

Winnetka Village Council
RESCHEDULED STUDY SESSION
Village Hall
510 Green Bay Road
Thursday, October 13, 2016
7:00 PM

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AGENDA

- 1) Call to Order
- 2) Stormwater Early Action Study for Western and Southwestern Winnetka.....2
- 3) Public Comment
- 4) Closed Session
- 5) Adjournment

NOTICE

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Agenda Item Executive Summary

Title: Stormwater Early Action Study for Western and Southwestern Winnetka

Presenter: Steven M. Saunders, Director of Public Works/Village Engineer

Agenda Date: 10/13/2016

Consent: YES NO

- Ordinance
- Resolution
- Bid Authorization/Award
- Policy Direction
- Informational Only

Item History:

Last fall, the Village engaged Strand Associates to re-evaluate the Village’s western drainage basins for creative, cost-effective westward looking improvements for the 100-year event. Strand has taken a holistic approach to this project, evaluating a variety of conveyance, detention, retention, infiltration, property buyout or individual protection retrofit programs, and a host of other traditional and emerging stormwater management technologies. After carefully considering the feasibility, cost, benefit, and measure of protection of each opportunity, Strand proposed a combination of projects that produce a desirable balance of flood reduction, cost-effectiveness, and phased implementation. This series of projects, if fully implemented, would significantly reduce the number of homes in the watershed that are at risk of overland flooding during the design event.

Executive Summary:

The proposed vision as presented in June, 2016 consists of 15 discrete stormwater storage and conveyance projects, water quality management improvements, and distributed green infrastructure improvements, in four phases. The estimated project cost to implement all four phases, including engineering and necessary contingencies, is \$57,717,000 in current dollars. At the June 14 Study Session, the Village Council directed Strand to develop an “Early Action Plan” which identifies projects that could potentially be implemented while the Village continues to evaluate several of the larger plan components such as flood storage projects located on Forest Preserve District of Cook County (FPDCC) lands, Crow Island Park property, and Duke Childs Field. Strand identified and evaluated potential early action projects using the following criteria:

- Projects that may be implemented immediately without significant barriers in terms of physical constraints and required approvals.
- Projects that provide a discernable benefit for stormwater and flood control or water quality benefits.
- Projects that are determined to be cost-effective and don’t pose a negative impact within the scope of the full Stormwater Vision.

Strand has completed this Early Action Plan evaluation, which is attached.

Recommendation:

Review Strand Associates' Early Action Study and provide policy direction to staff for potential implementation or alternative phasing.

Attachments:

Agenda Report
Stormwater Early Action Study for Western and Southwestern Winnetka

Agenda Report

Subject: Stormwater Alternatives Study for Western and Southwestern Winnetka – Early Action Study and Alternative Phasing Evaluation

Prepared By: Steven M. Saunders, Director of Public Works/Village Engineer

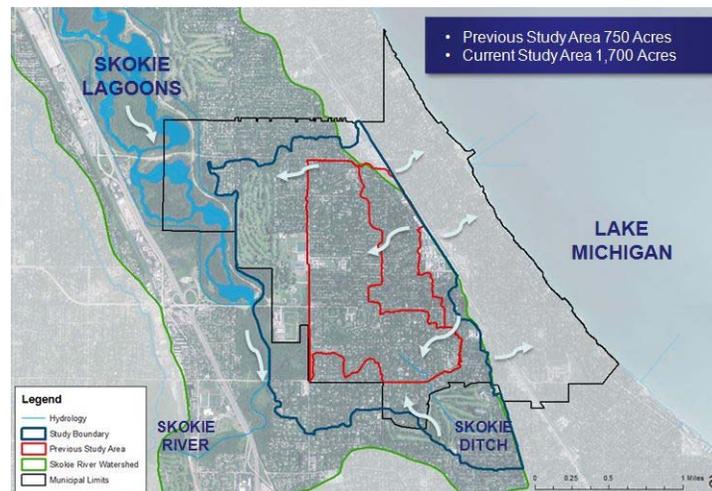
Date: October 5, 2016

Background

Last fall, the Village engaged Strand Associates to re-evaluate the Village’s western drainage basins for creative, cost-effective westward looking improvements for the 100-year event, taking into account the Village’s flood-control goals and objectives. Strand has taken a holistic approach to this project, evaluating a variety of grey and green infrastructure approaches, conveyance, detention, retention, infiltration, property buyout or individual protection retrofit programs, and a host of other traditional and emerging stormwater management technologies.

Project Scope

The study boundaries are shown below:



After evaluating watershed data such as topography, density of development, impervious ground cover and soil conditions, roadway network, utilities, frequency of flooding, neighborhood character, and various plans for improvements or changes in the watershed, Strand identified a host of potential stormwater management and flood control opportunities. These opportunities include many traditional stormwater management

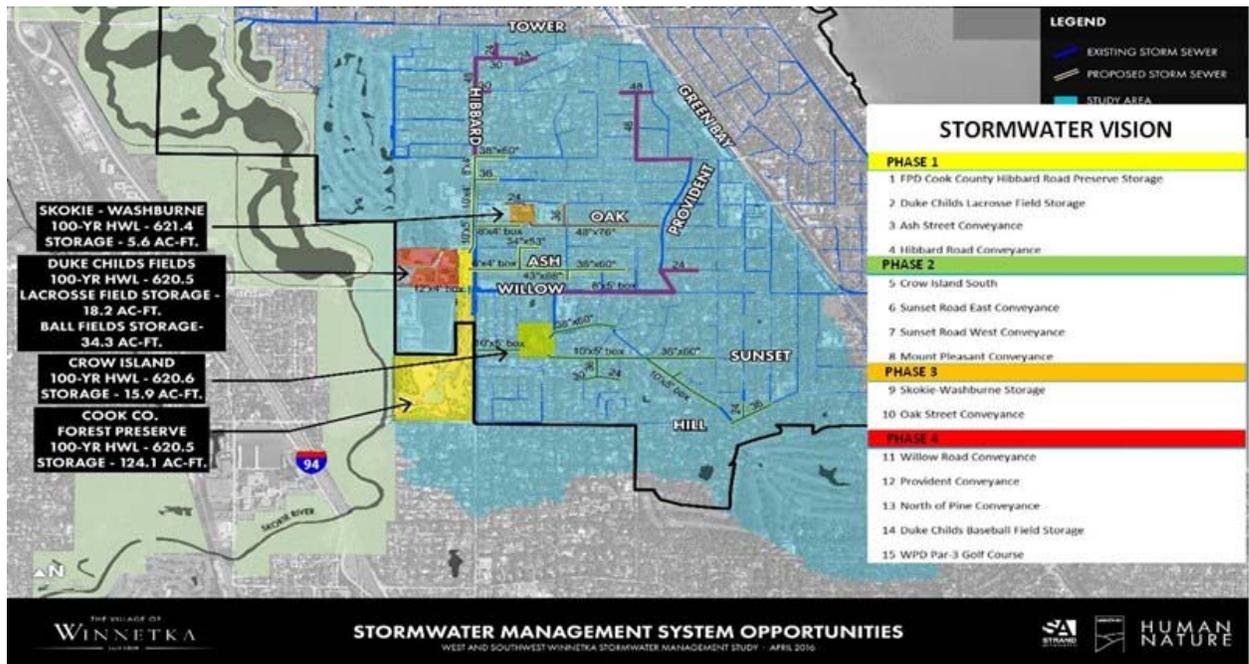
methods as well as a selection of more innovative and creative solutions that may not have been previously considered.

Alternative Evaluation

The key portion of Strand’s work was a robust, “no stone unturned” sustainable watershed evaluation to identify and evaluate a wide range of potential flood risk reduction strategies. These include individual homeowner or neighborhood-scale improvements and regulatory or zoning changes, up to large-scale stormwater storage and conveyance improvements. Using a sustainable watershed evaluation process, Strand identified and assessed 44 stormwater management opportunities that could meet the Village’s flood protection goals in practical, feasible, creative, and cost-effective ways.

Concept Vision

After carefully considering the feasibility, practicality, cost, benefit, and measure of protection of each opportunity, Strand proposed a combination of projects that produce a desirable balance of flood reduction, cost-effectiveness, and phased implementation. This series of projects, if fully implemented, would significantly reduce the number of homes in the watershed that are at risk of overland flooding during the design event. The proposed vision as presented in June, 2016 consists of 15 discrete stormwater storage and conveyance projects, water quality management improvements, and distributed green infrastructure improvements, in four phases. Strand’s Stormwater Vision is shown in the following figure:



There are critical community entities in the watershed that will be integral to successful and sustainable stormwater and flood mitigation improvements. Strand continues to assist the Village in exploring partnerships with stakeholders whose goals and objectives are directly impacted by stormwater issues and will also benefit from the Village’s stormwater management efforts. In 2016, Strand conducted an extensive public engagement effort to gain valuable input from the community and to better understand the needs, desires, and opportunities addressed by the identified alternatives.

The estimated project cost to implement all four phases, including engineering and necessary contingencies, is \$57,717,000 in current dollars. The project cost is illustrated by phase in the following figure:

• Phase 1	Cost
o FPDCC Hibbard Road stormwater storage project	\$ 8,582,000
o Duke Childs lacrosse field stormwater storage project	\$ 1,005,000
o Winnetka landfill improvements - lacrosse field relocation	\$ 2,331,000
o Ash Street conveyance project	\$ 5,107,000
o Hibbard Road North conveyance project	\$ 6,553,000
Total	\$ 23,578,000
• Phase 2	Cost
o Crow Island South stormwater storage project	\$ 1,841,000
o Sunset Drive East conveyance project	\$ 10,356,000
o Sunset Drive West conveyance project	\$ 2,821,000
o Mount Pleasant conveyance project	\$ 1,362,000
Total	\$ 16,380,000
• Phase 3	Cost
o Washburne-Skokie school underground stormwater storage project	\$ 1,381,000
o Oak Street conveyance project	\$ 3,294,000
Total	\$ 4,675,000
• Phase 4	Cost
o Provident local storm sewer improvement project	\$ 2,930,000
o Willow Road local storm sewer improvement project	\$ 5,284,000
o North of Pine conveyance project	\$ 2,408,000
o Duke Childs/WPD Par-3 Golf Course/FPDCC storage project	\$ 2,461,000
Total	\$ 13,084,000
Project Total	\$ 57,717,000

Village Council Review and Early Action Evaluation

At the June 14 Study Session, the Village Council directed Strand to develop an “Early Action Plan” which identifies projects that could potentially be implemented while the Village continues to evaluate several of the larger plan components such as flood storage

projects located on Forest Preserve District of Cook County (FPDCC) lands, Crow Island Park property, and Duke Childs Field. Strand identified and evaluated potential early action projects using the following criteria:

- Projects that may be implemented immediately without significant barriers in terms of physical constraints and required approvals.
- Projects that provide a discernable benefit for stormwater and flood control or water quality benefits.
- Projects that are determined to be cost-effective and don't pose a negative impact within the scope of the full Stormwater Vision.

Strand has completed this Early Action Plan evaluation, and the following early action projects are suggested for consideration.

North of Willow Watershed Area

Potential early action projects to benefit the Tree Streets neighborhood include an 18 acre-foot stormwater storage basin at the soccer and lacrosse fields at Duke Childs Field. To make this an immediately viable project, concerns raised by the New Trier High School District (NTHSD) would have to be addressed, which means this storage would likely need to be placed below ground, which increases the cost by approximately \$2.5 million, but hopefully presents fewer project constraints and challenges to gain necessary approvals from NTHSD.

Along with creation of storage at Duke Childs Field, improved conveyance will be necessary along Hibbard Road and Ash Street to allow gravity drainage of the Tree Streets neighborhood to the Duke Childs storage facility. Programmed green infrastructure measures such as parkway bioretention basins would also be constructed concurrently with these conveyance improvements.

The proposed North Willow early action projects are shown in Figure 3, and the effectiveness of these early action projects is shown in Figures 4 through 6. The opinion of probable construction cost to implement the North Willow Watershed early action projects is \$9,861,000, shown in Table 1.

The 5.9 acre-feet Skokie-Washburne underground detention basin and portions of stormwater conveyance improvements draining to this basin were also evaluated, but produced a very small additional benefit at a significant cost. As a result, these improvements are not recommended until further Stormwater Vision components are implemented.

South of Willow Watershed Area

For the neighborhoods south of Willow Road, the Stormwater Vision identified the primary storage opportunity to provide this relief in a potential 15.9 acre-foot stormwater facility on the south side of the Crow Island Park property. Because many questions and concerns about this component remain to be discussed, the Crow Island project is not recommended as an early action project.

Without a storage facility to receive stormwater the other opportunities south of Willow, which are predominantly conveyance projects (see Figure 8), have limited effectiveness as shown in Figures 9 through 13. The opinion of probable construction cost to implement these conveyance projects is \$9,402,000, shown in Table 2. Therefore, until downstream storage on the Crow Island Park property or the Forest Preserves of Cook County properties can be implemented, these conveyance projects are not deemed to be candidates for early action.

Advancement of Concept Planning Along Skokie Ditch Corridor

While conveyance and storage opportunities south of Willow Road are not candidates for early action, the Stormwater Vision identified conveyance improvements in the existing Skokie Ditch between White Oak Lane and the south end of Birch Street shown in Figure 14. This proposed improvement consists of significant expansion of the size and flow capacity of the ditch, which lies in a rear-yard easement on private property. Because this project will significantly affect the appearance and use of these rear yards, and because construction is likely to be disruptive, early design, planning, and coordination to address the significant interaction and coordination with affected adjacent property owners could minimize the project implementation schedule.

Advancement and Potential Implementation of Distributed Green Infrastructure

An important component of the Village's stormwater management and flood control Vision is implementation of distributed green infrastructure (GI). GI consists of installations that mimic natural stormwater processes by allowing stormwater to infiltrate into underlying soil, rather than to become runoff. Examples include rain gardens, bioswales, infiltration basins, permeable pavements, and other measures. In addition to the GI components of the large conveyance projects within the Stormwater Vision, there are other strategic locations in the watershed for additional GI projects that would provide runoff control and surface storage as well as improved water quality benefits. These GI projects would be implemented over an extended period of time with other roadway or utility projects programmed in the Village to consolidate construction impacts and potentially reduce construction costs.

Evaluate a Pilot Area of Mitigation Zones

The Stormwater Vision noted that there could be as many as 61 properties potentially still at risk of flooding, even with full implementation of all of the projects in the Vision. A suggested early action project would be to identify one or more of the mitigation zones as a pilot study area. Strand has identified two adjacent mitigation zones near the intersection of Chestnut and Cherry and near the intersection of Ash and Birch (see Figure 15) for an initial pilot program. The pilot program would involve field survey data gathering, verification of flood risk to specific structures and for those structures determined to be prone to flooding, conduct evaluations for individual or group property flood protection activities.

Recommendation

While Strand has identified 5 early action possibilities, only one, construction of storage at Duke Childs Field and associated conveyance in the “Tree Street” neighborhood, produces effective results, and only for storms up to about a 10-year event. Unfortunately, providing significant stormwater relief for larger storm events to the most affected areas of the watershed requires both sizable conveyance improvements and storage areas to which stormwater can be conveyed. These types of improvements are accompanied by sizable capital investment, and take time to engineer, coordinate and construct. For example, coordination with New Trier High School, engineering, permitting, and utility relocation, for the early action project in the “Tree Streets” area will likely take all of 2017, with construction taking all of 2018 and into early 2019. This timeframe is aggressive, but hardly “early action”.

For areas south of Willow Road, little effective relief is available without constructing downstream storage areas to which the excess runoff causing flooding can be safely conveyed. As a result, staff recommends considering these projects as part of an alternate phasing sequence, shown below, that allows planning and coordination of projects to proceed in parallel, and accounts for the need to provide effective downstream storage.

Possible Alternate Phasing: 2017-2021

Phase 1	Approximate Timing
<ul style="list-style-type: none"> • Forest Preserve Coordination/Approval • Duke Childs Field – Coordination & Engineering • South of Willow conveyance projects – Coordination & Planning • Crow Island Park – Community Engagement & Planning • Distributed Green Infrastructure • Mitigation Zones – Engineering and implementation 	Calendar 2017 Timing contingent on Forest Preserve approval
Phase 2	Approximate Timing
<ul style="list-style-type: none"> • Forest Preserve – Engineering & Permitting • Duke Childs Field – Construction • Tree Streets Conveyance – Engineering • South of Willow Storage and Conveyance – Engineering & Permitting • Distributed Green Infrastructure • Mitigation Zones – Engineering and implementation 	Calendar 2018
Phase 3	Approximate Timing
<ul style="list-style-type: none"> • Forest Preserve – Construction • Tree Streets Conveyance – Construction • South of Willow Storage and Conveyance – Construction • Distributed Green Infrastructure • Mitigation Zones – Engineering and implementation 	Calendar 2019-2021

Remaining projects identified in Phases 3 and 4 of the Strand Vision report could be programmed for following years, in a similar downstream to upstream parallel sequence.

This phasing will provide an effective, directed, achievable program schedule that will bring real flood relief to some affected areas by late 2018.

Attachments

1. Stormwater Early Action Study for Western and Southwestern Winnetka

Professional

Engineering

Services

Stormwater Early
Action Study for
Western and
Southwestern
Winnetka

Report

Village of

Winnetka, IL

October 2016





Strand Associates, Inc.®

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Joliet, IL 60431

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October 3, 2016

Mr. Steve Saunders, P.E., Director of Public Works
Village of Winnetka
1390 Willow Road
Winnetka, IL 60564

Re: Stormwater Early Action Study for Western and Southwestern Winnetka

Dear Mr. Saunders,

Enclosed are two copies of the final report Stormwater Early Action Study for Western and Southwestern Winnetka.

Please call me with questions.

Sincerely,

STRAND ASSOCIATES, INC.®

A handwritten signature in black ink, appearing to read 'Michael R. Waldron'.

Michael R. Waldron, P.E.
Senior Associate

Enclosure: Report

Report for Village of Winnetka, Illinois

Stormwater Early Action Study for Western and Southwestern Winnetka



Michael R. Waldron 10/20/16
EX-11/20/17

Prepared by:

STRAND ASSOCIATES, INC.®
1170 Houbolt Road
Joliet, IL 60431
www.strand.com

October 2016



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- APPENDIX A–Cost Opinion–North Willow Early Action projects
- APPENDIX B–Cost Opinion–South Willow Early Action projects
- APPENDIX C– Tabulation of Flood Depths for Early Action projects

BACKGROUND AND PURPOSE

In October 2015, the Village engaged Strand Associates, Inc.® (Strand) to provide stormwater and flood control study services for the western and southwestern areas of the Village shown within the red line boundary on Figure 1. The intent of the study was to identify creative and cost-effective “westward looking” improvements for stormwater and flood control, taking into account the Village’s overall goals and objectives. This study took a holistic view of the western watershed, shown in the blue boundary on Figure 1, with evaluation of a variety of grey and green approaches including conveyance, detention, infiltration, property acquisition, and individual property protections.

The Vision (see Figure 2) that came out of this study was presented in a June 2016 report titled “Stormwater Alternatives Study for Western and Southwestern Winnetka,” and it represents a concept level plan for the Village to meet its Target Level of Service. Because it is still a concept, there are questions, concerns, and details that will need to be resolved before any single project can be implemented. However, the Vision lays a strong foundation for the Village to make decisions moving forward with stormwater and flood control in western and southwestern Winnetka.

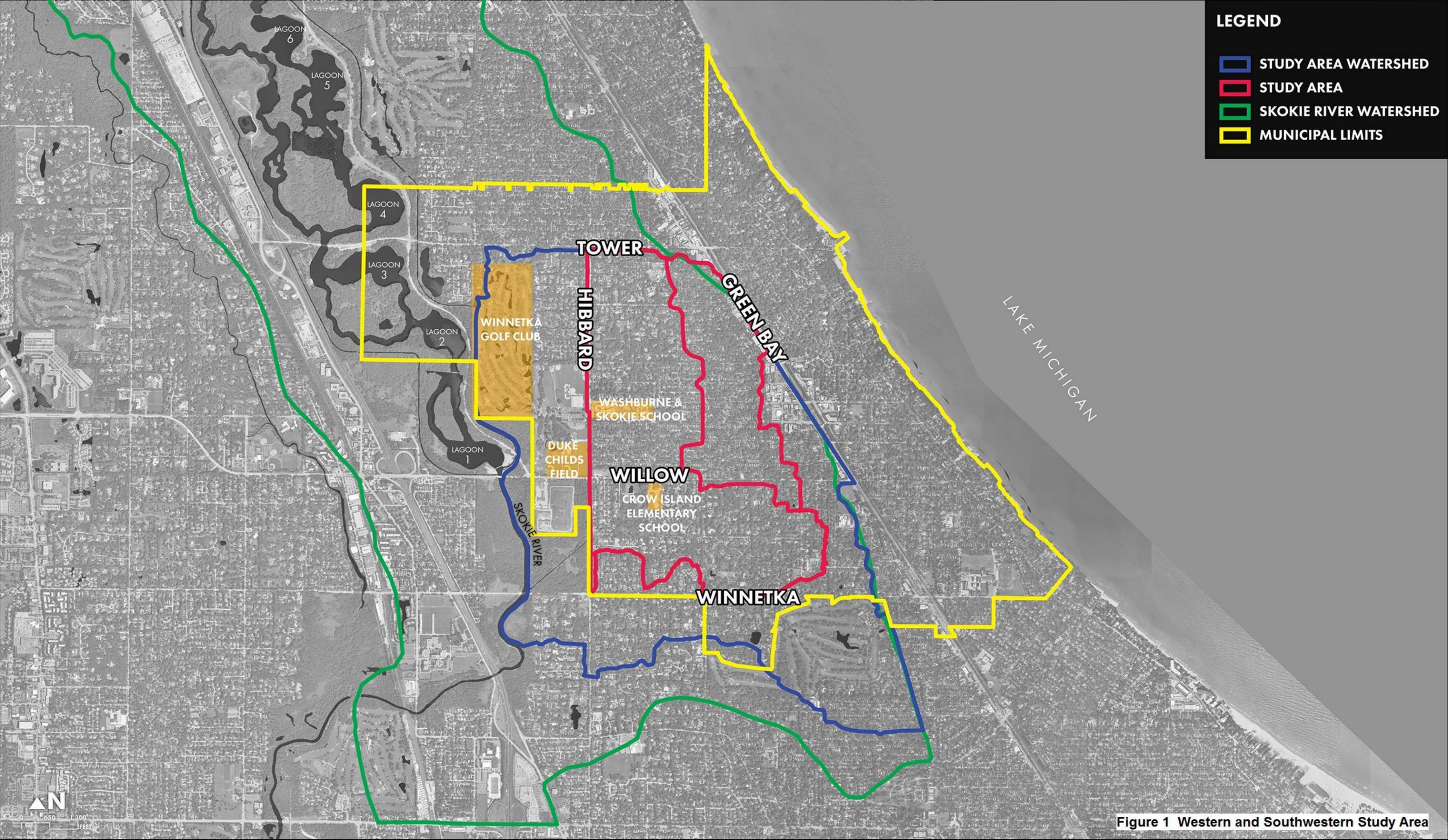
Since completion of the 2016 Vision, the Village directed Strand to develop an “Early Action Plan” that identifies potential projects that can be implemented immediately while the Village continues to negotiate terms for several of the larger plan components such as flood storage projects located on Forest Preserves of Cook County (FPCC) lands, Crow Island Park property, and Duke Childs Field. This Early Action Plan evaluation includes performing the following tasks:

1. Identify and evaluate a series of potential flood risk reduction projects that may be implemented immediately without significant barriers in terms of physical constraints and required approvals.
2. Evaluate potential Early Action projects or a combination of projects with updated hydrologic and hydraulic models. Based on the results of the modeling, estimate the potential flood risk reduction benefits that can be realized during this interim Early Action Plan period.
3. Prepare updated opinions of probable construction cost for each potential Early Action component project.

The following report briefly summarizes the results of the Early Action Plan evaluation.

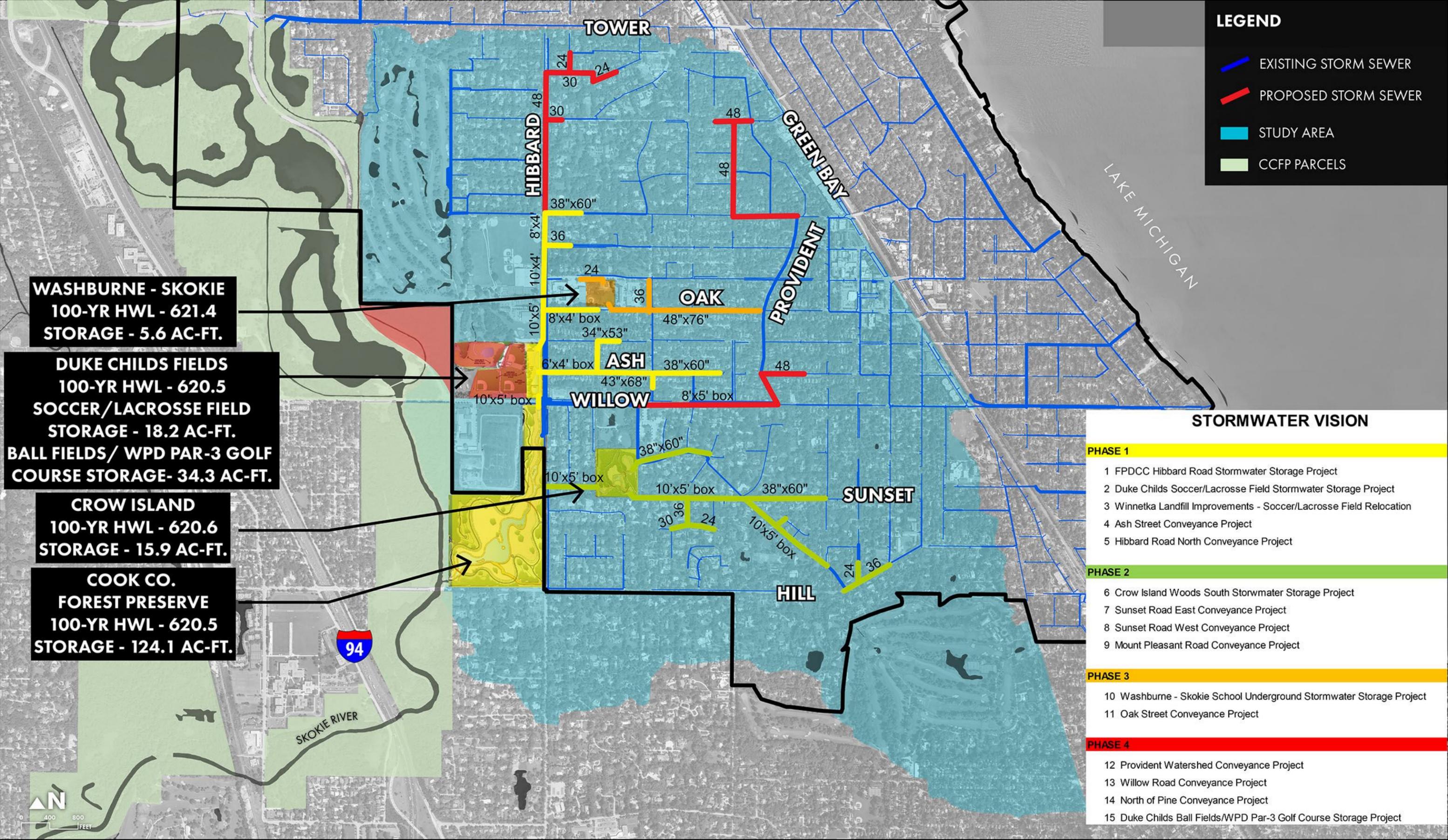
POTENTIAL EARLY ACTION PROJECTS

As stated in the June 2016 report, the locations within the study area that have exhibited greatest flooding extents and depths are in the “Tree Streets” neighborhood in the North Willow Watershed and in widespread portions of the South Willow Watershed, primarily along DeWindt Road, Sunset Road, Higginson Lane, White Oak Lane, and Birch Street. Existing conditions stormwater modeling results indicate that in both the North and South Willow Watersheds widespread flooding begins to occur for as little as a 2-year recurrence interval storm event. Given the relative high frequency and severity of flooding



- LEGEND**
- STUDY AREA WATERSHED
 - STUDY AREA
 - SKOKIE RIVER WATERSHED
 - MUNICIPAL LIMITS

Figure 1 Western and Southwestern Study Area



LEGEND

- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- STUDY AREA
- CCFP PARCELS

WASHBURNE - SKOKIE
 100-YR HWL - 621.4
 STORAGE - 5.6 AC-FT.

DUKE CHILDS FIELDS
 100-YR HWL - 620.5
 SOCCER/LACROSSE FIELD
 STORAGE - 18.2 AC-FT.
 BALL FIELDS/ WPD PAR-3 GOLF
 COURSE STORAGE- 34.3 AC-FT.

CROW ISLAND
 100-YR HWL - 620.6
 STORAGE - 15.9 AC-FT.

COOK CO.
 FOREST PRESERVE
 100-YR HWL - 620.5
 STORAGE - 124.1 AC-FT.

STORMWATER VISION

- PHASE 1**
- 1 FPDCC Hibbard Road Stormwater Storage Project
 - 2 Duke Childs Soccer/Lacrosse Field Stormwater Storage Project
 - 3 Winnetka Landfill Improvements - Soccer/Lacrosse Field Relocation
 - 4 Ash Street Conveyance Project
 - 5 Hibbard Road North Conveyance Project
- PHASE 2**
- 6 Crow Island Woods South Stormwater Storage Project
 - 7 Sunset Road East Conveyance Project
 - 8 Sunset Road West Conveyance Project
 - 9 Mount Pleasant Road Conveyance Project
- PHASE 3**
- 10 Washburne - Skokie School Underground Stormwater Storage Project
 - 11 Oak Street Conveyance Project
- PHASE 4**
- 12 Provident Watershed Conveyance Project
 - 13 Willow Road Conveyance Project
 - 14 North of Pine Conveyance Project
 - 15 Duke Childs Ball Fields/WPD Par-3 Golf Course Storage Project

Figure 2 Western and Southwestern Stormwater Vision

experienced, these neighborhoods were identified as being the highest priority zones for providing immediate flood risk reduction benefits.

Physical characteristics common to these two neighborhoods that contribute most significantly to the high frequency and extent of flooding are:

1. Flat topography.
2. Inadequate stormwater conveyance capacity because of undersized pumping facilities.
3. Lack of positive overland flood routes once capacities of the stormwater conveyance systems are exceeded.

To provide effective flood risk reduction benefits to these areas, implementation of substantial gravity conveyance improvements is necessary, thus limiting the reliance on undersized storm sewers and pump stations. But simply providing only gravity conveyance improvements from these neighborhoods without also providing sufficient downstream flood storage volume will prove to be ineffective because there is no place to receive the conveyed stormwater.

A. North Willow Watershed Early Action projects

To provide meaningful flood risk reduction benefits within the Tree Streets neighborhood, implementing both conveyance and flood storage improvements was considered. Flood storage improvements identified in the Stormwater Vision that would provide immediate benefit to the Tree Streets neighborhood included an 18 acre-foot stormwater storage basin at the soccer and lacrosse fields at Duke Childs Fields. Two options were considered in the Stormwater Vision that included an aboveground open water basin and an enclosed underground basin. The most cost-effective of the two basin options was implementation of the open detention basin, which also included important water quality treatment measures (i.e., wet detention and/or bioretention).

However, to implement the open surface detention option would require permanent relocation of the NTHSD soccer and lacrosse fields. The alternative that was considered in the Stormwater Vision would relocate the soccer and lacrosse fields to the Village's landfill site. While conceptual layouts of this option indicated that sufficient land area is available to replicate the existing playing fields and provide sufficient access and parking, NTHSD representatives have expressed several concerns to this relocation concept. These concerns included playability during windy conditions, the fields not being immediately contiguous to the ball fields, the need for providing rest rooms, and potential issues resulting from settlement and loss of use of the fields during construction.

Given the many challenges related to relocation of the soccer and lacrosse fields, it would be unrealistic to expect that these issues could be resolved such that the project could proceed quickly as an Early Action project. Implementation of the underground storage option at Duke Childs Field, while more costly than the surface storage option by approximately \$2.5 million, presents fewer project constraints and challenges to gain necessary approvals from NTHSD. This option would maintain the current location of the soccer and lacrosse fields and would involve reconstruction of the fields above the underground

storage chambers. Coordination with NTHSD will be necessary to address sports programming during construction.

Along with creation of storage in the North Willow watershed, conveyance improvements are necessary to provide the most immediate benefit to the Tree Streets neighborhood. As depicted in Figure 3, the Hibbard Road conveyance system would extend up to Oak Street and the Ash Street conveyance system would extend west to Berkley Avenue and up to Cherry Street between Berkley and Glendale Avenues. Construction of these conveyance improvements would allow gravity drainage of the Tree Streets neighborhood to the Duke Childs underground detention basin. Previously programmed GI measures such as parkway bioretention basins would be constructed concurrently with these conveyance improvements.

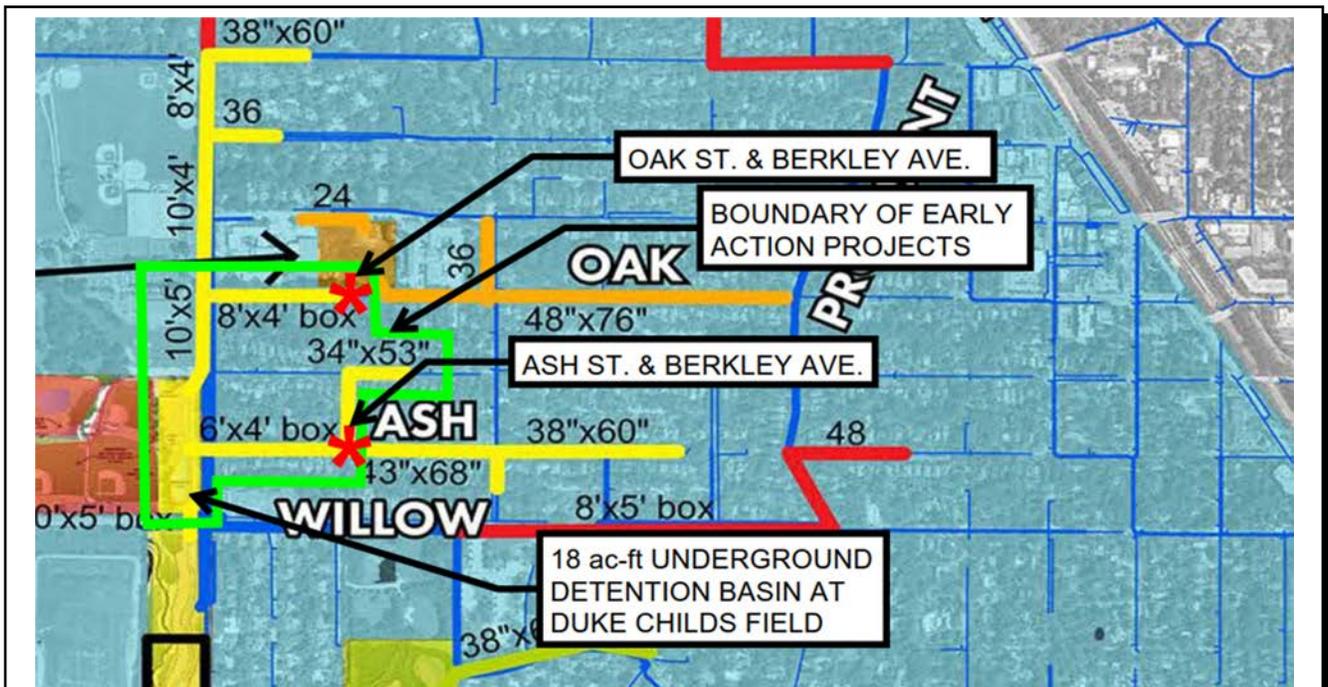
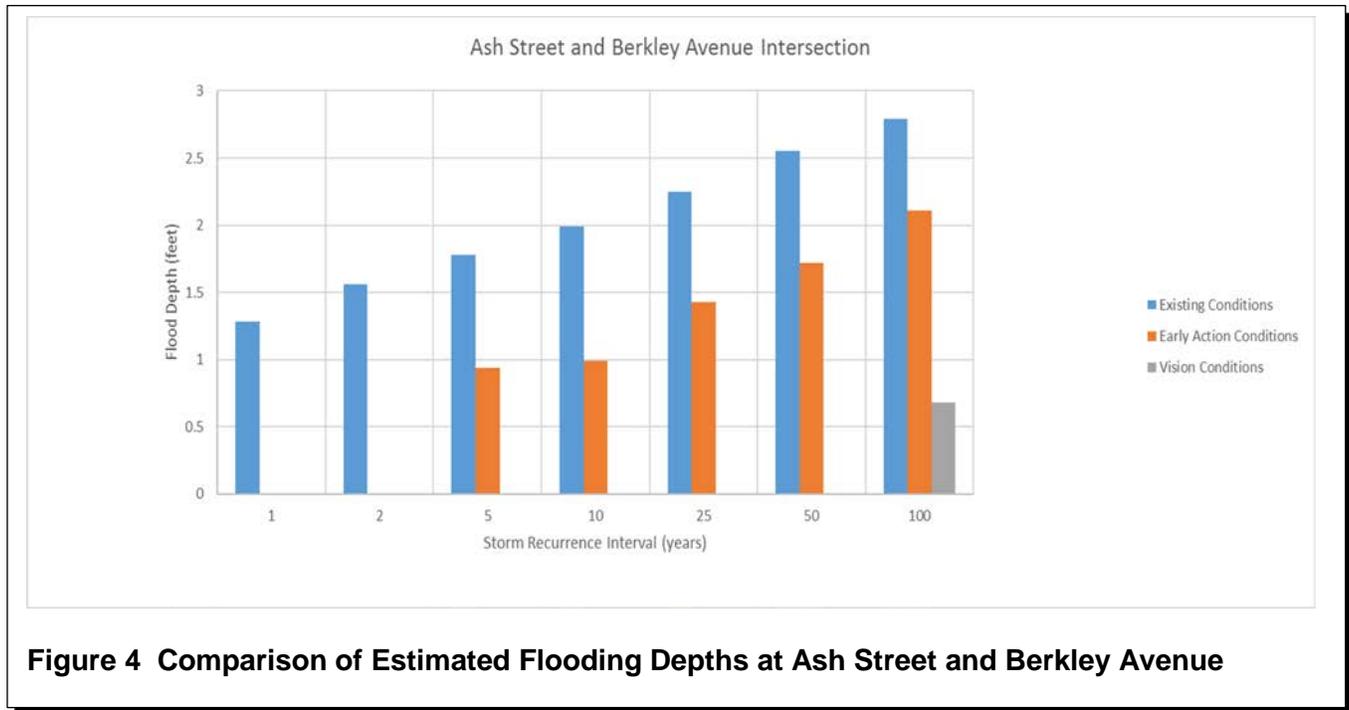


Figure 3 North Willow Watershed Early Action projects

Stormwater models representing the North Willow watershed Early Action projects were performed for a range of return interval storm events (1-, 2-, 5-, 10-, 25-, 50-, and 100-year storm events). Estimated flood depths at two critical locations in the Tree Streets neighborhood (the intersection of Ash Street and Berkley Avenue and the intersection of Oak Street and Berkley Avenue) are summarized in Figure 4. Three project conditions are represented: Existing Conditions, Early Action Conditions, and Full Vision Conditions. Flood depth extents and depth mapping for each of these conditions is provided in Appendices C through F.

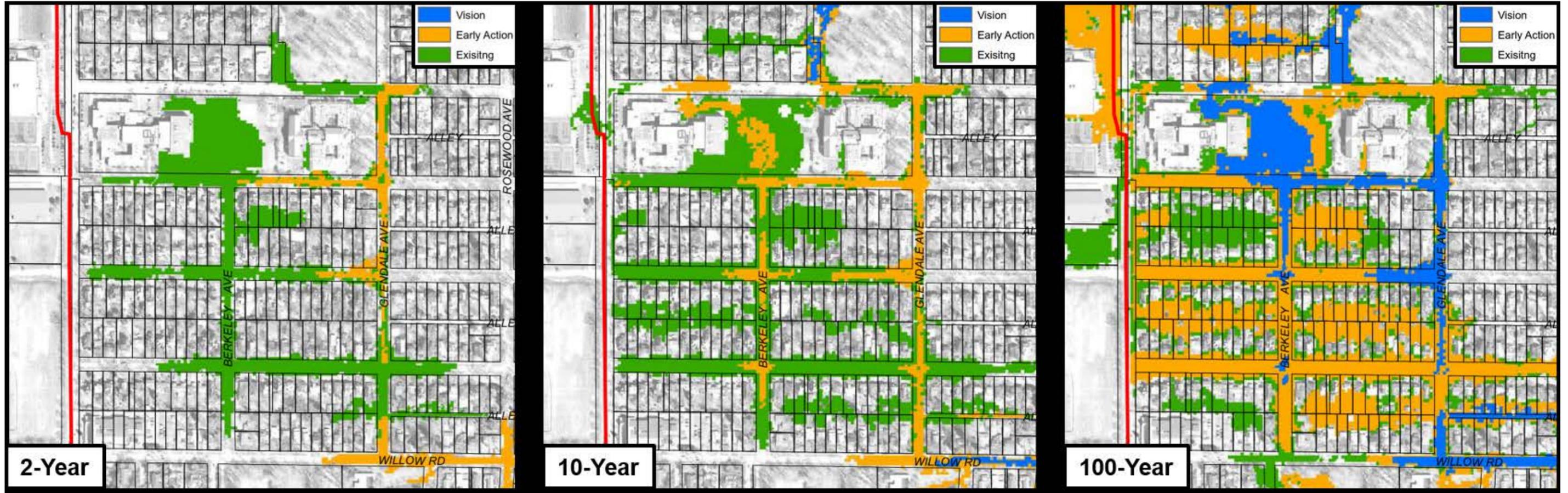
Mapping has been created to show the extents of flooding under existing conditions compared to flooding after implementation of the Early Action Plan and after implementation of the full Stormwater Vision. Figure 5 shows a map of the 2- year, 10-year, and 100-year storm events with the blue areas reflecting the extents of flooding that remain following implementation of the full Stormwater Vision. The blue and

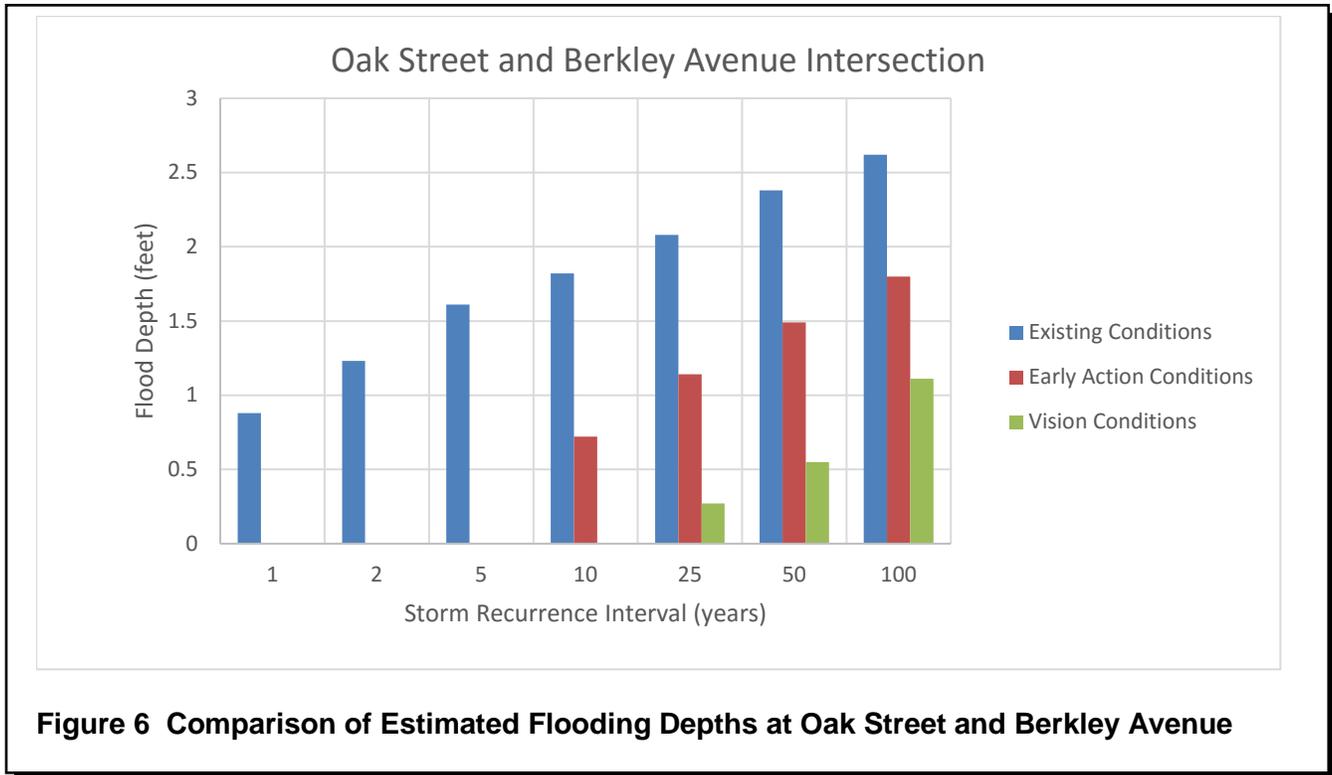
orange together represent the extents of flooding that remain following implementation of the North Willow Watershed Early Action projects, which is limited to within the roadway right-of-way. The green represents existing conditions or the reduction in flooding due to the Early Action projects.



The modeling results indicate that sufficient capacity would be available for the Tree Streets neighborhood to eliminate flooding at these two locations up to and including a 5-year return interval event (note that flooding at these two locations currently occurs for a 1-year return interval event). While surface flooding would still occur at these two locations for storms exceeding a 5-year return interval event, the modeling results indicate that beneficial flood depth reductions would be realized. At the Ash Street and Berkley Avenue intersection, flood depth would be reduced by 1.01, and 0.69 feet realized for a 10-year and 100-year return interval event, respectively (refer to Figure 5). Similarly, at the Oak Street and Berkley Avenue intersection, flood depth would be reduced by 1.10, and 0.82 feet would be realized for a 10-year and 100-year return interval event, respectively (refer to Figure 6).

Figure 5 Comparison of 2-year, 10-year, and 100-year Event Flooding Extents for North Willow Watershed Early Action projects in Tree Streets Neighborhood





The estimated construction cost to implement the North Willow Watershed Early Action projects is \$9,861,000. A summary of the individual project costs is provided in Table 1 and detailed cost estimates are provided in Appendix A. As stated previously, this project cost would include a cost increase of approximately \$2.5 million to implement underground storage at Duke Childs Fields compared with the surface detention contemplated in the Stormwater Vision. However, eliminating the need to relocate the soccer and lacrosse fields to the Village’s landfill site will provide much greater flexibility for disposal of excess excavated material from the contemplated flood control projects.

Project	Cost
Duke Childs Field 18 acre-feet Underground Detention Basin	\$4,368,000
Hibbard Road Conveyance Project (Duke Childs Basin to Oak Street)	\$1,327,000
Oak Street Conveyance Project (Hibbard Road to Berkley Avenue)	\$1,451,000
Ash Street, Berkley Avenue and Cherry Street Conveyance Project	\$2,715,000
Total Project Cost	\$9,861,000

Table 1 Cost Opinion Summary of North Willow Watershed Early Action projects

Strand Associates, Inc.® also evaluated early implementation of the 5.9 acre-feet Skokie-Washburne underground detention basin and portions of stormwater conveyance improvements draining to this basin located along Elm Street, Oak Street, and Glendale Avenue (refer to Figure 7). However, the incremental benefit realized by implementing these additional projects appears to be negligible. At the Ash Street and Berkley Avenue intersection, flood depth would be reduced by 0.11 and 0.06 feet for a 10-year and 100-year return interval event, respectively. Similarly, at the Oak Street and Berkley Avenue intersection,

additional flood depth reductions of 0.26 through 0.04 feet would be realized for a 10-year through a 100-year return interval event, respectively. The cost to implement these additional projects is approximately \$3,183,000, raising the total cost to \$13,044,000.

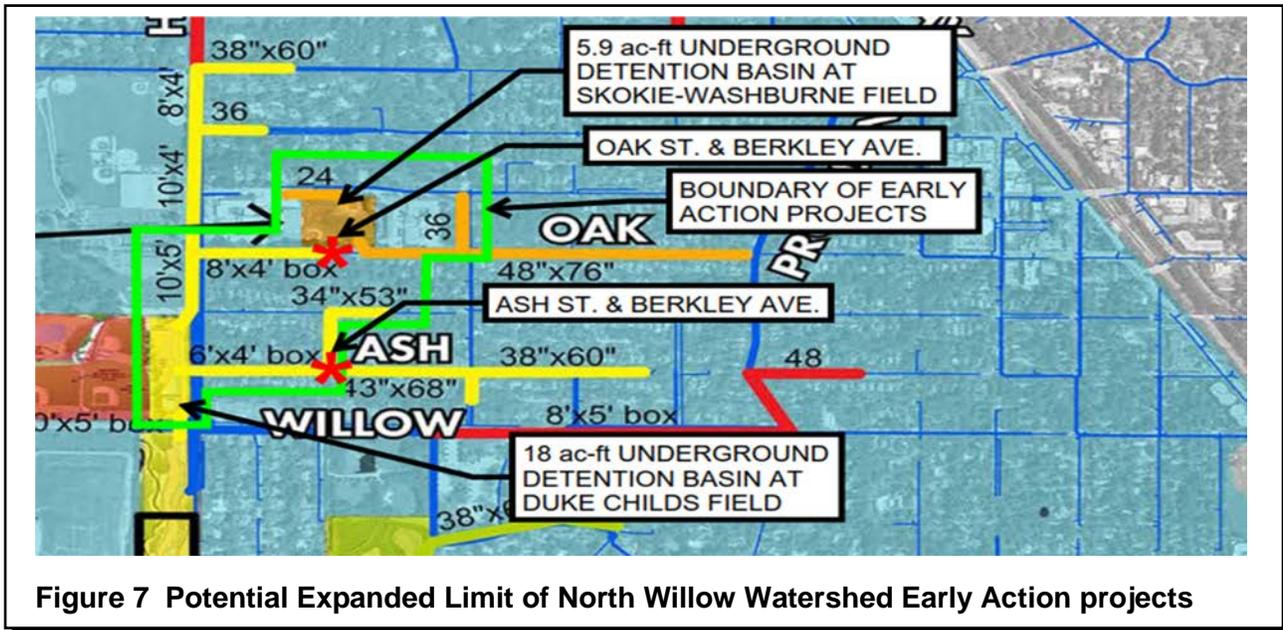


Figure 7 Potential Expanded Limit of North Willow Watershed Early Action projects

B. South Willow Watershed Early Action projects

As stated in the June 2016 Stormwater Alternatives Study, opportunities to create regional flood storage upstream of the Forest Preserve District of Cook County (FPCC) lands that will provide flood relief to the South Willow Watershed are fairly limited. The Stormwater Vision identified the potential for a 15.9 acre-feet stormwater detention basin along the south portion of Crow Island Park property that would provide both flood storage and water quality benefits. However, many questions and concerns remain relative to this component, and advancing this project would require a significant public and community partner interaction and engagement process. For this reason, the Crow Island Park property storage project is not recommended as an Early Action project.

Strand Associates, Inc.® also evaluated potential stormwater conveyance projects in the South Willow Watershed for their potential as Early Action projects to provide flood risk reduction. In the Stormwater Vision, the primary east-west stormwater conveyance improvement route draining the South Willow Watershed was located along Sunset Road through the Crow Island Park property, and ultimately to FPCC lands. This conveyance route faces several potential constraints, including the need to cross Crow Island Park and a very narrow private roadway corridor along Sunset Road between White Oak Lane and Crow Island Park.

An alternative conveyance route was identified in the June 2016 alternatives study using Locust Road and Mount Pleasant Street. This route was considered as an Early Action project because the route is generally along public streets with fewer constraints and a positive outlet via the existing Mt. Pleasant Pump Station. Potential Early Action conveyance improvements within the South Willow Watershed are depicted in Figure 8. In addition to the storm sewer along Mount Pleasant Street and Locust Road, storm

sewer along Sunset Road between Locust Road and White Oak Lane and storm sewer improvements serving the DeWindt neighborhood are included.

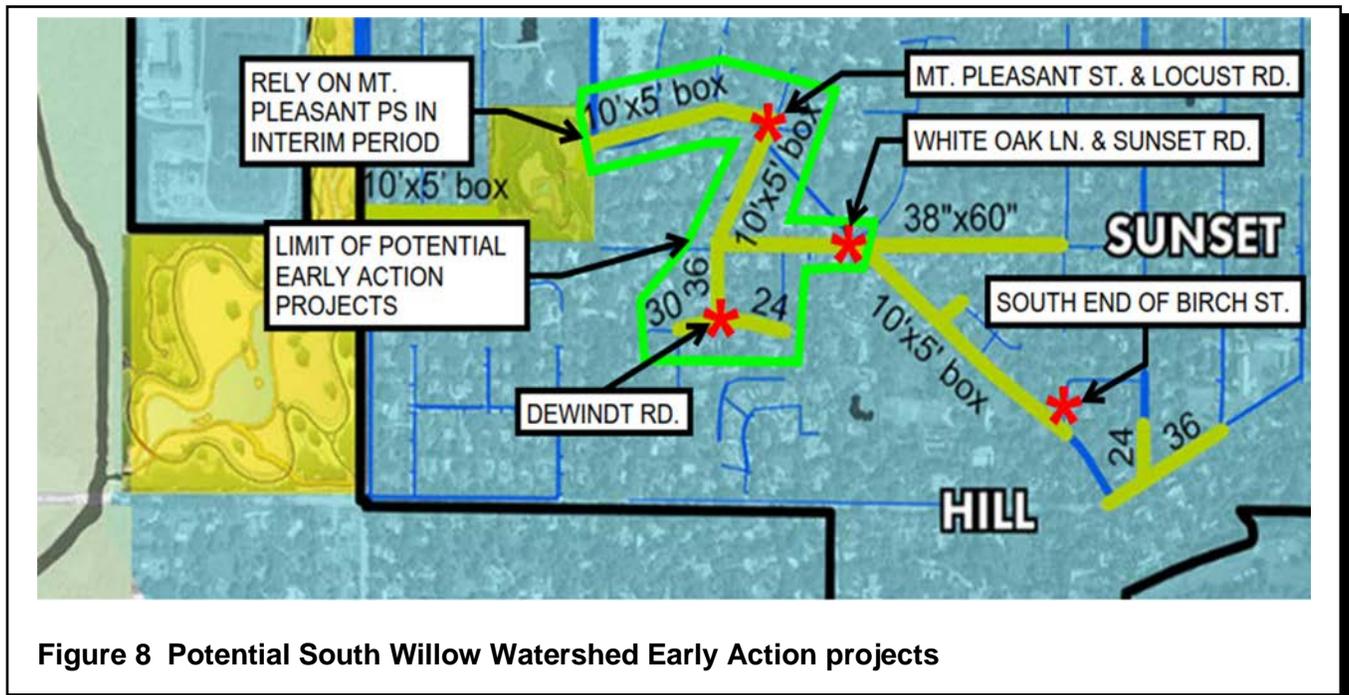


Figure 8 Potential South Willow Watershed Early Action projects

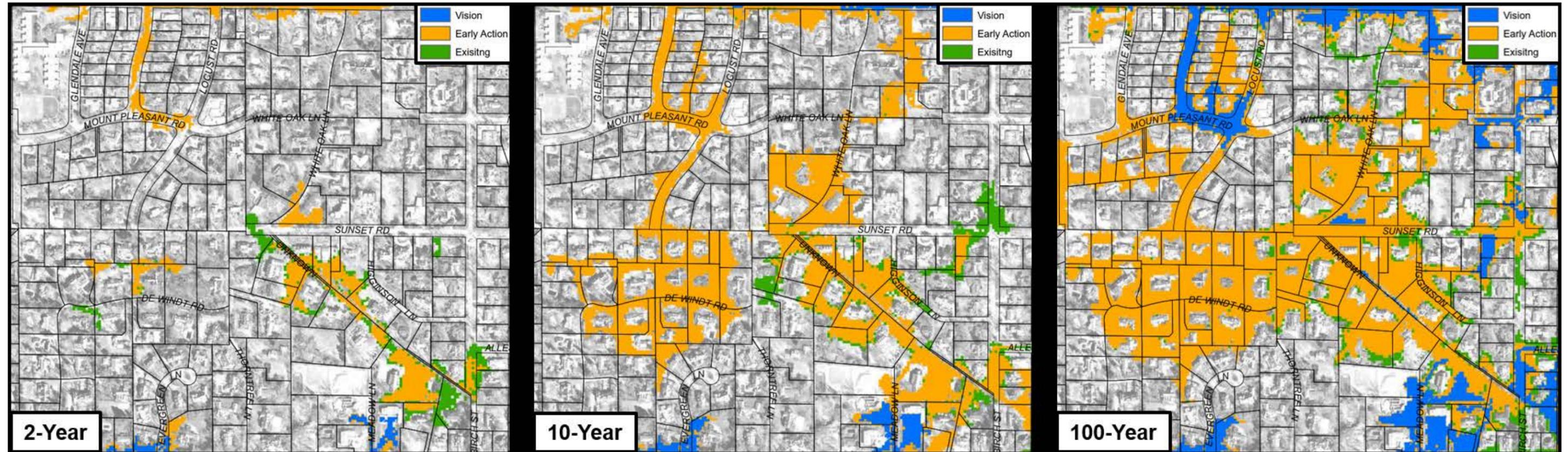
Stormwater models representing the South Willow Watershed Early Action projects were performed for a range of return interval storm events (1-, 2-, 5-, 10-, 25-, 50- and 100-year storm events). Given the favorable results for implementation of the North Willow Watershed Early Action projects (not including Skokie-Washburne storage and related conveyance improvements), the South Willow Watershed Early Action project modeling analyses were done assuming implementation of the North Willow Watershed Early Action projects.

Estimated flood depths at four critical locations in the South Willow Watershed neighborhood (DeWindt Road, south end of the Birch Street cul-de-sac, intersection of White Oak Lane and Sunset Road, and the intersection of Mt. Pleasant Street and Locust Road) are summarized in Figures 10 through 13, respectively. Three project conditions are represented: Existing Conditions, Early Action Conditions, and Full Vision Conditions. Flood depth extents and depth mapping for each of these three conditions are provided in Appendices C through F.

Mapping has been created to show the extents of flooding under existing conditions compared to flooding after implementation of the Early Action plan and after implementation of the full Stormwater Vision. Figure 9 shows a map of the 2-year, 10-year, and 100-year storm events with the blue areas reflecting the extents of flooding that remain following implementation of the full Stormwater Vision. The blue and orange together represent the extents of flooding that remain following implementation of the South Willow Watershed Early Action projects. The green represents existing conditions or the reduction in flooding due to the Early Action projects. Review of this exhibit shows that flooding extent reductions from existing conditions to Early Action project conditions (areas shaded in green) are minimal. Although significant conveyance improvements would be made, the limited existing capacity of the Mt. Pleasant

Pump Station (approximately 22 cubic feet per second) would still operate as a bottleneck. Unless significant flood storage volume is introduced or conveyance improvements extend downstream to FPCC lands, flood reduction benefits for any South Willow Watershed Early Action projects will be limited.

Figure 9 Comparison of 2-year, 10-year, and 100-year Event Flooding Extents for Early Action projects in South Willow Watershed Neighborhood



Modeling results indicate that some flood reduction benefits would be realized for smaller storm events (between a 1-year and 5-year return interval storm event) along DeWindt Road. These results appear to be reasonable given the limited existing capacity of the private DeWindt Road Pump Station (approximately 1.6 cubic feet per second). However, the modeling results indicate that for a 10- and 25-year storm event, flooding conditions could actually be aggravated (0.07 and 0.31 feet, respectively, refer to Figure 10).

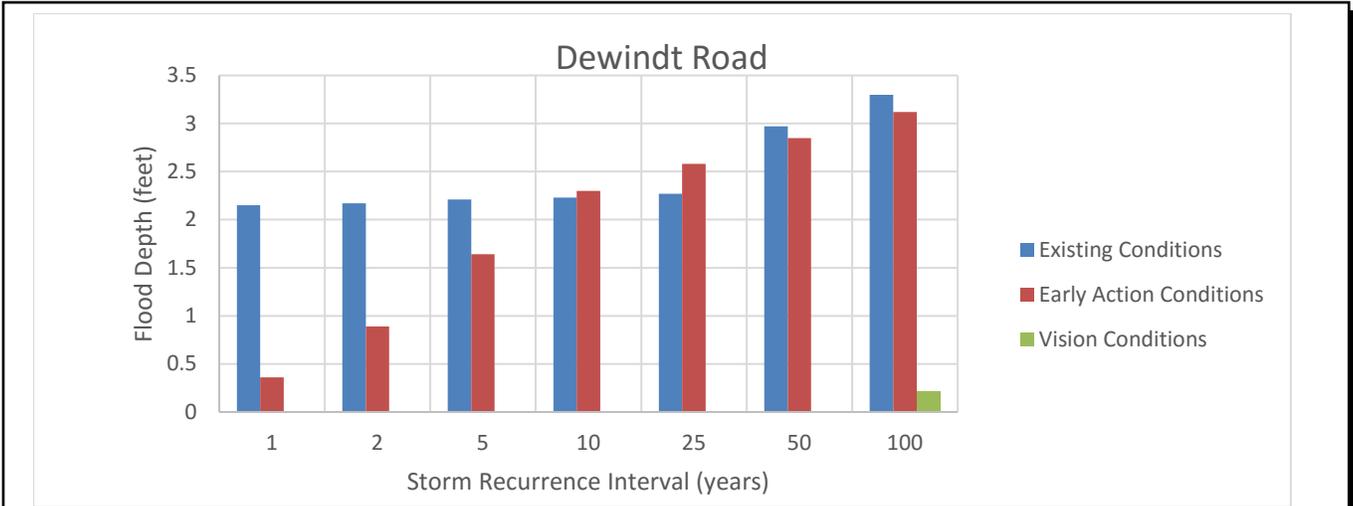


Figure 10 Comparison of Estimated Flooding Depths at DeWindt Road

Review of stormwater modeling results for the south end of the Birch Street cul-de-sac indicates minimal estimated flood depth reductions would be realized. The maximum estimated flood depth reduction is 0.27 feet for a 50-year return interval storm event (refer to Figure 11).



Figure 11 Comparison of Estimated Flooding Depths at South End of Birch Street Cul-de-Sac

Review of stormwater modeling results at the intersection of White Oak Lane and Sunset Road indicates slightly better estimated flood depth reductions would be realized. The maximum estimated flood depth reduction of 1.06 feet would be realized for a 1-year return interval storm event. However, flood depth reduction benefits for 2-year return interval storms and greater are lessened, varying between 0.18 and 0.45 feet (refer to Figure 12).

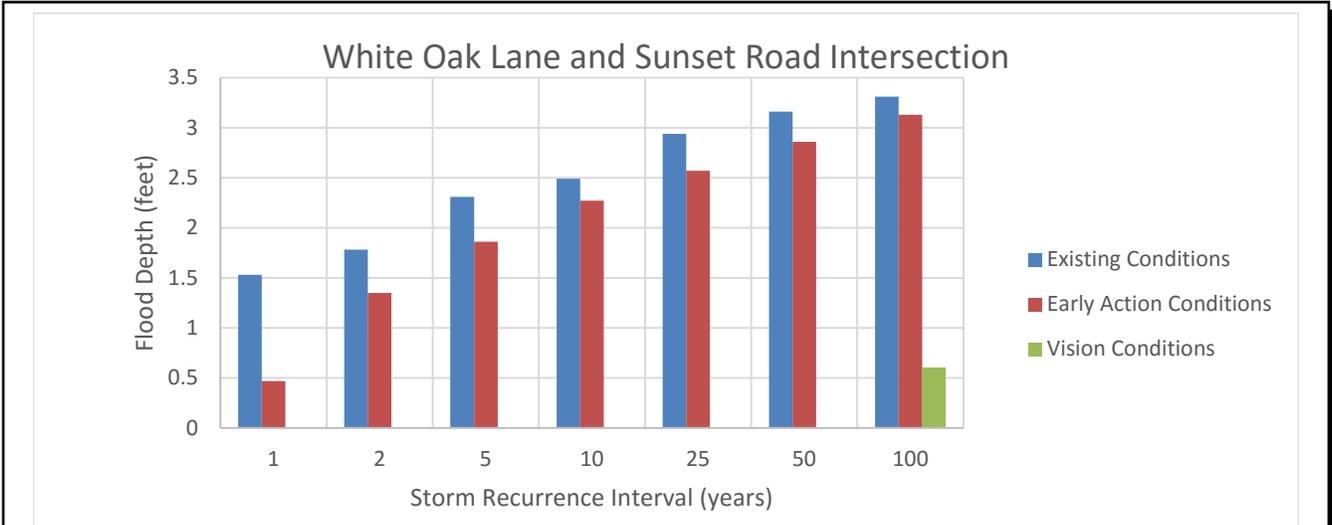


Figure 12 Comparison of Estimated Flooding Depths at White Oak Lane/Sunset Road

Review of stormwater modeling results at the intersection of Mt. Pleasant Street and Locust Road indicates the maximum estimated flood depth reduction of 0.77 feet would be realized for a 1-year return interval storm event. However, flood depth reduction benefits for 2-year return interval storms and greater are lessened, varying between 0.11 and 0.28 feet (refer to Figure 13).

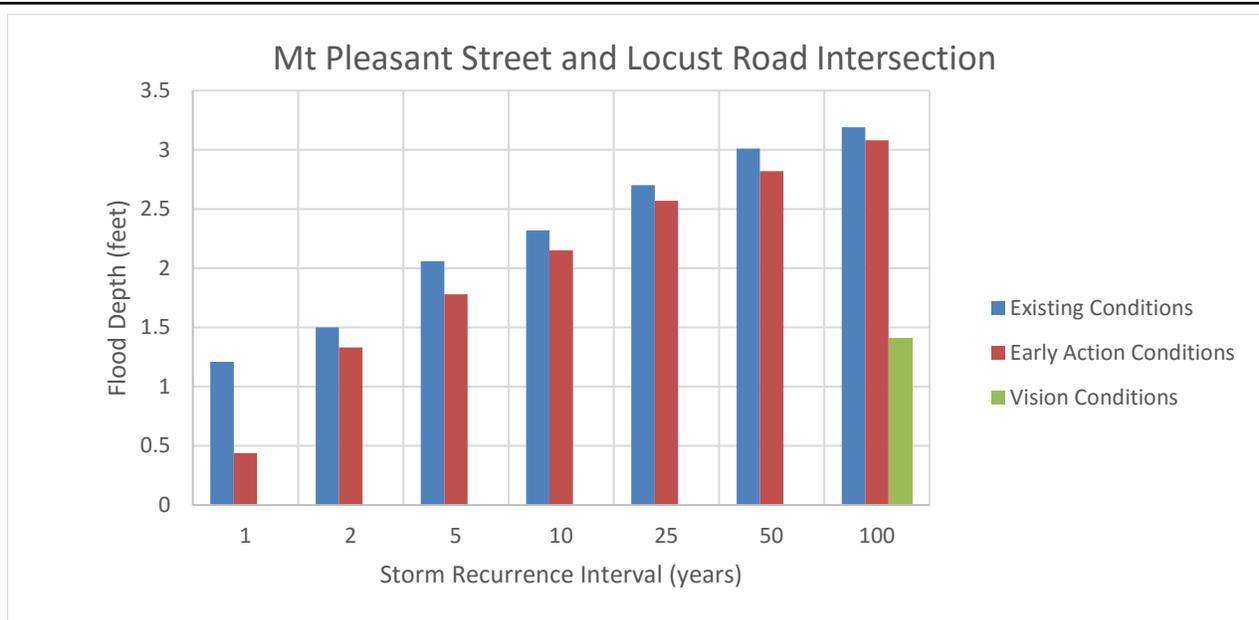


Figure 13 Comparison of Estimated Flooding Depths at Mt. Pleasant Street/Locust Road

The estimated construction cost to implement the South Willow Watershed Early Action projects is \$9,402,000. A summary of the individual project costs is provided in Table 8 and detailed cost estimates are provided in Appendix B. As stated previously, this project cost would include a cost increase of approximately \$2.0 million to implement stormwater conveyance improvements along the alternate Locust Road and Mt. Pleasant Street route. This conveyance route would be in lieu of the Sunset Road route between Locust Road and Crow Island Woods that was programmed in the Stormwater Vision.

Project	Cost
Mount Pleasant Street Conveyance Project	\$3,624,000
Locust Road and Sunset Road Conveyance Project	\$5,302,000
DeWindt Road Conveyance Project	\$476,000
Total Project Cost	\$9,402,000

Table 2 Cost Opinion Summary of South Willow Watershed Early Action projects

C. Advancement of Concept Planning Along Skokie Ditch Corridor

Even if the Village elects not to proceed with implementation of capital improvements as Early Action projects for the South Willow Watershed, there is potential for advancing concept level planning activities. Given the many physical constraints that are present for implementing programmed conveyance improvements along the existing Skokie Ditch between White Oak Lane and the south end of Birch Street, this is an area that could be targeted for Early Action concept planning.

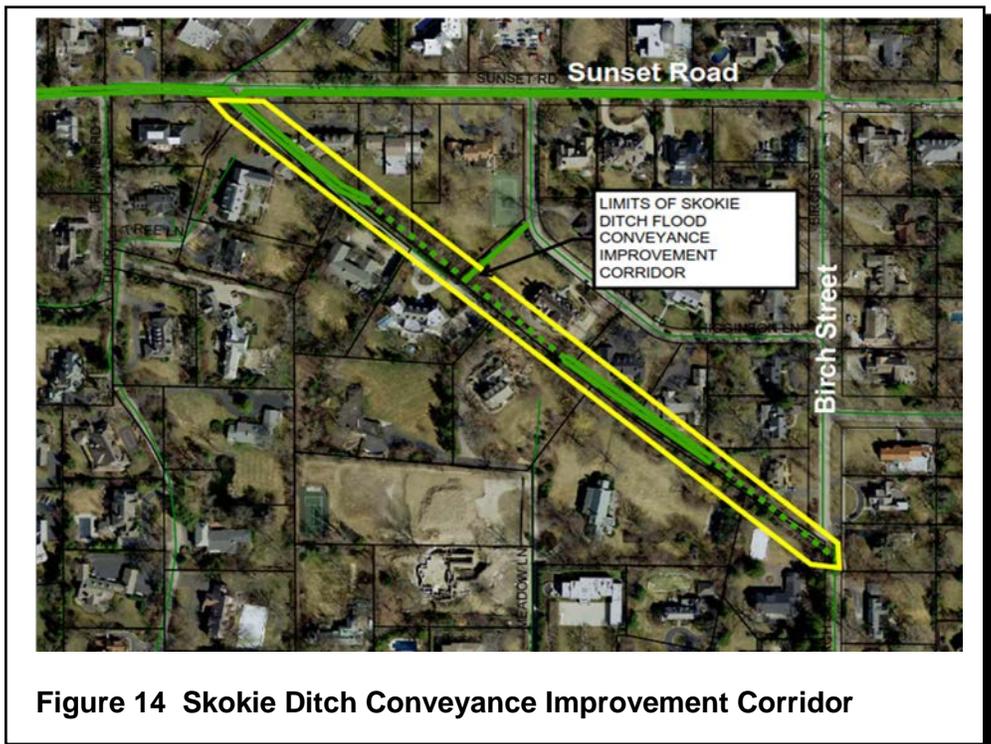


Figure 14 Skokie Ditch Conveyance Improvement Corridor

As stated in the June 2016 report, two segments of the existing 1,500-foot Skokie Ditch are currently open daylighted channels. The Stormwater Vision assumed that these two segments of the Skokie Ditch would remain open channels (shown as dashed lines on Figure 14).

The open channel typical cross section would have a 10-foot bottom width and 2:1 side slopes that would be armored with creek rock to match existing surrounding grades. However, there may be potential to establish greater limits of open channel section through this corridor if adjacent property owners are amenable to this concept. Expanding the limits of this primary conveyance route to be daylighted open stream may result in enhanced water quality enhancements as compared to an enclosed conduit system. Furthermore, providing open channel conveyance versus closed conduit systems could also result in cost savings.

Because these conveyance improvements would be located on private property, significant interaction and coordination with affected adjacent property owners would be necessary. A summary of potential concept planning tasks that could be performed follows:

1. Meet with affected property owners individually or as part of a neighborhood level workshop to discuss the proposed improvements and plans. Determine each affected property owner's willingness to allow implementation of open channel conveyance improvements in lieu of enclosed conduit systems.

2. Perform more detailed site topographic surveys, including tree surveys, along the Skokie Ditch conveyance route.
3. Develop more advanced site planning and engineering along the conveyance route to develop scaled drawings and exhibits of the proposed conveyance facilities and depict more detailed constructability, disturbance, and restoration information. Continue to share this information with affected property owners and begin to develop a refined conveyance plan through the Skokie Ditch project corridor.
4. Develop updated stormwater modeling results and cost opinions to reflect potential revisions to the Stormwater Vision.
5. Evaluate and quantify potential stormwater quality enhancements that could result from the revised Skokie Ditch conveyance improvement plan.

D. Advancement and Potential Implementation of Distributed GI

An important component of the Village's Stormwater Vision is implementation of distributed GI; in particular, bioswales and rain gardens. These green practices provide a level of stormwater runoff control for lower intensity, more frequent rainfalls while also providing valuable water quality improvements.

Bioswales and rain gardens are proposed to be constructed in the roadway right-of-way along the same corridors as the large conveyance projects on Ash Street and Oak Street under the North Willow Early Action projects discussed above. However, the Village may choose to implement additional GI in other locations in the watershed. This Early Action project would begin with identifying strategic locations in the watershed. These GI projects would connect to the Village's existing storm sewer system so they could strategically provide runoff control and surface storage on low capacity systems that are susceptible to surcharging. Other GI locations could provide improved water quality benefits supporting other water quality initiatives in the watershed.

Upon selecting areas or specific locations for GI projects, these GI projects could be implemented with other roadway or utility projects programmed in the Village to consolidate construction impacts and potentially reduce construction costs.

E. Evaluate a Pilot Area of Mitigation Zones

Section 3.09 of the June 2016 report stated that even with full implementation of the Stormwater Vision, there could be as many as 61 properties that are potentially still at risk of flooding (refer to Figure 15). To address these “mitigation zones,” an evaluation process that considers individual property mitigation would need to be undertaken. A potential Early Action activity would be to identify a pilot area of mitigation zones for study.

Figure 15 shows a suggested pilot area that includes the mitigation zone on Birch Street between Ash Street and Cherry Street and the mitigation zone on Chestnut Street between Cherry Street and Oak Street. These mitigation zones were selected because the Village currently has water main and roadway improvements programmed for 2017 in these areas, so identified stormwater improvements could be coupled with those infrastructure projects. Additionally, the Chestnut zone appears to impact the Birch Street zone so evaluating them together is necessary.

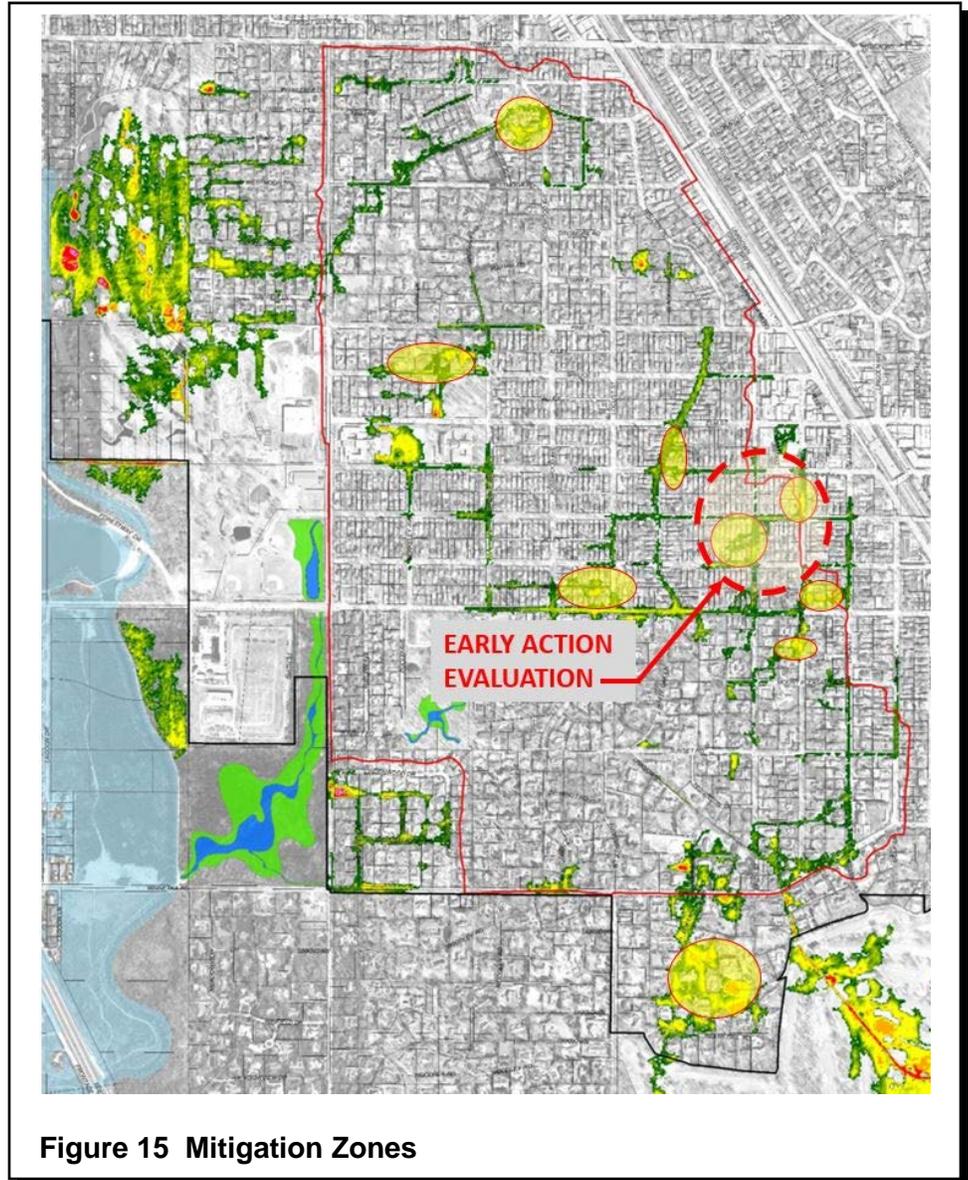


Figure 15 Mitigation Zones

As stated in the June report, the first step of the evaluation process would involve additional data gathering to confirm whether the identified mitigation properties are indeed at risk of structural flooding. Note that the flood risk reduction estimates that were prepared were based primarily on available LIDAR topographic data. It is suggested that detailed field topographic surveys be collected for the at-risk properties in the pilot area to determine low entry, finished floor, and lowest adjacent grade elevations. These elevations can then be compared to the regional predicted proposed conditions flood elevations to determine whether the surveyed structures are flood-prone.

It is assumed that some of the estimated structures in the pilot area may not need further flood protection. Those properties and specific buildings that are determined to still be at risk of flooding in the pilot area for the design storm can then be further evaluated for individual or group property flood protection activities.

APPENDIX A
COST OPINION
NORTH WILLOW EARLY ACTION PROJECTS

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winnetka, Cook County, Illinois
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

North of Willow Early Action Project
Duke Childs Soccer/Lacrosse Field Underground Stormwater Storage Project

1.00		MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10		GENERAL CONDITIONS - HARD COST				
	1.11	Mobilization Allowance (5% Hard Costs)	5.00%	LS	\$ 2,810,500.00	\$ 140,525.00
	1.12	Survey, Const. Layout & As-Builts (3% Hard Costs)	1.00%	LS	\$ 2,810,500.00	\$ 28,105.00
	1.13	Traffic Control - Signage Detours, Etc.	0.50%	LS	\$ 2,810,500.00	\$ 14,052.50
	1.14	Traffic Control - Flagging	1.00%	LS	\$ 2,810,500.00	\$ 28,105.00
	1.15	Site Sanitary Facilities	4.00	MTH	\$ 650.00	\$ 2,600.00
	1.16	Contractors Field Office	4.00	MTH	\$ 3,000.00	\$ 12,000.00
1.20		GENERAL CONDITIONS - SOFT COST				
	1.21	Insurance & Bonds (1% Hard Costs)	1.00%	LS	\$ 2,810,500.00	\$ 28,105.00
	1.22	GC Overhead/Management (4% Hard Costs)	4.00%	LS	\$ 2,810,500.00	\$ 112,420.00
					SUBTOTAL	\$ 365,912.50

2.00		EARTHWORK	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10		DEMOLITION				
	2.11	Clearing and Grubbing	-	AC	\$ 5,000.00	\$ -
	2.12	Topsoil stripping and stockpile	7,100.00	CY	\$ 5.00	\$ 35,500.00
						\$ -
2.20		EARTH EXCAVATION				
	2.21	Earth Excavation and Disposal (Off-site re-use Landfill)	20,000.00	CY	\$ 10.00	\$ 200,000.00
		Earth Excavation and Disposal (On-site re-use)	20,000.00	CY	\$ 5.00	\$ 100,000.00
	2.21	Salvaged Topsoil Respread (6")	21,300.00	SY	\$ 5.00	\$ 106,500.00
						\$ -
					SUBTOTAL	\$ 442,000.00

3.00		LANDSCAPE	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10		RESTORATION				
	3.11	Turf Grass Seeding	4.50	AC	\$ 5,000.00	\$ 22,500.00
	3.12	Native Seed Mix 2 (Upland Meadow)	-	AC	\$ 8,000.00	\$ -
	3.13	Native Tree Reforestation (1.5" cal., 25' o.c., 81 trees/ac.)	-	AC	\$ 12,150.00	\$ -
						\$ -
3.20		EROSION CONTROL				
	3.21	Stabilized Construction Entrance	1.00	LS	\$ 6,000.00	\$ 6,000.00
	3.22	Temp. Erosion Blanket	-	SY	\$ 2.00	\$ -
					SUBTOTAL	\$ 28,500.00

4.00		HARDSCAPE	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10						
	3.11	Aggregate Base Installation (12" CA-6)	14,000.00	SY	\$ -	\$ -
	3.12	Bituminous Binder Course (4")	2,652.00	TON	\$ -	\$ -
	3.13	Bituminous Surface Course IL-19, N50 (2")	1,326.00	TON	\$ -	\$ -
						\$ -
					SUBTOTAL	\$ -

10/2/2016

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

North of Willow Early Action Project
 Duke Childs Soccer/Lacrosse Field Underground Stormwater Storage Project

5.00		MISCELLANEOUS	QUANTITY	UNIT	UNIT PRICE	TOTAL
5.10		MISCELLANEOUS				
	5.11	Precast Concrete Storage Vaults	18.00	AC-FT	\$ 130,000.00	\$ 2,340,000.00
	5.12	Interconnecting 72" RCP Storm Sewer		LF	\$ 250.00	\$ -
						\$ -
					SUBTOTAL	\$ 2,340,000.00

TOTAL \$ 3,176,412.50

6.00		ENGINEERING AND CONT.	QUANTITY	UNIT	UNIT PRICE	TOTAL
	6.11	Design and Construction Eng. (15%)	15%	LS	\$ 3,176,412.50	\$ 476,461.88
	6.12	Permitting (1%)	1%	LS	\$ 3,176,412.50	\$ 31,764.13
	6.13	Design Contingency - Storage (20%)	20%	LS	\$ 3,176,412.50	\$ 635,282.50
	6.14	Project Mgmt. (1.5%)	1.5%	LS	\$ 3,176,412.50	\$ 47,646.19
					SUBTOTAL	\$ 1,191,154.69

TOTAL \$ 4,367,567.19

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**North of Willow Early Action Project
 Hibbard Road Conveyance Project - Duke Childs Basin to Oak Street**

1.00		MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10		GENERAL CONDITIONS - HARD COST				
	1.11	Mobilization Allowance (5% Hard Costs)	5.00%	LS	\$ 763,132.51	\$ 38,156.63
	1.12	Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LS	\$ 763,132.51	\$ 22,893.98
	1.13	Traffic Control - Signage Detours, Etc.	1.00%	LS	\$ 763,132.51	\$ 7,631.33
	1.14	Traffic Control - Flagging	2.00%	LS	\$ 763,132.51	\$ 15,262.65
	1.15	Site Sanitary Facilities	4.00	MTH	\$ 650.00	\$ 2,600.00
	1.16	Contractors Field Office	4.00	MTH	\$ 3,000.00	\$ 12,000.00
1.20		GENERAL CONDITIONS - SOFT COST				
	1.21	Insurance & Bonds (1% Hard Costs)	1.00%	LS	\$ 763,132.51	\$ 7,631.33
	1.22	GC Overhead/Management (4% Hard Costs)	4.00%	LS	\$ 763,132.51	\$ 30,525.30
					SUBTOTAL	\$ 136,701.20

2.00		PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10		DEMOLITION				
	2.11	Pavement Sawcutting	805.00	LF	\$ 2.25	\$ 1,811.25
	2.12	Bituminous Surface Removal - 3"	640.23	SY	\$ 4.15	\$ 2,656.95
	2.13	Aggregate Base Course Removal - 12"	245.63	CY	\$ 30.00	\$ 7,368.94
	2.14	PCC Curb Removal	308.00	LF	\$ 3.25	\$ 1,001.00
2.20		PIPE INSTALLATION				
	2.21	Install 12" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 40.00	\$ -
	2.22	Install 15" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 50.00	\$ -
	2.23	Install 18" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 60.00	\$ -
	2.24	Install 24" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 75.00	\$ -
	2.25	Install 30" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 100.00	\$ -
	2.26	Install 36" RCP Storm Sewer (4-6' Depth)	307.00	LF	\$ 125.00	\$ 38,375.00
	2.27	Install 42" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 200.00	\$ -
	2.28	Install 48" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 275.00	\$ -
	2.29	Install 54" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 350.00	\$ -
	2.30	Install 60" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.31	Install 34"x53" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 250.00	\$ -
	2.32	Install 38"x60" HERCP Storm Sewer (4-6' Depth)	276.00	LF	\$ 300.00	\$ 82,800.00
	2.33	Install 43"x68" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.34	Install 48"x76" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 500.00	\$ -
	2.35	Install 6'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 672.00	\$ -
	2.36	Install 8'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 784.00	\$ -
	2.37	Install 10'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,155.00	\$ -
	2.38	Install 8'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 840.00	\$ -
	2.39	Install 10'x5' RCBC Storm Sewer (4-6' Depth)	244.00	LF	\$ 1,225.00	\$ 298,900.00
	2.40	Storm Manhole	10.00	EA	\$ 10,000.00	\$ 100,000.00
	2.41	High Capacity Inlets	2.00	EA	\$ 6,500.00	\$ 13,000.00
	2.42	Trench Backfill (CA-7)	163.42	CY	\$ 54.65	\$ 8,930.64
	2.43	Spoil Removal (Win. Landfill)	2,387.11	CY	\$ 10.00	\$ 23,871.14
					SUBTOTAL	\$ 578,714.92

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**North of Willow Early Action Project
 Hibbard Road Conveyance Project - Duke Childs Basin to Oak Street**

3.00		SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10		ROADWAY PAVING & CONCRETE				
	3.11	Aggregate Base Installation (12" CA-6)	245.63	SY	\$ 14.25	\$ 3,500.25
	3.12	Bituminous Binder Course (4")	153.65	TON	\$ 85.00	\$ 13,060.65
	3.13	Bituminous Surface Course IL-19, N50 (2")	76.83	TON	\$ 90.00	\$ 6,914.46
	3.14	B6.12 Curb & Gutter	308.00	LF	\$ 20.00	\$ 6,160.00
	3.15	Sidewalk Including Aggregate	-	SF	\$ 5.25	\$ -
3.20		ROW RESTORATION				
	3.21	Driveway Replacement Allowance	2.00	LS	\$ 6,000.00	\$ 12,000.00
	3.22	Parkway Seed and Blanket	348.22	SY	\$ 10.00	\$ 3,482.23
	3.23	Parkway Bioretention Basins (50' Long TYP)	2.00	EA	\$ 11,300.00	\$ 22,600.00
	3.24	Tree Removal and Replacement	2.00	EA	\$ 1,000.00	\$ 2,000.00
					SUBTOTAL	\$ 69,717.59

4.00		UTILITY RELOCATES/REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10		WATER MAIN & SERVICES				
	4.11	Water Main Replacement (8")	-	LF	\$ 150.00	\$ -
	4.12	Water Service Leads	13.00	EA	\$ 2,500.00	\$ 32,500.00
	4.13	6' Direct Bury Fire Hydrants w/ Aux. Valve	-	EA	\$ 5,000.00	\$ -
	4.14	8" Gate Valve in 48" Dia. Vault	4.00	EA	\$ 4,500.00	\$ 18,000.00
	4.15	Perpendicular Water Crossings	4.00	EA	\$ 2,000.00	\$ 8,000.00
4.20		STORM SEWER				
	4.21	Storm Sewer Replacement (18" RCP)	-	LF	\$ 60.00	\$ -
	4.22	Storm Sewer Removal	210.00	LF	\$ 20.00	\$ 4,200.00
	4.23	Storm Sewer Manhole 4' Allowance	8.00	EA	\$ 2,500.00	\$ 20,000.00
	4.24	Catch Basin/Inlet Leads	16.00	EA	\$ 2,000.00	\$ 32,000.00
	4.25	Perpendicular Storm Crossings	-	EA	\$ 1,000.00	\$ -
4.30		SANITARY SEWER				
	4.31	Sanitary Sewer Replacement (8")	-	LF	\$ 150.00	\$ -
	4.32	San. MH 4' Allowance	-	EA	\$ 2,500.00	\$ -
					SUBTOTAL	\$ 114,700.00

TOTAL \$ 899,833.71

5.00		ENGINEERING AND CONT.	QUANTITY	UNIT	UNIT PRICE	TOTAL
	5.11	Design and Construction Eng. (15%)	15%	LS	\$ 899,833.71	\$ 134,975.06
	5.12	Permitting (1%)	1%	LS	\$ 899,833.71	\$ 8,998.34
	5.13	Design Contingency - Conveyance (30%)	30%	LS	\$ 899,833.71	\$ 269,950.11
	5.14	Project Mgmt. (1.5%)	1.5%	LS	\$ 899,833.71	\$ 13,497.51
					SUBTOTAL	\$ 427,421.01

TOTAL \$ 1,327,254.72

Stormwater Early Action Study for Western and Southwest Winnetka
Village of Winetka, Cook County, Illinois

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**North of Willow Early Action Project
Oak Street Conveyance Project (Hibbard to Berkley)**

1.00		MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10		GENERAL CONDITIONS - HARD COST				
	1.11	Mobilization Allowance (5% Hard Costs)	5.00%	LS	\$ 829,287.12	\$ 41,464.36
	1.12	Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LS	\$ 829,287.12	\$ 24,878.61
	1.13	Traffic Control - Signage Detours, Etc.	1.00%	LS	\$ 829,287.12	\$ 8,292.87
	1.14	Traffic Control - Flagging	2.00%	LS	\$ 829,287.12	\$ 16,585.74
	1.15	Site Sanitary Facilities	6.00	MTH	\$ 650.00	\$ 3,900.00
	1.16	Contractors Field Office	6.00	MTH	\$ 3,000.00	\$ 18,000.00
1.20		GENERAL CONDITIONS - SOFT COST				
	1.21	Insurance & Bonds (1% Hard Costs)	1.00%	LS	\$ 829,287.12	\$ 8,292.87
	1.22	GC Overhead/Management (4% Hard Costs)	4.00%	LS	\$ 829,287.12	\$ 33,171.48
					SUBTOTAL	\$ 154,585.94

2.00		PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10		DEMOLITION				
	2.11	Pavement Sawcutting	750.00	LF	\$ 2.25	\$ 1,687.50
	2.12	Bituminous Surface Removal - 3"	506.67	SY	\$ 4.15	\$ 2,102.67
	2.13	Aggregate Base Course Removal - 12"	239.26	CY	\$ 30.00	\$ 7,177.78
	2.14	PCC Curb Removal	737.00	LF	\$ 3.25	\$ 2,395.25
2.20		PIPE INSTALLATION				
	2.21	Install 12" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 40.00	\$ -
	2.22	Install 15" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 50.00	\$ -
	2.23	Install 18" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 60.00	\$ -
	2.24	Install 24" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 75.00	\$ -
	2.25	Install 30" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 100.00	\$ -
	2.26	Install 36" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 125.00	\$ -
	2.27	Install 42" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 200.00	\$ -
	2.28	Install 48" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 275.00	\$ -
	2.29	Install 54" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 350.00	\$ -
	2.30	Install 60" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.31	Install 34"x53" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 250.00	\$ -
	2.32	Install 38"x60" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 300.00	\$ -
	2.33	Install 43"x68" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.34	Install 48"x76" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 500.00	\$ -
	2.35	Install 6'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 672.00	\$ -
	2.36	Install 8'x4' RCBC Storm Sewer (4-6' Depth)	826.00	LF	\$ 784.00	\$ 647,584.00
	2.37	Install 10'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,155.00	\$ -
	2.38	Install 8'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 840.00	\$ -
	2.39	Install 10'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,225.00	\$ -
	2.40	Storm Manhole	3.00	EA	\$ 10,000.00	\$ 30,000.00
	2.41	High Capacity Inlets	2.00	EA	\$ 6,500.00	\$ 13,000.00
	2.42	Trench Backfill (CA-7)	188.60	CY	\$ 54.65	\$ 10,307.17
	2.43	Spoil Removal (Win. Landfill)	2,738.70	CY	\$ 10.00	\$ 27,386.98
					SUBTOTAL	\$ 741,641.34

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**North of Willow Early Action Project
 Oak Street Conveyance Project (Hibbard to Berkley)**

3.00		SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10		ROADWAY PAVING & CONCRETE				
	3.11	Aggregate Base Installation (12" CA-6)	717.78	SY	\$ 14.25	\$ 10,228.33
	3.12	Bituminous Binder Course (4")	121.60	TON	\$ 85.00	\$ 10,336.00
	3.13	Bituminous Surface Course IL-19, N50 (2")	60.80	TON	\$ 90.00	\$ 5,472.00
	3.14	B6.12 Curb & Gutter	737.00	LF	\$ 20.00	\$ 14,740.00
	3.15	Sidewalk Including Aggregate	71.65	SF	\$ 5.25	\$ 376.16
3.20		ROW RESTORATION				
	3.21	Driveway Replacement Allowance	-	LS	\$ 6,000.00	\$ -
	3.22	Parkway Seed and Blanket	589.33	SY	\$ 10.00	\$ 5,893.28
	3.23	Parkway Bioretention Basins (50' Long TYP)	2.00	EA	\$ 11,300.00	\$ 22,600.00
	3.24	Tree Removal and Replacement	10.00	EA	\$ 500.00	\$ 5,000.00
					SUBTOTAL	\$ 74,645.77

4.00		UTILITY RELOCATES/REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10		WATER MAIN & SERVICES				
	4.11	Water Main Replacement (8")	-	LF	\$ 150.00	\$ -
	4.12	Water Service Leads		EA	\$ 2,500.00	\$ -
	4.13	6' Direct Bury Fire Hydrants w/ Aux. Valve		EA	\$ 5,000.00	\$ -
	4.14	8" Gate Valve in 48" Dia. Vault		EA	\$ 4,500.00	\$ -
	4.15	Perpendicular Water Crossings		EA	\$ 2,000.00	\$ -
4.20		STORM SEWER				
	4.21	Storm Sewer Replacement (18" RCP)	-	LF	\$ 60.00	\$ -
	4.22	Storm Sewer Removal	-	LF	\$ 20.00	\$ -
	4.23	Storm Sewer Manhole 4' Allowance	2.00	EA	\$ 2,500.00	\$ 5,000.00
	4.24	Catch Basin/Inlet Leads	4.00	EA	\$ 2,000.00	\$ 8,000.00
	4.25	Perpendicular Storm Crossings	-	EA	\$ 1,000.00	\$ -
4.30		SANITARY SEWER				
	4.31	Sanitary Sewer Replacement (8")	-	LF	\$ 150.00	\$ -
	4.32	San. MH 4' Allowance	-	EA	\$ 2,500.00	\$ -
					SUBTOTAL	\$ 13,000.00

TOTAL \$ 983,873.06

5.00		ENGINEERING AND CONT.	QUANTITY	UNIT	UNIT PRICE	TOTAL
	5.11	Design and Construction Eng. (15%)	15%	LS	\$ 983,873.06	\$ 147,580.96
	5.12	Permitting (1%)	1%	LS	\$ 983,873.06	\$ 9,838.73
	5.13	Design Contingency - Conveyance (30%)	30%	LS	\$ 983,873.06	\$ 295,161.92
	5.14	Project Mgmt. (1.5%)	1.5%	LS	\$ 983,873.06	\$ 14,758.10
					SUBTOTAL	\$ 467,339.70

TOTAL \$ 1,451,212.76

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**North of Willow Early Action Project
 Ash Street, Berkley Ave. & Cherry St. Conveyance Project**

1.00		MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10		GENERAL CONDITIONS - HARD COST				
	1.11	Mobilization Allowance (5% Hard Costs)	5.00%	LS	\$ 1,571,179.88	\$ 78,558.99
	1.12	Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LS	\$ 1,571,179.88	\$ 47,135.40
	1.13	Traffic Control - Signage Detours, Etc.	1.00%	LS	\$ 1,571,179.88	\$ 15,711.80
	1.14	Traffic Control - Flagging	2.00%	LS	\$ 1,571,179.88	\$ 31,423.60
	1.15	Site Sanitary Facilities	5.00	MTH	\$ 650.00	\$ 3,250.00
	1.16	Contractors Field Office	5.00	MTH	\$ 3,000.00	\$ 15,000.00
1.20		GENERAL CONDITIONS - SOFT COST				
	1.21	Insurance & Bonds (1% Hard Costs)	1.00%	LS	\$ 1,571,179.88	\$ 15,711.80
	1.22	GC Overhead/Management (4% Hard Costs)	4.00%	LS	\$ 1,571,179.88	\$ 62,847.20
					SUBTOTAL	\$ 269,638.78

2.00		PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10		DEMOLITION				
	2.11	Pavement Sawcutting	2,600.00	LF	\$ 2.25	\$ 5,850.00
	2.12	Bituminous Surface Removal - 3"	1,093.97	SY	\$ 4.15	\$ 4,539.97
	2.13	Aggregate Base Course Removal - 12"	475.82	CY	\$ 30.00	\$ 14,274.64
	2.14	PCC Curb Removal	857.56	LF	\$ 3.25	\$ 2,787.07
2.20		PIPE INSTALLATION				
	2.21	Install 12" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 40.00	\$ -
	2.22	Install 15" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 50.00	\$ -
	2.23	Install 18" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 60.00	\$ -
	2.24	Install 24" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 75.00	\$ -
	2.25	Install 30" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 100.00	\$ -
	2.26	Install 36" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 125.00	\$ -
	2.27	Install 42" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 200.00	\$ -
	2.28	Install 48" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 275.00	\$ -
	2.29	Install 54" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 350.00	\$ -
	2.30	Install 60" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.31	Install 34"x53" HERCP Storm Sewer (4-6' Depth)	810.00	LF	\$ 250.00	\$ 202,500.00
	2.32	Install 38"x60" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 300.00	\$ -
	2.33	Install 43"x68" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.34	Install 48"x76" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 500.00	\$ -
	2.35	Install 6'x4' RCBC Storm Sewer (4-6' Depth)	840.00	LF	\$ 672.00	\$ 564,480.00
	2.36	Install 8'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 784.00	\$ -
	2.37	Install 10'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,155.00	\$ -
	2.38	Install 8'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 840.00	\$ -
	2.39	Install 10'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,225.00	\$ -
	2.40	Storm Manhole	2.00	EA	\$ 10,000.00	\$ 20,000.00
	2.41	High Capacity Inlets	8.00	EA	\$ 6,500.00	\$ 52,000.00
	2.42	Trench Backfill (CA-7)	1,073.04	CY	\$ 54.65	\$ 58,641.39
	2.43	Spoil Removal (Win. Landfill)	5,302.59	CY	\$ 10.00	\$ 53,025.88
					SUBTOTAL	\$ 978,098.96

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**North of Willow Early Action Project
 Ash Street, Berkley Ave. & Cherry St. Conveyance Project**

3.00		SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10		ROADWAY PAVING & CONCRETE				
	3.11	Aggregate Base Installation (12" CA-6)	1,427.46	SY	\$ 14.25	\$ 20,341.37
	3.12	Bituminous Binder Course (4")	262.55	TON	\$ 85.00	\$ 22,316.97
	3.13	Bituminous Surface Course IL-19, N50 (2")	131.28	TON	\$ 90.00	\$ 11,814.86
	3.14	B6.12 Curb & Gutter	857.56	LF	\$ 20.00	\$ 17,151.20
	3.15	Sidewalk Including Aggregate	2,495.00	SF	\$ 5.25	\$ 13,098.75
3.20		ROW RESTORATION				
	3.21	Driveway Replacement Allowance	12.00	LS	\$ 6,000.00	\$ 72,000.00
	3.22	Parkway Seed and Blanket	1,170.78	SY	\$ 10.00	\$ 11,707.78
	3.23	Parkway Bioretention Basins (50' Long TYP)	6.00	EA	\$ 11,300.00	\$ 67,800.00
	3.24	Tree Removal and Replacement	10.00	EA	\$ 1,000.00	\$ 10,000.00
					SUBTOTAL	\$ 246,230.93

4.00		UTILITY RELOCATES/REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10		WATER MAIN & SERVICES				
	4.11	Water Main Replacement (8")	810.00	LF	\$ 150.00	\$ 121,500.00
	4.12	Water Service Leads	23.00	EA	\$ 2,500.00	\$ 57,500.00
	4.13	6' Direct Bury Fire Hydrants w/ Aux. Valve	2.00	EA	\$ 5,000.00	\$ 10,000.00
	4.14	8" Gate Valve in 48" Dia. Vault	2.00	EA	\$ 4,500.00	\$ 9,000.00
	4.15	Perpendicular Water Crossings	1.00	EA	\$ 2,000.00	\$ 2,000.00
4.20		STORM SEWER				
	4.21	Storm Sewer Replacement (18" RCP)	-	LF	\$ 60.00	\$ -
	4.22	Storm Sewer Removal	400.00	LF	\$ 20.00	\$ 8,000.00
	4.23	Storm Sewer Manhole 4' Allowance	5.00	EA	\$ 2,500.00	\$ 12,500.00
	4.24	Catch Basin/Inlet Leads	8.00	EA	\$ 2,000.00	\$ 16,000.00
	4.25	Perpendicular Storm Crossings	-	EA	\$ 1,000.00	\$ -
4.30		SANITARY SEWER				
	4.31	Sanitary Sewer Replacement (8")	669.00	LF	\$ 150.00	\$ 100,350.00
	4.32	San. MH 4' Allowance	4.00	EA	\$ 2,500.00	\$ 10,000.00
					SUBTOTAL	\$ 346,850.00

TOTAL \$ 1,840,818.66

5.00		ENGINEERING AND CONT.	QUANTITY	UNIT	UNIT PRICE	TOTAL
	5.11	Design and Construction Eng. (15%)	15%	LS	\$ 1,840,818.66	\$ 276,122.80
	5.12	Permitting (1%)	1%	LS	\$ 1,840,818.66	\$ 18,408.19
	5.13	Design Contingency - Conveyance (30%)	30%	LS	\$ 1,840,818.66	\$ 552,245.60
	5.14	Project Mgmt. (1.5%)	1.5%	LS	\$ 1,840,818.66	\$ 27,612.28
					SUBTOTAL	\$ 874,388.87

TOTAL \$ 2,715,207.53

APPENDIX B
COST OPINION
SOUTH WILLOW EARLY ACTION PROJECTS

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**South Willow Early Action Project
 Mount Pleasant Street Conveyance Project**

1.00		MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10		GENERAL CONDITIONS - HARD COST				
	1.11	Mobilization Allowance (5% Hard Costs)	5.00%	LS	\$ 2,108,348.25	\$ 105,417.41
	1.12	Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LS	\$ 2,108,348.25	\$ 63,250.45
	1.13	Traffic Control - Signage Detours, Etc.	1.00%	LS	\$ 2,108,348.25	\$ 21,083.48
	1.14	Traffic Control - Flagging	2.00%	LS	\$ 2,108,348.25	\$ 42,166.97
	1.15	Site Sanitary Facilities	3.00	MTH	\$ 650.00	\$ 1,950.00
	1.16	Contractors Field Office	3.00	MTH	\$ 3,000.00	\$ 9,000.00
1.20		GENERAL CONDITIONS - SOFT COST				
	1.21	Insurance & Bonds (1% Hard Costs)	1.00%	LS	\$ 2,108,348.25	\$ 21,083.48
	1.22	GC Overhead/Management (4% Hard Costs)	4.00%	LS	\$ 2,108,348.25	\$ 84,333.93
					SUBTOTAL	\$ 348,285.72

2.00		PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10		DEMOLITION				
	2.11	Pavement Sawcutting	1,360.00	LF	\$ 2.25	\$ 3,060.00
	2.12	Bituminous Surface Removal - 3"	1,862.16	SY	\$ 4.15	\$ 7,727.95
	2.13	Aggregate Base Course Removal - 12"	715.74	CY	\$ 30.00	\$ 21,472.13
	2.14	PCC Curb Removal	733.00	LF	\$ 3.25	\$ 2,382.25
2.20		PIPE INSTALLATION				
	2.21	Install 12" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 40.00	\$ -
	2.22	Install 15" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 50.00	\$ -
	2.23	Install 18" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 60.00	\$ -
	2.24	Install 24" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 75.00	\$ -
	2.25	Install 30" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 100.00	\$ -
	2.26	Install 36" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 125.00	\$ -
	2.27	Install 42" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 200.00	\$ -
	2.28	Install 48" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 275.00	\$ -
	2.29	Install 54" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 350.00	\$ -
	2.30	Install 60" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.31	Install 34"x53" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 250.00	\$ -
	2.32	Install 38"x60" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 300.00	\$ -
	2.33	Install 43"x68" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.34	Install 48"x76" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 500.00	\$ -
	2.35	Install 6'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 672.00	\$ -
	2.36	Install 8'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 784.00	\$ -
	2.37	Install 10'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,155.00	\$ -
	2.38	Install 8'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 840.00	\$ -
	2.39	Install 10'x5' RCBC Storm Sewer (4-6' Depth)	1,140.00	LF	\$ 1,225.00	\$ 1,396,500.00
	2.40	Storm Manhole	8.00	EA	\$ 10,000.00	\$ 80,000.00
	2.41	High Capacity Inlets	4.00	EA	\$ 6,500.00	\$ 26,000.00
	2.42	Trench Backfill (CA-7)	782.50	CY	\$ 54.65	\$ 42,763.81
	2.43	Spoil Removal (Win. Landfill)	6,060.99	CY	\$ 10.00	\$ 60,609.93
					SUBTOTAL	\$ 1,640,516.07

3.00		SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10		ROADWAY PAVING & CONCRETE				
	3.11	Aggregate Base Installation (12" CA-6)	2,147.21	SY	\$ 14.25	\$ 30,597.79
	3.12	Bituminous Binder Course (4")	446.92	TON	\$ 85.00	\$ 37,988.02
	3.13	Bituminous Surface Course IL-19, N50 (2")	223.46	TON	\$ 90.00	\$ 20,111.30
	3.14	B6.12 Curb & Gutter	733.00	LF	\$ 20.00	\$ 14,660.00
	3.15	Sidewalk Including Aggregate	-	SF	\$ 5.25	\$ -

3.20		ROW RESTORATION				
	3.21	Driveway Replacement Allowance	10.00	LS	\$ 6,000.00	\$ 60,000.00
	3.22	Parkway Seed and Blanket	740.01	SY	\$ 10.00	\$ 7,400.07
	3.23	Parkway Bioretention Basins (50' Long TYP)	6.00	EA	\$ 11,300.00	\$ 67,800.00
	3.24	Tree Removal and Replacement	25.00	EA	\$ 1,000.00	\$ 25,000.00
					SUBTOTAL	\$ 263,557.18

4.00		UTILITY RELOCATES/REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10		WATER MAIN & SERVICES				
	4.11	Water Main Replacement (8")	-	LF	\$ 150.00	\$ -
	4.12	Water Service Leads	-	EA	\$ 2,500.00	\$ -
	4.13	6' Direct Bury Fire Hydrants w/ Aux. Valve	-	EA	\$ 5,000.00	\$ -
	4.14	8" Gate Valve in 48" Dia. Vault	-	EA	\$ 4,500.00	\$ -
	4.15	Perpendicular Water Crossings	1.00	EA	\$ 2,000.00	\$ 2,000.00
4.20		STORM SEWER				
	4.21	Storm Sewer Replacement (18" RCP)	-	LF	\$ 60.00	\$ -
	4.22	Storm Sewer Removal	30.00	LF	\$ 20.00	\$ 600.00
	4.23	Storm Sewer Manhole 4' Allowance	5.00	EA	\$ 2,500.00	\$ 12,500.00
	4.24	Catch Basin/Inlet Leads	10.00	EA	\$ 2,000.00	\$ 20,000.00
	4.25	Perpendicular Storm Crossings	-	EA	\$ 1,000.00	\$ -
4.30		SANITARY SEWER				
	4.31	Sanitary Sewer Replacement (10")	881.00	LF	\$ 175.00	\$ 154,175.00
	4.32	San. MH 4' Allowance	6.00	EA	\$ 2,500.00	\$ 15,000.00
					SUBTOTAL	\$ 204,275.00

TOTAL \$ 2,456,633.97

5.00		ENGINEERING AND CONT.	QUANTITY	UNIT	UNIT PRICE	TOTAL
	5.11	Design and Construction Eng. (15%)	15%	LS	\$ 2,456,633.97	\$ 368,495.10
	5.12	Permitting (1%)	1%	LS	\$ 2,456,633.97	\$ 24,566.34
	5.13	Design Contingency - Conveyance (30%)	30%	LS	\$ 2,456,633.97	\$ 736,990.19
	5.14	Project Mgmt. (1.5%)	1.5%	LS	\$ 2,456,633.97	\$ 36,849.51
					SUBTOTAL	\$ 1,166,901.14

TOTAL \$ 3,623,535.11

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**South Willow Early Action Project
 Locust Road and Sunset Road Conveyance Project**

1.00		MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10		GENERAL CONDITIONS - HARD COST				
	1.11	Mobilization Allowance (5% Hard Costs)	5.00%	LS	\$ 3,079,885.07	\$ 153,994.25
	1.12	Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LS	\$ 3,079,885.07	\$ 92,396.55
	1.13	Traffic Control - Signage Detours, Etc.	1.00%	LS	\$ 3,079,885.07	\$ 30,798.85
	1.14	Traffic Control - Flagging	2.00%	LS	\$ 3,079,885.07	\$ 61,597.70
	1.15	Site Sanitary Facilities	6.00	MTH	\$ 650.00	\$ 3,900.00
	1.16	Contractors Field Office	6.00	MTH	\$ 3,000.00	\$ 18,000.00
1.20		GENERAL CONDITIONS - SOFT COST				
	1.21	Insurance & Bonds (1% Hard Costs)	1.00%	LS	\$ 3,079,885.07	\$ 30,798.85
	1.22	GC Overhead/Management (4% Hard Costs)	4.00%	LS	\$ 3,079,885.07	\$ 123,195.40
					SUBTOTAL	\$ 514,681.61

2.00		PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10		DEMOLITION				
	2.11	Pavement Sawcutting	2,162.00	LF	\$ 2.25	\$ 4,864.50
	2.12	Bituminous Surface Removal - 3"	3,637.69	SY	\$ 4.15	\$ 15,096.41
	2.13	Aggregate Base Course Removal - 12"	1,355.16	CY	\$ 30.00	\$ 40,654.67
	2.14	PCC Curb Removal	1,100.00	LF	\$ 3.25	\$ 3,575.00
2.20		PIPE INSTALLATION				
	2.21	Install 12" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 40.00	\$ -
	2.22	Install 15" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 50.00	\$ -
	2.23	Install 18" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 60.00	\$ -
	2.24	Install 24" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 75.00	\$ -
	2.25	Install 30" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 100.00	\$ -
	2.26	Install 36" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 125.00	\$ -
	2.27	Install 42" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 200.00	\$ -
	2.28	Install 48" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 275.00	\$ -
	2.29	Install 54" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 350.00	\$ -
	2.30	Install 60" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.31	Install 34"x53" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 250.00	\$ -
	2.32	Install 38"x60" HERCP Storm Sewer (4-6' Depth)	1,160.00	LF	\$ 300.00	\$ 348,000.00
	2.33	Install 43"x68" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.34	Install 48"x76" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 500.00	\$ -
	2.35	Install 6'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 672.00	\$ -
	2.36	Install 8'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 784.00	\$ -
	2.37	Install 10'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,155.00	\$ -
	2.38	Install 8'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 840.00	\$ -
	2.39	Install 10'x5' RCBC Storm Sewer (4-6' Depth)	1,471.00	LF	\$ 1,225.00	\$ 1,801,975.00
	2.40	Storm Manhole	6.00	EA	\$ 10,000.00	\$ 60,000.00
	2.41	High Capacity Inlets	4.00	EA	\$ 6,500.00	\$ 26,000.00
	2.42	Trench Backfill (CA-7)	903.25	CY	\$ 54.65	\$ 49,362.78
	2.43	Spoil Removal (Win. Landfill)	10,049.07	CY	\$ 10.00	\$ 100,490.67
					SUBTOTAL	\$ 2,450,019.03

3.00		SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10		ROADWAY PAVING & CONCRETE				
	3.11	Aggregate Base Installation (12" CA-6)	4,065.47	SY	\$ 14.25	\$ 57,932.90
	3.12	Bituminous Binder Course (4")	873.05	TON	\$ 85.00	\$ 74,208.85
	3.13	Bituminous Surface Course IL-19, N50 (2")	436.52	TON	\$ 90.00	\$ 39,287.04
	3.14	B6.12 Curb & Gutter	1,100.00	LF	\$ 20.00	\$ 22,000.00
	3.15	Sidewalk Including Aggregate	-	SF	\$ 5.25	\$ -

3.20		ROW RESTORATION				
	3.21	Driveway Replacement Allowance	13.00	LS	\$ 6,000.00	\$ 78,000.00
	3.22	Parkway Seed and Blanket	768.73	SY	\$ 10.00	\$ 7,687.25
	3.23	Parkway Bioretention Basins (50' Long TYP)	8.00	EA	\$ 11,300.00	\$ 90,400.00
	3.24	Tree Removal and Replacement	50.00	EA	\$ 1,000.00	\$ 50,000.00
					SUBTOTAL	\$ 419,516.04

4.00		UTILITY RELOCATES/REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10		WATER MAIN & SERVICES				
	4.11	Water Main Replacement (8")	-	LF	\$ 150.00	\$ -
	4.12	Water Service Leads	12.00	EA	\$ 2,500.00	\$ 30,000.00
	4.13	6' Direct Bury Fire Hydrants w/ Aux. Valve	-	EA	\$ 5,000.00	\$ -
	4.14	8" Gate Valve in 48" Dia. Vault	2.00	EA	\$ 4,500.00	\$ 9,000.00
	4.15	Perpendicular Water Crossings	6.00	EA	\$ 2,000.00	\$ 12,000.00
4.20		STORM SEWER				
	4.21	Storm Sewer Replacement (18" RCP)	-	LF	\$ 60.00	\$ -
	4.22	Storm Sewer Removal	1,455.00	LF	\$ 20.00	\$ 29,100.00
	4.23	Storm Sewer Manhole 4' Allowance	5.00	EA	\$ 2,500.00	\$ 12,500.00
	4.24	Catch Basin/Inlet Leads	10.00	EA	\$ 2,000.00	\$ 20,000.00
	4.25	Perpendicular Storm Crossings	-	EA	\$ 1,000.00	\$ -
4.30		SANITARY SEWER				
	4.31	Sanitary Sewer Replacement (8")	585.00	LF	\$ 150.00	\$ 87,750.00
	4.32	San. MH 4' Allowance	4.00	EA	\$ 2,500.00	\$ 10,000.00
					SUBTOTAL	\$ 210,350.00

TOTAL \$ 3,594,566.68

5.00		ENGINEERING AND CONT.	QUANTITY	UNIT	UNIT PRICE	TOTAL
	5.11	Design and Construction Eng. (15%)	15%	LS	\$ 3,594,566.68	\$ 539,185.00
	5.12	Permitting (1%)	1%	LS	\$ 3,594,566.68	\$ 35,945.67
	5.13	Design Contingency - Conveyance (30%)	30%	LS	\$ 3,594,566.68	\$ 1,078,370.01
	5.14	Project Mgmt. (1.5%)	1.5%	LS	\$ 3,594,566.68	\$ 53,918.50
					SUBTOTAL	\$ 1,707,419.17

TOTAL \$ 5,301,985.86

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**South Willow Early Action Project
 Dewindt Road Conveyance Project**

1.00		MOBILIZATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1.10		GENERAL CONDITIONS - HARD COST				
	1.11	Mobilization Allowance (5% Hard Costs)	5.00%	LS	\$ 268,965.46	\$ 13,448.27
	1.12	Survey, Const. Layout & As-Builts (3% Hard Costs)	3.00%	LS	\$ 268,965.46	\$ 8,068.96
	1.13	Traffic Control - Signage Detours, Etc.	1.00%	LS	\$ 268,965.46	\$ 2,689.65
	1.14	Traffic Control - Flagging	2.00%	LS	\$ 268,965.46	\$ 5,379.31
	1.15	Site Sanitary Facilities	3.00	MTH	\$ 650.00	\$ 1,950.00
	1.16	Contractors Field Office	3.00	MTH	\$ 3,000.00	\$ 9,000.00
1.20		GENERAL CONDITIONS - SOFT COST				
	1.21	Insurance & Bonds (1% Hard Costs)	1.00%	LS	\$ 268,965.46	\$ 2,689.65
	1.22	GC Overhead/Management (4% Hard Costs)	4.00%	LS	\$ 268,965.46	\$ 10,758.62
					SUBTOTAL	\$ 53,984.47

2.00		PIPE INSTALLATION	QUANTITY	UNIT	UNIT PRICE	TOTAL
2.10		DEMOLITION				
	2.11	Pavement Sawcutting	1,418.00	LF	\$ 2.25	\$ 3,190.50
	2.12	Bituminous Surface Removal - 3"	611.37	SY	\$ 4.15	\$ 2,537.20
	2.13	Aggregate Base Course Removal - 12"	203.79	CY	\$ 30.00	\$ 6,113.74
	2.14	PCC Curb Removal	-	LF	\$ 3.25	\$ -
2.20		PIPE INSTALLATION				
	2.21	Install 12" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 40.00	\$ -
	2.22	Install 15" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 50.00	\$ -
	2.23	Install 18" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 60.00	\$ -
	2.24	Install 24" RCP Storm Sewer (4-6' Depth)	329.00	LF	\$ 75.00	\$ 24,675.00
	2.25	Install 30" RCP Storm Sewer (4-6' Depth)	240.00	LF	\$ 100.00	\$ 24,000.00
	2.26	Install 36" RCP Storm Sewer (4-6' Depth)	402.00	LF	\$ 125.00	\$ 50,250.00
	2.27	Install 42" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 200.00	\$ -
	2.28	Install 48" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 275.00	\$ -
	2.29	Install 54" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 350.00	\$ -
	2.30	Install 60" RCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.31	Install 34"x53" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 250.00	\$ -
	2.32	Install 38"x60" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 300.00	\$ -
	2.33	Install 43"x68" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 400.00	\$ -
	2.34	Install 48"x76" HERCP Storm Sewer (4-6' Depth)	-	LF	\$ 500.00	\$ -
	2.35	Install 6'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 672.00	\$ -
	2.36	Install 8'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 784.00	\$ -
	2.37	Install 10'x4' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,155.00	\$ -
	2.38	Install 8'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 840.00	\$ -
	2.39	Install 10'x5' RCBC Storm Sewer (4-6' Depth)	-	LF	\$ 1,225.00	\$ -
	2.40	Storm Manhole	-	EA	\$ 10,000.00	\$ -
	2.41	High Capacity Inlets	-	EA	\$ 6,500.00	\$ -
	2.42	Trench Backfill (CA-7)	102.11	CY	\$ 54.65	\$ 5,580.53
	2.43	Spoil Removal (Win. Landfill)	1,375.71	CY	\$ 10.00	\$ 13,757.07
					SUBTOTAL	\$ 130,104.05

Stormwater Early Action Study for Western and Southwest Winnetka
 Village of Winetka, Cook County, Illinois
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

**South Willow Early Action Project
 Dewindt Road Conveyance Project**

3.00		SITE & ROADWAY RECONSTRUCTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
3.10		ROADWAY PAVING & CONCRETE				
	3.11	Aggregate Base Installation (12" CA-6)	611.37	SY	\$ 14.25	\$ 8,712.09
	3.12	Bituminous Binder Course (4")	146.73	TON	\$ 85.00	\$ 12,472.04
	3.13	Bituminous Surface Course IL-19, N50 (2")	73.36	TON	\$ 90.00	\$ 6,602.84
	3.14	B6.12 Curb & Gutter	-	LF	\$ 20.00	\$ -
	3.15	Sidewalk Including Aggregate	-	SF	\$ 5.25	\$ -
3.20		ROW RESTORATION				
	3.21	Driveway Replacement Allowance	4.00	LS	\$ 6,000.00	\$ 24,000.00
	3.22	Parkway Seed and Blanket	247.44	SY	\$ 10.00	\$ 2,474.44
	3.23	Parkway Bioretention Basins (50' Long TYP)	2.00	EA	\$ 11,300.00	\$ 22,600.00
	3.24	Tree Removal and Replacement	20.00	EA	\$ 1,000.00	\$ 20,000.00
					SUBTOTAL	\$ 96,861.41

4.00		UTILITY RELOCATES/REPLACEMENTS	QUANTITY	UNIT	UNIT PRICE	TOTAL
4.10		WATER MAIN & SERVICES				
	4.11	Water Main Replacement (8")	-	LF	\$ 150.00	\$ -
	4.12	Water Service Leads	4.00	EA	\$ 2,500.00	\$ 10,000.00
	4.13	6' Direct Bury Fire Hydrants w/ Aux. Valve	-	EA	\$ 5,000.00	\$ -
	4.14	8" Gate Valve in 48" Dia. Vault	-	EA	\$ 4,500.00	\$ -
	4.15	Perpendicular Water Crossings	3.00	EA	\$ 2,000.00	\$ 6,000.00
4.20		STORM SEWER				
	4.21	Storm Sewer Replacement (18" RCP)	-	LF	\$ 60.00	\$ -
	4.22	Storm Sewer Removal	-	LF	\$ 20.00	\$ -
	4.23	Storm Sewer Manhole 4' Allowance	4.00	EA	\$ 2,500.00	\$ 10,000.00
	4.24	Catch Basin/Inlet Leads	8.00	EA	\$ 2,000.00	\$ 16,000.00
	4.25	Perpendicular Storm Crossings	-	EA	\$ 1,000.00	\$ -
4.30		SANITARY SEWER				
	4.31	Sanitary Sewer Replacement (8")	-	LF	\$ 150.00	\$ -
	4.32	San. MH 4' Allowance	-	EA	\$ 2,500.00	\$ -
					SUBTOTAL	\$ 42,000.00

TOTAL \$ 322,949.94

5.00		ENGINEERING AND CONT.	QUANTITY	UNIT	UNIT PRICE	TOTAL
	5.11	Design and Construction Eng. (15%)	15%	LS	\$ 322,949.94	\$ 48,442.49
	5.12	Permitting (1%)	1%	LS	\$ 322,949.94	\$ 3,229.50
	5.13	Design Contingency - Conveyance (30%)	30%	LS	\$ 322,949.94	\$ 96,884.98
	5.14	Project Mgmt. (1.5%)	1.5%	LS	\$ 322,949.94	\$ 4,844.25
					SUBTOTAL	\$ 153,401.22

TOTAL \$ 476,351.16

APPENDIX C

TABULATION OF FLOOD DEPTHS FOR EARLY ACTION PROJECTS

**APPENDIX C
TABULATION OF FLOOD DEPTHS FOR EARLY ACTION PROJECTS**

Storm Recurrence Interval (Years)	Existing Condition Flood Depth (Feet)	Proposed Flood Depth Early Action (Feet)	Early Action Flood Depth Reduction (Feet)	Proposed Flood Depth Full Vision (Feet)	Proposed Vision Flood Depth Reduction (Feet)
1	1.28	0.00	1.28	0.00	1.28
2	1.56	0.00	1.56	0.00	1.56
5	1.78	0.00	1.78	0.00	1.78
10	1.99	0.98	1.01	0.00	1.99
25	2.25	1.44	0.81	0.00	2.25
50	2.55	1.73	0.82	0.00	2.55
100	2.79	2.10	0.69	0.68	2.11

Table C-1 Comparison of Estimated Flooding Depths at Ash Street and Berkley Avenue

Storm Recurrence Interval (Years)	Existing Condition Flood Depth (Feet)	Proposed Flood Depth Early Action (Feet)	Early Action Flood Depth Reduction (Feet)	Proposed Flood Depth Full Vision (Feet)	Proposed Vision Flood Depth Reduction (Feet)
1	0.88	0.00	0.88	0.00	0.88
2	1.23	0.00	1.23	0.00	1.23
5	1.61	0.00	1.61	0.00	1.61
10	1.82	0.72	1.10	0.00	1.82
25	2.08	1.14	0.94	0.27	1.81
50	2.38	1.49	0.89	0.55	1.83
100	2.62	1.80	0.82	1.11	1.51

Table C-2 Comparison of Estimated Flooding Depths at Oak Street and Berkley Avenue

Storm Recurrence Interval (Years)	Existing Condition Flood Depth (Feet)	Proposed Flood Depth Early Action (Feet)	Early Action Flood Depth Reduction (Feet)	Proposed Flood Depth Full Vision (Feet)	Proposed Vision Flood Depth Reduction (Feet)
1	2.15	0.36	1.79	0.00	2.15
2	2.17	0.89	1.28	0.00	2.17
5	2.21	1.64	0.57	0.00	2.21
10	2.23	2.30	-0.07	0.00	2.23
25	2.27	2.58	-0.31	0.00	2.27
50	2.97	2.85	0.12	0.00	2.97
100	3.30	3.12	0.18	0.21	3.09

Table C-3 Comparison of Estimated Flooding Depths at DeWindt Road

Storm Recurrence Interval (Years)	Existing Condition Flood Depth (Feet)	Proposed Flood Depth Early Action (Feet)	Early Action Flood Depth Reduction (Feet)	Proposed Flood Depth Full Vision (Feet)	Proposed Vision Flood Depth Reduction (Feet)
1	2.15	0.36	1.79	0.00	2.15
2	2.17	0.89	1.28	0.00	2.17
5	2.21	1.64	0.57	0.00	2.21
10	2.23	2.30	-0.07	0.00	2.23
25	2.27	2.58	-0.31	0.00	2.27
50	2.97	2.85	0.12	0.00	2.97
100	3.30	3.12	0.18	0.21	3.09

Table C-3 Comparison of Estimated Flooding Depths at DeWindt Road

Storm Recurrence Interval (Years)	Existing Condition Flood Depth (Feet)	Proposed Flood Depth Early Action (Feet)	Early Action Flood Depth Reduction (Feet)	Proposed Flood Depth Full Vision (Feet)	Proposed Vision Flood Depth Reduction (Feet)
1	1.53	0.47	1.06	0.00	1.53
2	1.78	1.35	0.43	0.00	1.78
5	2.31	1.86	0.45	0.00	2.31
10	2.49	2.27	0.22	0.00	2.49
25	2.94	2.57	0.37	0.00	2.94
50	3.16	2.86	0.30	0.00	3.16
100	3.31	3.13	0.18	0.60	2.71

Table C-5 Comparison of Estimated Flooding Depths at White Oak Lane/Sunset Road

Storm Recurrence Interval (Years)	Existing Condition Flood Depth (Feet)	Early Action Flood Depth (Feet)	Early Action Flood Depth Reduction (Feet)	Proposed Vision Flood Depth (Feet)	Proposed Vision Flood Depth Reduction (Feet)
1	1.21	0.44	0.77	0.00	1.21
2	1.50	1.33	0.17	0.00	1.50
5	2.06	1.78	0.28	0.00	2.06
10	2.32	2.15	0.17	0.00	2.32
25	2.70	2.57	0.13	0.00	2.70
50	3.01	2.82	0.19	0.00	3.01
100	3.19	3.08	0.11	1.41	1.78

Table C-6 Comparison of Estimated Flooding Depths at Mt. Pleasant Street/Locust Road

For more location information
please visit www.strand.com

Office Locations

Brenham, Texas | 979.836.7937

Cincinnati, Ohio | 513.861.5600

Columbus, Indiana | 812.372.9911

Columbus, Ohio | 614.835.0460

Indianapolis, Indiana | 317.423.0935

Joliet, Illinois | 815.744.4200

Lexington, Kentucky | 859.225.8500

Louisville, Kentucky | 502.583.7020

Madison, Wisconsin* | 608.251.4843

Milwaukee, Wisconsin | 414.271.0771

Phoenix, Arizona | 602.437.3733

*Corporate Headquarters

