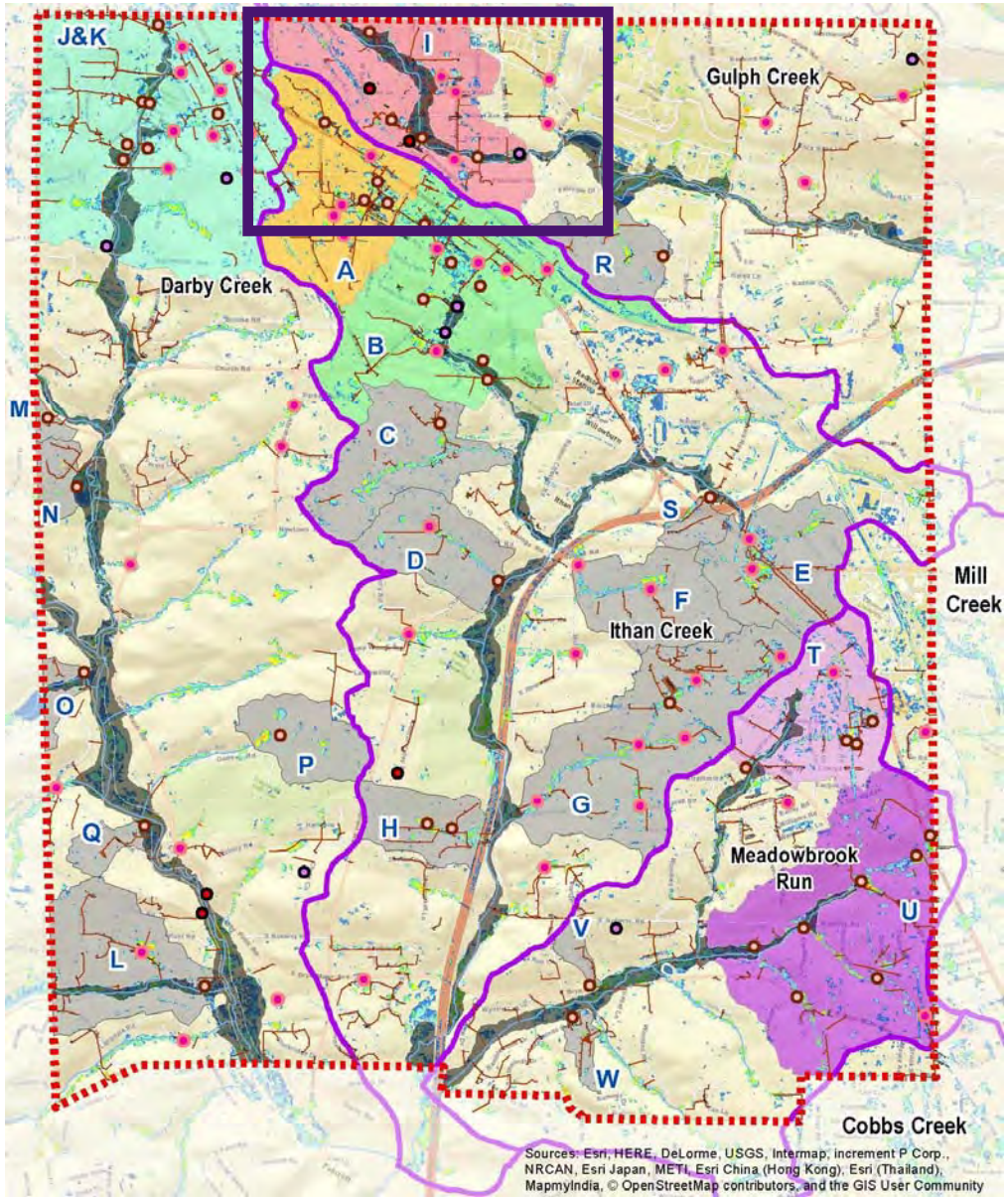
Results of Project Ranking by Priority Problem Area (Flood Reduction and Storage Volume Only)



Results of Project Ranking by Priority Problem Area (All Prioritization Criteria)

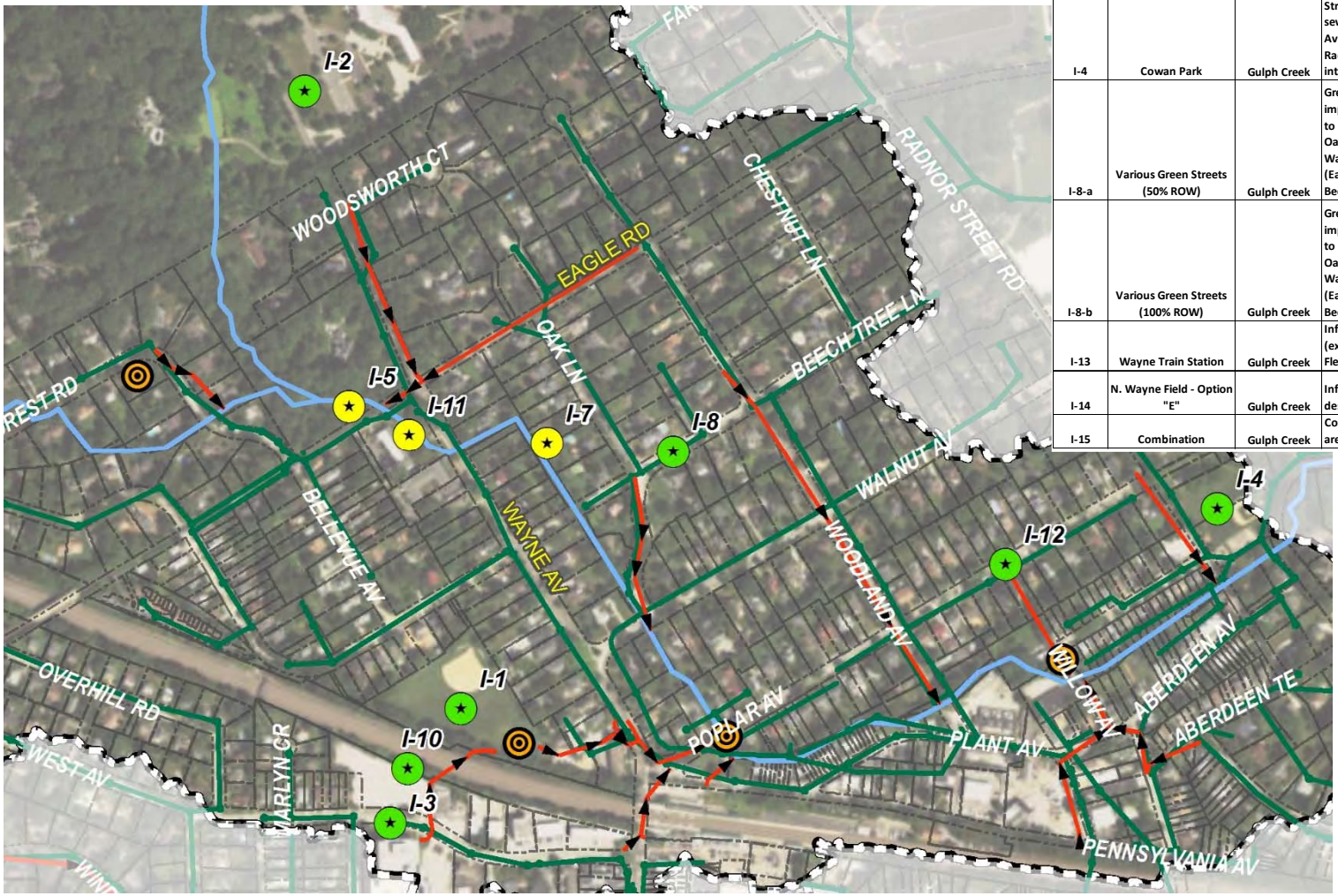


Priority Problem Area I



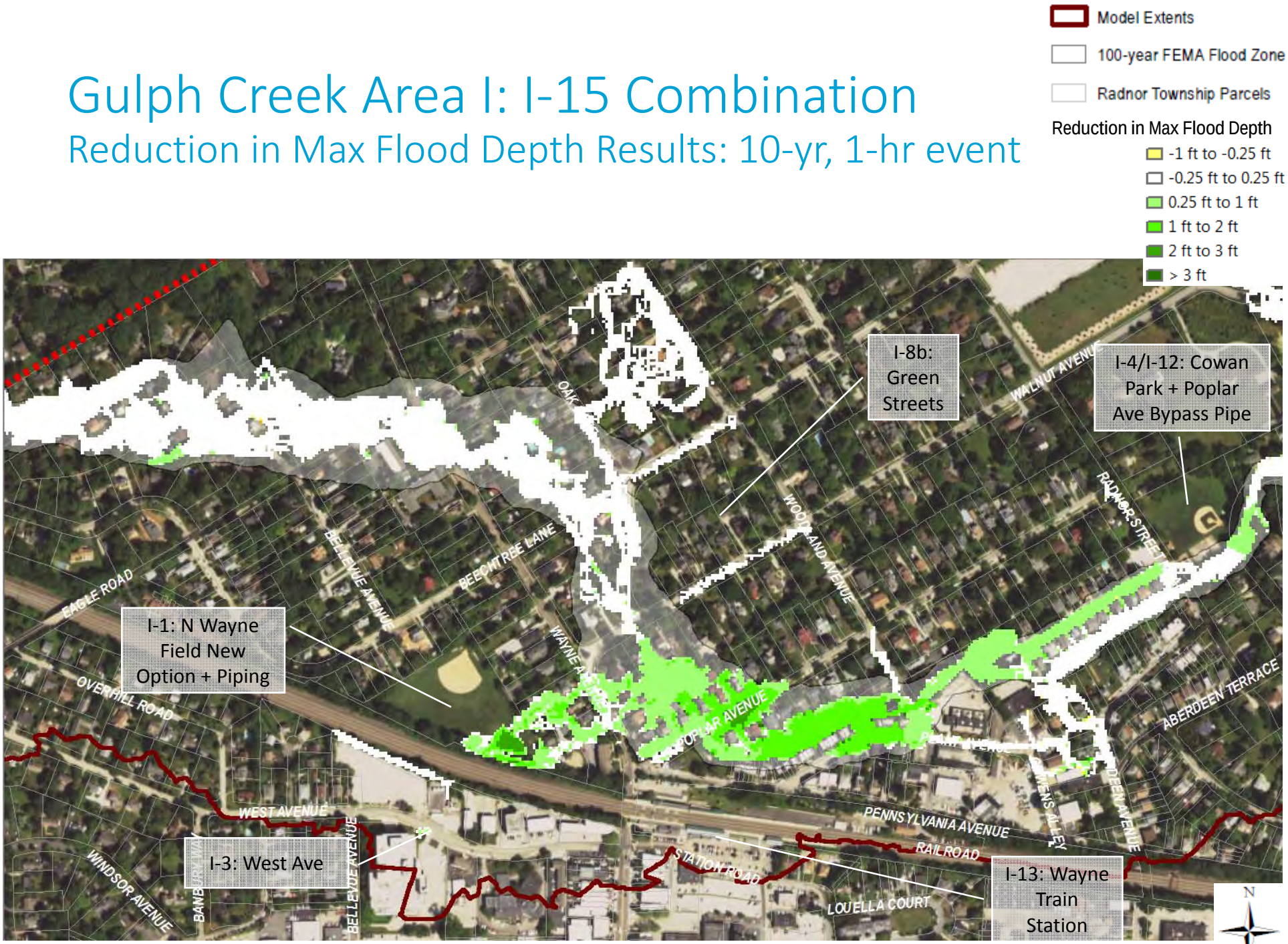
Potential Flood Mitigation Projects – Area I

ID #	Name/Location	Watershed	Description	Owner
I-1	N. Wayne Field - New Option	Gulph Creek	Large underground infiltration / storage system in park; includes large diameter storm sewer to redirect runoff into park (Eagle Road to Bellevue Ave to park)	School District
I-3	West Ave Green Street	Gulph Creek	Green street project (AT&T lot to Francis Ave)	Township
I-4	Cowan Park	Gulph Creek	Large underground infiltration / storage system in park; would also capture runoff from Radnor Street Road; includes large diameter storm sewer for conveying excessive runoff (Poplar Ave to Radnor Street Road and then down Radnor Street Road to Cowan Park); could be integrated with new sanitary sewer project	Township
I-8-a	Various Green Streets (50% ROW)	Gulph Creek	Green street projects (50% of right-of-way impervious captured): Walnut Ave (N. Wayne to Woodland), N. Wayne Ave (Eagle to Poplar), Oak Lane (Eagle to Walnut), Beechtree Lane (N. Wayne Ave to Chestnut Lane), Woodland Ave (Eagle to Poplar), Chestnut Lane (Eagle to Beechtree)	Township
I-8-b	Various Green Streets (100% ROW)	Gulph Creek	Green street projects (100% of right-of-way impervious captured): Walnut Ave (N. Wayne to Woodland), N. Wayne Ave (Eagle to Poplar), Oak Lane (Eagle to Walnut), Beechtree Lane (N. Wayne Ave to Chestnut Lane), Woodland Ave (Eagle to Poplar), Chestnut Lane (Eagle to Beechtree)	Township
I-13	Wayne Train Station	Gulph Creek	Infiltration / storage trench in parking lot (expanded from preliminary design by Gannett Fleming)	SEPTA
I-14	N. Wayne Field - Option "E"	Gulph Creek	Infiltration / storage basin in park (Option "E" designed by Chagrin Valley Engineers)	School District
I-15	Combination	Gulph Creek	Combination of all projects in priority problem area I (except I-8-a and I-14)	---



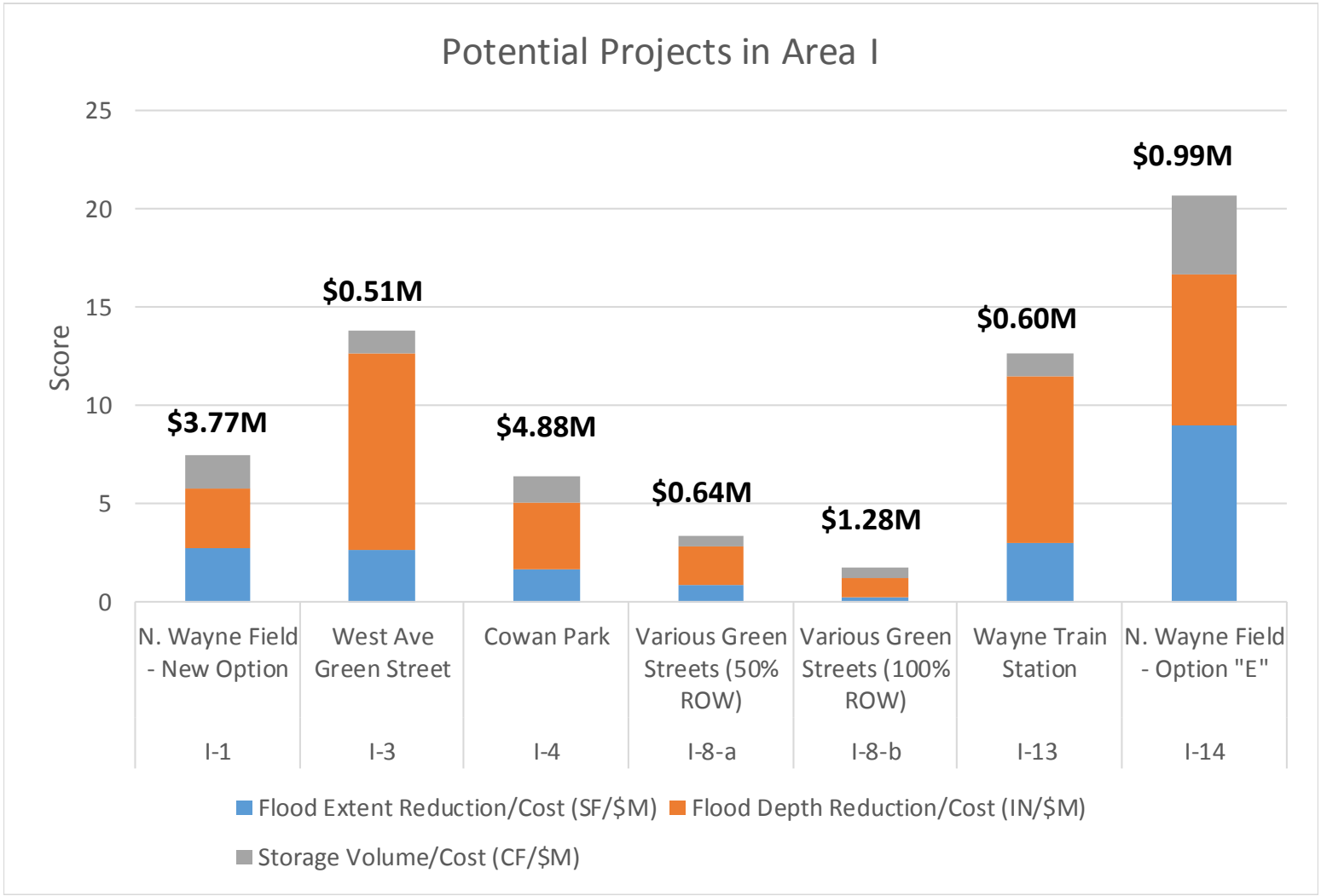
Gulph Creek Area I: I-15 Combination

Reduction in Max Flood Depth Results: 10-yr, 1-hr event

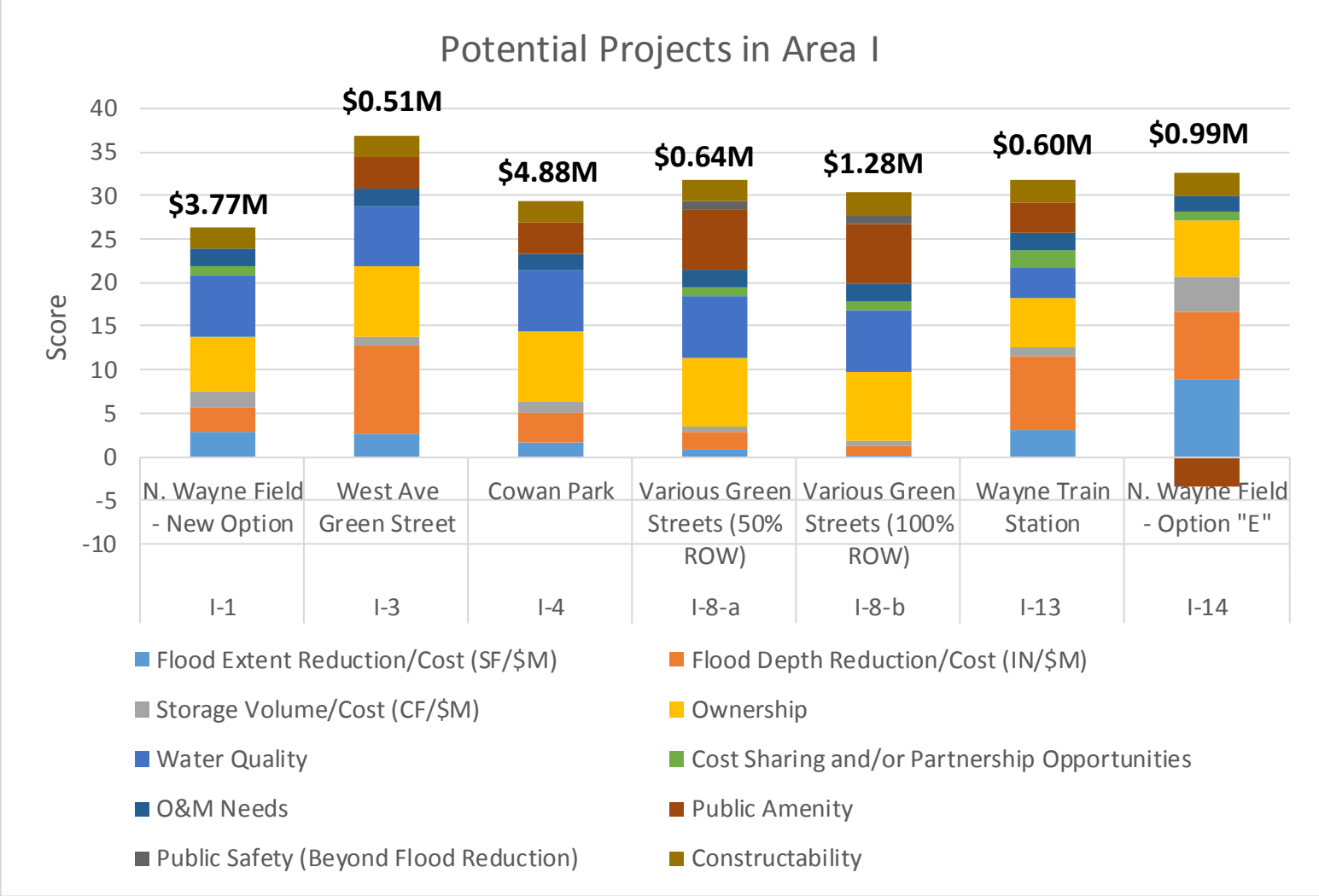


NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

Results of Project Ranking by Priority Problem Area (Flood Reduction and Storage Volume Only)



Results of Project Ranking by Priority Problem Area (All Prioritization Criteria)



North Wayne Basin Modeling Analysis

Original design, existing conditions, and proposed improvements for several storm events

- Existing Conditions
  - 12-18 inches of sedimentation
  - Less than 30,000 ft^3 of storage
  - Obstructed inlet
- Original Design (i.e. existing basin is cleaned out / restored)
  - Approx. 49,000 ft^3 of storage (original storage volume restored)
  - Unobstructed inlet
- Proposed Improvements (CVE Option “E”)
  - Approx. 147,000 ft^3 of storage
  - Reconfigured outlet structure
  - New outlet pipe (to existing pipe in N. Wayne Ave)

Design Storm	Total Rainfall (in)
2 year, 1 hour	1.44
5 year, 1 hour	1.79
10 year, 1 hour	2.03
25 year, 1 hour	2.40

North Wayne Basin Model Results Summary

Improvements from existing clogged basin conditions

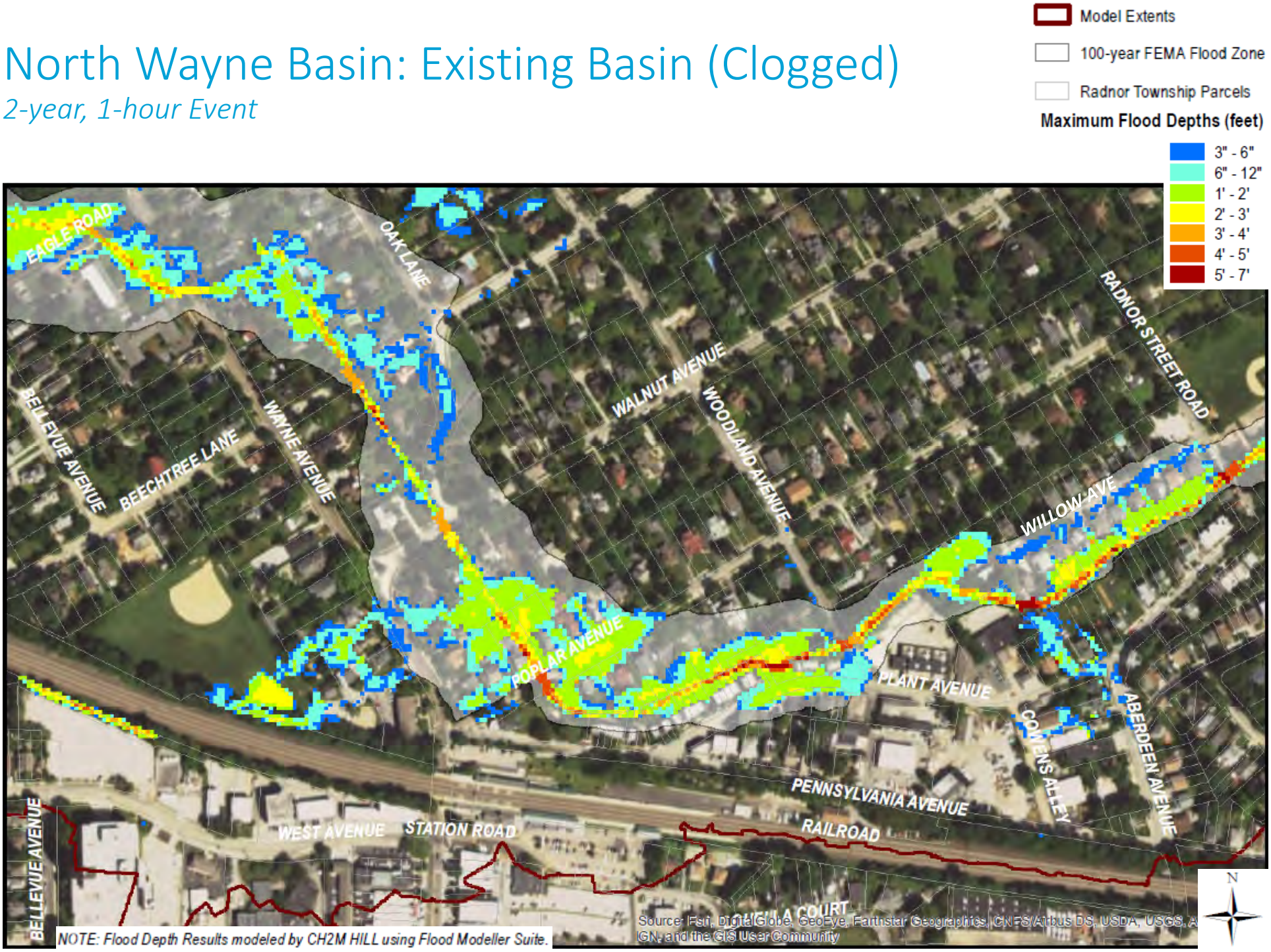
Storm Event (Total Depth)	Basin Improvement*	Flooding Locations				
		between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
2-year, 1-hour (1.44")	Cleaned	↓	↓	↓	—	—
	Proposed	⬇	↓	↑	↓	—
5-year, 1-hour (1.79")	Cleaned	↓	↓	↓	—	—
	Proposed	⬇	↓	↓	—	—
10-year, 1-hour (2.03")	Cleaned	↓	—	↑	—	—
	Proposed	⬇	↓	↑	—	—
25-year, 1-hour (2.40")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

**Improvement from Existing Clogged basin condition*

Key	
↓	slight decrease in flooding extent & depth
↓	decrease in flooding extent & depth
⬇	significant decrease in flooding extent & depth
—	little to no change
↑	slight increase in flooding extent & depth

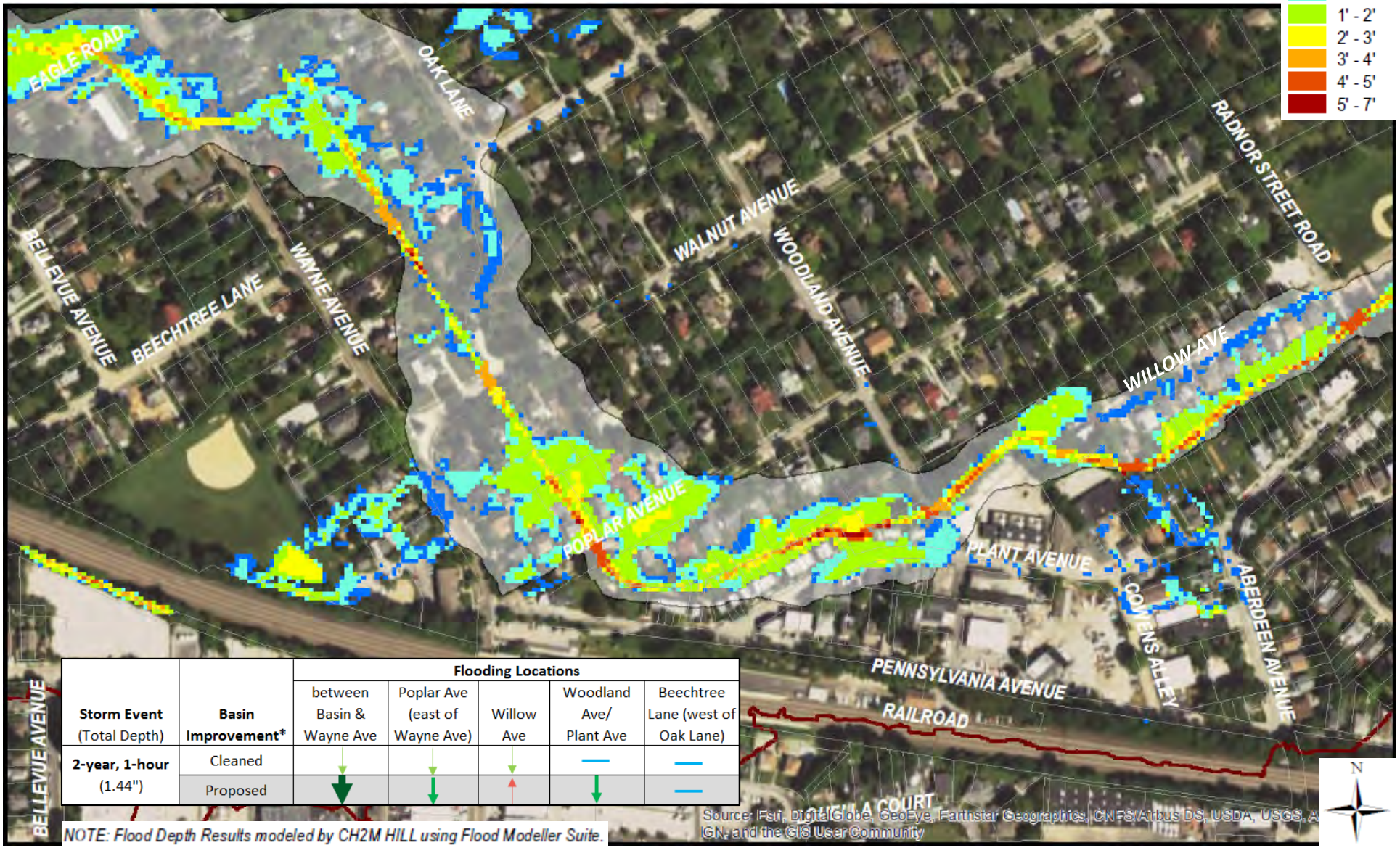
North Wayne Basin: Existing Basin (Clogged)

2-year, 1-hour Event



North Wayne Basin: Existing Basin (Cleaned)

2-year, 1-hour Event

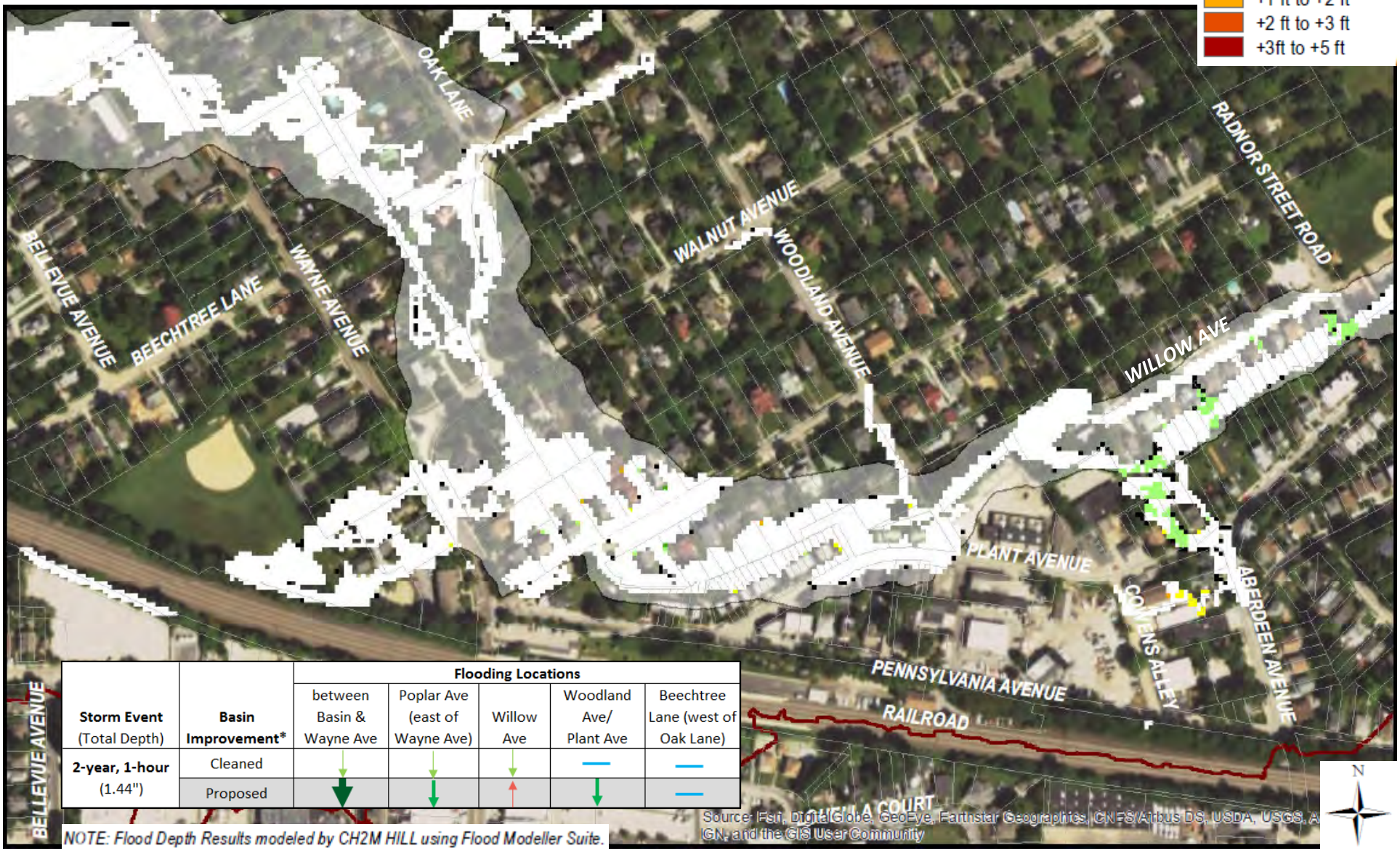


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
2-year, 1-hour (1.44")	Cleaned	↓	↓	↓	—	—
	Proposed	↓	↓	↑	↓	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Existing Basin (Cleaned)

2-year, 1-hour Event

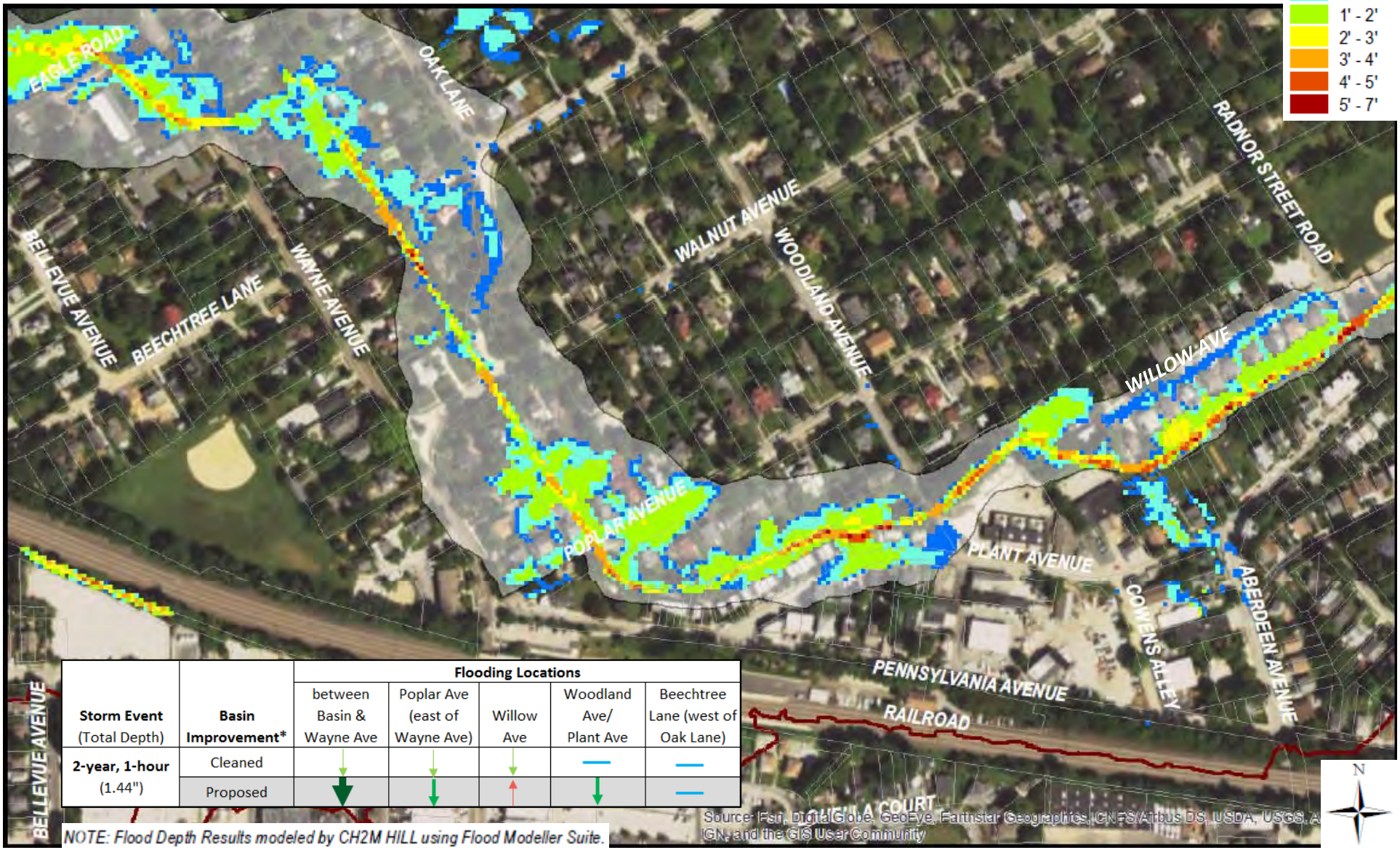


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
2-year, 1-hour (1.44")	Cleaned	↓	↓	↓	—	—
	Proposed	↓↓	↓	↑	↓	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Proposed Basin

2-year, 1-hour Event

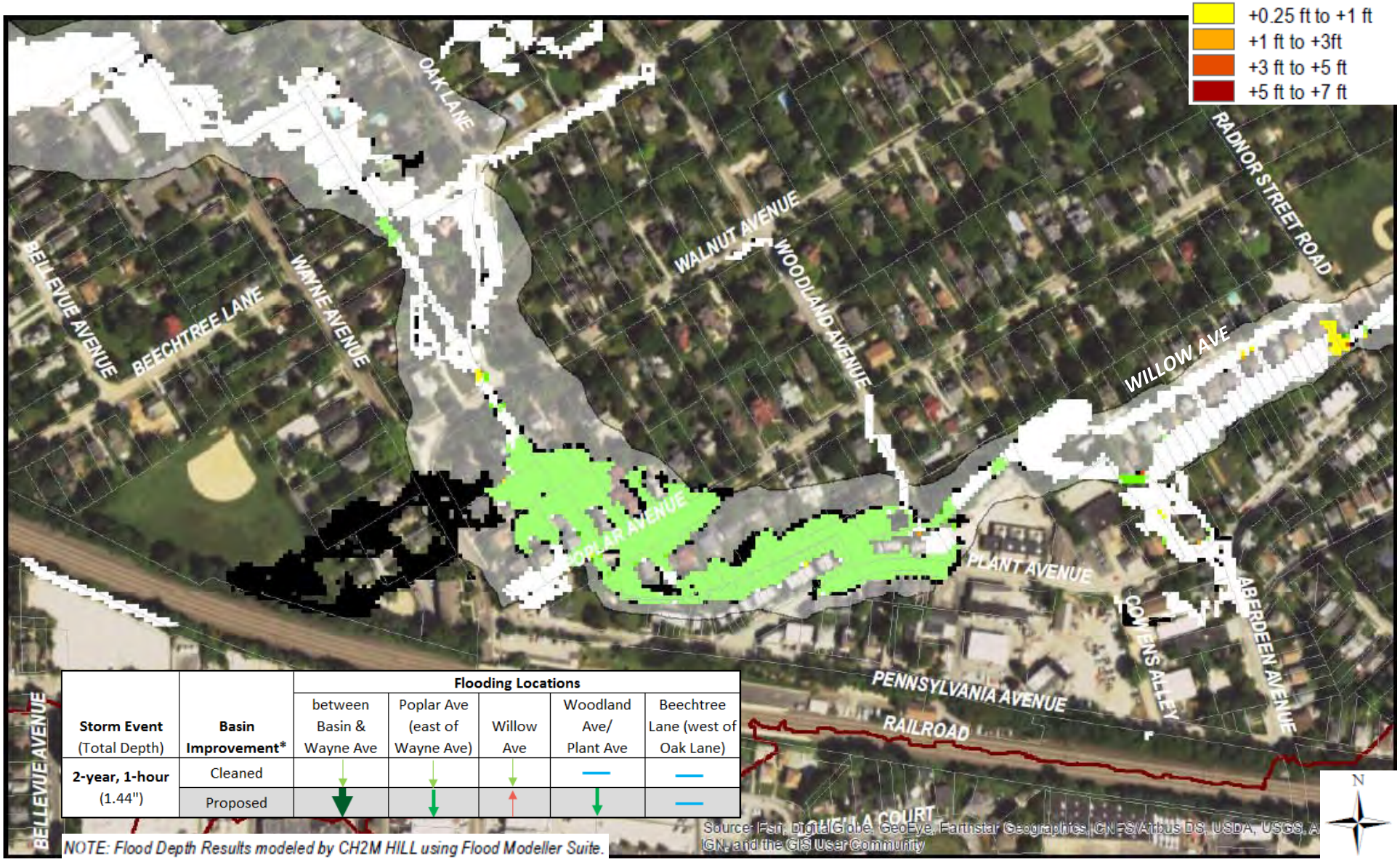


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
2-year, 1-hour (1.44")	Cleaned	↓	↓	↓	—	—
	Proposed	↓	↓	↑	↓	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Proposed Basin

2-year, 1-hour Event

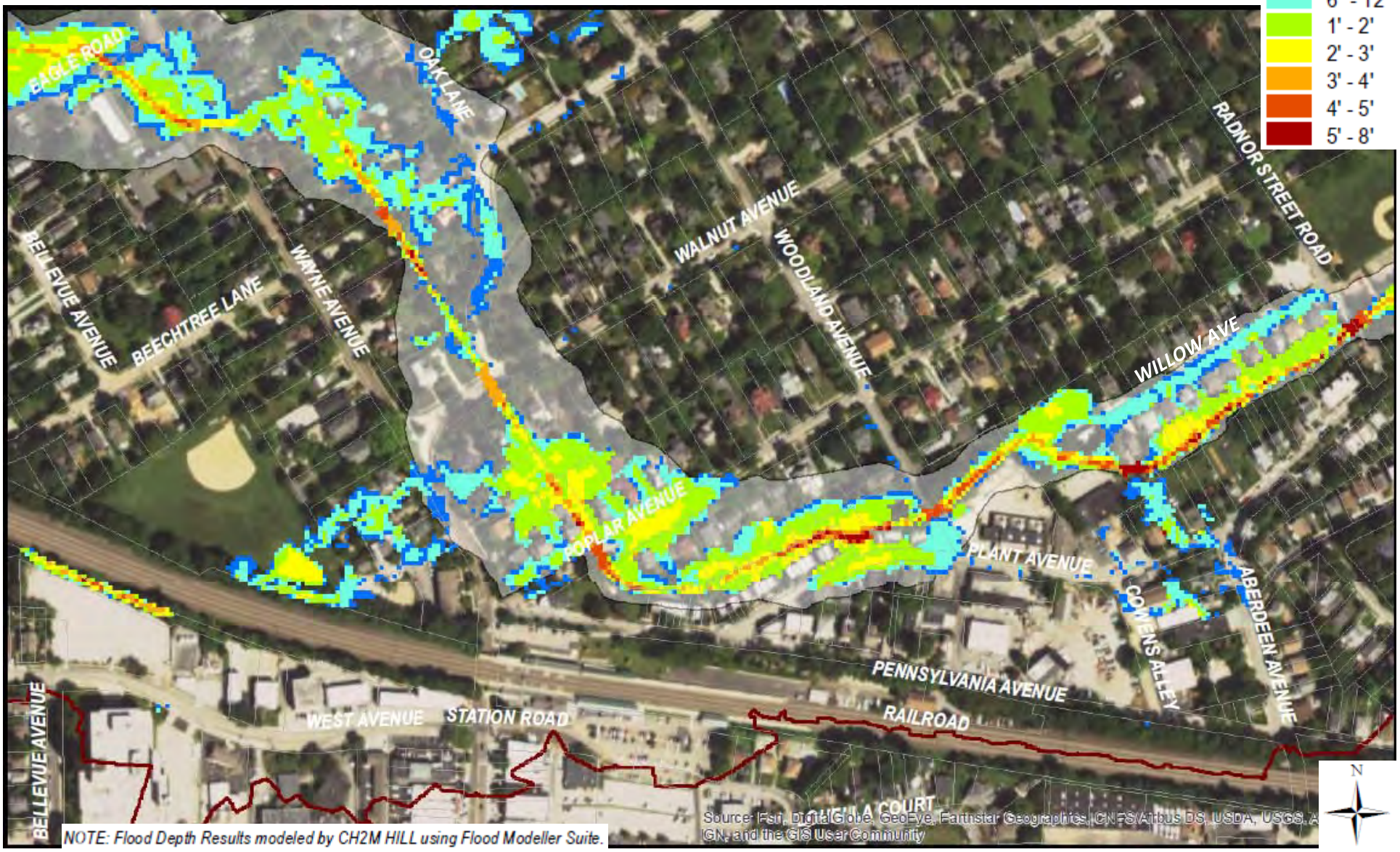


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
2-year, 1-hour (1.44")	Cleaned	↓	↓	↓	—	—
	Proposed	↓↓	↓	↑	↓	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

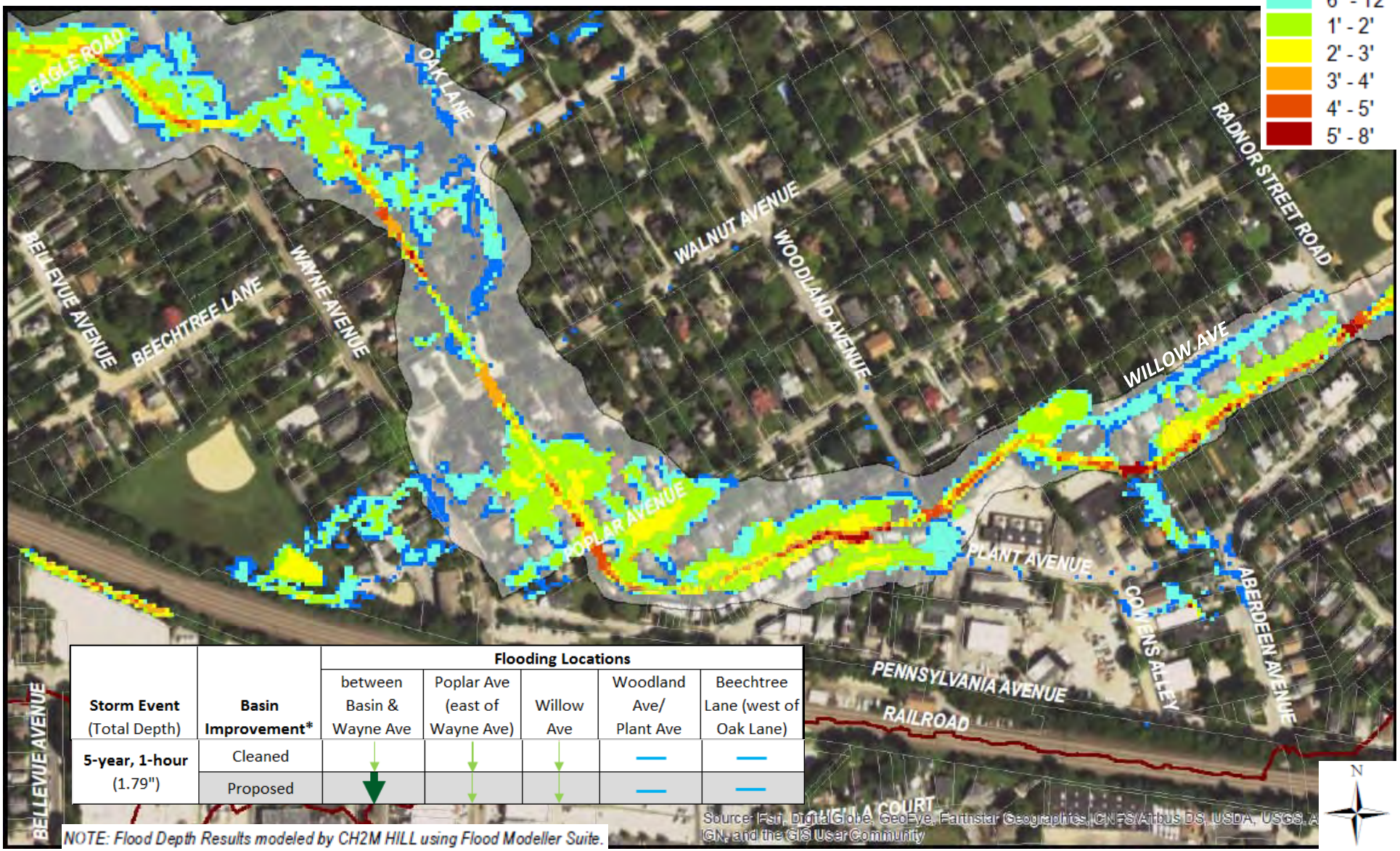
North Wayne Basin: Existing Basin (Clogged)

5-year, 1-hour Event



North Wayne Basin: Existing Basin (Cleaned)

5-year, 1-hour Event

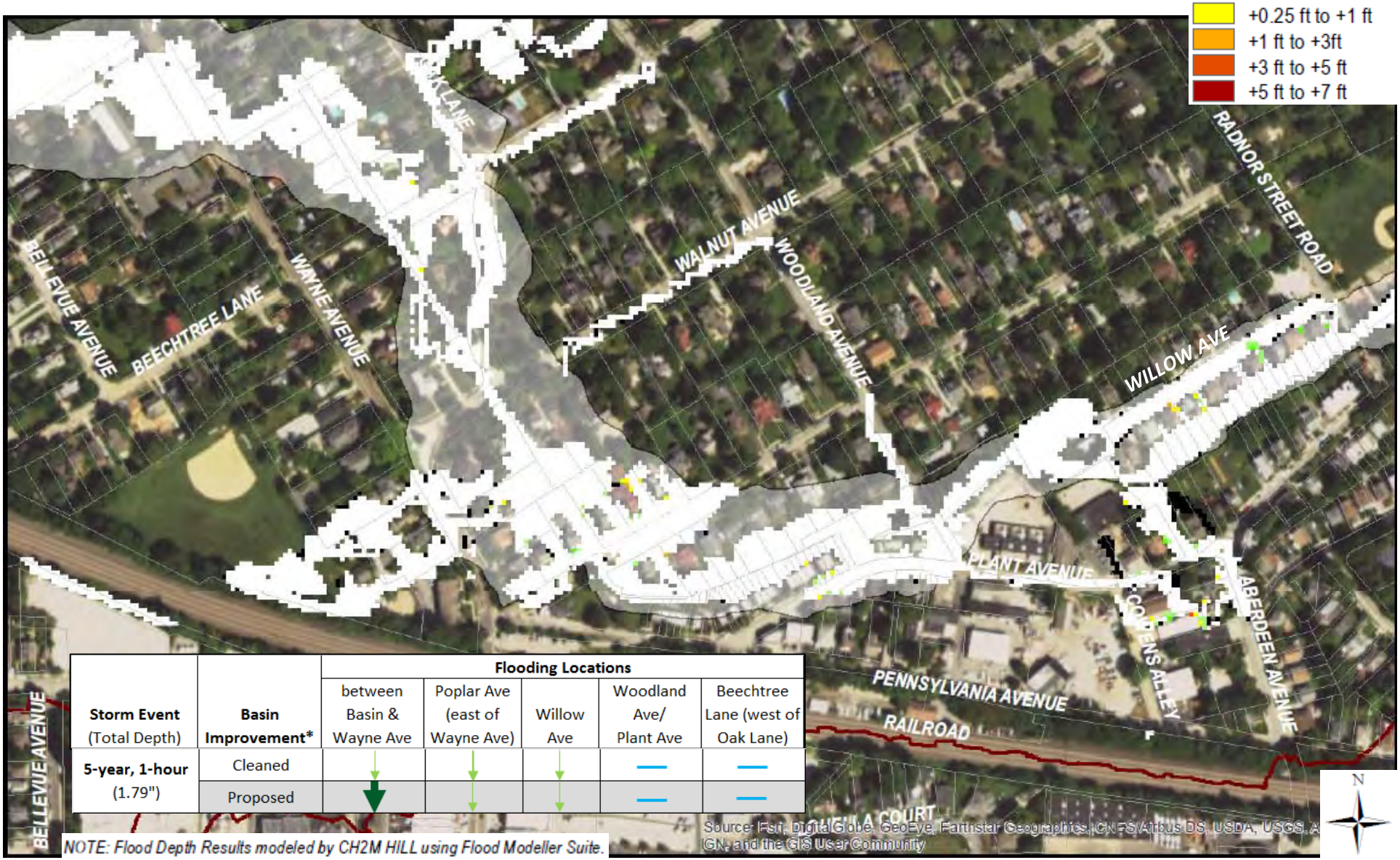


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
5-year, 1-hour (1.79")	Cleaned	↓	↓	↓	—	—
	Proposed	↓	↓	↓	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Existing Basin (Cleaned)

5-year, 1-hour Event

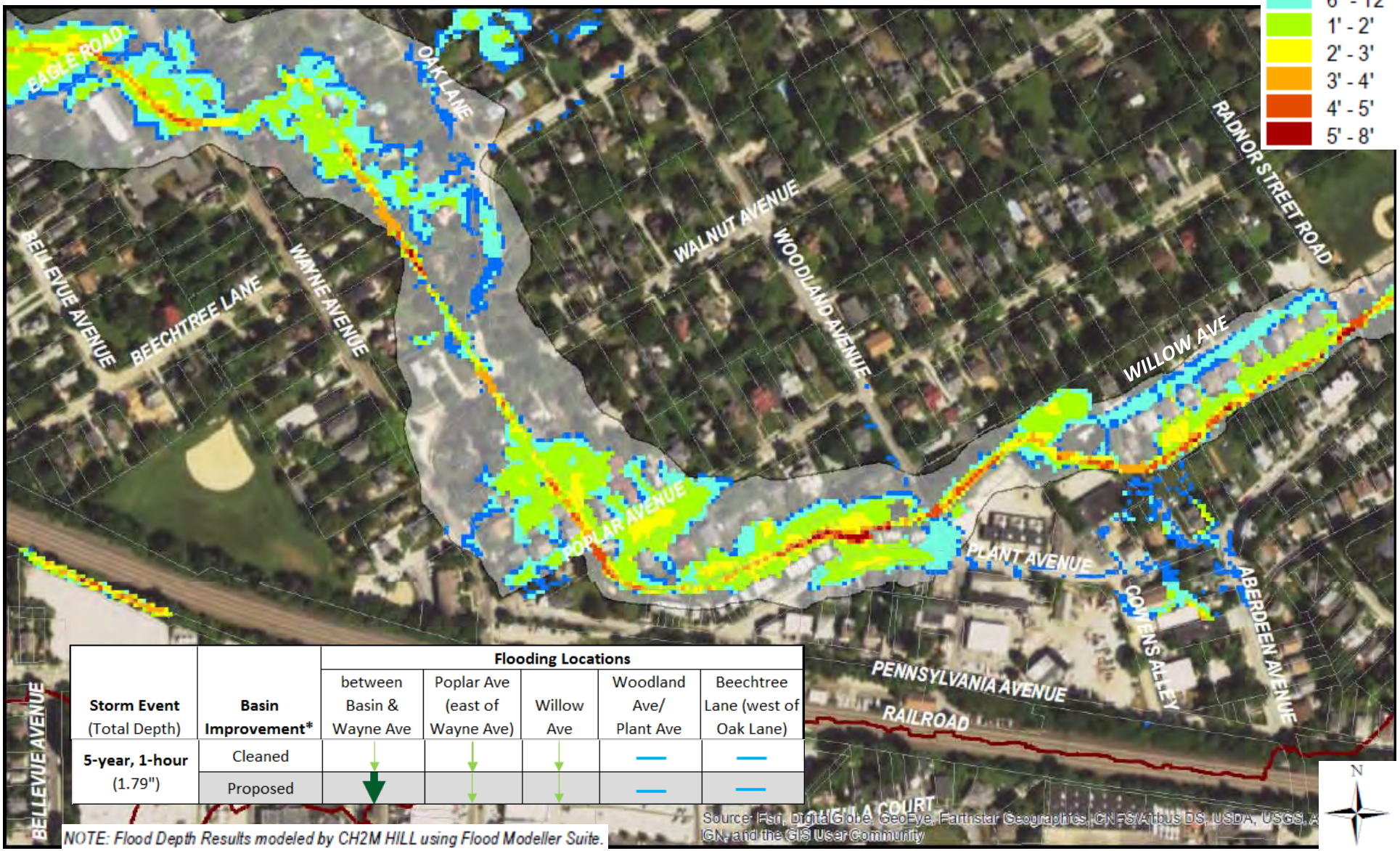


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
5-year, 1-hour (1.79")	Cleaned	↓	↓	↓	—	—
	Proposed	▼	↓	↓	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Proposed Basin

5-year, 1-hour Event



Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
5-year, 1-hour (1.79")	Cleaned	↓	↓	↓	—	—
	Proposed	↓	↓	↓	—	—

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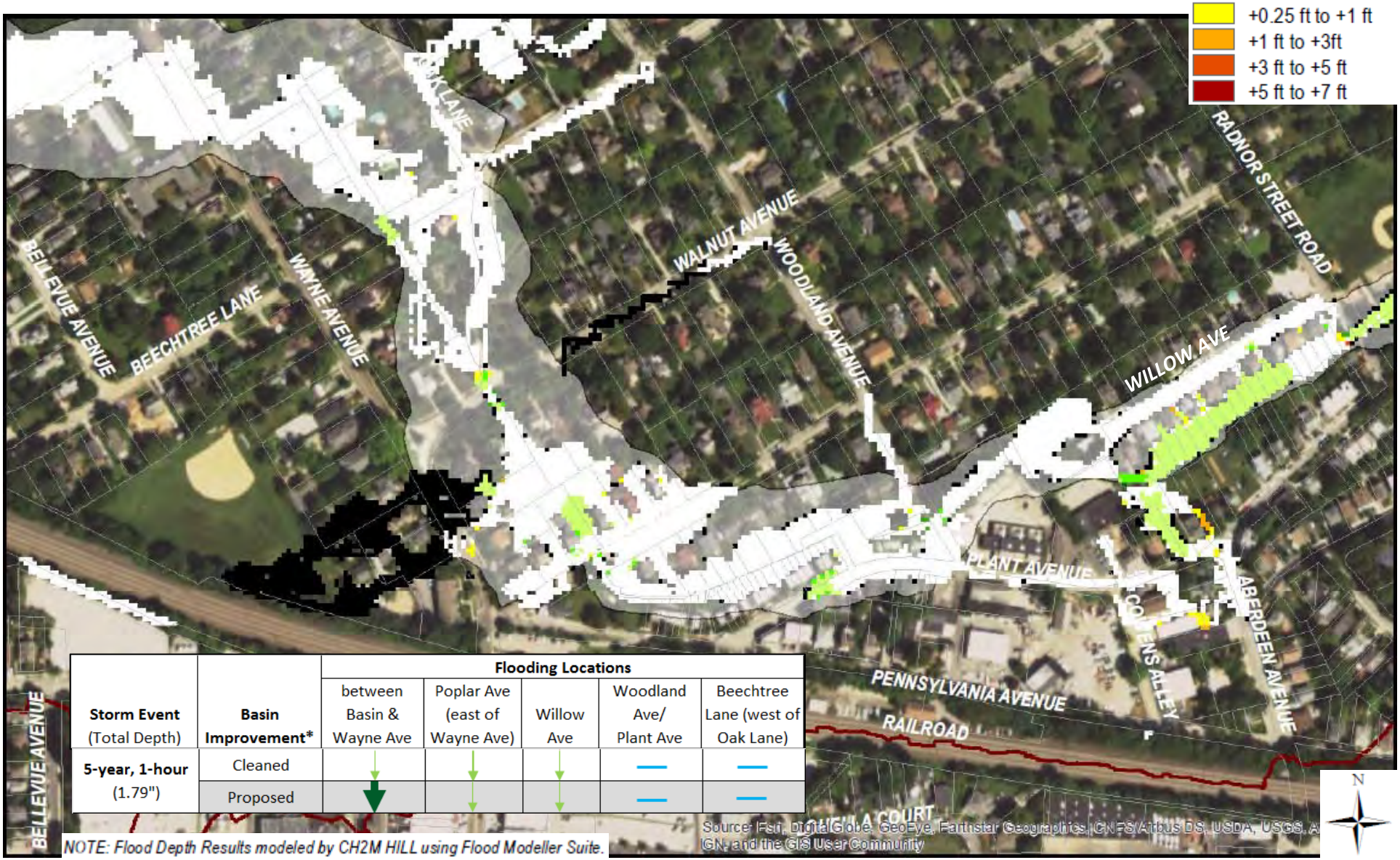
North Wayne Basin: Proposed Basin

5-year, 1-hour Event

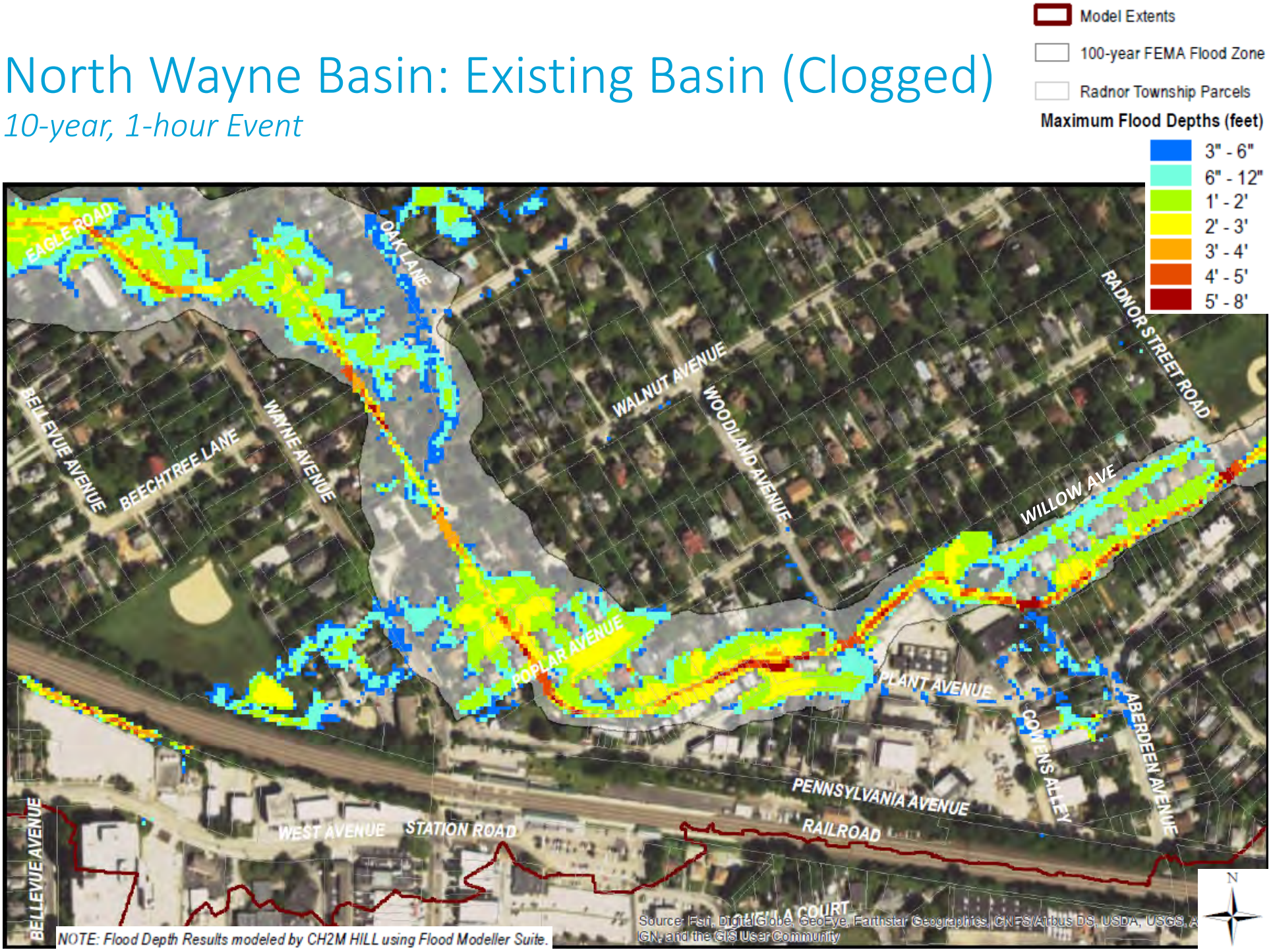


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations				
		between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
5-year, 1-hour (1.79")	Cleaned	↓	↓	↓	—	—
	Proposed	↓	↓	↓	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

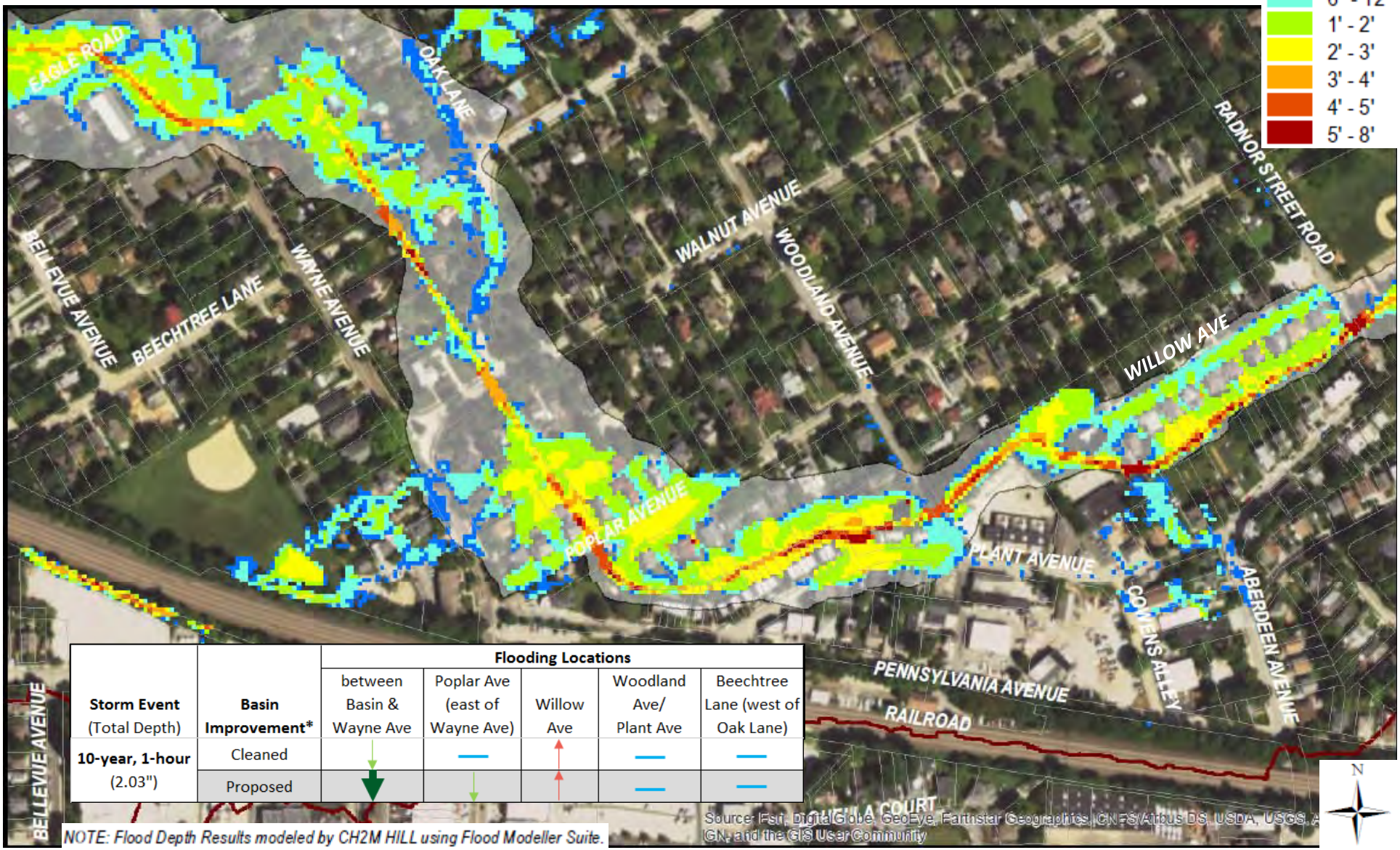
North Wayne Basin: Existing Basin (Clogged)

10-year, 1-hour Event



North Wayne Basin: Existing Basin (Cleaned)

10-year, 1-hour Event

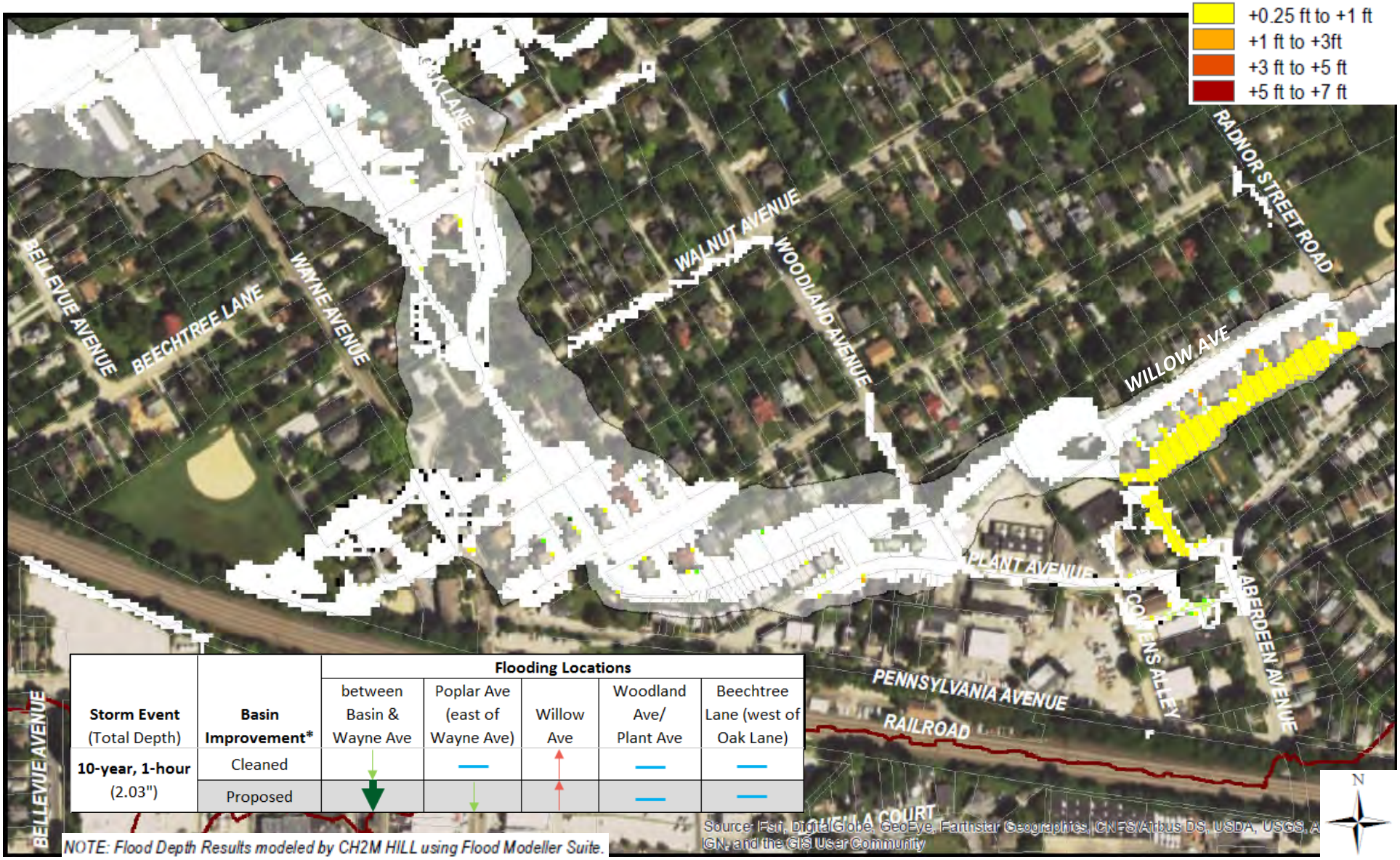


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
10-year, 1-hour (2.03")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Existing Basin (Cleaned)

10-year, 1-hour Event

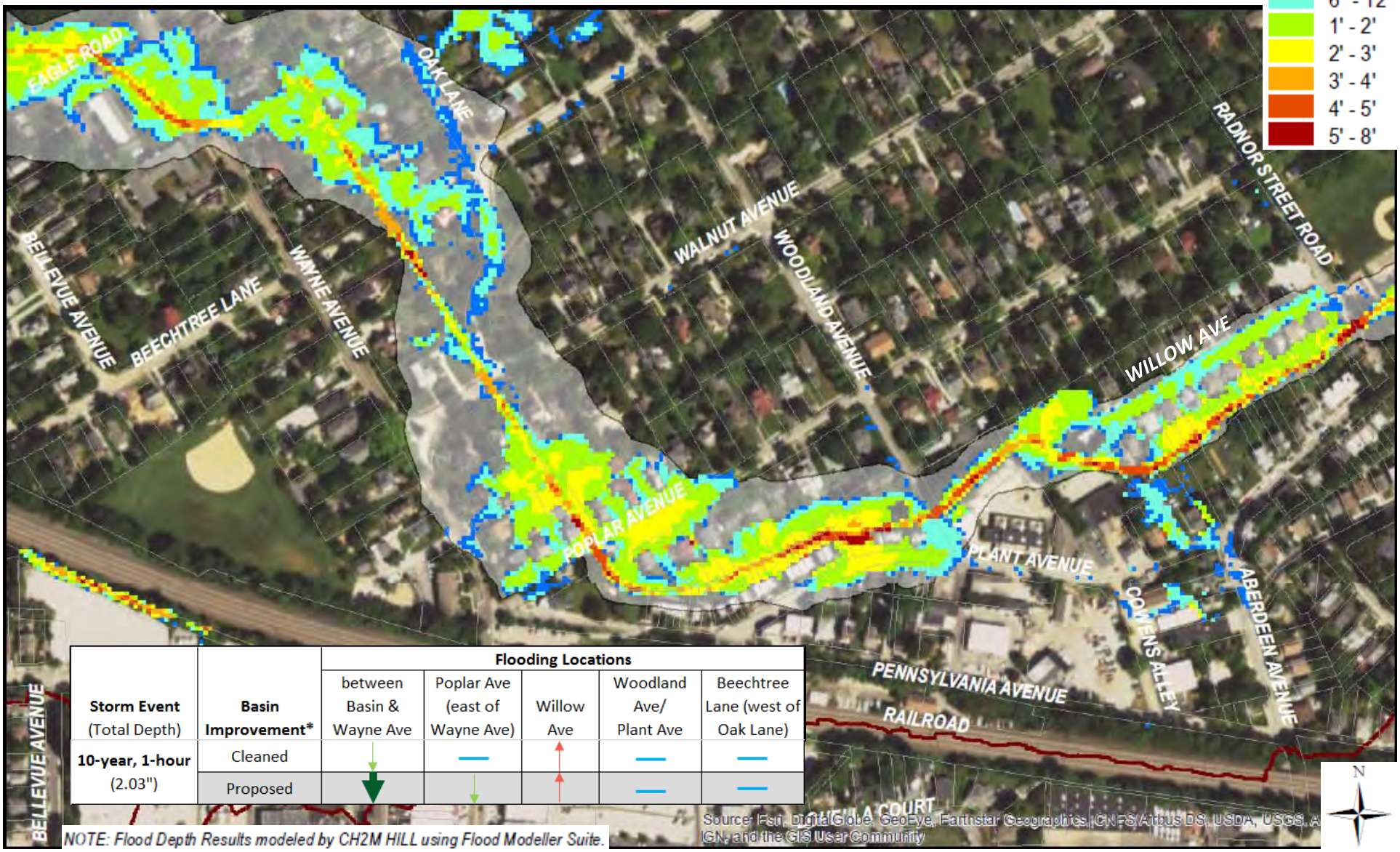


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
10-year, 1-hour (2.03")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Proposed Basin

10-year, 1-hour Event

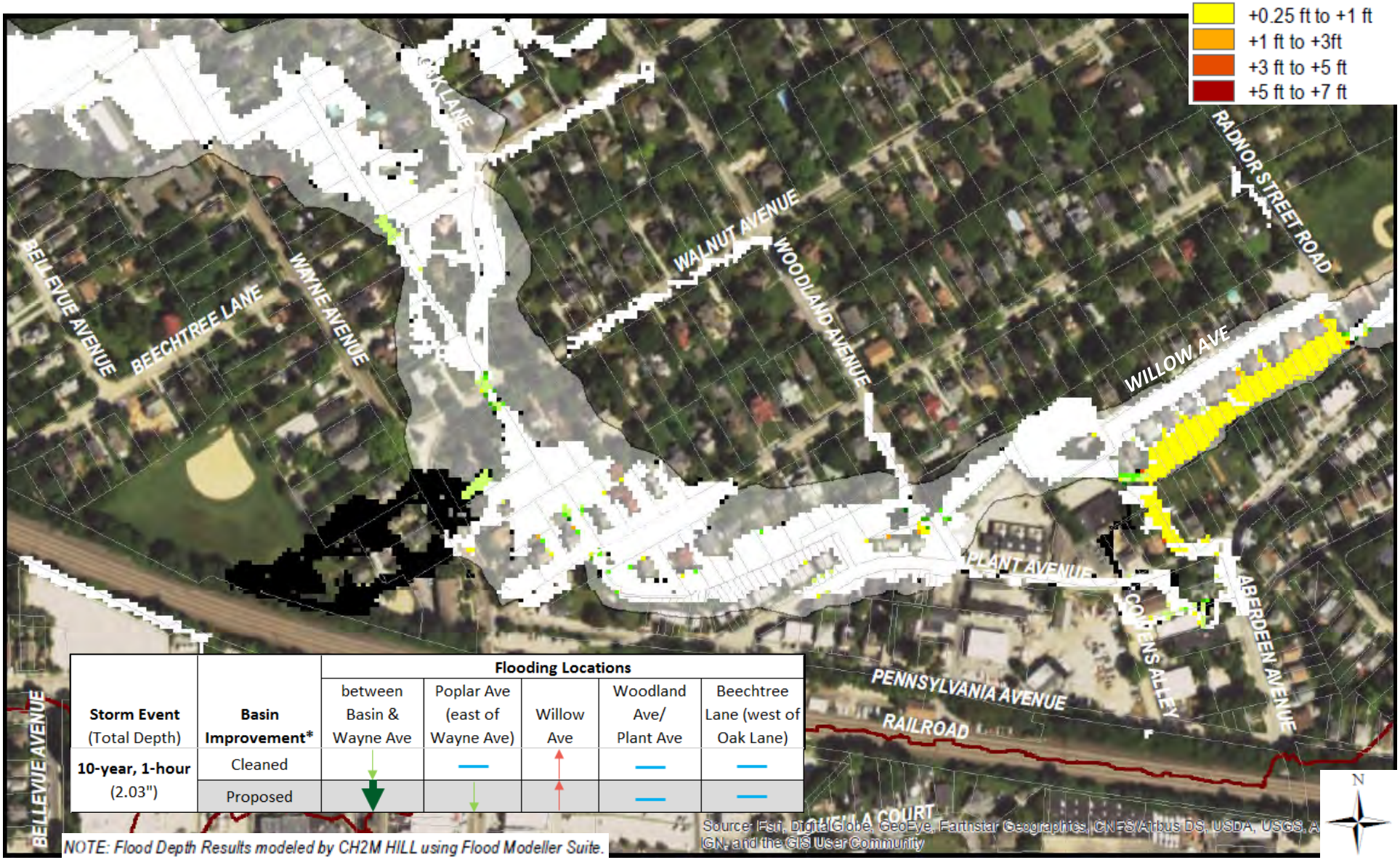


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
10-year, 1-hour (2.03")	Cleaned		—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Proposed Basin

10-year, 1-hour Event

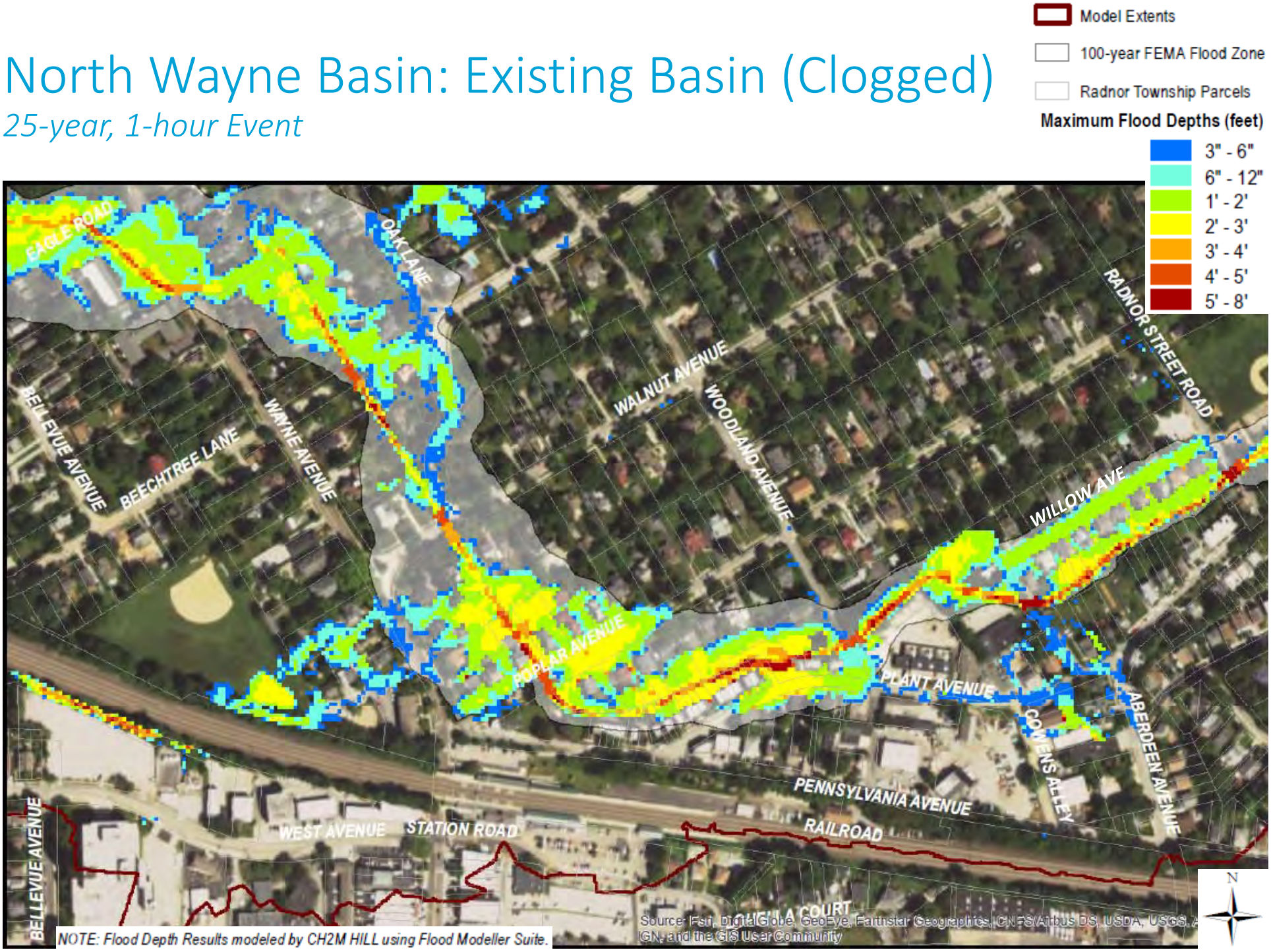


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
10-year, 1-hour (2.03")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Existing Basin (Clogged)

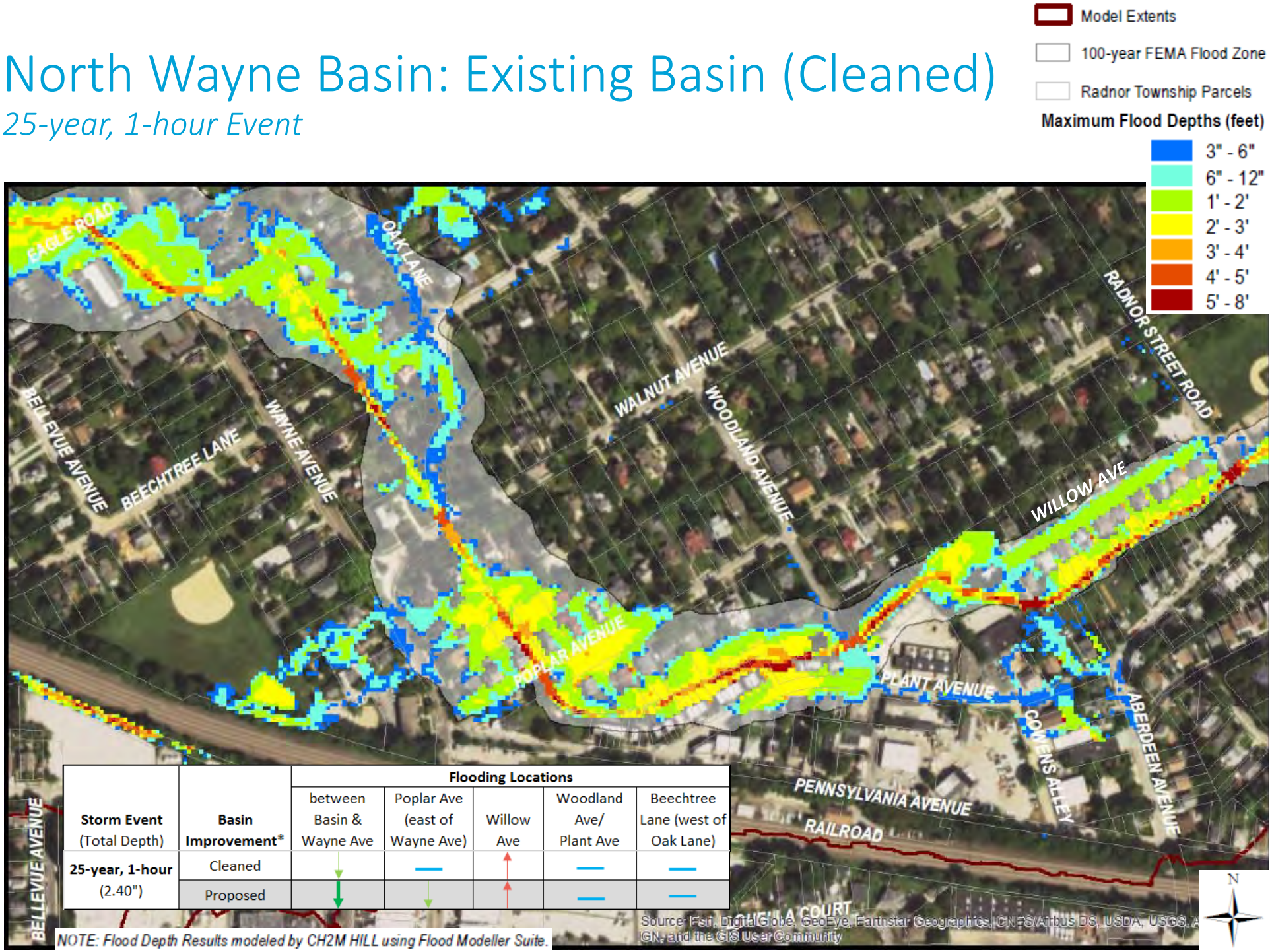
25-year, 1-hour Event



NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Existing Basin (Cleaned)

25-year, 1-hour Event

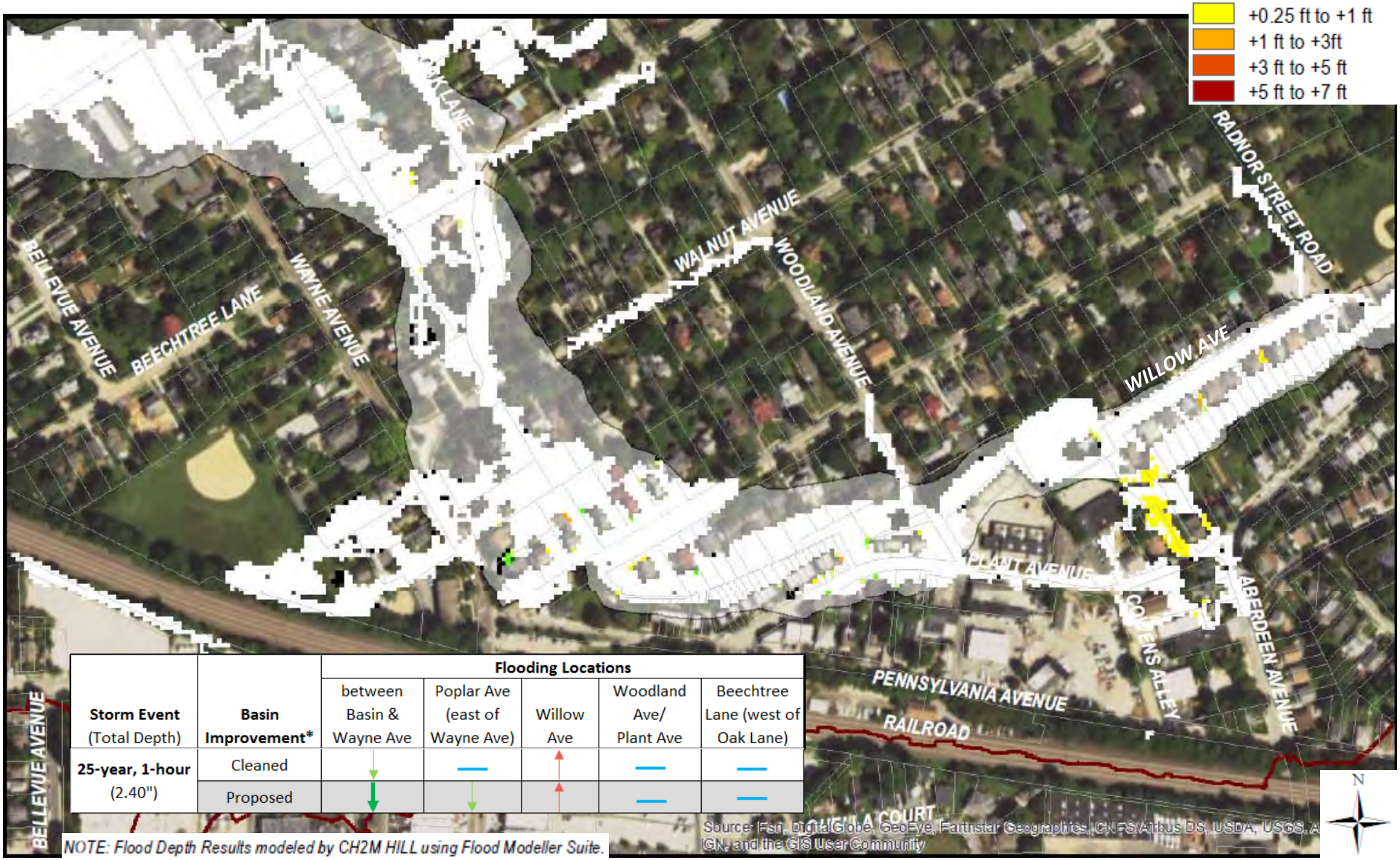


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
25-year, 1-hour (2.40")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Existing Basin (Cleaned)

25-year, 1-hour Event

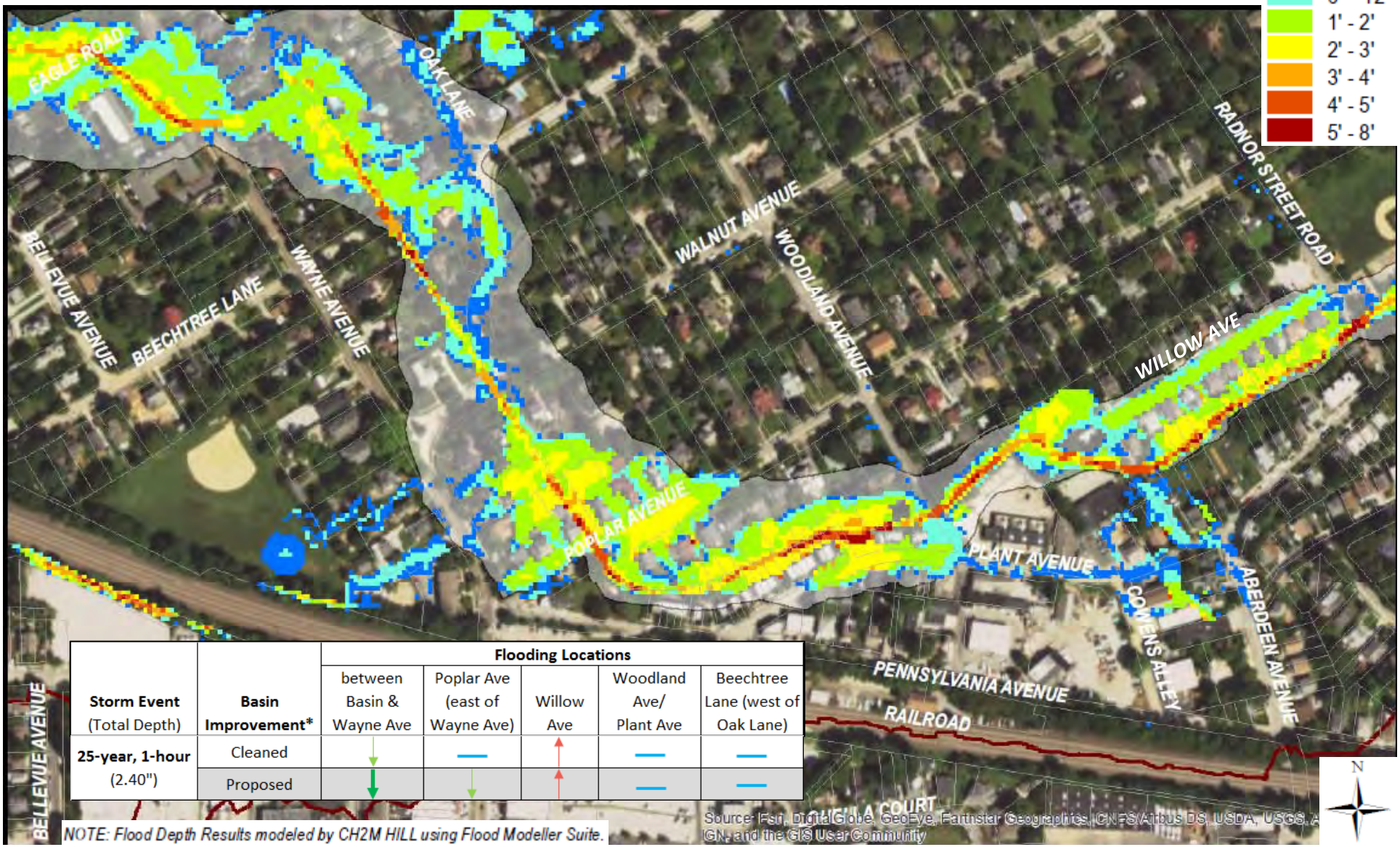


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
25-year, 1-hour (2.40")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Proposed Basin

25-year, 1-hour Event

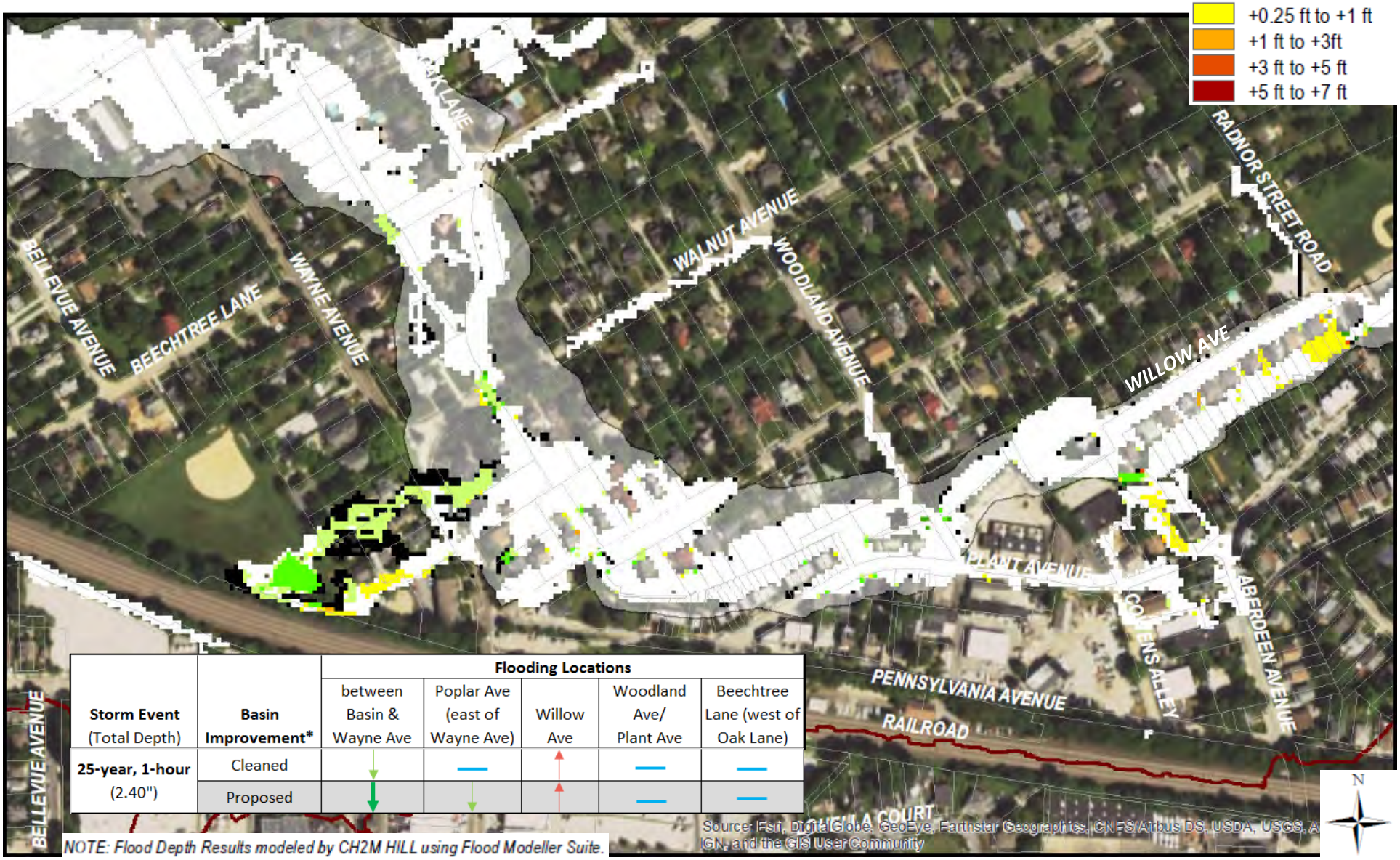


Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
25-year, 1-hour (2.40")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

North Wayne Basin: Proposed Basin

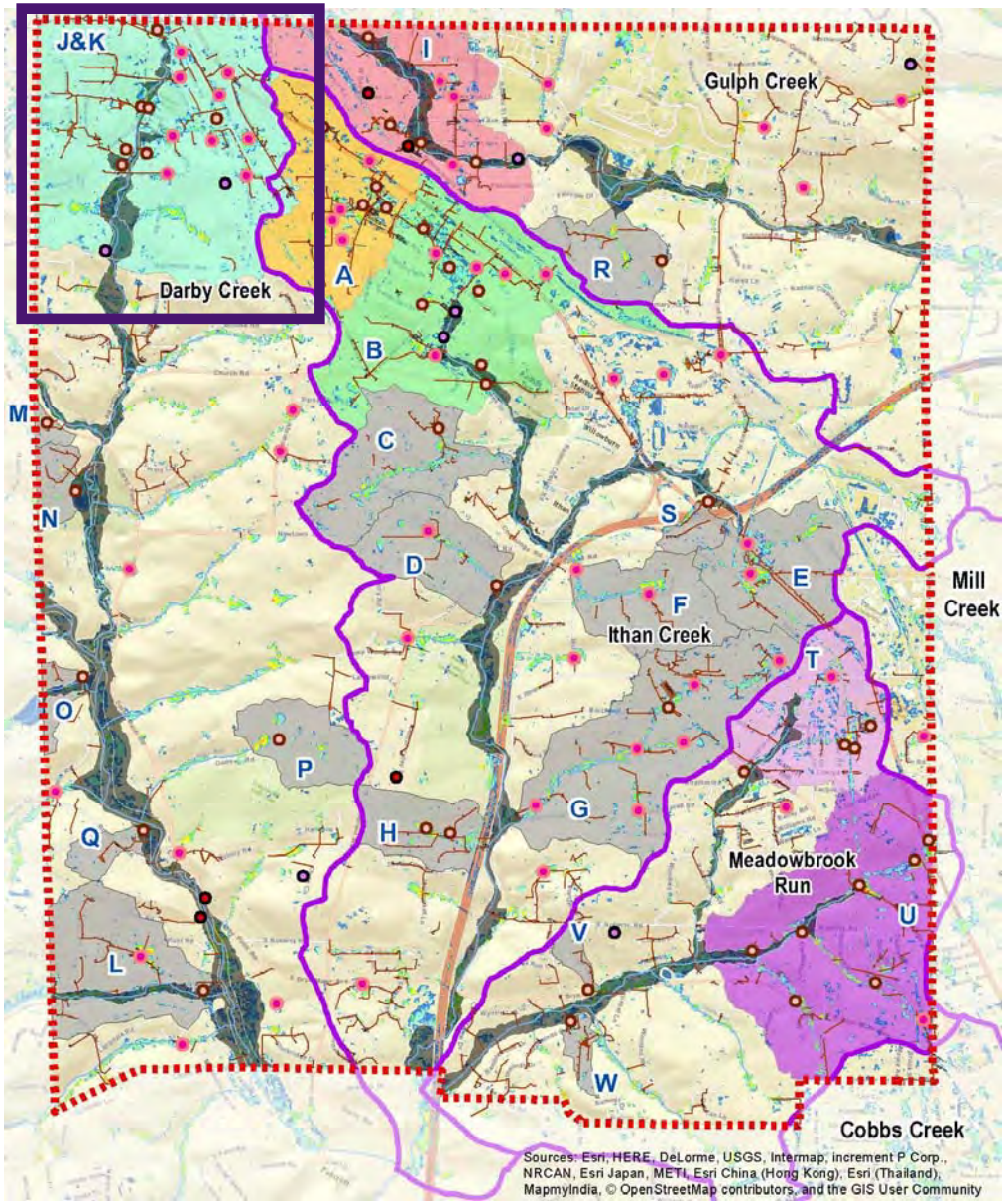
25-year, 1-hour Event



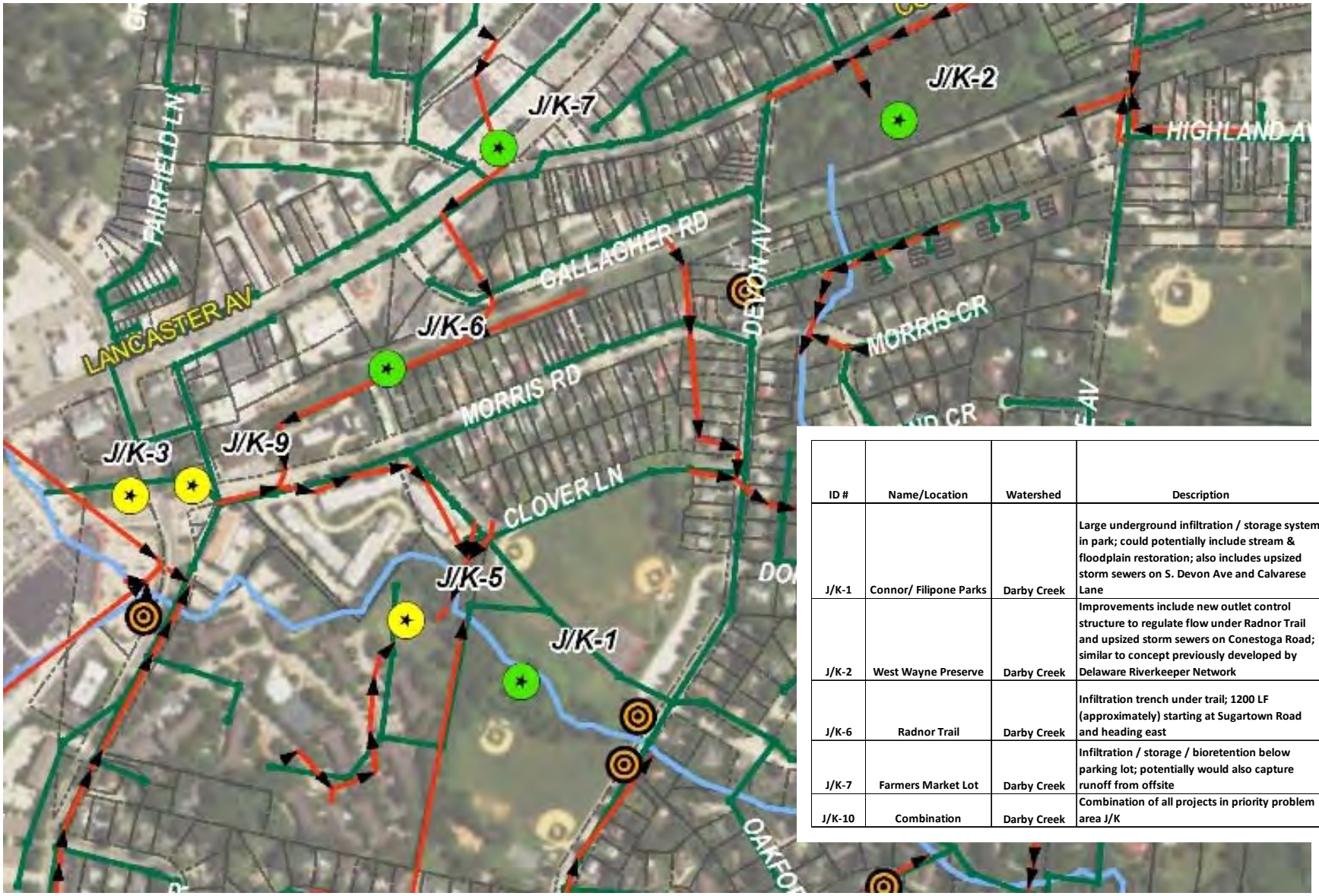
Storm Event (Total Depth)	Basin Improvement*	Flooding Locations: between Basin & Wayne Ave	Poplar Ave (east of Wayne Ave)	Willow Ave	Woodland Ave/ Plant Ave	Beechtree Lane (west of Oak Lane)
25-year, 1-hour (2.40")	Cleaned	↓	—	↑	—	—
	Proposed	↓	↓	↑	—	—

NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

Priority Problem Area J/K



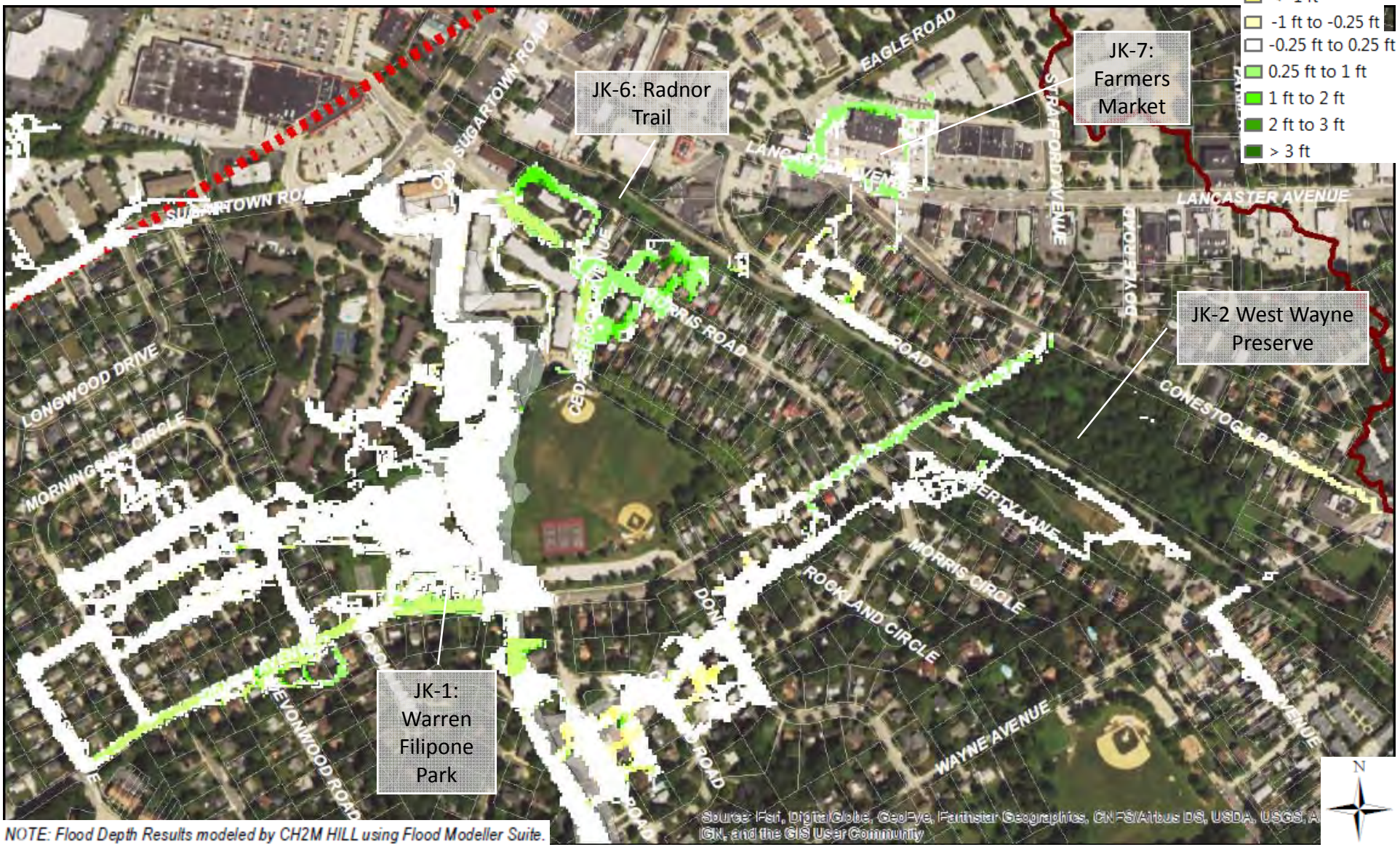
Potential Flood Mitigation Projects – Area J/K



ID #	Name/Location	Watershed	Description	Owner
J/K-1	Connor/ Filipone Parks	Darby Creek	Large underground infiltration / storage system in park; could potentially include stream & floodplain restoration; also includes upsized storm sewers on S. Devon Ave and Calvarese Lane	Township
J/K-2	West Wayne Preserve	Darby Creek	Improvements include new outlet control structure to regulate flow under Radnor Trail and upsized storm sewers on Conestoga Road; similar to concept previously developed by Delaware Riverkeeper Network	Township
J/K-6	Radnor Trail	Darby Creek	Infiltration trench under trail; 1200 LF (approximately) starting at Sugartown Road and heading east	Township
J/K-7	Farmers Market Lot	Darby Creek	Infiltration / storage / bioretention below parking lot; potentially would also capture runoff from offsite	Private - Commercial
J/K-10	Combination	Darby Creek	Combination of all projects in priority problem area J/K	---

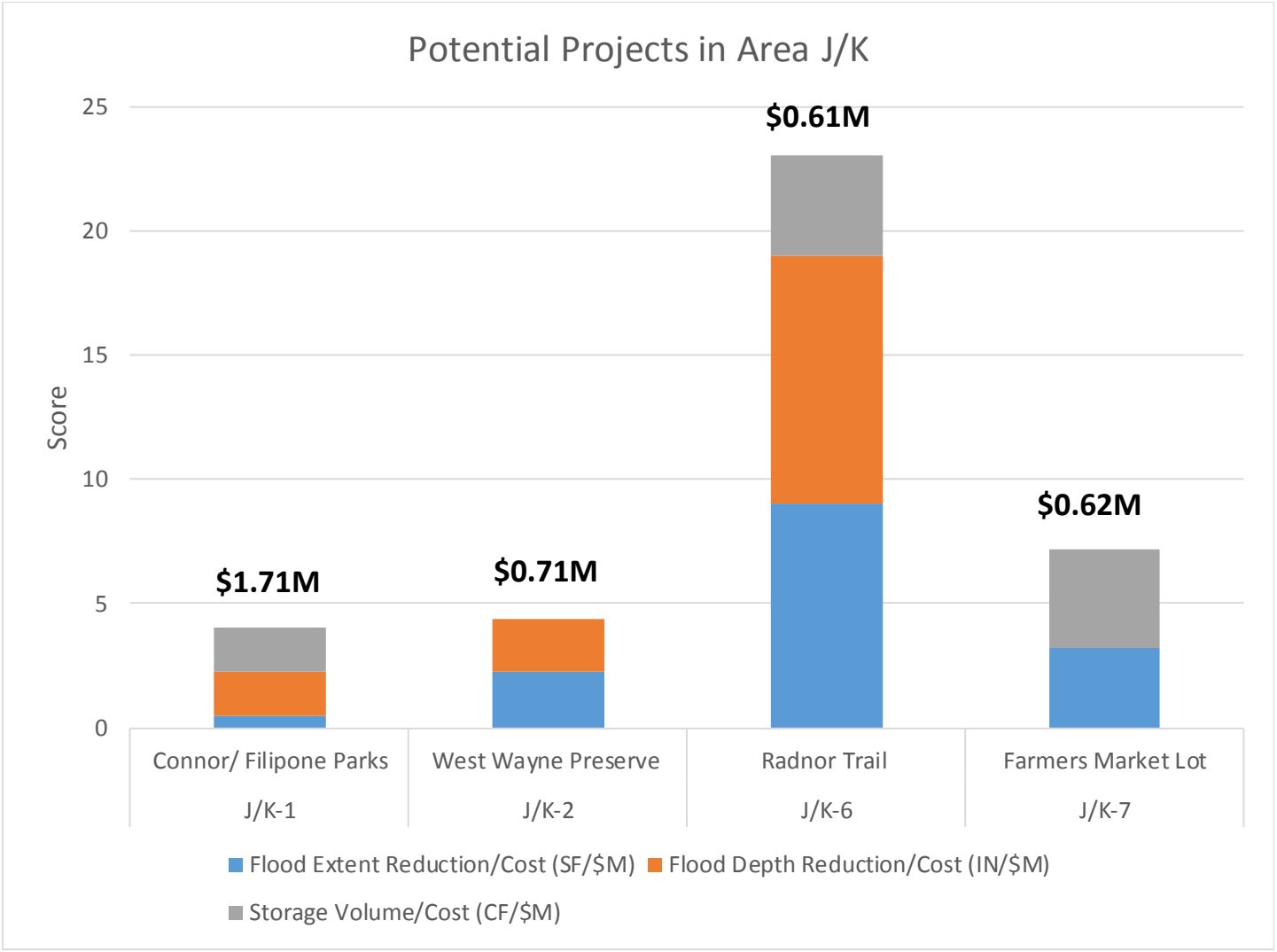
Darby Creek Area J/K: JK-10 Combination

Reduction in Max Flood Depth Results: 10-yr, 1-hr event

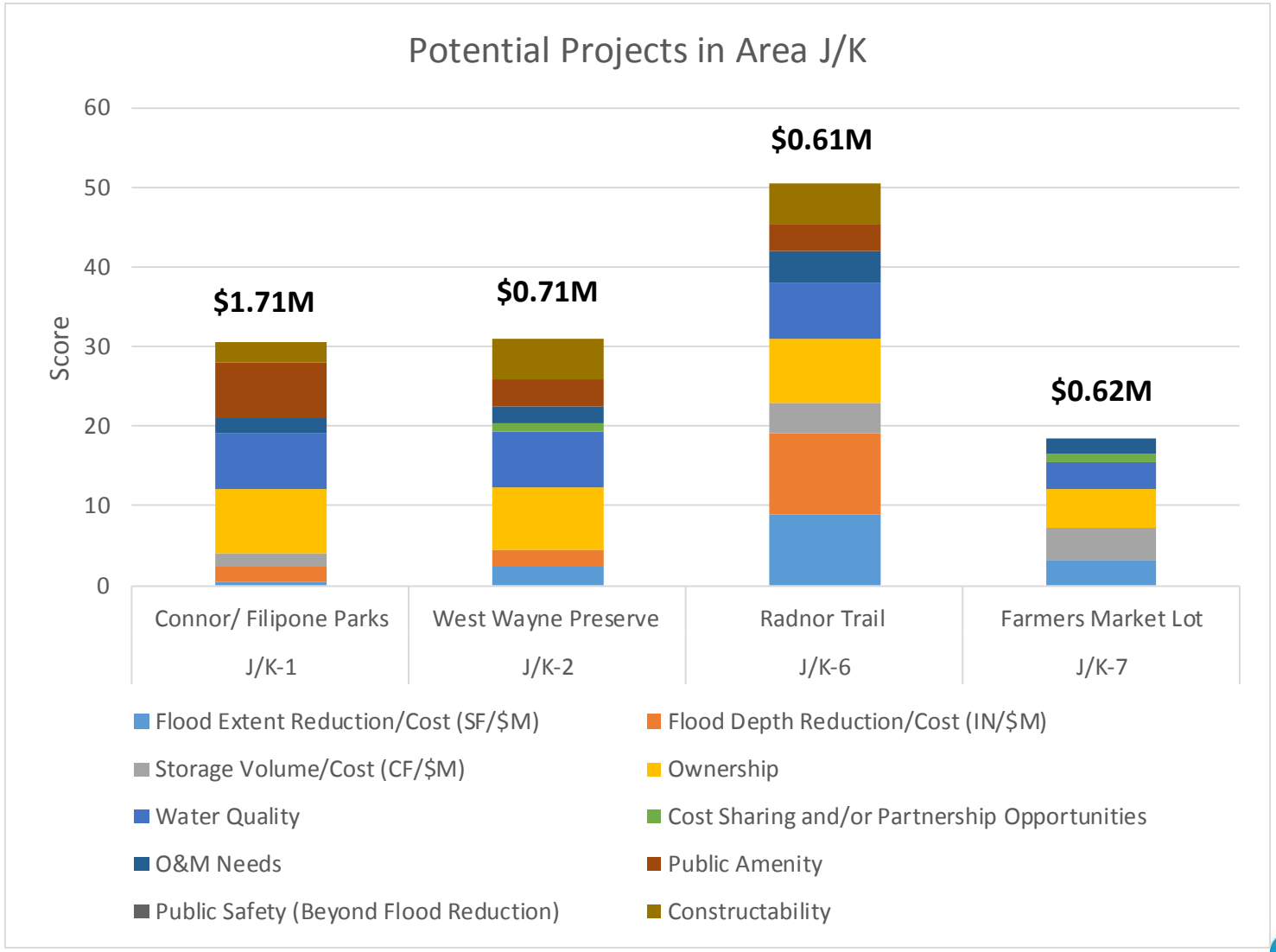


NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

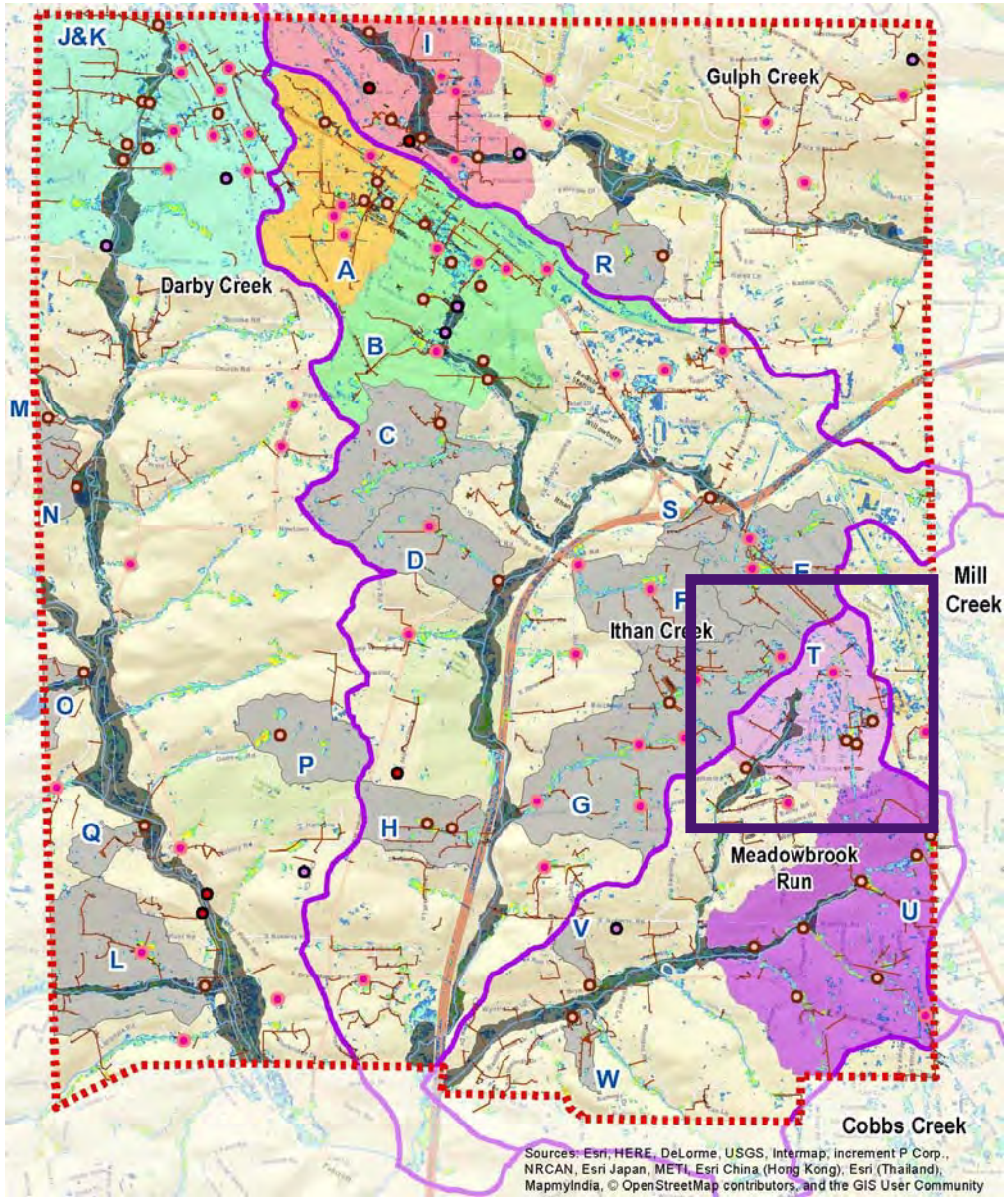
Results of Project Ranking by Priority Problem Area (Flood Reduction and Storage Volume Only)



Results of Project Ranking by Priority Problem Area (All Prioritization Criteria)



Priority Problem Area T

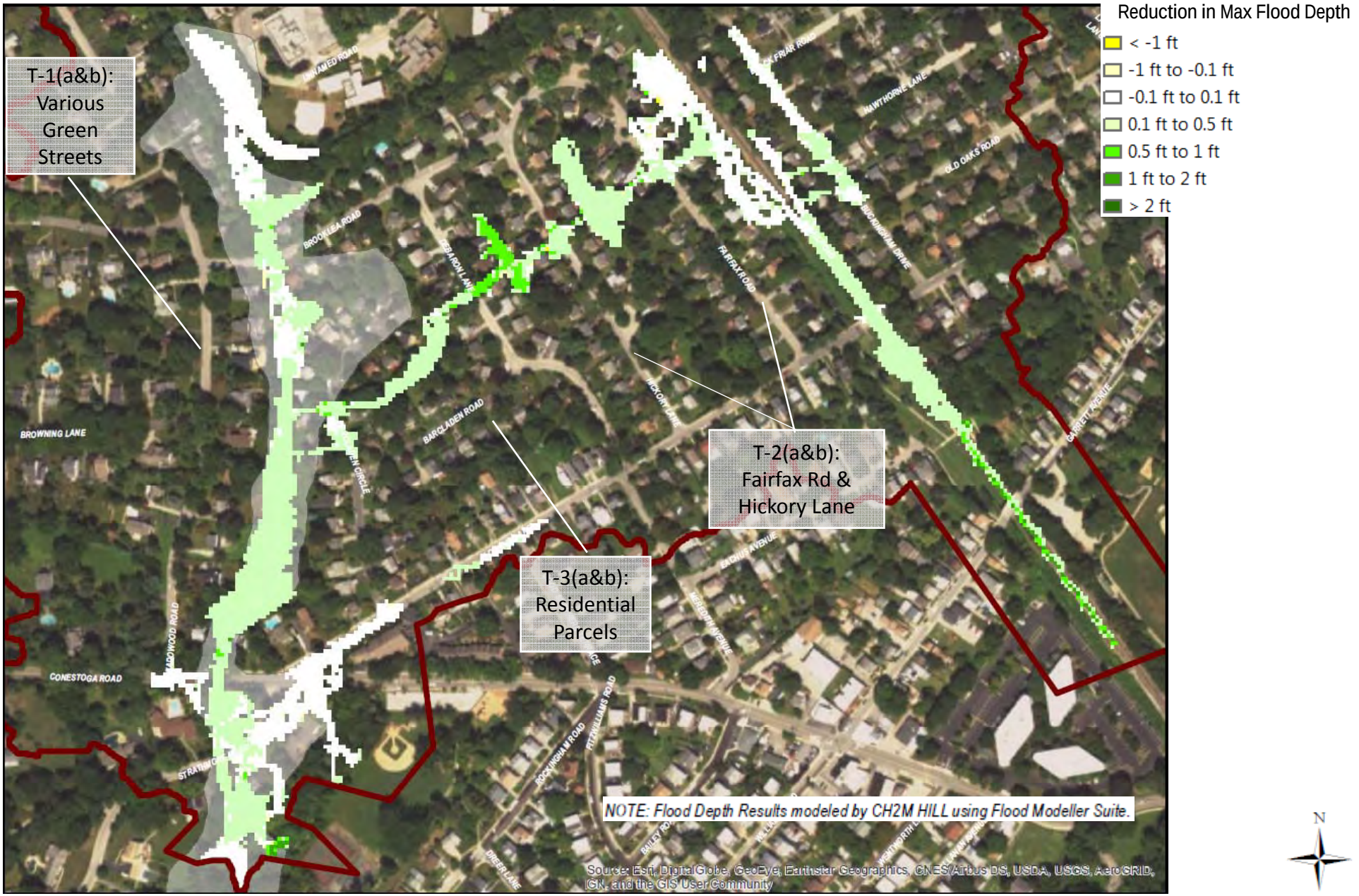


Potential Flood Mitigation Projects – Area T

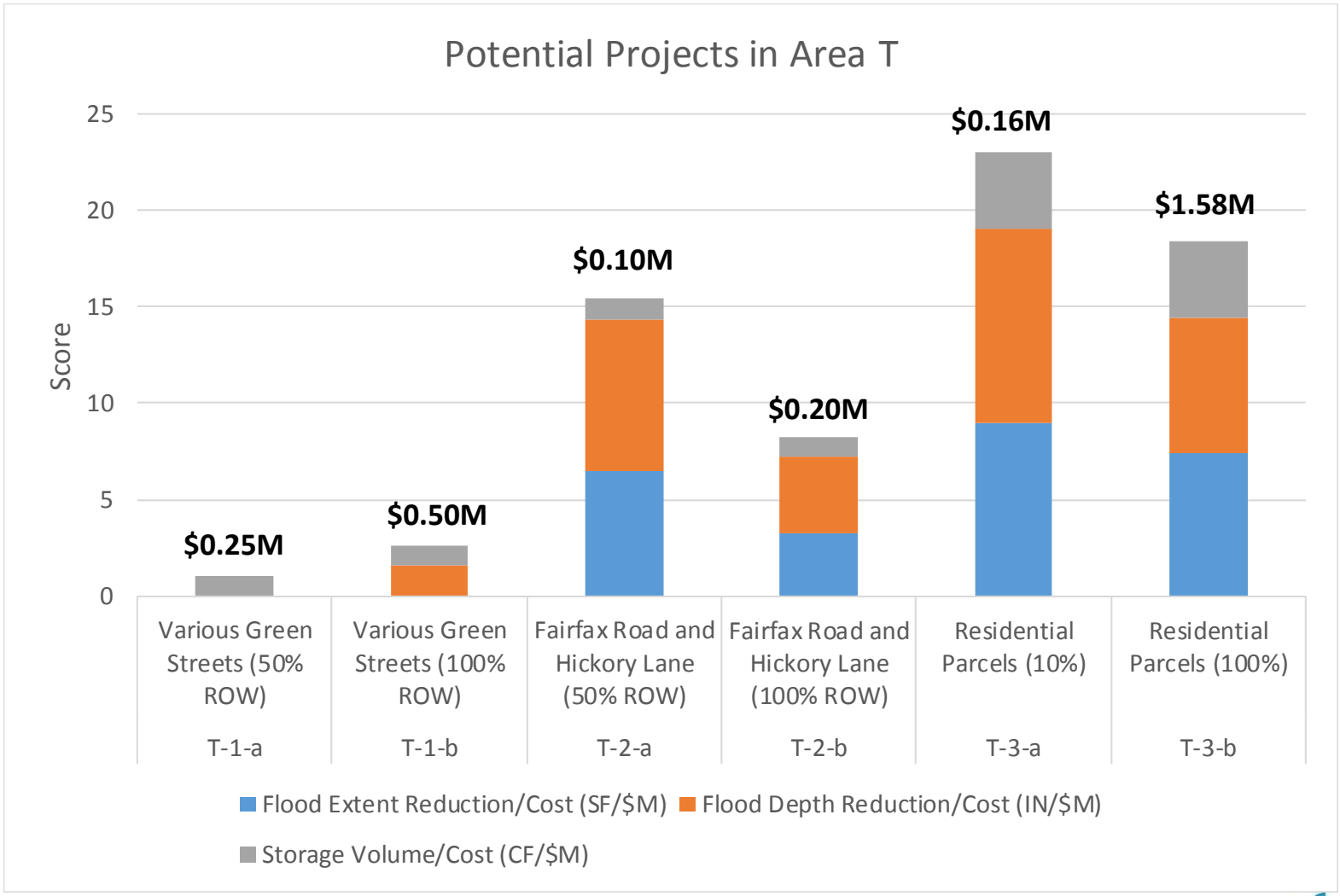
ID #	Name/Location	Watershed	Description	Owner
T-1-a	Various Green Streets (50% ROW)	Meadowbrook Creek	Green street opportunities with bumpouts and infiltration / storage trenches (50% of right-of-way impervious captured); Extent: Meadowood Road (Conestoga to Ithan), Browning Lane (south, 600ft west of Meadowood), Lowrys Lane (Conestoga to Fairfax)	Township
T-1-b	Various Green Streets (100% ROW)	Meadowbrook Creek	Green street opportunities with bumpouts and infiltration / storage trenches (100% of right-of-way impervious captured); Extent: Meadowood Road (Conestoga to Ithan), Browning Lane (south, 600ft west of Meadowood), Lowrys Lane (Conestoga to Fairfax)	Township
T-2-a	Fairfax Road and Hickory Lane (50% ROW)	Meadowbrook Creek	Retrofit existing grass circular median areas, create bioretention areas to manage right-of-way runoff (50% of right-of-way impervious captured)	Township
T-2-b	Fairfax Road and Hickory Lane (100% ROW)	Meadowbrook Creek	Retrofit existing grass circular median areas, create bioretention areas to manage right-of-way runoff (100% of right-of-way impervious captured)	Township
T-3-a	Residential Parcels (10%)	Meadowbrook Creek	Medium/low density residential with large front yards with potetial space for rain gardens/rain barrels (10% of residential impervious captured)	Private - Residential
T-3-b	Residential Parcels (100%)	Meadowbrook Creek	Medium/low density residential with large front yards with potetial space for rain gardens/rain barrels (100% of residential impervious captured)	Private - Residential
T-5	Combination	Meadowbrook Creek	Combination of all projects in priority problem area T (except T-1-a, T-2-a, and T-3-a)	---

Valley Run Area T: T-5 Combination

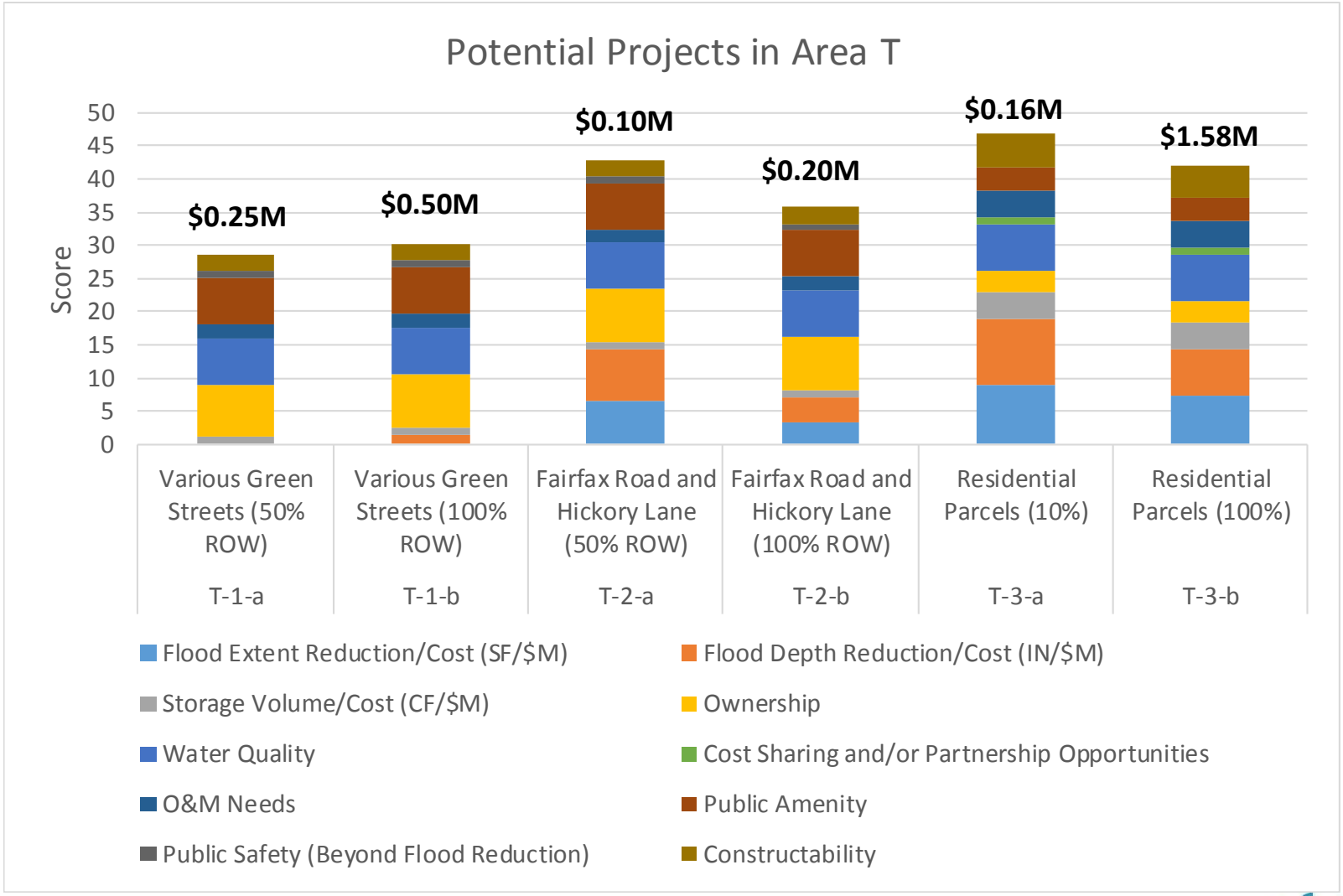
Reduction in Max Flood Depth Results: 10-yr, 1-hr event



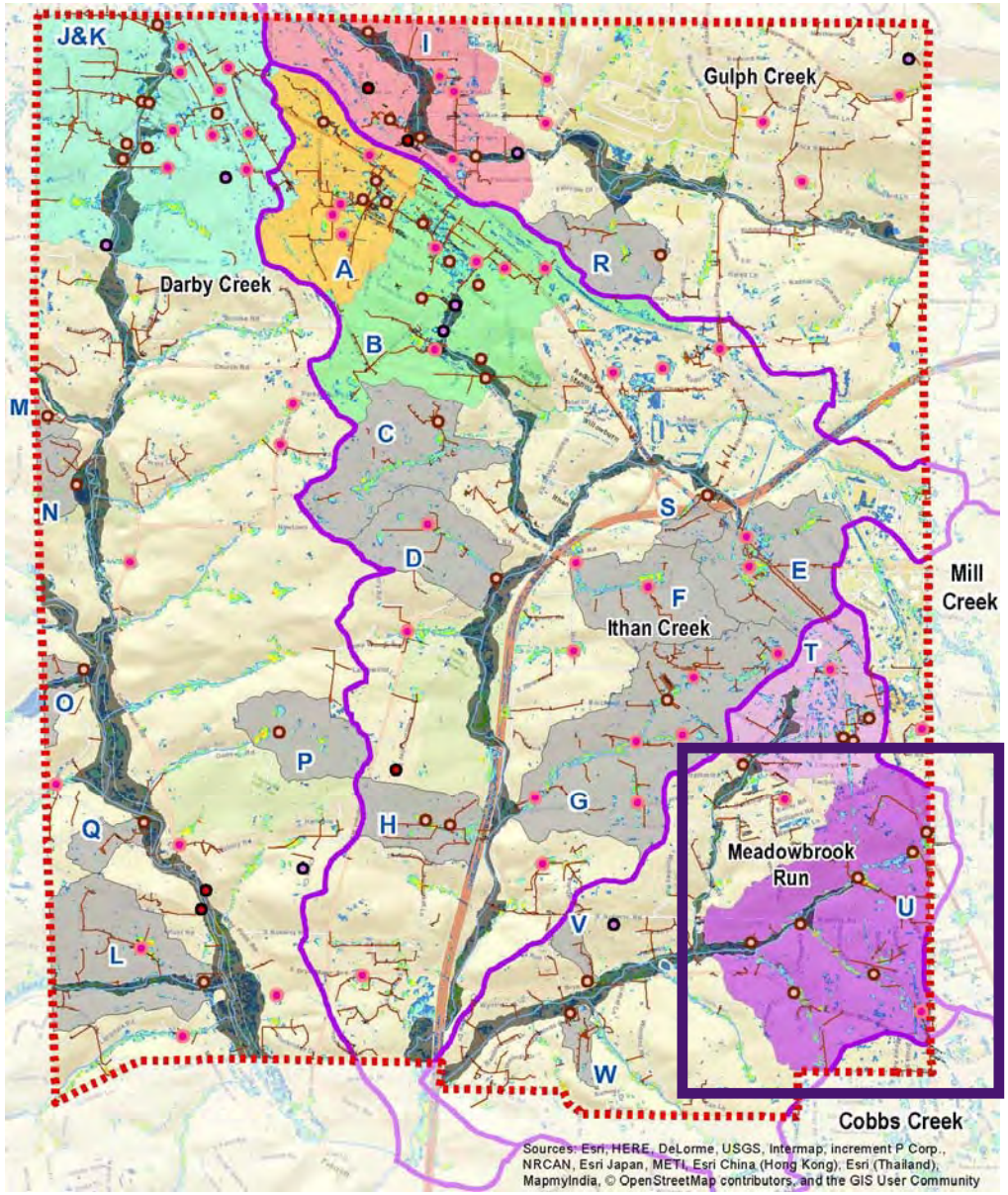
Results of Project Ranking by Priority Problem Area (Flood Reduction and Storage Volume Only)



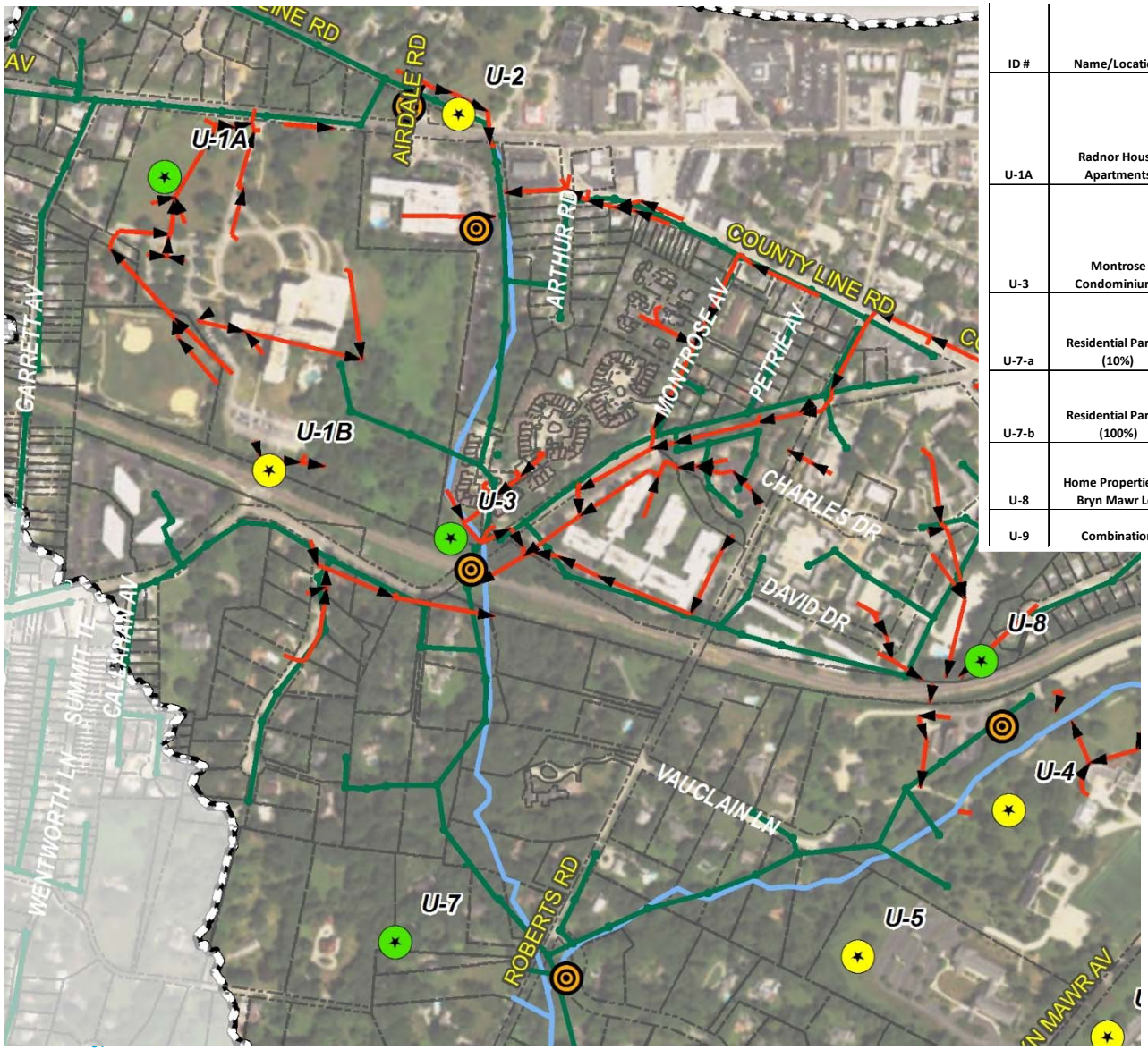
Results of Project Ranking by Priority Problem Area (All Prioritization Criteria)



Priority Problem Area U



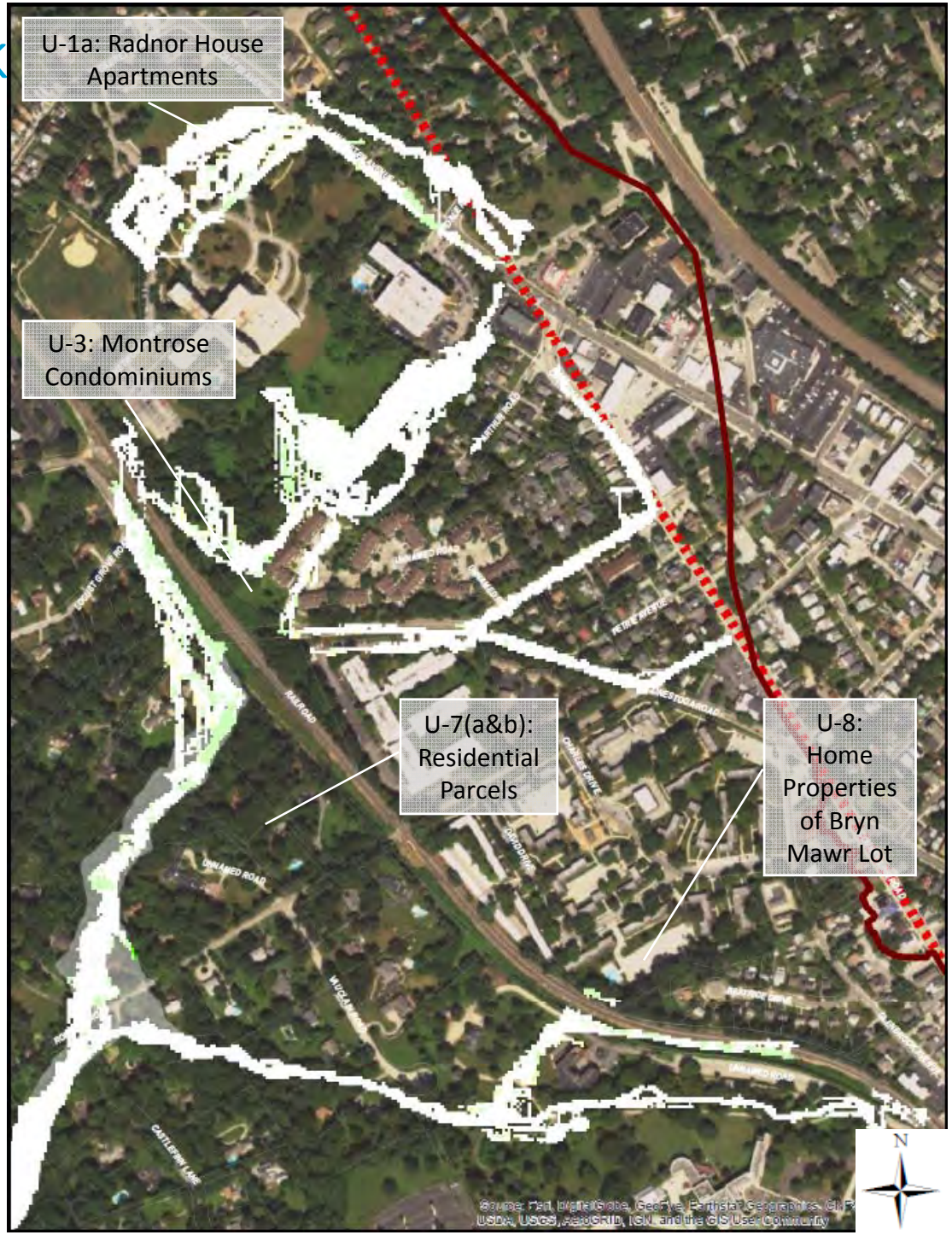
Potential Flood Mitigation Projects – Area U



ID #	Name/Location	Watershed	Description	Owner
U-1A	Radnor House Apartments	Meadowbrook Creek	Large parking lot drains to sewer that is conveyed through large open space area along E. Lancaster Ave; potential to intercept runoff from storm sewer and manage with vegetated bioretention/swale system that can also enhance open space	Private - Commercial
U-3	Montrose Condominiums	Meadowbrook Creek	Increase storage capacity of basin with grading and enhance plantings; modify outlet structure to control low flows; stream channel restoration possible; existing sanitary sewer crosses stream channel and basin	Private - Residential
U-7-a	Residential Parcels (10%)	Meadowbrook Creek	Medium/low density residential with large front yards with potetial space for rain gardens/rain barrels (10% of residential impervious captured)	Private - Residential
U-7-b	Residential Parcels (100%)	Meadowbrook Creek	Medium/low density residential with large front yards with potetial space for rain gardens/rain barrels (100% of residential impervious captured)	Private - Residential
U-8	Home Properties of Bryn Mawr Lot	Meadowbrook Creek	Infiltration / storage below parking lot; potentially would also capture runoff nearby streets	Private - Commercial
U-9	Combination	Meadowbrook Creek	Combination of all projects in priority problem area U (except U-7-a)	---

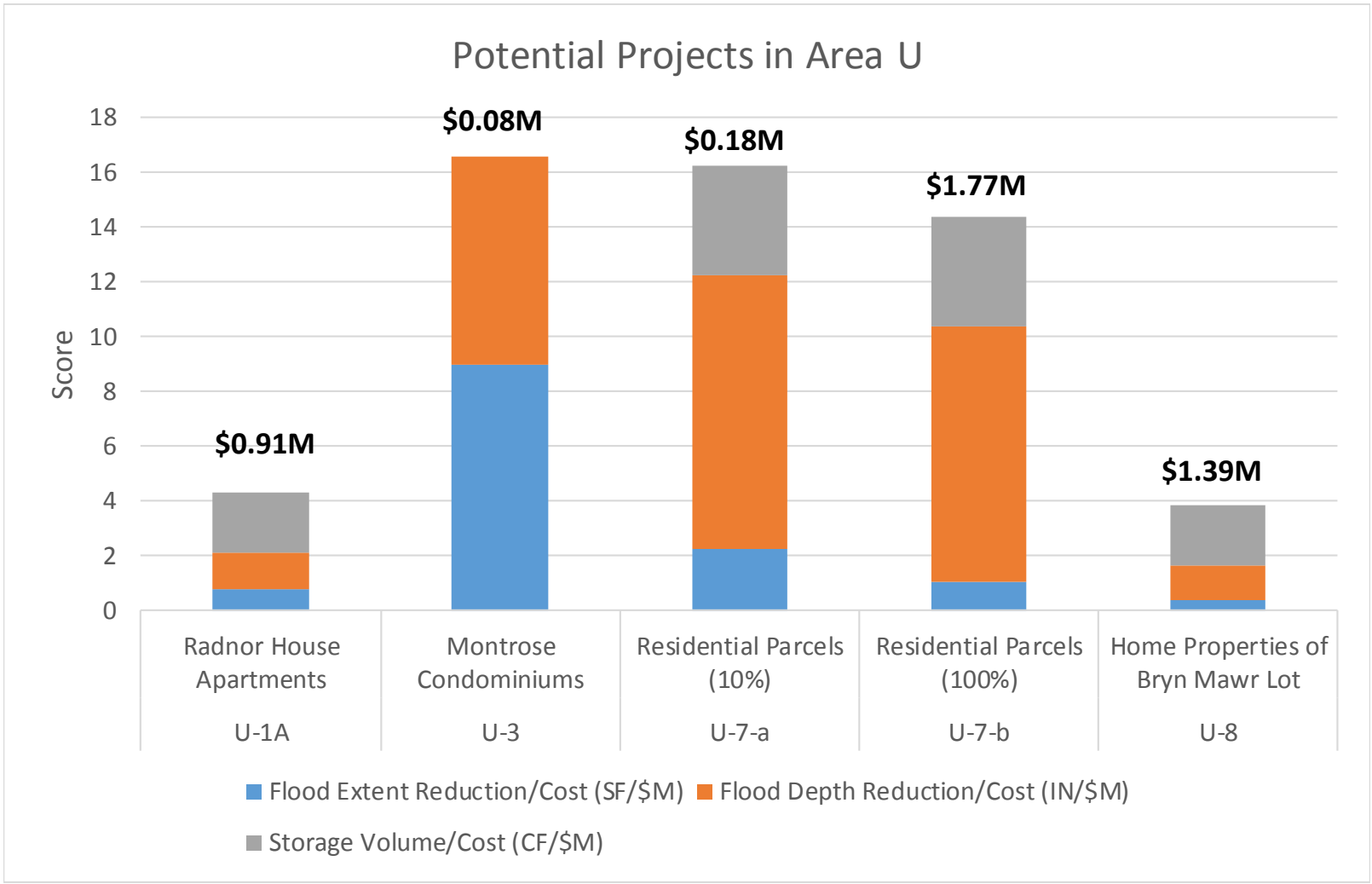
Upper Meadowbrook Area U: U-9 Combination

Reduction in Max Flood Depth Results: 10-yr, 1-hr event

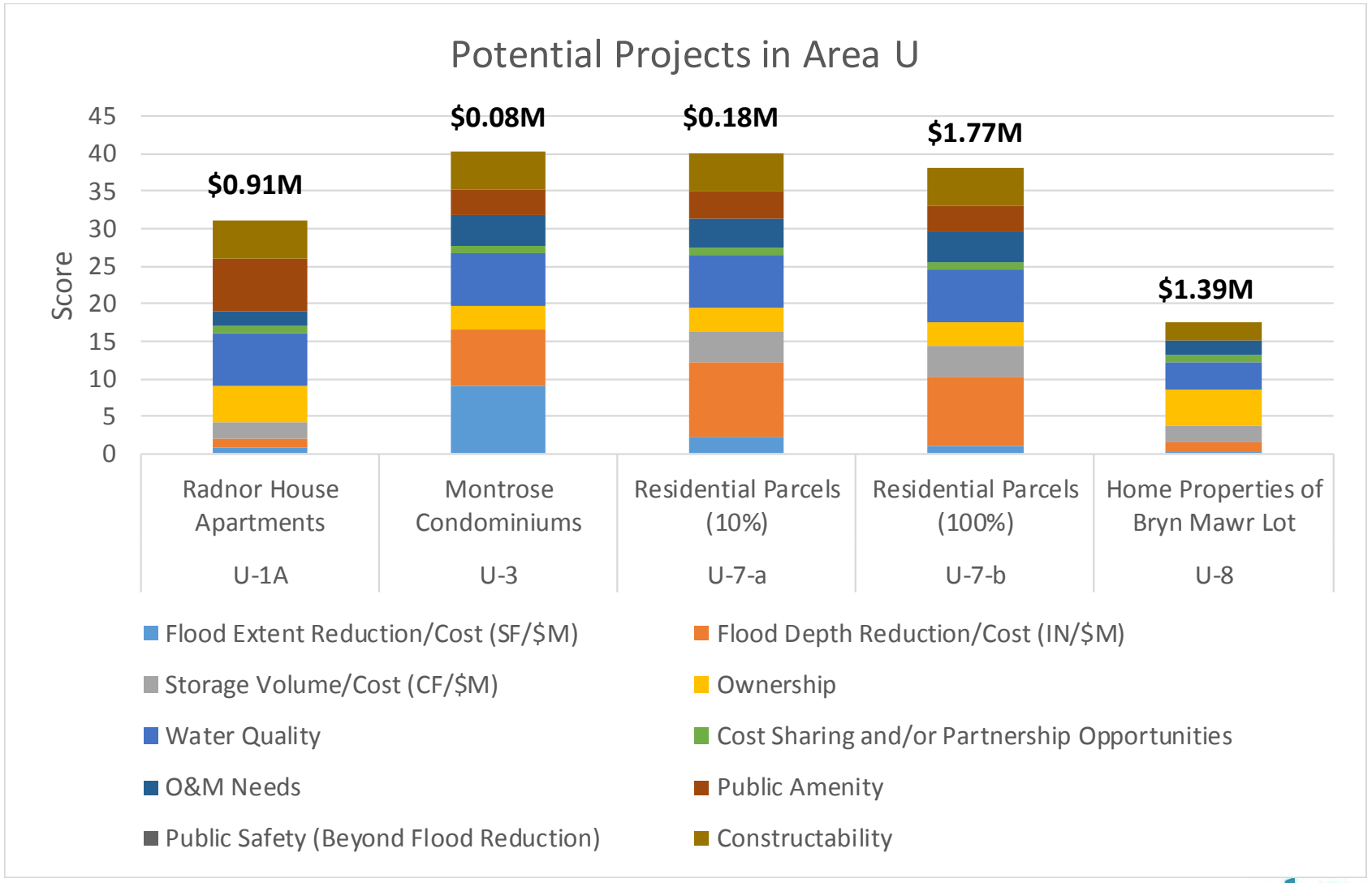


NOTE: Flood Depth Results modeled by CH2M HILL using Flood Modeller Suite.

Results of Project Ranking by Priority Problem Area (Flood Reduction and Storage Volume Only)

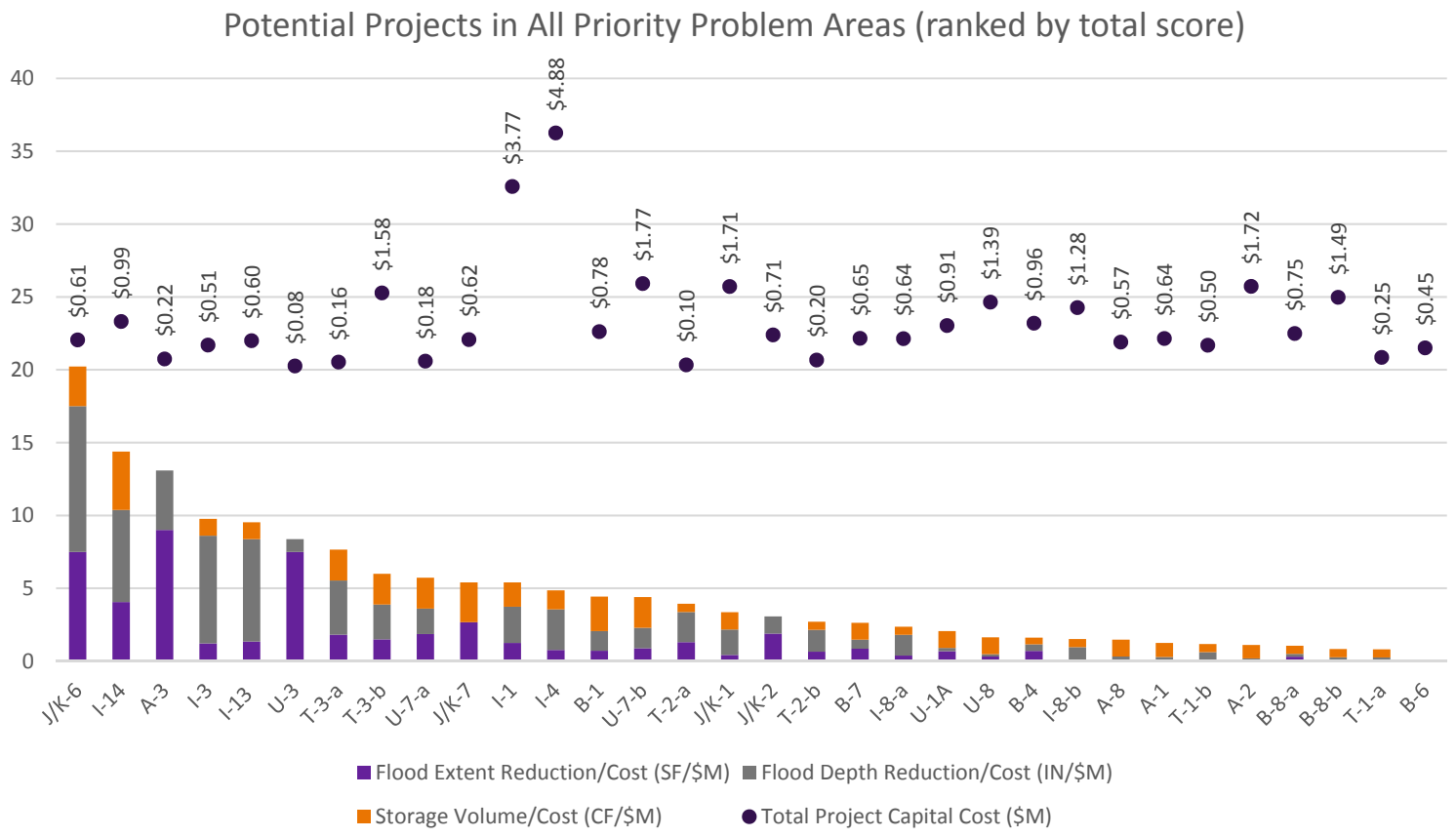


Results of Project Ranking by Priority Problem Area (All Prioritization Criteria)



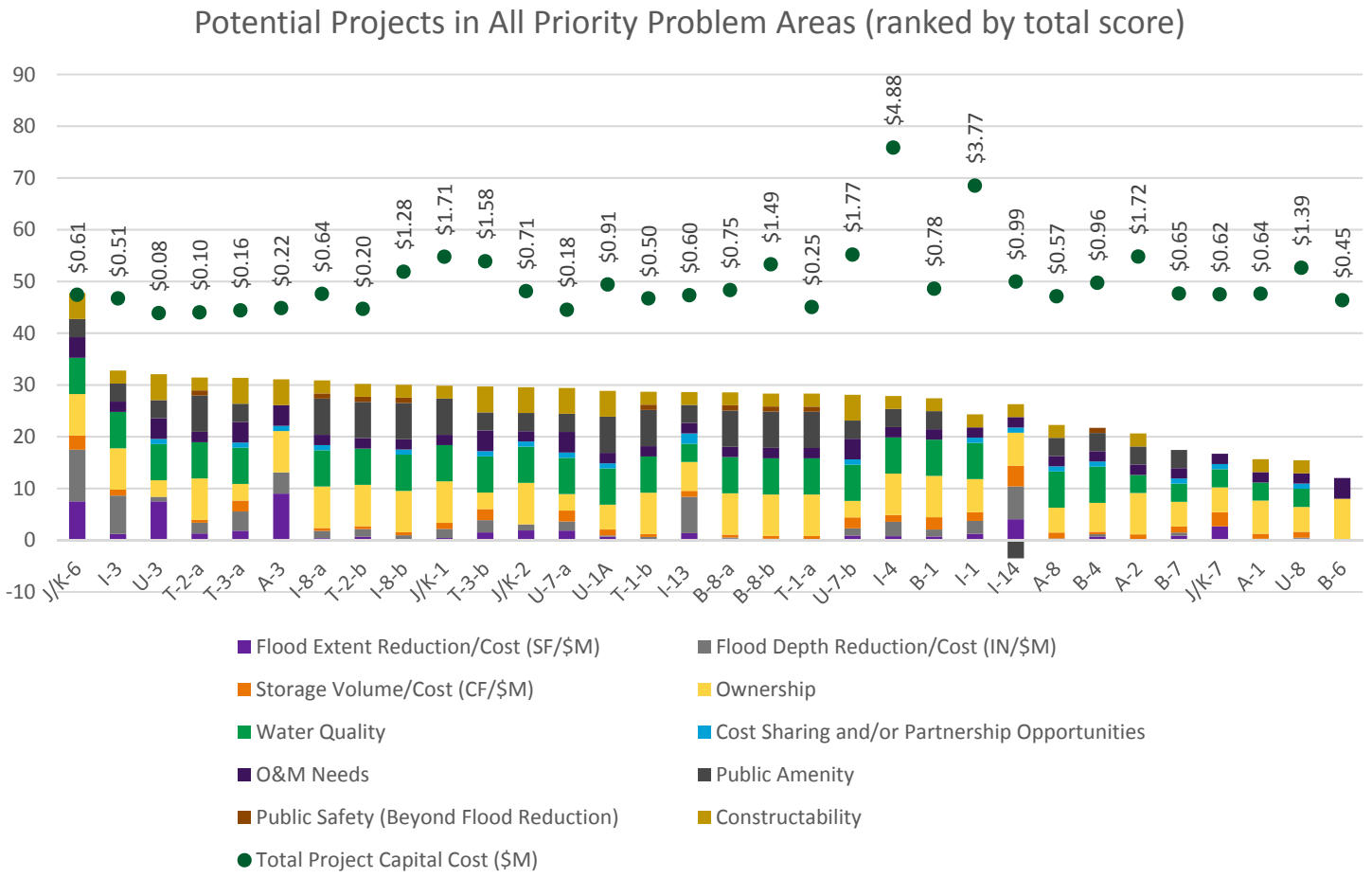
Results of Project Ranking by All Priority Problem Areas (Flood Reduction and Storage Volume Only)

ID #	Name/Location
J/K-6	Radnor Trail
I-14	N. Wayne Field - Option "E"
A-3	S. Wayne Ave Inlets/Pipes
I-3	West Ave Green Street
I-13	Wayne Train Station
U-3	Montrose Condominiums - Conestoga Road
T-3-a	Residential Parcels (10%)
T-3-b	Residential Parcels (100%)
U-7-a	Residential Parcels (10%)
J/K-7	Farmers Market



Results of Project Ranking by All Priority Problem Areas (All Prioritization Criteria)

ID #	Name/Location
J/K-6	Radnor Trail
I-3	West Ave Green Street
U-3	Montrose Condominiums - Conestoga Road
T-2-a	Fairfax Road and Hickory Lane (50% ROW)
T-3-a	Residential Parcels (10%)
A-3	S. Wayne Ave Inlets/Pipes
I-8-a	Various Green Streets (50% ROW)
T-2-b	Fairfax Road and Hickory Lane
I-8-b	Various Green Streets (100% ROW)
J/K-1	Connor/Filipone Parks



Thank You