

**APPENDIX C  
OPPORTUNITY MATRIX**

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No.	Map/ Text ID	Control Type	Opportunity	Pros	Cons	Lower Volume Range (Ac- Ft)	Higher Volume Range (Ac- Ft)	Land Acquisition	Reliance on Mechanical Facilities	Maintains Existing Drainage Patterns	Regulatory Authority Acceptance	Property Owner Acceptance	Overall Effectiveness	Relative Cost
1	1a	Private Property: Rain Barrels	Property owner participation with 2 barrels per property. Assumes 20-40% (600 to 1200 homes) participation in study area	<ul style="list-style-type: none"> <li>- Opportunity for residents to participate in reducing the stormwater issues in the community</li> <li>- Potential to augment/reduce larger stormwater control features</li> <li>- Potential to create incentives by offering stormwater utility fee credits or rebates</li> </ul>	<ul style="list-style-type: none"> <li>- Due to the limited capacity of these techniques additional controls will still be required</li> <li>- Potential for increased cost and maintenance requirements for property owners</li> <li>- Barrels need to be empty prior to large storm event to achieve benefit</li> </ul>	0.2	0.4	NA	+	+	+	+	+	
2	1b	Private Property: Pervious Driveways	Property owner construction of pervious driveways. Assumes 3-8% (100 to 250 homes) participation in study area and a 1,200 SF driveway	<ul style="list-style-type: none"> <li>- Opportunity for residents to participate in reducing the stormwater issues in the community</li> <li>- Potential to augment/reduce larger stormwater control features</li> <li>- Provides opportunity for water quality treatment</li> <li>- Potential to create incentives by offering stormwater utility fee credits or rebates</li> </ul>	<ul style="list-style-type: none"> <li>- Due to the limited capacity of these techniques and Winnetka's low permeability soils additional controls will still be required</li> <li>- Potential for increased cost and maintenance requirements for property owners</li> <li>- Limited storage volume: additional controls will still be required</li> </ul>	2	5	NA	+	+	+		-	
3	1c	Private Property: Rain Gardens	Property owner construction of rain garden on their property. Assumes 10-20% (310 to 610 homes) participation and a 500 SF rain garden	<ul style="list-style-type: none"> <li>- Opportunity for residents to participate in reducing the stormwater issues in the community</li> <li>- Potential to augment/reduce larger stormwater control features</li> <li>- Provides opportunity for water quality treatment</li> <li>- Potential to create incentives by offering stormwater utility fee credits or rebates</li> </ul>	<ul style="list-style-type: none"> <li>- Due to the limited capacity of these techniques and Winnetka's low permeability soils additional controls will still be required</li> <li>- Potential for increased cost and maintenance requirements for property owners</li> <li>- Limited storage volume: additional controls will still be required</li> </ul>	3	6	NA	+	+	+	+	+	
4	1d	Street Curb Bump Outs	Village reconstruction of street intersections with curb bump outs. Assumes 210 SF bump out with 4 per intersection at 20-30% (50 to 70 ) of Village intersections	<ul style="list-style-type: none"> <li>- Use of Village-owned right-of-way</li> <li>- Provides opportunity for water quality treatment</li> <li>- Opportunity to enhance aesthetics in the neighborhoods and community</li> <li>- Provides traffic calming benefits</li> </ul>	<ul style="list-style-type: none"> <li>- Will require disruption to road network and residents</li> <li>- Will require a period of "learning" for users</li> <li>- May require removal of parkway trees</li> <li>- Some increased cost and maintenance for Village</li> <li>- Winnetka's low permeability soils reduce effectiveness and require more soil engineering</li> <li>- Limited storage volume: additional controls will still be required</li> </ul>	1.0	1.4	+	+	+	+	+		
5	1e	Street Intersection Bioretention Storage	Village closing and reconstructing street intersections with larger scale rain gardens. Assumes 1 intersection	<ul style="list-style-type: none"> <li>- Use of Village-owned right-of-way</li> <li>- Provides opportunity for water quality treatment</li> <li>- Opportunity to enhance aesthetics and park lands in the neighborhoods and community</li> <li>- Less tree removal than other right-of-way improvements</li> <li>- Provides traffic calming benefits</li> </ul>	<ul style="list-style-type: none"> <li>- Will require permanent disruption to the current road network</li> <li>- Will require an extended period of "learning" for residents and users due to change in local traffic patterns</li> <li>- May be perceived to increase traffic on other streets in the neighborhood</li> <li>- Some increased cost and maintenance for Village</li> <li>- Winnetka's low permeability soils reduce effectiveness and require more soil engineering</li> <li>- Limited storage volume: additional controls will still be required</li> </ul>	0.5	0.8	+	+	+	+	+		
6	1f	Parkway Bioretention Storage	Village construction of bioretention basins between sidewalk and curb. Assumes implementation along 20-30% of proposed storm sewer conveyance project length.	<ul style="list-style-type: none"> <li>- Use of Village-owned right-of-way</li> <li>- Provides opportunity for water quality treatment</li> <li>- Implemented in conjunction with proposed storm sewer projects</li> </ul>	<ul style="list-style-type: none"> <li>- Will require disruption to local streets and residents</li> <li>- May require removal of parkway trees</li> <li>- Increased cost to Village for native plantings and long-term maintenance</li> <li>- Winnetka's low permeability soils reduce effectiveness and require more soil engineering</li> <li>- Limited storage volume: additional controls will still be required</li> </ul>	3	5	+	+	+	+	+	+	
7	1g	Induced Infiltration	Use of Passive-Induced Infiltration Structures	<ul style="list-style-type: none"> <li>- Potential to reduce stormwater runoff volumes in watershed</li> <li>- Opportunity to recharge aquifers</li> </ul>	<ul style="list-style-type: none"> <li>- Presence of suitable conditions for infiltration measures (i.e. glacial deposits 20' thick or more within 50' of ground surface not available</li> <li>- Difficult to predict effectiveness and actual volume captured</li> </ul>	NA	NA	+	+	+	+	+	+	
8	1h	Infiltration Wells	Village construction of deep infiltration wells. Assumed to be installed at new Village rain gardens.	<ul style="list-style-type: none"> <li>- Potential to reduce stormwater runoff volumes in watershed</li> <li>- Can be installed in fairly small footprint of area</li> <li>- Potential to recharge aquifers</li> </ul>	<ul style="list-style-type: none"> <li>- Wells need to extend to 80' deep or greater</li> <li>- May not be acceptable by Illinois Environmental Protection Agency and Illinois Department of Natural Resources.</li> <li>- Difficult to predict effectiveness and actual volume captured</li> </ul>	NA	NA	+	+	+	-	+		
9	2	Underground Storage	Construct underground storage at Washburn and Skokie Schools	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka SD 36)</li> <li>- Provides direct benefit to heavily impacted Tree Streets neighborhood</li> <li>- Geographically ideal location close to areas of severe and recurring flooding</li> <li>- Opportunity to provide educational opportunities</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka SD 36</li> <li>- Limited storage volume creation available</li> <li>- More costly than surface storage (typically 5 times greater)</li> <li>- Presence of 33" MWRD interceptor that crosses the site needs to be addressed</li> <li>- Timing of construction needs to be coordinated with school year and other activities at the site</li> </ul>	4	6		+	+	+	+	-	
10	3	Surface Storage	Construct Surface Storage at West Elm Street Park	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Provides opportunity for water quality treatment</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka Park District</li> <li>- Limited storage volume creation available</li> <li>- Significant topographic relief to overcome, more difficult and costly to grade as a result</li> <li>- Potential removal or impact to most of the mature hardwood trees on site</li> </ul>	8	12		+	+	+	-	-	
11	4	Surface Storage	Construct Storage at Park District Maintenance Facility west side of Hibbard at Pine	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Provides opportunity for water quality treatment</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka Park District</li> <li>- Limited storage volume available</li> <li>- Increased cost to fund relocation of the existing maintenance building and storage areas</li> </ul>	2	3		+	+	+	+	-	
12	5	Surface Storage	Construct Storage at Crow Island Woods: South Portion	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Provides opportunity for water quality treatment</li> <li>- Opportunity to enhance/restore portions of currently degraded habitat</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka Park District</li> <li>- Potential impact to historic Crow Island Woods including some high quality, mature trees</li> <li>- Stormwater management project not favorably received by neighboring residents</li> <li>- Perceived safety concerns with neighboring elementary school and private residential neighborhoods</li> </ul>	20	35		+	+	+		+	

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13	6	Surface Storage	Construct Storage at Crow Island Woods: North Portion	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Provides opportunity for water quality treatment at existing wetland area</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka Park District</li> <li>- Stormwater management project not favorably received by neighboring residents</li> <li>- Significant impact to highly used and valued public open space</li> <li>- Proximity to elementary school creates potential safety hazard issues</li> <li>- Potentially buried residual cinder contamination at site</li> <li>- Requires relocation of historic log cabin</li> </ul>	15	25	-	+	+	-	-	+	
14	7a	Surface Storage	Construct Storage on Vacant Lots - Meadow Lane	<ul style="list-style-type: none"> <li>- Utilization of existing open space</li> <li>- Geographically logical location, near areas that currently flood</li> </ul>	<ul style="list-style-type: none"> <li>- Significant land acquisition cost, asking price \$2.5 million</li> <li>- Limited amount of flood storage volume can be created</li> </ul>	2	3	-	+	+	+	-	-	
15	7b	Surface Storage	Construct Storage on Vacant Lot - Dewindt Road	<ul style="list-style-type: none"> <li>- Geographically logical location, near areas that currently flood</li> </ul>	<ul style="list-style-type: none"> <li>- Significant land acquisition cost, asking price \$1.75 million</li> <li>- Limited amount of flood storage volume can be created</li> </ul>	1	2	-	+	+	+	-	-	
16	7c	Surface Storage	Construct Storage on Vacant Lots - Hibbard Road	<ul style="list-style-type: none"> <li>- Geographically logical location, near areas that currently flood</li> </ul>	<ul style="list-style-type: none"> <li>- Significant land acquisition cost, asking price \$1.5 million</li> <li>- Limited amount of flood storage volume can be created</li> </ul>	1.5	2.5	-	+	+	+	-	-	
17	8a	Surface Storage	Construct Surface Storage on Vacant Lots: Hope, Faith, and Charity Church on Hill Road	<ul style="list-style-type: none"> <li>- Utilization of existing open space</li> </ul>	<ul style="list-style-type: none"> <li>- Limited storage volume available</li> <li>- Use of property would be altered</li> </ul>	2	3	-	+	+	+	+	-	
18	8b	Underground Storage	Construct Underground Storage on Vacant Lots: Hope, Faith, and Charity Church on Hill Road	<ul style="list-style-type: none"> <li>- Utilization of existing open space</li> <li>- Could maintain current active use of property</li> </ul>	<ul style="list-style-type: none"> <li>- Limited storage volume available</li> <li>- More costly than surface storage (typically 5 times greater)</li> </ul>	2	3	-	+	+	+	+	-	
19	9	Surface Storage	Construct Flood Storage at Indian Hill Golf Course	<ul style="list-style-type: none"> <li>- Open space available for above ground and/or underground storage</li> <li>- Potential to hold back additional flow from the golf course</li> <li>- Potential to direct flow from Winnetka to the golf course for storage</li> </ul>	<ul style="list-style-type: none"> <li>- Storage of runoff from a neighboring community on a privately owned golf course, very difficult to get approved</li> <li>- Indian Hill CC already experiences significant flooding issues, likely wouldn't be willing to take more water</li> <li>- Limited flood control benefit, Indian Hill CC already greatly reduces stormwater flows into the Village</li> </ul>	4	6	-	+	-	+	-	-	
20	10	Surface Storage	Construct Flood Storage on FPDCC Lands: North Forest Way Site	<ul style="list-style-type: none"> <li>- Publicly owned property (FPDCC)</li> <li>- Opportunity to activate open space with multiple recreational uses</li> <li>- Existing elevations are well suited for storage creation, near elevation 620 which will require less earthmoving</li> <li>- Opportunity to enhance/restore wetland/prairie habitat</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from FPDCC</li> <li>- Will require water quality treatment prior to discharge to the FPDCC</li> <li>- Likely are regulatory wetlands present, will require wetland mitigation or purchase of credits</li> <li>- Geographically remote from primary conveyance locations, higher cost to convey to location</li> </ul>	20	30	-	+	-	+	-	+	
21	11	Surface Storage	Construct Flood Storage on FPDCC Lands: South of Willow and West of Landfill Site	<ul style="list-style-type: none"> <li>- Publicly owned property (FPDCC)</li> <li>- Opportunity to activate open space with multiple recreational uses</li> <li>- Good opportunity for reuse of excess excavated material at adjacent landfill, results in reduction in hauling costs and more sustainable practice</li> <li>- Opportunity to enhance/restore wetland/prairie habitat</li> </ul>	<ul style="list-style-type: none"> <li>- Requires approval from FPDCC</li> <li>- Will require water quality treatment prior to discharge to the FPDCC</li> <li>- Existing ground surface elevation is higher (varies between elev. 624 &amp; 628), would require more earthmoving to obtain storage between optimal elevations of 615 and 621</li> <li>- Likely there are regulatory wetlands present, would require wetland mitigation or purchase of credits</li> </ul>	20	35	-	+	-	+	-	+	
22	12	Surface Storage	Construct Flood Storage on FPDCC Lands: South and East of Landfill, west of Hibbard	<ul style="list-style-type: none"> <li>- Publicly owned property (FPDCC)</li> <li>- Opportunity to activate open space with multiple recreational uses</li> <li>- Maintains the current drainage patterns, i.e no flow would need to be "diverted" to this location</li> <li>- Good opportunity for reuse of excess excavated material at adjacent landfill, results in reduction in hauling costs and more sustainable practice</li> <li>- Opportunity to enhance/restore wetland/prairie habitat</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from FPDCC</li> <li>- Will require water quality treatment prior to discharge to the Forest Preserve</li> <li>- Likely there are regulatory wetlands present, would require wetland mitigation or purchase of credits</li> </ul>	60	100	-	+	+	+	-	+	
23	13	Surface Storage	Construct Flood Storage on FPDCC Lands: Northfield Site South of Winnetka Avenue	<ul style="list-style-type: none"> <li>- Publicly owned property (FPDCC)</li> <li>- Opportunity to activate open space with multiple recreational uses</li> <li>- Potential flood control benefits for neighboring communities (Northfield &amp; Uninc. Cook Co.)</li> <li>- Opportunity to enhance/restore wetland/prairie habitat</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from FPDCC</li> <li>- Will require water quality treatment prior to discharge to the FPDCC</li> <li>- Existing ground surface elevation is higher (varies between elev. 622 &amp; 625), would require more earthmoving to obtain storage between optimal elevations of 615 and 621</li> <li>- Lands are immediately adjacent to residential neighborhood, potential negative impacts</li> </ul>	15	25	-	+	+	+	-	+	

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24	14a	Surface Storage	Provide Surface Storage in Skokie Lagoons: Achieved by Raising or Lowering Dam Spillway to Create Flood Storage	<ul style="list-style-type: none"> <li>- Potentially minimizes need for creation of flood storage at other locations</li> <li>- Places stormwater in an area that already receives stormwater</li> <li>- Improvements could be coupled with enhancements to the lagoon</li> </ul>	<ul style="list-style-type: none"> <li>- Requires approval from FPDCC; in initial meetings, District staff said storage in the lagoons would not be permitted</li> <li>- Diverts stormwater from one subwatershed to another violating most design and regulatory standards</li> <li>- Heightened water quality scrutiny since the lagoons have documented impaired water quality</li> <li>- Will require water quality treatment prior to discharge to the Forest Preserve</li> <li>- Significant infrastructure, operation, and maintenance cost to implement pumping and force main to get stormwater to the lagoons</li> <li>- If raising the dam spillway, would need to address potential increases in upstream flood heights and resultant flood damage</li> <li>- If lowering the dam spillway, restoration and regrading of exposed banks needed</li> <li>- If lowering the dam spillway, would lessen depth of normal pool and have impacts on water quality/navigation</li> <li>- Poses a much greater regional impact requiring approval from a number of regulatory agencies as well as neighboring communities</li> </ul>	60	75		+	-	-	-	+	-
25	14b	Surface Storage	Provide Surface Storage in Skokie Lagoons: Achieved Through Predictive Storage Drawdown Technology	<ul style="list-style-type: none"> <li>- Potentially minimizes need for creation of flood storage at other locations</li> <li>- Places stormwater in an area that already receives stormwater</li> </ul>	<ul style="list-style-type: none"> <li>- Requires approval from FPDCC; in initial meetings, District staff said storage in the lagoons would not be permitted</li> <li>- Concept would divert stormwater from one subwatershed to another violating most design and regulatory standards</li> <li>- Depends on mechanical facilities to provide necessary volume</li> <li>- Depends on very new technology, accuracy of weather forecasting, and significant technological investment</li> <li>- Heightened water quality scrutiny since the lagoons have documented impaired water quality</li> <li>- Will require water quality treatment prior to discharge to the Forest Preserve</li> <li>- Significant infrastructure, operation, and maintenance cost to control the system and implement pumping and force main to get stormwater to the lagoons</li> <li>- If raising the dam spillway, would need to address potential increases in upstream flood heights and resultant flood damage</li> <li>- If lowering the dam spillway, restoration and regrading of exposed banks needed</li> <li>- If lowering the dam spillway, would lessen depth of normal pool and have impacts on water quality/navigation</li> <li>- Poses a much greater regional impact requiring approval from a number of regulatory agencies as well as neighboring communities</li> </ul>	60	75		-	-	-	-	+	
26	15a	Surface Storage	Construct Surface Storage at Duke Childs Field: Relocate Lacrosse and Soccer Fields to Top of Winnetka Landfill Site	<ul style="list-style-type: none"> <li>- Publicly owned property (New Trier High School SD)</li> <li>- Reuse of excess excavated material at Winnetka landfill allows for cost reduction for soil hauling/disposal</li> <li>- Opportunity to provide regional water quality improvements prior to discharge to FPDCC lands</li> <li>- Large open space available for above ground storage</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from New Trier High School SD</li> <li>- Loss of field/play space</li> <li>- Requires relocation of fields to other location, potentially top of Winnetka's landfill</li> <li>- Requires relocation of fields to other location, potentially top of Winnetka's landfill</li> <li>- Physical challenges with field relocation on landfill (access, placement of needed facilities, managing gas vents/monitoring wells)</li> </ul>	12	18		+	+	+		+	+
27	15b	Underground Storage	Construct Underground Storage at Duke Childs Field: Maintain Lacrosse and Soccer Fields at Same Location	<ul style="list-style-type: none"> <li>- Publicly owned property (New Trier High School SD)</li> <li>- Maintains current location of lacrosse and soccer field</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from New Trier High School SD</li> <li>- Potential loss of field/play space during construction</li> <li>- More costly than surface storage (typically 5 times greater)</li> <li>- Ability to implement water quality improvements more difficult, less effective and more difficult to maintain</li> </ul>	12	18			+	+		+	-
28	16	Surface Storage	Construct Storage at Duke Childs Field West of Lacrosse Fields: Reconstruct Baseball/Softball Fields at Lowered Elevation	<ul style="list-style-type: none"> <li>- Publicly owned property (New Trier High School SD)</li> <li>- Large open space available for above ground storage</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from New Trier High School SD</li> <li>- Limits storage volume creation potential</li> <li>- Ball fields would be flood prone for larger storm events (i.e. greater than 10-Year event)</li> </ul>	24	32		+	+	+	-	+	+
29	17	Surface Storage	Construct Storage at Duke Childs Field West of Lacrosse Fields: Relocate Baseball/Softball Fields	<ul style="list-style-type: none"> <li>- Publicly owned property (New Trier High School SD)</li> <li>- Large open space available for above ground storage</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from New Trier High School SD</li> <li>- Loss of field/play space, suitable alternative location for fields required</li> </ul>	40	60		+	+	+	-	+	+
30	18a	Surface Storage	Construct Storage at Winnetka Golf Club Par 3 Course: Eliminate Course	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Large open space available for above ground storage</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka Park District</li> <li>- Winnetka Park District expressed that loss of all of the existing par 3 course would not be acceptable</li> <li>- May require disturbance to adjacent New Trier High School property</li> </ul>	25	35		+	+	+	-	+	+
31	18b	Surface Storage	Construct Storage at Winnetka Golf Club Par 3 Course: Maintain Playability of Course	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Large open space available for above ground storage</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka Park District</li> <li>- Would make all or a portion of the existing par 3 course unplayable at times during the year</li> </ul>	15	20		+	+	+	+		

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32	19a	Surface Storage	Construct Storage at Winnetka Golf Club: Eliminate Course	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Large open space available for above ground storage</li> </ul>	<ul style="list-style-type: none"> <li>- Winnetka Park District expressed that loss of all of the existing golf course is unacceptable</li> <li>- Diverts stormwater from one subwatershed to another violating most design and regulatory standards</li> <li>- Geographically remote location relative to primary flood prone areas and conveyance systems</li> <li>- Depends on mechanical facilities to convey stormwater to this location</li> <li>- Significant infrastructure, operation, and maintenance cost to implement pumping and force main to get stormwater to this location</li> </ul>	40	50		+	-	+	-	+	-
33	19b	Surface Storage	Construct Storage at Winnetka Golf Club: Maintain Playability of Course	<ul style="list-style-type: none"> <li>- Publicly owned property (Winnetka Park District)</li> <li>- Large open space available for above ground storage</li> <li>- Could include enhancements (new cart path) to the existing golf course</li> </ul>	<ul style="list-style-type: none"> <li>- Requires coordination and approval from Winnetka Park District</li> <li>- Ability to maintain a playable 18-hole course and create sufficient storage volume likely not feasible</li> <li>- Diverts stormwater from one subwatershed to another violating most design and regulatory standards</li> <li>- Geographically remote location relative to primary flood prone areas and conveyance systems</li> <li>- Depends on mechanical facilities to convey stormwater to this location</li> <li>- Significant infrastructure, operation, and maintenance cost to implement pumping and force main to get stormwater to this location</li> <li>- Would make all or portion of the golf course unplayable at times during the year</li> </ul>	4	6		+	-	+	+	+	-
34	20a	Conveyance Improvements	Increase Capacity of Ash Street Pump Station: Discharge to Skokie River	<ul style="list-style-type: none"> <li>- Provides benefit to an area highly susceptible to flooding (Tree Streets neighborhood)</li> <li>- Potentially minimizes need for creation of flood storage at other locations</li> </ul>	<ul style="list-style-type: none"> <li>- Would not gain regulatory approval due to the significant increase in water volume and associated hydraulic impacts to the Skokie River and watershed</li> <li>- Concept would divert stormwater to location where it doesn't currently discharge</li> <li>- Will require water quality treatment prior to discharge to the river</li> <li>- Will require a minimum 2 acre footprint for new pumping facilities (private property or Duke Childs Field)</li> <li>- Depends on mechanical facilities to provide flood protection</li> <li>- Significant infrastructure, operation, and maintenance cost to implement pumping and force main</li> </ul>	60	75	-	-	-	-	-	+	-
35	20b	Conveyance Improvements	Increase Capacity of Ash Street Pump Station: Discharge to New Storage	<ul style="list-style-type: none"> <li>- Provides benefit to an area highly susceptible to flooding (Tree Streets neighborhood)</li> </ul>	<ul style="list-style-type: none"> <li>- Depends on providing storage elsewhere to receive pumped stormwater (Winnetka Golf Course, FPDCC lagoons) and approval from those property owners</li> <li>- Would divert stormwater to location where it doesn't currently discharge</li> <li>- May require water quality treatment prior to discharge to receiving storage</li> <li>- Will require a minimum 2 acre footprint for new pumping facilities (private property or Duke Childs Field)</li> <li>- Depends on mechanical facilities to provide flood protection</li> <li>- Significant infrastructure, operation, and maintenance cost to implement pumping and force main</li> </ul>	60	75	-	-	-	-	-	+	-
36	21	Conveyance Improvements	Lower Hibbard Road and Connecting Tree Streets to Provide Additional Storage	<ul style="list-style-type: none"> <li>- Provides benefit to an area highly susceptible to flooding</li> </ul>	<ul style="list-style-type: none"> <li>- Results in minimal additional volume and overall effectiveness</li> <li>- Requires storage to be provided on Duke Childs Field to be effective (see evaluation of storage on Duke Childs Field)</li> <li>- May result in impassability of some streets following storm events</li> <li>- May require permanent closing of some of the intersections at Hibbard Road and permanent disruption to the current road network</li> <li>- Will require an extended period of "learning" for residents and users due to change in local traffic patterns</li> <li>- May be perceived to increase traffic on other streets in the neighborhood</li> <li>- Will require significant existing utility relocation</li> <li>- Significant cost to implement versus overall benefit</li> </ul>			+	+	+	+	-	-	
37	22a	Conveyance Improvements	Increase Capacity of Mt. Pleasant Pump Station: Discharge to Skokie River	<ul style="list-style-type: none"> <li>- Provides benefit to an area highly susceptible to flooding (DeWindt and Sunset)</li> <li>- Potentially minimizes need for creation of flood storage at other locations</li> </ul>	<ul style="list-style-type: none"> <li>- Would not gain regulatory approval due to the significant increase in water volume and associated hydraulic impacts to the Skokie River and watershed</li> <li>- Does not eliminate need for sizeable conveyance infrastructure out of the South of Willow area</li> <li>- Will require water quality treatment prior to discharge to the river</li> <li>- Will require a minimum 2 acre footprint for new pumping facilities (private property or Crow Island Woods)</li> <li>- Depends on mechanical facilities to provide flood protection</li> <li>- Significant infrastructure, operation, and maintenance cost to implement pumping and force main</li> </ul>			-	-	-	-	-	+	-

No.	Map/ Text ID	Control Type	Opportunity	Pros	Cons	Lower Volume Range (Ac- Ft)	Higher Volume Range (Ac- Ft)	Land Acquisition	Reliance on Mechanical Facilities	Maintains Existing Drainage Patterns	Regulatory Authority Acceptance	Property Owner Acceptance	Overall Effectiveness	Relative Cost
38	22b	Conveyance Improvements	Increase Capacity of Mt. Pleasant Pump Station: Discharge to New Storage	- Provides benefit to an area highly susceptible to flooding (DeWindt and Sunset)	- Depends on providing storage elsewhere to receive pumped stormwater (Winnetka Golf Course, FPDCC lagoons) and approval from those property owners - Would divert stormwater to location where it doesn't currently discharge - May require water quality treatment prior to discharge to receiving storage - Will require a minimum 2 acre footprint for new pumping facilities (private property or Duke Childs Field) - Depends on mechanical facilities to provide flood protection - Significant infrastructure, operation, and maintenance cost to implement pumping and force main			-	-	-			+	-
39	23	Conveyance Improvements	Construct Stormwater Conveyance Route Via Sunset Road to FPDCC Lands	- Shortest conveyance route available to drain South of Willow Watershed allows for best hydraulic conditions and best available flood conveyance capacity - Shortest conveyance route results in most economical route - Allows for potential regional water quality measures when coupled with storage on Crow Island Woods - Has best potential access for connecting with local storm sewer improvements benefitting the DeWindt Road neighborhood - Existing easements of adequate width appear to be available within privately owned portions of the route	- Portions of the conveyance route are along the private portion of Sunset Rd. - Portion of Sunset Rd. between Crow Island Woods and White Oak Ln. is a very narrow road corridor and will likely involve significant impacts to surrounding trees and landscaping - Portion of route passes through Crow Island Woods and will require Winnetka Park District coordination and approval	NA	NA		+	+	+	-	+	
40	24	Conveyance Improvements	Construct Stormwater Conveyance Route Via Hill Road to FPDCC Lands	- Majority of route is within Village controlled road right-of-way - Potential exists to align schedule of stormwater conveyance project with full road reconstruction of Hill Road which is programmed to occur within the next several years	- No ability to implement regional water quality measures within Crow Island Woods, no other suitable locations are available along this route, so distributed green infrastructure measures likely required in lieu of regional measures - Significantly longer route and therefore greater cost - Longer route results in greater head loss in the system, requiring larger box culvert size; equates to greater cost	NA	NA	+	+	+	+			-
41	25	Conveyance Improvements	Increase Capacity of Winnetka Avenue Pump Station	- Limits the amount flood storage that needs to be created, depending on how much pump capacity is increased	- Could have significant adverse flooding impacts to areas downstream along Skokie River and N. Branch Chicago River - Significant challenges to gain IDNR floodway permitting and MWRD approval, may not be permissible - Increased operation and maintenance - Recently upgraded pump station facility would need to be reconstructed again	NA	NA		-	+	-		+	-
42	26	Conveyance Improvements	Implement Gravity Pressure Storm Sewers to Outlet Directly to Skokie River	- Stormwater conveyance achieved across levee without the need to pump	- Could have significant adverse flooding impacts to areas downstream along Skokie River and N. Branch Chicago River - Significant challenges to gain IDNR floodway permitting and MWRD approval, may not be permissible - Minimal areas could be served by pressure main (likely only portions of Provident Watershed - Need to have parallel storm sewer mains along Willow Road, constructability a challenge - Water quality treatment needed prior to discharge to Skokie River	NA	NA	+	+	-	-	+		-
43	27	Redevelopment	Community Redevelopment and Infill Projects	- Regulations for redevelopment and infill can require developers to manage all or a portion of runoff on site - Provides opportunity for water quality treatment	- Cost implications of regulations could hinder development - Redevelopment and infill rates may not be achieved impacting the anticipated benefit	NA	NA	+	+	+	+	+		+
44	28	Zoning Amendments	Zoning Regulation Modifications	- Revise Zoning Regulations to Decrease Allowable Pervious Coverage could reduce stormwater runoff volumes in the watershed - Require Stormwater BMPs to provide runoff controls on private property - Require stormwater detention on residential parcels in conjunction with redevelopment or certain size improvements reduces storage volume needs in watershed	- Cost implications of regulations could hinder redevelopment and economic growth - Depends on implementation over time without definitive results	NA	NA	+	+	+	+	+		+