Winnetka Village Council
RESCHEDULED STUDY SESSION
Village Hall
510 Green Bay Road
Tuesday, June 30, 2015
7:00 PM

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AGENDA

1) Call to Order

2) Stormwater Program Alternative Options 2

3) Public Comment

4) Executive Session

5) Adjournment

NOTICE

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Agenda Item Executive Summary

Title: Stormwater Program Alternative Options

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

Agenda Date: 06/30/2015

Consent: ☐ YES ☑ NO

☐ Ordinance
☐ Resolution
☐ Bid Authorization/Award
☑ Policy Direction
☐ Informational Only

Item History:

Following severe flooding from Hurricane Ike in September 2008, and from an extreme rain event in July, 2011, the Village undertook a program of stormwater flood reduction studies to identify improvements that would protect key susceptible areas around the Village against a 100-year rain event. A key project in the resulting flood risk reduction strategy was the Willow Road Storrmwater Tunnel and Area Drainage Improvements (STADI) project which provided flood risk reduction for 100-year events to five separate drainage areas in the Village, at a 2012 estimated cost of $34.6 million. An updated cost estimate, presented in April 2015, is $58.5 million.

Executive Summary:

The Village is currently evaluating project costs, designs, and permitting feasibility so that decisions on the project's future are sound and based on information that is as reliable as possible. However, many Village residents, stakeholders, and some Trustees continue to question whether other feasible or cost-effective alternatives to the STADI project, that are either less expensive or do not increase stormwater tributary to Lake Michigan, exist. The 2011 CBBEL study did evaluate conveyance and detention-based options that did not involve transferring additional stormwater from western Winnetka to Lake Michigan; at the time, those options were deemed not feasible for 100-year protection levels, and more costly than the proposed STADI project, and thus have not been further developed. In light of the significant increase in estimated cost for the STADI project, and persistent discussions expressing a desire to find and evaluate alternatives to the STADI project, staff has identified a potential course of action to attempt to identify and evaluate feasible alternatives.

First, given that the 2011 cost estimates for the previously reviewed and dismissed separate, non-STADI options have not been updated since 2011, those previously developed cost estimates should be re-visited and updated to reflect current construction market conditions.

Second, a separate engineering firm could be retained to re-evaluate the separate western drainage basins for creative, cost-effective non-STADI improvements for storms ranging from the 10-year to the 100-year event, taking into account the Village's flood-control goals and objectives. It would be an opportunity to review the policies, needs and objectives of other public agency landholders to identify the extent that their properties could be beneficially used for stormwater improvements that would be consistent with landholder objectives. And, the Village could develop possible alternative improvements to an extent to reasonably make cost comparisons and identify potential risk factors and unknowns that may negatively impact project costs. If this second approach is desired, the engineering firm should be selected using a qualifications-based selection process that identifies firms with a demonstrated record of creative, effective, low-cost, sustainable and successful projects. If the Village Council chooses to pursue this option, it is estimated that the RFP process would take 6 to 8 weeks, and the engineering work would take 3 to 5 months at a cost of $125,000 to $150,000.

Upon completion of the STADI value engineering work, and the alternative evaluation work, a process of alternative comparison using project costs and project benefits could be undertaken. While project costs will have been identified in a relatively straightforward manner, project benefits are more complicated. Staff research has identified some cost-benefit methodologies used by agencies such as the US Army Corps of Engineers and the Federal Emergency Management Agency for evaluating larger stormwater protection projects, and these methods could potentially be modified to suit Winnetka's needs. Project benefits would consist of avoided structural flood damages; avoided public costs such as overtime, road closures, and delay; water quality benefits or losses; as well as less tangible factors such as the effect of widespread flooding on property values. Costs and benefits could be calculated and compared for both the STADI project and other non-STADI alternatives to assist the Village in determining which project or projects to advance.

Over the past several years, the Village has developed and deployed a number of tools to facilitate information and offer outreach opportunities. As the Council pursues the cost review, value engineering, permit submittal, and potential western options evaluation, Staff will continue to facilitate information flow to the community. This is an opportunity to focus on simplifying our message and collateral materials—highlighting the most critical information and making it easier to stay up-to-date and informed. In the short-term, Staff plans to engage with our public relations consultant to assist in revising and updating existing communication tools. At the same time, the Council and Staff will continue to provide ongoing opportunities for residents and stakeholders to provide input and comment. Ultimately, the approach will build to a dialogue about the Stormwater Management Program as a whole. In the short-term, Staff also recommends further developing strategies for the mid-to-long term and formalizing an outreach plan. As MWH proceeds with finalizing permits, the Village will be supporting the public input phase of the permit regulatory process, where local residents as well as regional stakeholders have a voice. The goal is that we build communications toward a two-way dialogue as the Village explores alternatives and potential solutions.

Recommendation:

Provide policy direction:
1. Consider whether to direct staff to prepare a Request for Proposals to identify and procure an engineering consulting firm to review and evaluate previously eliminated non-STADI alternatives, and to identify and evaluate other possible non-STADI alternatives to provide stormwater flood risk reduction to western areas of Winnetka.
2. Provide comment and direction on proposed communication and outreach plans.

Attachments:

Agenda Report

Agenda Report

Subject: **Stormwater Program Alternative Options**

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

Date: June 24, 2015

Program Background

In September of 2008, the Village experienced the remnants of Hurricane Ike, which deposited about 8.2 inches of rainfall over a 36-hour period and produced widespread and severe flooding. In response, the Village engaged the services of Christopher B. Burke Engineering, Ltd. (CBBEL) to undertake a stormwater flood risk reduction study for southwestern portions of the Village, north and south of Willow Road (see Figure 1a and 1b).

Figure 1a

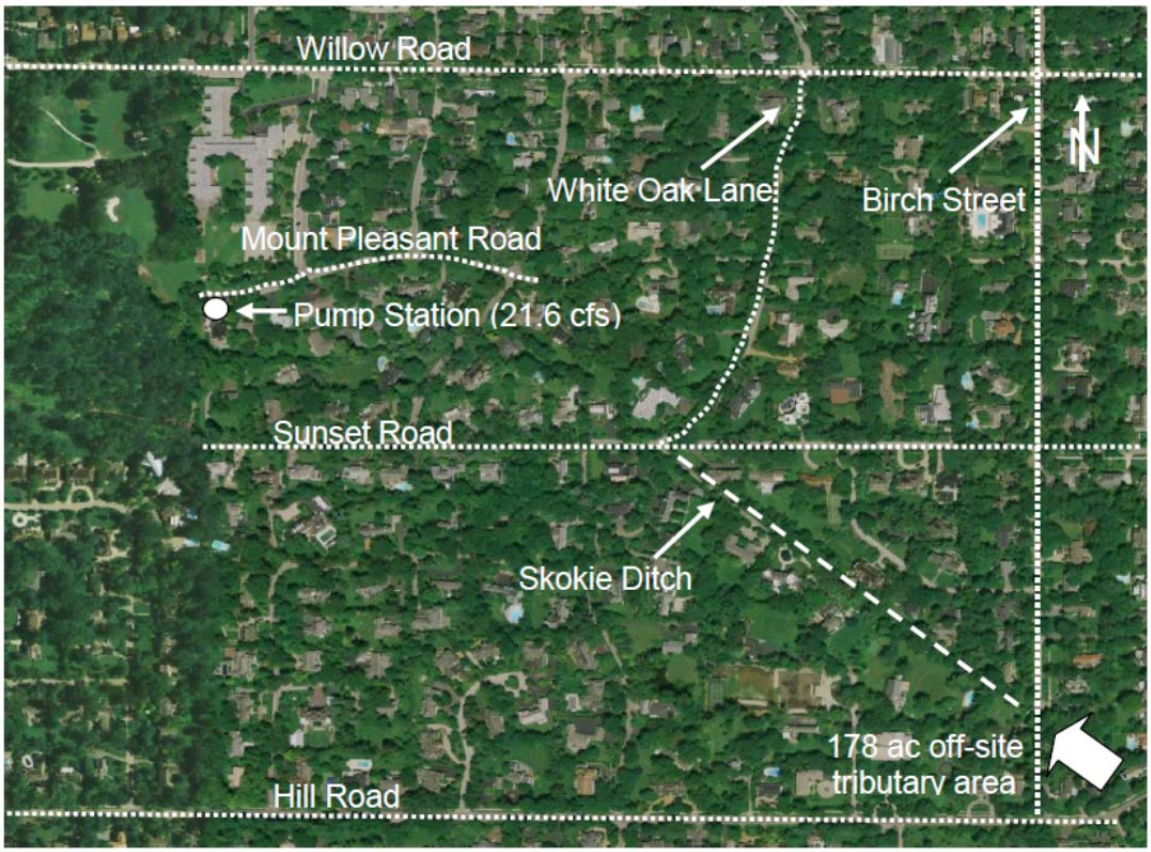

Figure 1b

The purpose of this study was to identify potential stormwater improvements that would reduce the risk of structural flooding in these areas for storms with 2-year, 5-year, and 10-year return periods. The study identified conveyance and detention improvements that would provide protection against a 10-year storm, at a cost of $8.1 million, in 2009 dollars. The proposed improvements are shown in Figure 2.

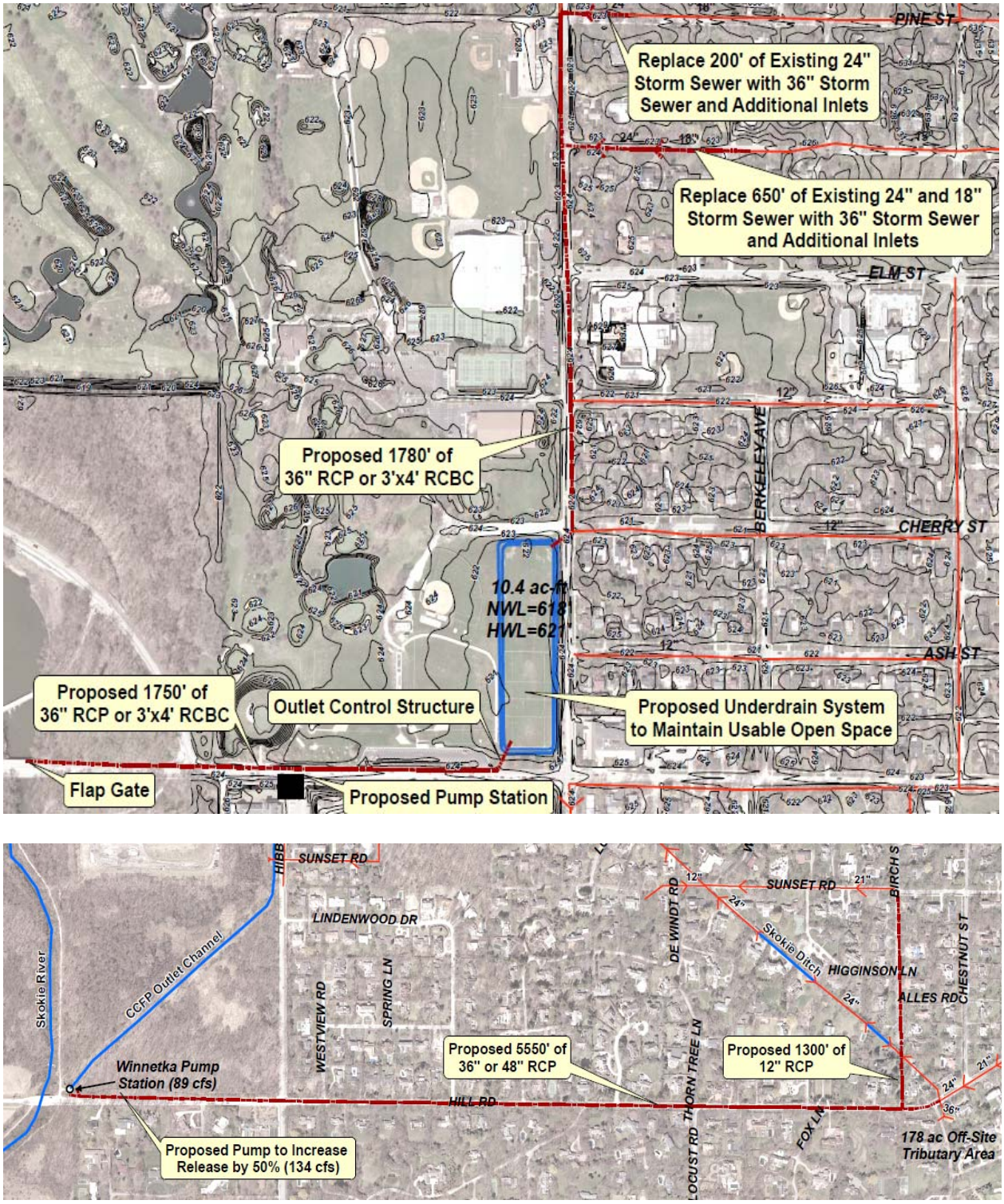

Figure 2

Upon reviewing the proposed improvements, the Village Council desired to perform similar studies of additional areas of the Village that experience frequent flooding. These additional areas are shown in Figure 3.

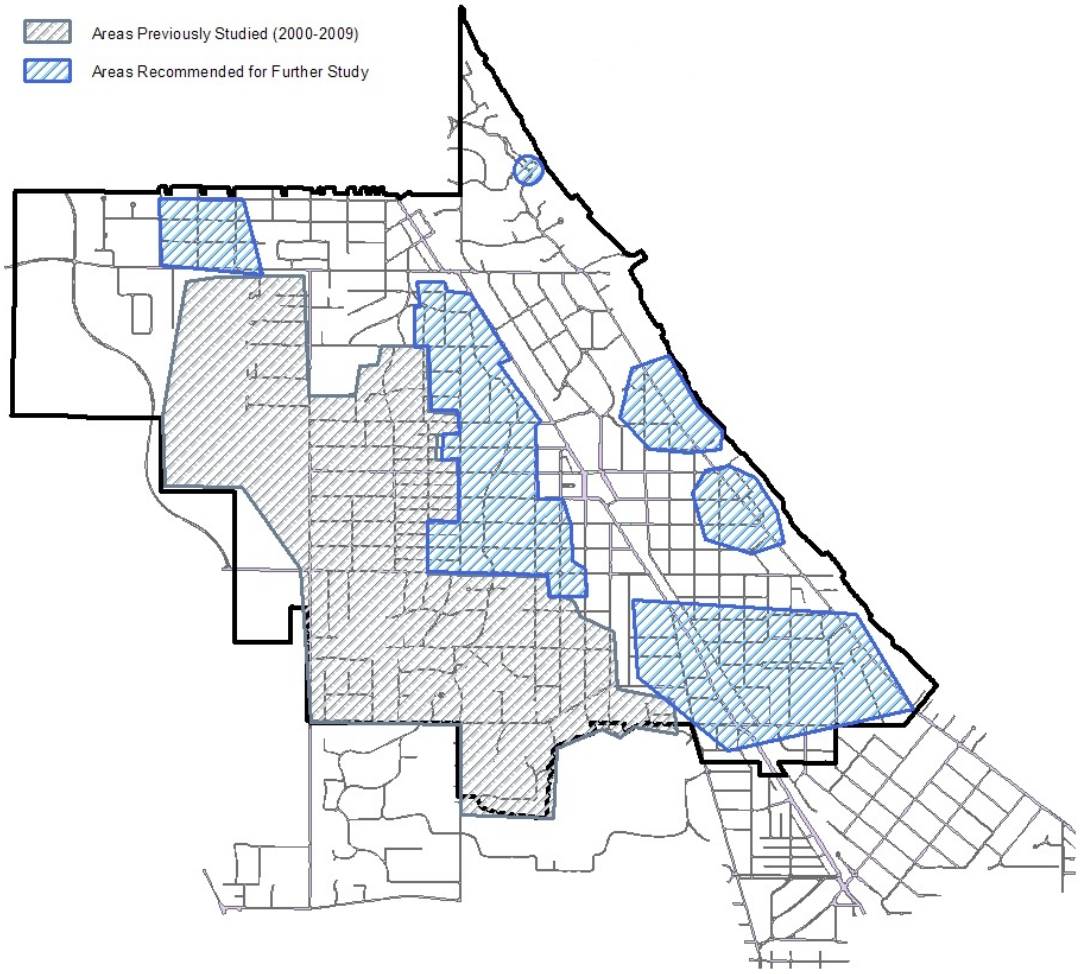

Figure 3

CBBEL was engaged to complete this study in October of 2010. The study was presented to the Village Council on July 12, 2011, and identified a total of $14.1 million in conveyance and detention improvements for all 8 studied areas. These improvements are shown in the following Table 1:

Drainage Area	Cost for 10-year protection (2011 dollars)	Comments
North Willow Road and Provident Avenue Study Areas	$6,842,000	New large-diameter storm sewers in drainage area, 2 ac-ft storage between Skokie & Washburne Schools, 10.4 ac-ft storage at Duke Childs Field
South Willow Road Study Area	3,500,000	New Hill Road storm sewer and increased pumping capacity
Cherry Street Outlet Study Area	$692,000	Larger storm sewers and larger outlet at Cherry Street
Winnetka Avenue Underpass Study Area	$2,434,000	Larger storm sewers and larger outlet at Elder Lane
Spruce Street Outlet Area (northeast Winnetka)	$368,000	New outlet at Lloyd Park only – no Tower Road improvements
Greenwood Avenue area (Northwest Winnetka)	$67,000	Minor grading and inlet capacity at low areas to provide 10-year protection to some structures at risk
Sheridan Road Ravine area	$146,000	Grading, piping, and increased inlet capacity
TOTAL	**$14,049,000**	

Table 1

Immediately subsequent to this presentation, on July 22-23, 2011, the Village experienced a storm that produced 6.5 inches of rain in 3.5 hours, resulting in widespread, extreme flash flooding that affected over 1,000 homes[1]. In the aftermath of this flooding, the Council directed CBBEL to evaluate how much of the flooding from this storm would have been prevented by the $14.1 million of improvements under consideration. CBBEL modeled the actual rainfall from the storm against the proposed improvement conditions and determined that the Village would still have experienced significant flooding. As a result, the Village Council directed CBBEL to identify potential improvements that would reduce the risk of structural flooding for more severe storms, with 25-year, 50-year, and 100-year return periods. CBBEL completed their study in October, 2011, and identified a series of stormwater piping and detention improvements that would provide protection against overland structural flooding, or severe flooding of key major roadways, in eight separate drainage areas of the Village. In addition, CBBEL identified a creative alternative that would combine improvements for 5 of these separate areas into a single project – providing protection against 100-year events – consisting of piping improvements connecting to a large new stormwater discharge to Lake Michigan at Willow Road. Because part of this large pipe beneath Willow Road would need to be constructed via tunneling methods, the project became

[1] Source: Combination of data from Fall, 2011 flood survey (Village of Winnetka), August 2011 flood damage survey (Cook County) and manual count of debris piles post-flood (Village of Winnetka)

known as the Willow Road Stormwater Tunnel project. The separate projects, and the combination tunnel project, are shown in the following Table 2:

Drainage Area	**2011 Cost: Separate Projects**	**2011 Cost: Combined Project**	**Notes**
North Willow Road and Provident Avenue Study Areas	$17.5 million	N/A	Includes stormwater detention as follows: District 36: 5.6 ac-ft Park Dist: 25.0 ac-ft NTHS: 13.4 ac-ft Forest Pres.: 58.5 ac-ft TOTAL: 102.5 ac-ft
South Willow Road Study Area	$17.8 million	N/A	Includes 65 acre-feet of detention under Cook County Forest Preserve property.
Cherry Street Outlet Study Area	$2.0 million	N/A	Area currently drains to Lake Michigan
Winnetka Avenue Underpass Study Area	$4.4 million	N/A	Area currently drains to Lake Michigan
Willow Road Stormwater Tunnel and Area Drainage Improvements	N/A	$32.5 million	
TOTAL	**$41.7 million**	**$32.5 million**	

Table 2

Source: Village of Winnetka Flood Risk Reduction Assessment: 25-, 50-, and 100-year Protection, prepared by CBBEL, October, 2011. (Table 9 and Table 10, pp. 42-43)

Subsequent to the Village Council's review of this October 2011 report, Village staff met with representatives of the Winnetka Park District, the New trier High School District, and the Cook County Forest Preserve District, to explore the feasibility of constructing large-scale stormwater detention facilities on land under their jurisdiction, including portions of the Skokie Playfield, Duke Childs Field, and large sections of the Forest Preserve both north and south of Willow Road. While the Park District and, to a lesser extent the High School District, were somewhat receptive to the possibility of shared use of their properties for possible stormwater storage, the Cook County Forest Preserve District was very clear in their position that they would be opposed to large-scale stormwater storage facilities on their property unless those facilities also significantly enhanced the mission and goals of the District.

Because the combined Willow Road Tunnel project cost was estimated to be approximately $9.2 million less than the cost of separate projects, and because it was deemed unlikely that the necessary detention could feasibly be constructed on Cook County Forest Preserve District property, the Village Council opted to further investigate the feasibility of the Willow Road Tunnel project, engaging Baird Associates and CBBEL to complete feasibility analyses of the outlet structure to Lake Michigan at

Willow Road, and the overall project concept, respectively. Based on this feasibility analysis, and a more detailed estimate of tunneling costs, the project cost estimate was increased to $34.6 million in September, 2012.

Current Project Status

After spending most of 2013 evaluating and planning financing for the proposed improvements, in addition to intensive communication and outreach efforts, the Village awarded a contract in January of 2014 to MWH Global to complete preliminary engineering, permitting, and detailed engineering for the Willow Road project.

On April 28, 2015, and again on May 12, 2015, the Village Council discussed a project update for the Willow Road Stormwater Tunnel and Area Drainage Improvements (STADI) project prepared by MWH, the Village's consulting engineering firm for the project. The Council reviewed the design process undertaken thus far, including: the preliminary project review in June of 2014, soil boring and detailed surveying information, proposed water quality management plans, and an updated cost estimate.

The Village's 2012 cost estimate of $34.6 million for the STADI project was based on conceptual design, broad field data, and typical unit construction costs. MWH's work has further detailed the tunnel's initial design and therefore allowed for an updated preliminary opinion of probable construction cost. MWH used additional information about quantities of materials, site-specific considerations, as well as utility and field data to update the cost estimate. MWH's current estimate is $58.5 million. In addition to the more detailed data at MWH's disposal, the engineers explained that cost increases were also driven by a greater length of deep sewer tunnel, increased underground construction costs, and outfall/water quality management requirements.

Willow Road STADI Project Next Steps

On June 2, 2015, due to the significant increase in estimated cost, the Village Council awarded a contract to V3 Companies to complete an independent, third-party engineering review of the project. The third-party project review will focus on two project aspects: 1) the accuracy and reliability of the estimate and 2) whether there are other more cost effective ways to design and implement the project. There are significant benefits to this review. The cost review will provide the community with an additional level of certainty and confidence in MWH's estimate, to inform future decision-making on the project. The value engineering process will creatively evaluate the STADI project and identify potential changes to the project that might better accomplish the desired level of structural flood risk-reduction at a lower capital cost, while providing better overall value and confidence in the effectiveness of the design.

On a parallel timeline, the Village Council also advanced the portion of MWH's contract devoted to completing the necessary permit applications and submitting them to the respective review agencies, while not advancing engineering from the current 30% stage. There are several benefits to this approach. Despite several discussions with the Illinois EPA, permitting and water quality aspects are still key feasibility aspects of the project. While the EPA has helpfully engaged in these discussions, they have also been very clear

that they will need a full permit application with all necessary details before they will be able to begin officially reviewing the project. Feasibility will ultimately rest on permitability, and there is no way to ascertain this feasibility until the completion of the permit process is reached. This process is estimated to take 12 or more months from time of submittal, so submitting at this time will begin that process and allow the project to move forward, without significant additional expenditure for engineering.

The milestones for these three projects are as follows:

- Cost review: tentatively scheduled for Village Council review July 7.
- Value engineering review: tentatively scheduled for the September 15 Regular Council Meeting or the October 13 Study Session.
- Permit submittal: pre-submittal discussions with stakeholder groups early July; permit submittal early September; initial agency review follow up November; and report to Village Council December 2015.

Alternative Evaluation

The Village is currently engaged in deliberate, targeted steps to fully evaluate STADI project costs, designs, and permitting feasibility so that decisions on the project's future are sound and based on information that is as reliable as possible. However, many Village residents, stakeholders, and some Trustees continue to question whether other feasible or cost-effective alternatives to the STADI project, that are either less expensive or do not increase stormwater tributary to Lake Michigan, exist. As described above, the 2011 CBBEL study did evaluate conveyance and detention-based options that did not involve transferring additional stormwater from western Winnetka to Lake Michigan. At the time of evaluation, those options were deemed not feasible for 100-year protection levels, and more costly than the proposed STADI project, and thus have not been further developed. In light of the significant increase in estimated cost for the STADI project, and persistent discussions expressing a desire to find and evaluate alternatives to the STADI project, staff has identified a potential course of action to attempt to identify and evaluate feasible alternatives.

First, given that the $41.7 million cost estimate (shown in Table 2) for the previously reviewed and dismissed separate, non-STADI options has not been updated since 2011, and was completed using the same conceptual methodology that produced a $32.5 million cost estimate for the Willow Road STADI project, those previously developed cost estimates should be re-visited and updated to reflect current construction market conditions.

Second, a separate engineering firm could be retained to re-evaluate the separate western drainage basins for creative, cost-effective non-STADI improvements for storms ranging from the 10-year to the 100-year event, taking into account the Village's flood-control goals and objectives. It would be an opportunity to review the policies, needs and objectives of other public agency landholders to identify the extent that their properties could be beneficially used for stormwater improvements that would be consistent with landholder objectives. And, the Village could develop possible alternative improvements

to an extent to reasonably make cost comparisons and *identify potential risk factors and unknowns that may negatively impact project costs.*

If this second approach is desired, the engineering firm should be selected using a qualifications-based selection process that identifies firms with a demonstrated record of creative, effective, low-cost, sustainable and successful projects. If the Village Council chooses to pursue this option, it is estimated that the RFP process would take 6 to 8 weeks, and the engineering work would take 3 to 5 months at a cost of $125,000 to $150,000.

Finally, upon completion of the STADI value engineering work, and the alternative evaluation work, a process of alternative comparison using project costs and project benefits could be undertaken. While project costs will have been identified in a relatively straightforward manner, project benefits are more complicated. Staff research has identified some cost-benefit methodologies used by agencies such as the US Army Corps of Engineers and the Federal Emergency Management Agency for evaluating larger stormwater protection projects, and these methods could potentially be modified to suit Winnetka's needs. Project benefits would consist of avoided structural flood damages; avoided public costs such as overtime, road closures, and delay; water quality benefits or losses; as well as less tangible factors such as the effect of widespread flooding on property values. Costs and benefits could be calculated and compared for both the STADI project and other non-STADI alternatives to assist the Village in determining which project or projects to advance.

Communications and Outreach

Factual and timely communication is a core component of the Village's Stormwater Management Program. Over the past several years, the Village has developed and deployed a number of tools to facilitate information and offer outreach opportunities, including:

- Dedicated Program website;
- Stormwater comments email;
- Regular Council action summaries;
- Press releases;
- E-Winnetka blasts;
- Stormwater Monthly Summary Reports;
- Council meeting webcasts and cable broadcasts;
- Utility estimator tool;
- Stormwater mitigation seminars;
- Special Winnetka Report newsletters; and
- Town Hall meetings.

As the Council pursues the cost review, value engineering, permit submittal, and potential western options evaluation, Staff will continue to facilitate information flow to the community. This is an opportunity to focus on simplifying our message and collateral materials—highlighting the most critical information and making it easier to stay up-to-date and informed. In the short-term, Staff plans to engage with our public

relations consultant to assist in revising and updating existing communication tools, such as our website, fact sheets, press releases, web Q&A, etc.

At the same time, the Council and Staff will continue to provide ongoing opportunities for residents and stakeholders to provide input and comment. While consultants will be doing a great deal of technical work that will ultimately be presented to the Council and community, it is also a time to first listen to stakeholders, then to continually revise and refine the communications about what the Village is doing and why. Ultimately, this approach builds to a dialogue about the Stormwater Management Program as a whole.

In the short-term, Staff also recommends further developing strategies for the mid-to-long term and formalizing an outreach plan. As MWH proceeds with finalizing permits, the Village will be supporting the public input phase of the permit regulatory process, where local residents as well as regional stakeholders have a voice. The goal is that we build communications toward a two-way dialogue as the Village explores alternatives and potential solutions.

Recommendation

Provide policy direction:

1. Consider whether to direct staff to prepare a Request for Proposals to identify and procure an engineering consulting firm to review and evaluate previously eliminated non-STADI alternatives, and to identify and evaluate other possible non-STADI alternatives to provide stormwater flood risk reduction to western areas of Winnetka.
2. Provide comment and direction on proposed communication and outreach plans.