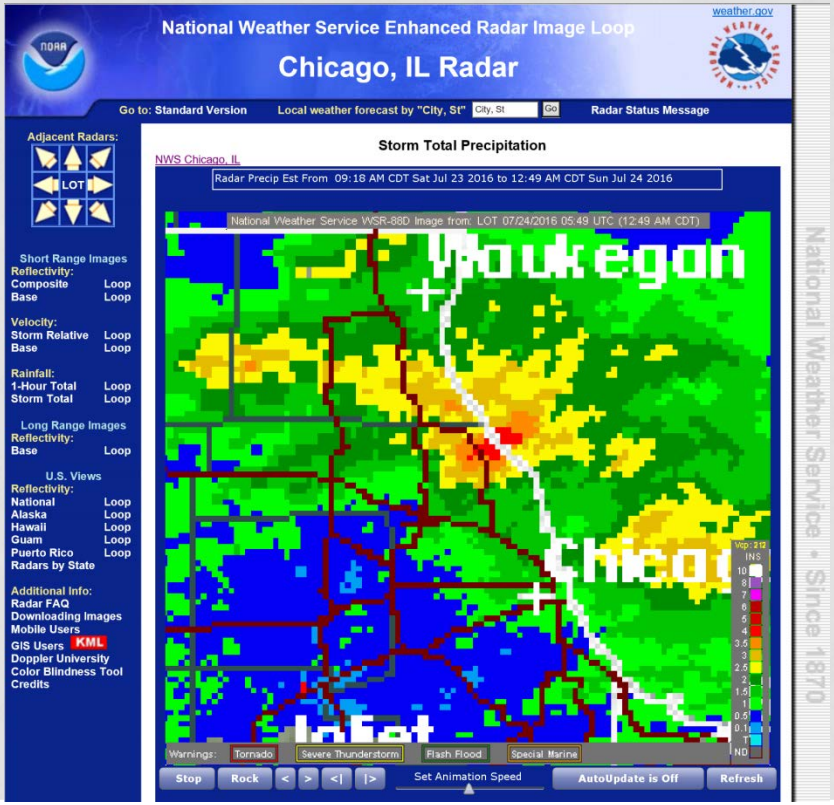
VILLAGE COUNCIL STORMWATER REPORT

JULY 23, 2016 STORM EVENT

STORM RAINFALL AND RADAR IMAGERY

- Total rainfall 4.99 inches
  - 2.74 inches between 5:40 and 7:10, then a lull until 9:30
  - 2.04 inches between 9:30 and 11:00, then light rain until 1:00 am
- Very localized event



COMPARISON WITH PREVIOUS EVENTS

- This event 4.99 inches in ~6 hours
- April 18, 2013
  - 3.5” in 12-hour period
  - Saturated ground before event
- July 22-23, 2011
  - 7.8” total
  - 6.49” in 3.5 hour period
- September 13-15, 2008
  - 8.19” total, 36+/- hour duration
- August 21-22, 2002
  - 5.44” total, 6 hour duration

STORM RESPONSE TIMELINE
JULY 23, 2016

- 5:04 p.m. Saturday
  - Received alert from weather service predicting periods of showers and thunderstorms and "rainfall amounts likely between 0.3-0.6 inches, with locally heavier amounts of up to 1-1.5 inches through Sunday morning."
- 4:30 to 4:40 p.m. Saturday
  - Rainfall begins
  - 0.43 inches of rainfall by 5:00
- 5:00 p.m. to 7:00 p.m. Saturday
  - Additional 2.32 inches of rainfall
  - Police and Fire departments responding to flooding calls, alarms, and stranded motorists
  - Water & Electric crews called out for power outages
  - Public Works crews called out for widespread street and basement flooding

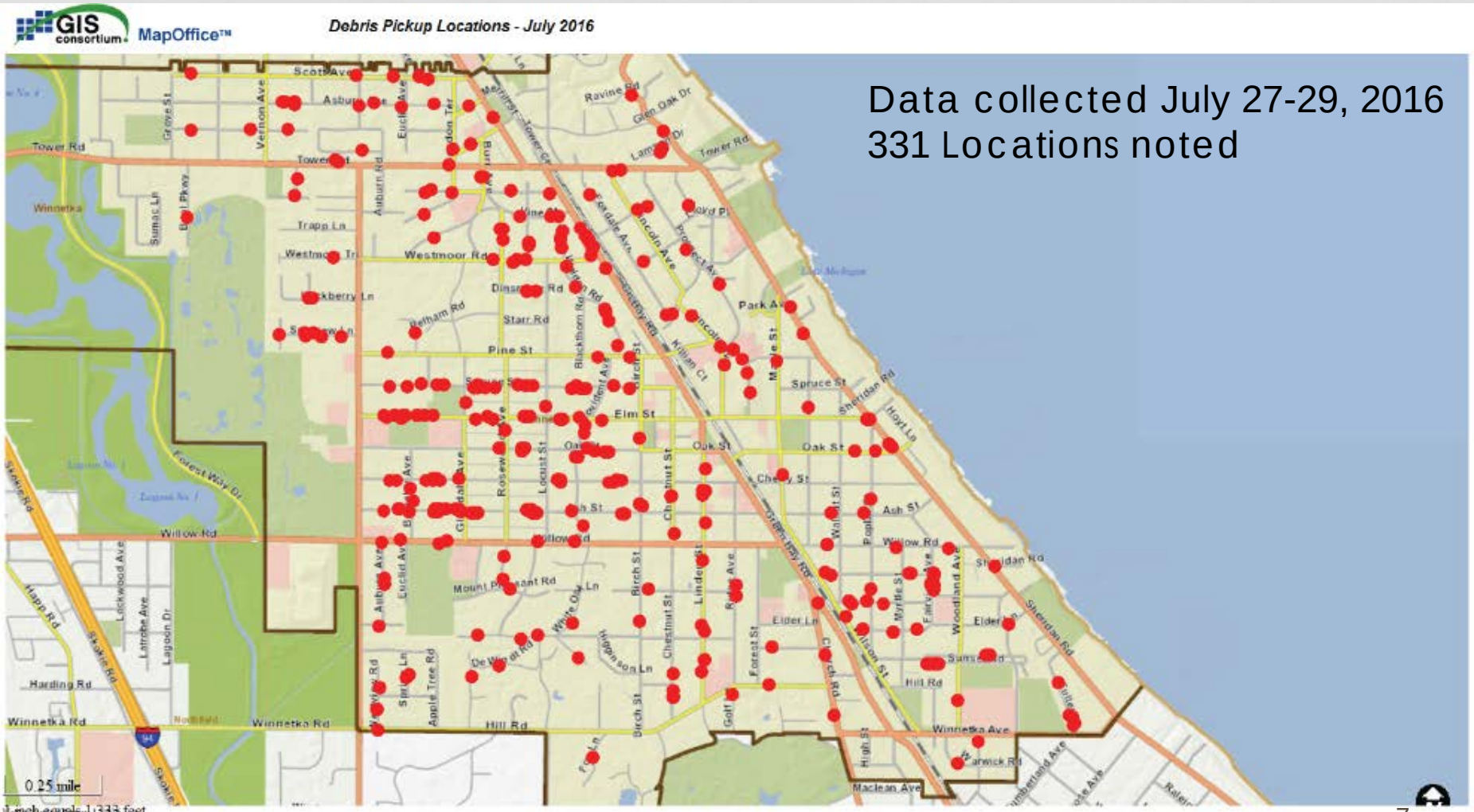
STORM RESPONSE TIMELINE CONT.

- 7:00 p.m. to 9:00 p.m. Saturday
  - Lull in rainstorm allows some street flooding to subside
  - Water & Electric crews working on power restoration
  - Supplemental pumping deployed to Skokie River to lower elevations in Hibbard Road storm sewer
- 9:00 p.m. to 12:00 a.m. Saturday
  - Additional 2.24 inches of rainfall
  - Continued street closures and emergency response
- 12:00 a.m. to 3:00 a.m. Sunday
  - Rainfall ends
  - Most power restored
  - Many streets re-opened
  - Emergency operations wind down

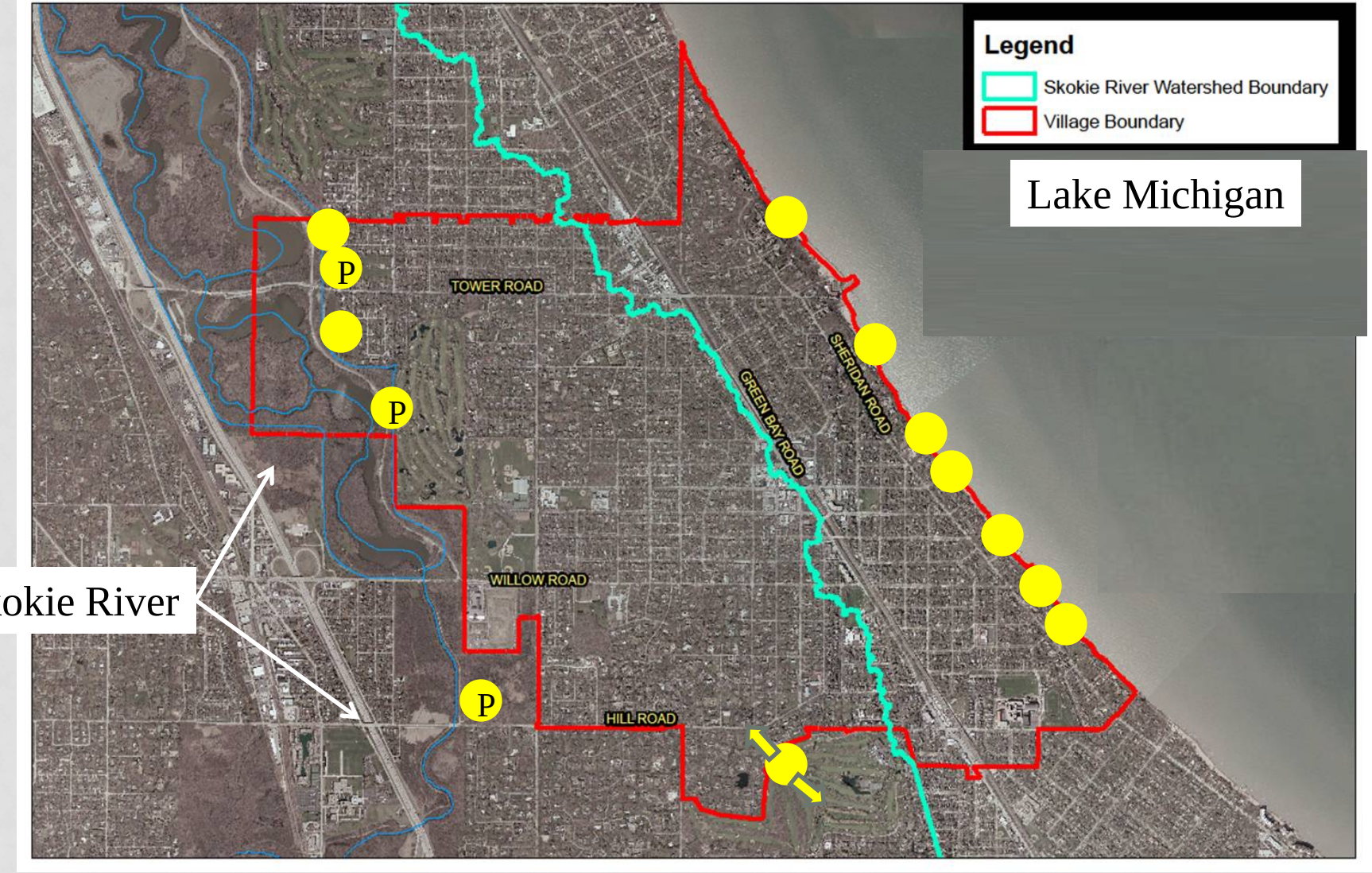
STORM RESPONSE TIMELINE CONT.

- 3:00 a.m. to 8:00 a.m. Sunday
  - Supplemental pumping continues to Skokie River to lower elevations in Hibbard Road storm sewer
- 8:00 a.m. to 2:00 p.m. Sunday
  - Supplemental/continued pumping at Ash Street
  - “Tree streets” opened to traffic
- 2:00 p.m. through Sunday night
  - Sunset/Birch/DeWindt/White Oak area drains

DEBRIS PILES



STORM SYSTEM OVERVIEW



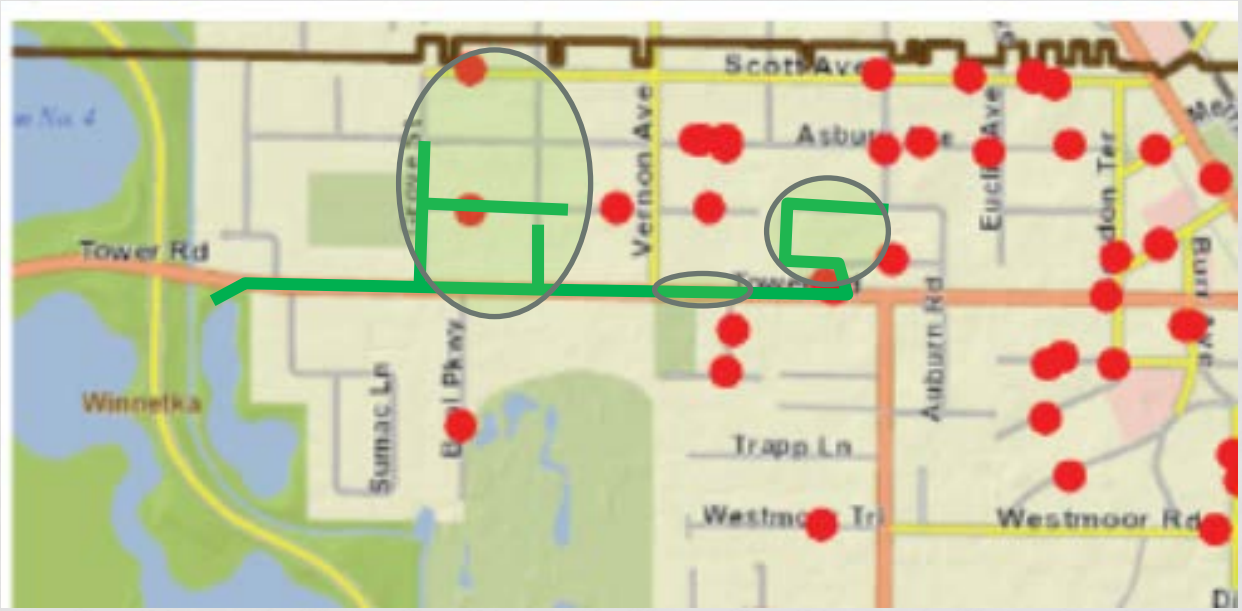
SANITARY SYSTEM OVERVIEW

WHAT WENT RIGHT

- Northwest Winnetka improvements
- Winnetka Avenue Pump Station improvements
- Ash Street pump
- Northeast Winnetka improvements

NORTHWEST WINNETKA IMPROVEMENTS

- Completed fall 2015
- No calls for structure or street flooding from stormwater
- Some sanitary backups and seepage



WINNETKA AVENUE PUMP STATION

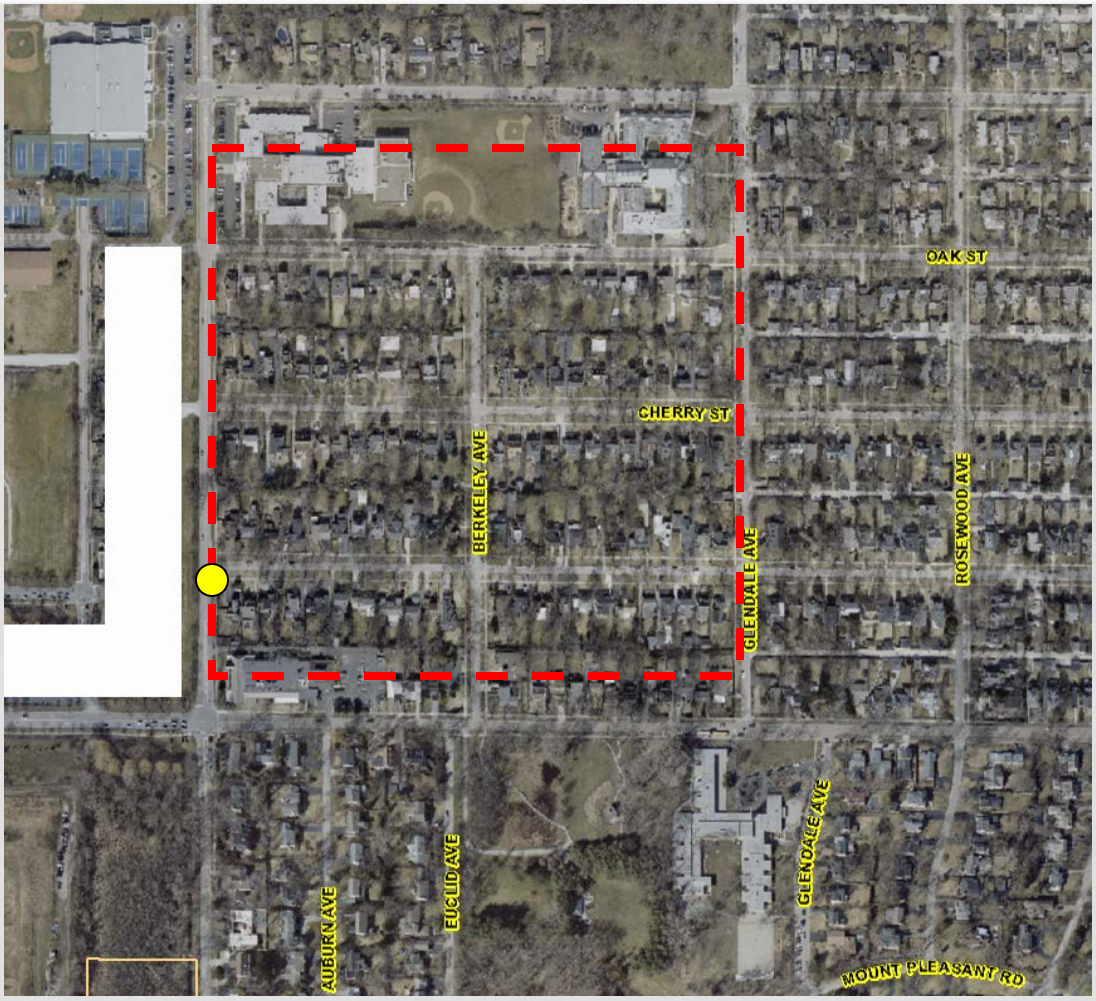
- Main pumping station on Forest Preserve property where Skokie River passes under Winnetka Avenue
- Upgraded in 2014 from 40,000 gpm to 60,000 gpm
- Improved reliability and control systems
- Anti-clogging screens
- Goal: Improved reliability, capacity, reduced maintenance

ASH STREET PUMP

- Located at Ash & Hibbard
- Pumps to Hibbard with overflow to ballfield
- Drains area bounded by Glendale, Elm, Willow, Hibbard
- Pump is sized for ~ 2-year event due to limited upstream and downstream storm sewer capacity
  - 2-hour design storm, 1.79 inches
  - Upstream storm sewers have lower capacity
  - Hibbard Road system has lower capacity
- 2015 upgrade - primarily reliability and technology improvements, with increased capacity
- Goal: reduce drawdown times and nuisance flooding

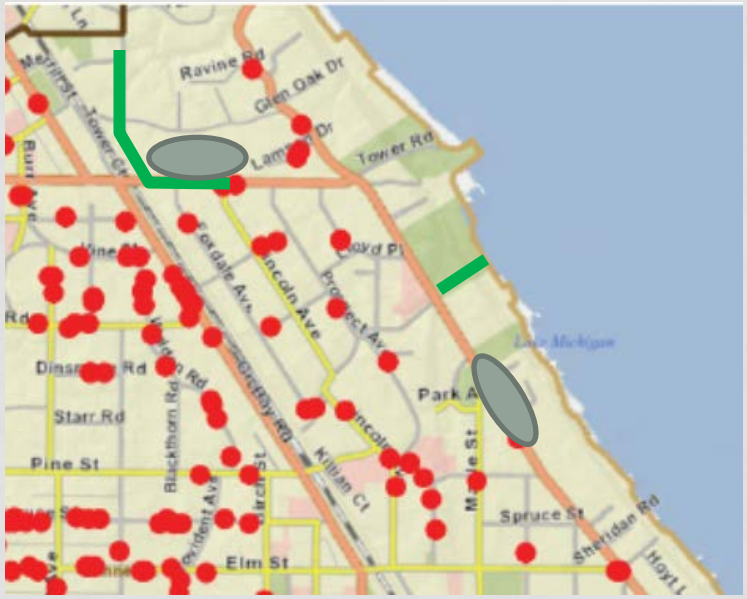
yes

ASH STREET PUMP DRAINAGE AREA



NORTHEAST WINNETKA IMPROVEMENTS

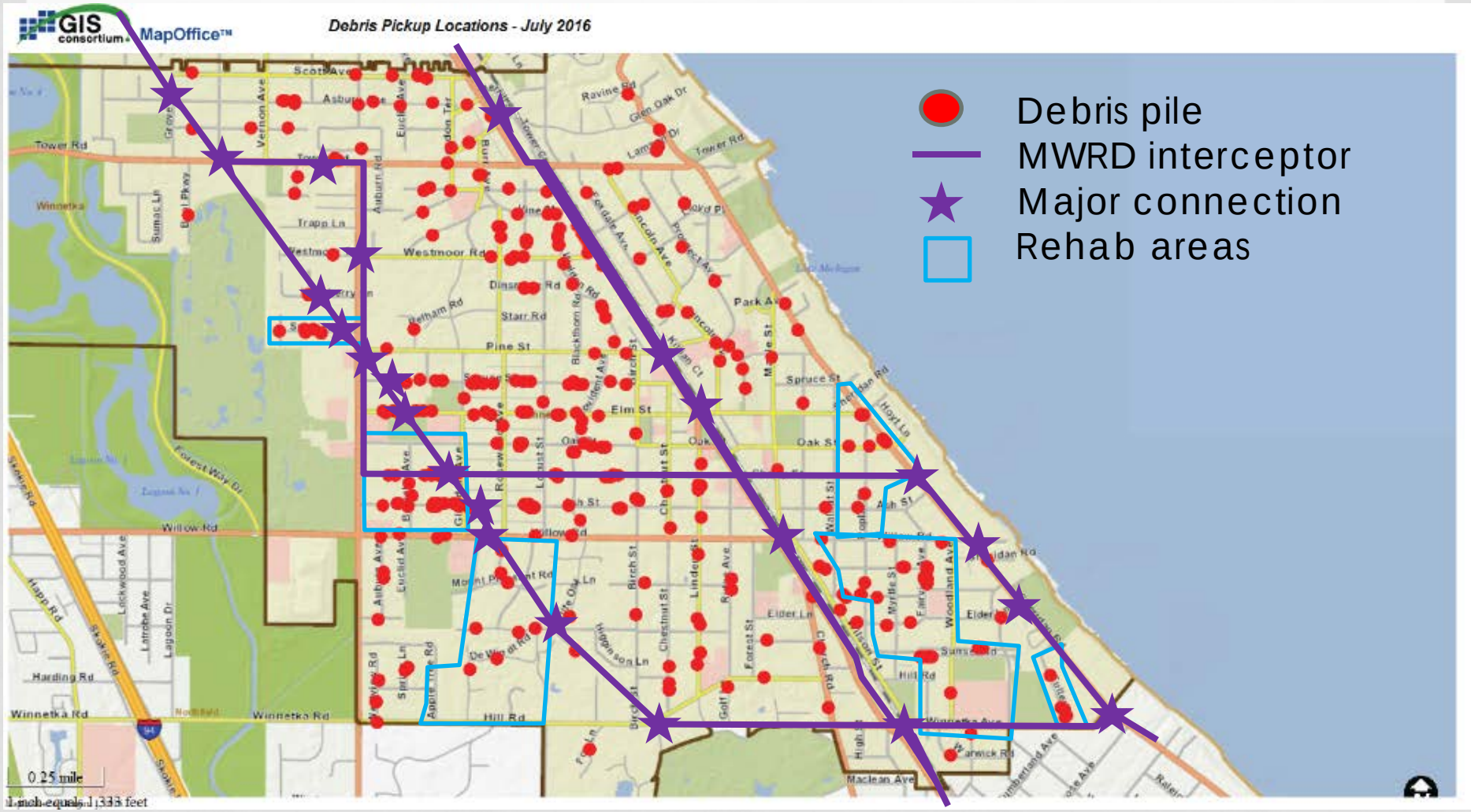
- Completed fall 2013 (Lloyd outlet) and fall 2014 (Tower Road)
- Targeted improvement to reduce overland flooding along Tower Manor, east Tower Road and along Sheridan Road
- Tower Manor portion worked
- Some properties along Tower Road still experienced water



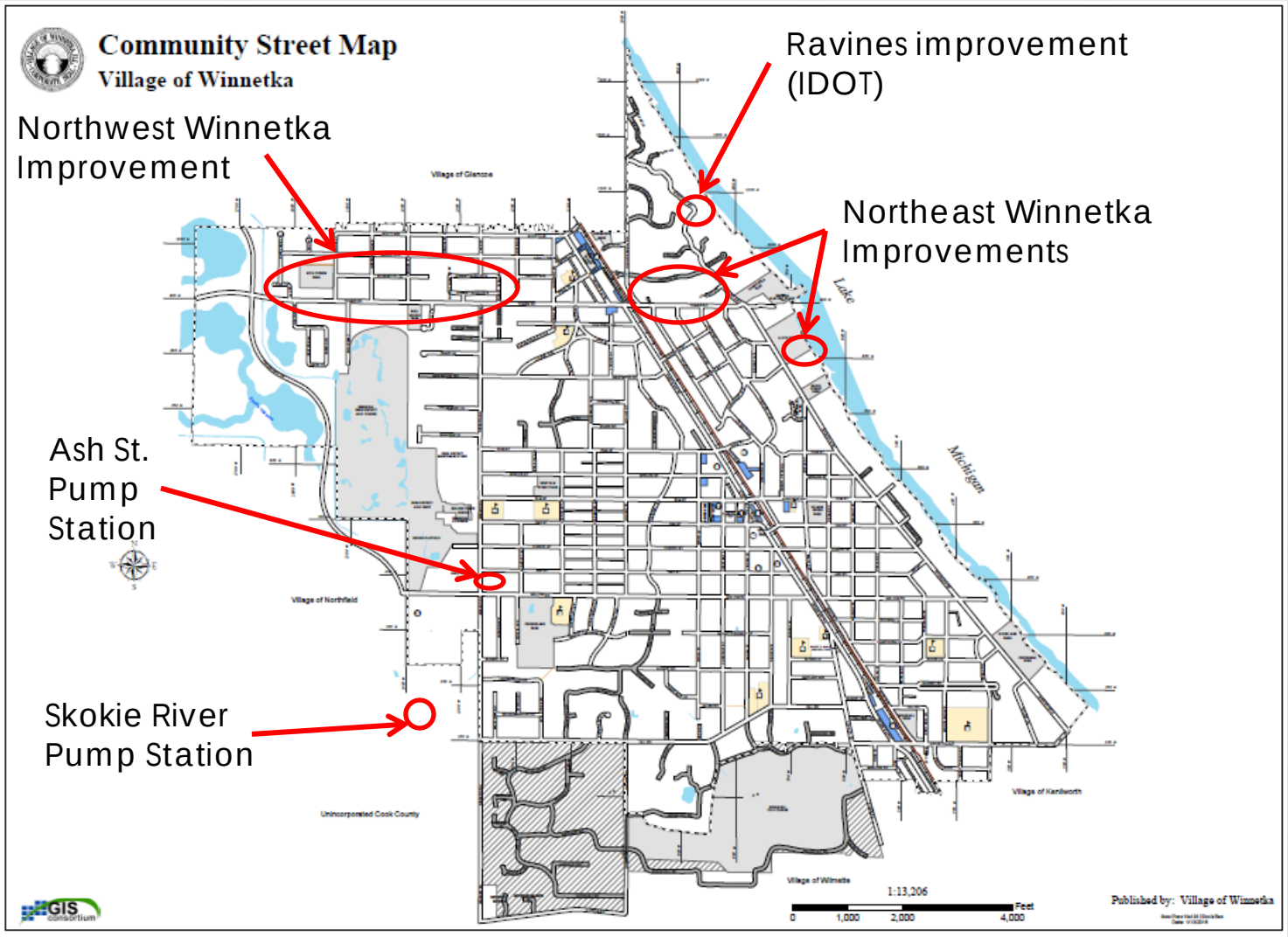
WHAT WENT WRONG

- Northeast Winnetka improvements
  - Some homes along north side of Tower Road
- Sanitary backups throughout Village
- Studied drainage areas without prioritized improvements
  - Winnetka Avenue underpass area
  - East Cherry/Oak/Ash/Sheridan area
  - Hubbard Woods area
  - West Elm Street district/Chestnut Street
- Timeliness of street closures due to after-hours event

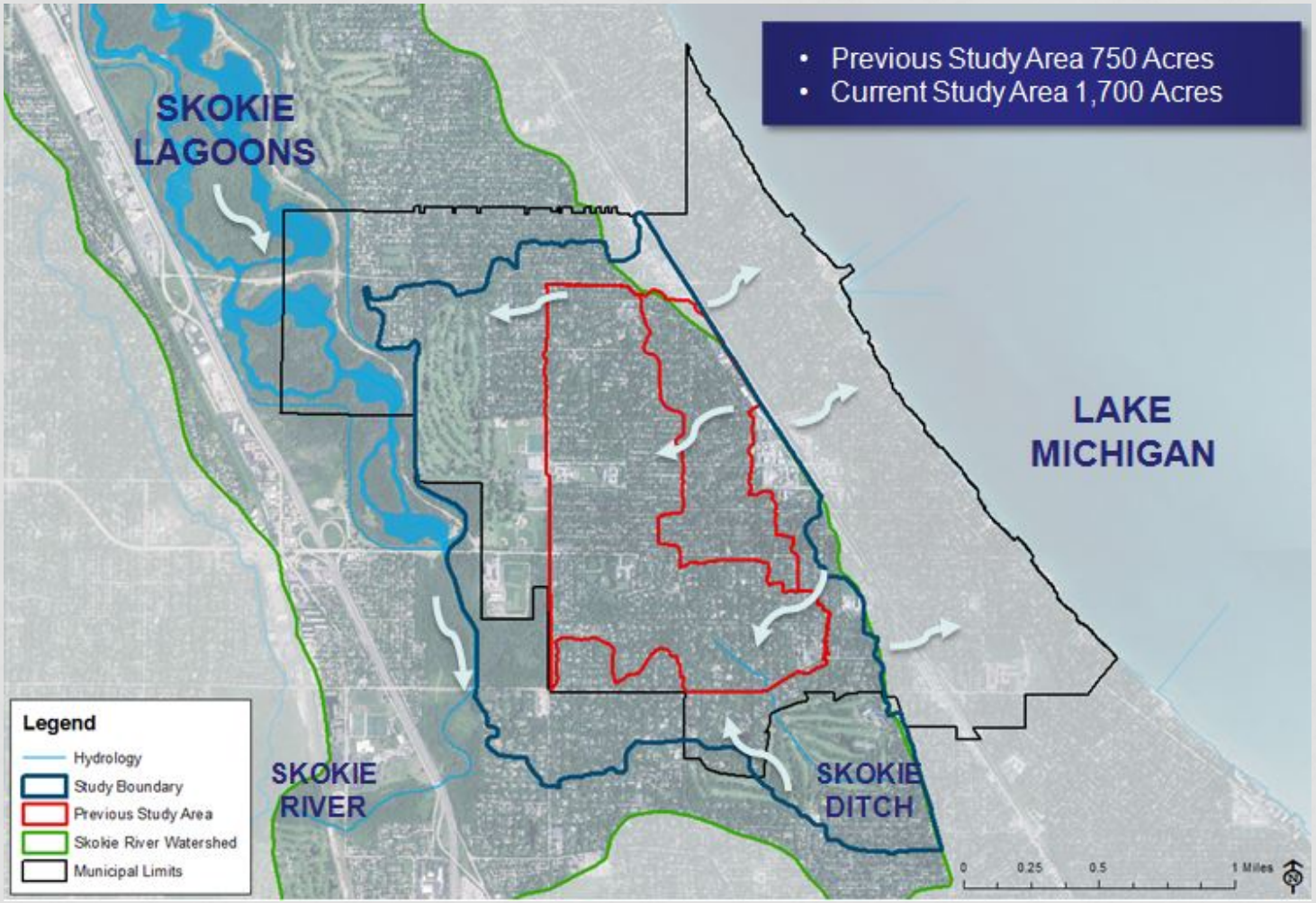
DEBRIS PILES OVERLAID WITH SANITARY SEWER AREAS



STORMWATER IMPROVEMENTS SINCE 2011



STRAND WESTERN ALTERNATIVE EVALUATION – DESCRIPTION



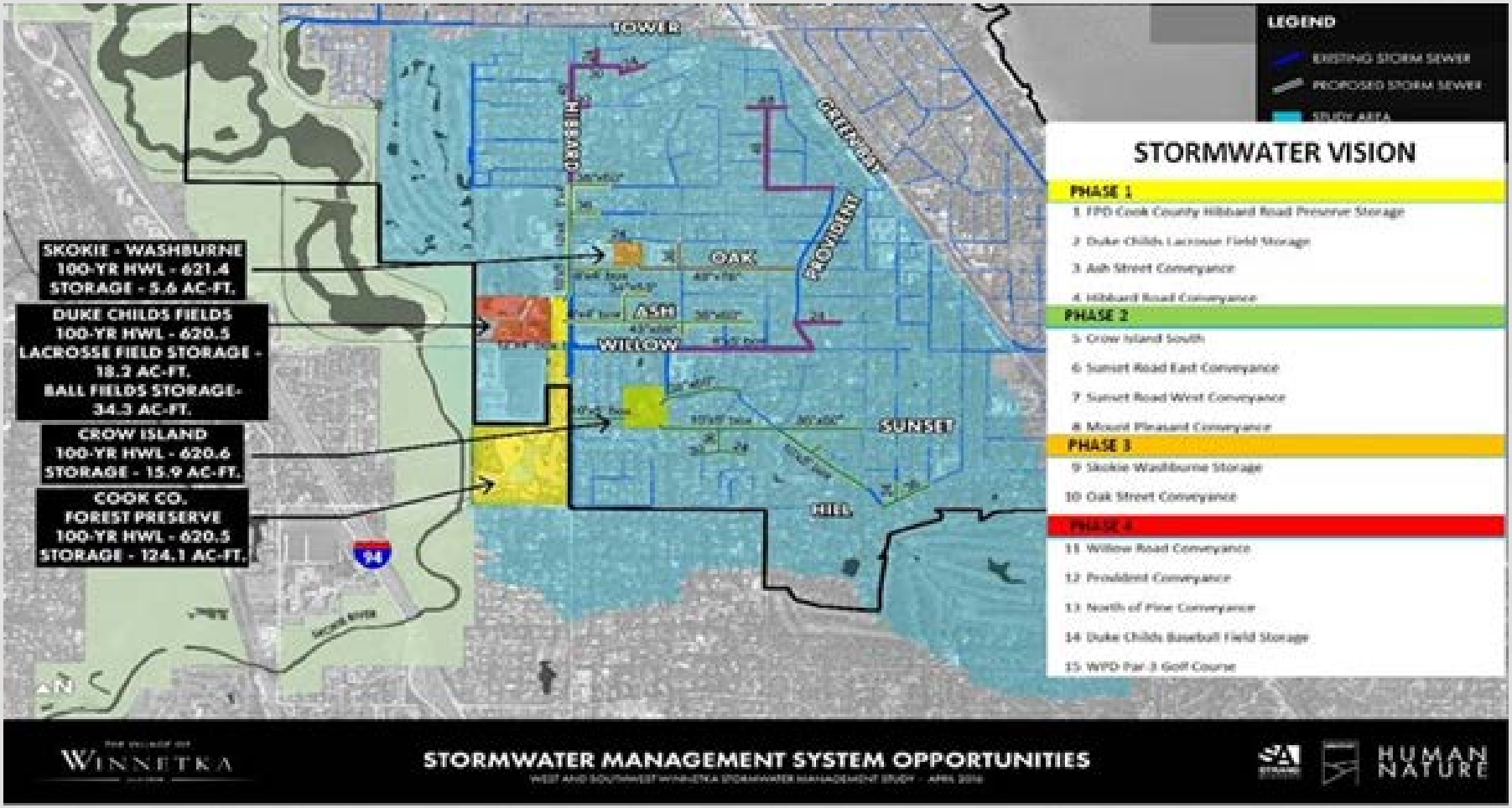
STRAND WESTERN ALTERNATIVE EVALUATION - DESCRIPTION

- Re-evaluate the Village's western drainage basins
- Creative, cost-effective westward looking (i.e. non-Tunnel) improvements
- Holistic approach to the project
  - Grey and green infrastructure approaches
  - Conveyance
  - Detention
  - Retention
  - Infiltration
  - Property buyout or individual protection retrofit programs
  - Other traditional and emerging stormwater management technologies.

STRAND WESTERN ALTERNATIVE EVALUATION - TIMELINE

- September 1, 2015: Village Council suspends Willow Road STADI project due to dramatic increases in estimated cost
- October 6, 2015: Council awards contract to Strand Associates to perform a comprehensive evaluation of western and southwestern Winnetka to identify non-STADI options
- Week of November 16, 2015: Stakeholder meetings (CCFPD, D36, WPD, NTHS)
- January 21 & 23, 2016: Awareness Phase open houses
- February 24, 2016: Meeting with CCFPD staff
- March 3 & 5, 2016: Exploration Phase open houses
- April 7, 2016:Meeting with CCFPD staff
- April 12, 2016: Vision Phase Workshop
- May 10, 2016: Council update on Vision Phase
- May 23, June 2, June 15: Forest Preserve updates with Commissioner Suffredin and Forest Preserve stakeholder groups
- June 7, 2016: Strand final concept vision presentation
- June 14, 2016: Village Council discussion & direction on next steps
- June 23, 2016: Meeting with CCFPD staff/Suffredin
- July 21, 2016: CCFPD staff provides guidance documents that begin to outline an appropriate approval process

STRAND WESTERN ALTERNATIVE EVALUATION - CONCEPT



STRAND WESTERN ALTERNATIVES EVALUATION – NEXT STEPS/PROCESS

- Cook County Forest Preserve District
  - August 23 CCFPD meeting
  - Develop process to identify and resolve open issues sequentially, working towards CCFPD Board approval
- Internal agency stakeholders
  - At appropriate point with Forest Preserve, develop further discussions and details for water storage and quality measure on Village or local agency controlled properties
- Re-evaluate phasing and sub-projects for early action items
  - Strand to report at October study session
  - Possible project engineering for 2017 budget
- Detailed engineering investigation of "mitigation zones"
  - 2017 Budget item to be presented to Council for discussion

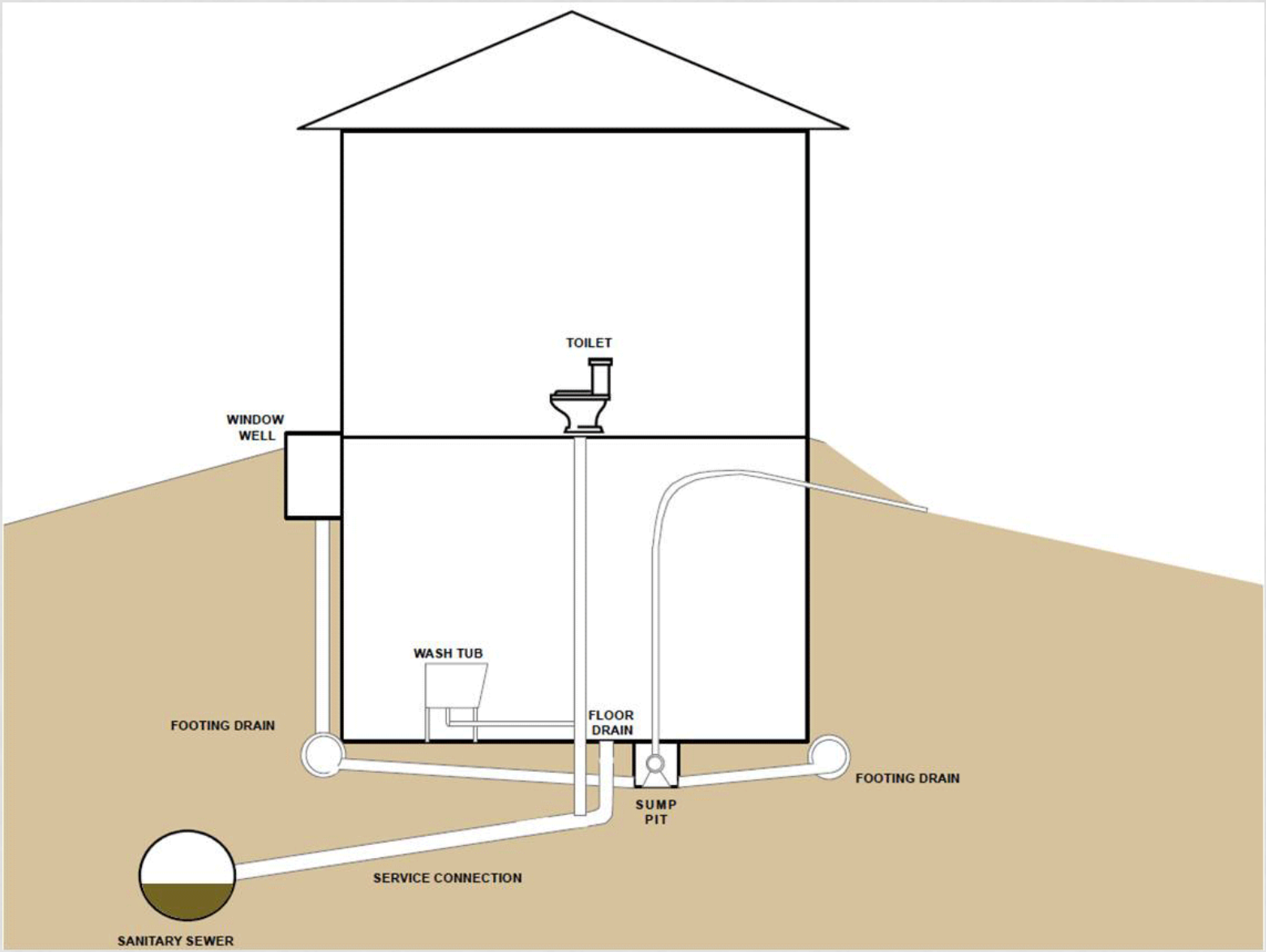
SANITARY SEWER IMPROVEMENTS

- Summer 2012: Village-wide flow monitoring to prioritize areas for detailed investigation
- Summer 2013: Perform smoke testing, dye testing, and external home inspections in areas identified as high priority. These areas included mostly southeast and southwest sections of the Village.
- 2013 – 2016: Annual sewer relining program of approximately 16,500 LF feet of sanitary sewer lines of various diameter.
- Late 2014/early 2015: Correction of illegal connections to the sanitary sewer (i.e. window wells, downspouts, yard drains, etc.) identified during smoke testing.
- 2014 – 2015: Internal relining of 169 sanitary sewer manholes; replacement of 60 manhole covers; and installation of internal chimney seals to prevent water from entering the system via the frame and cover.

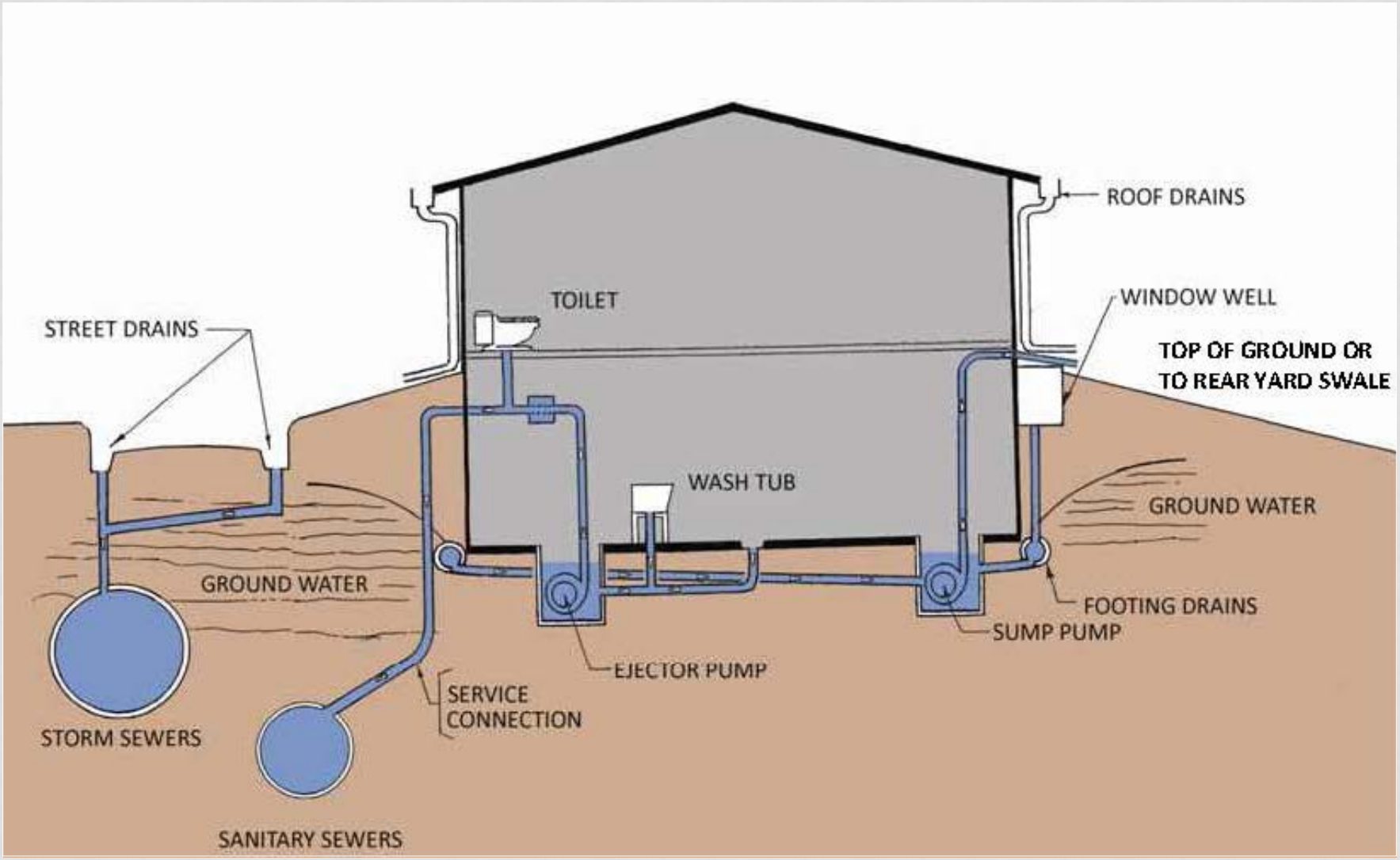
FUTURE STEPS: SANITARY

- Continue smoke and dye testing in additional basins in east and north Winnetka and complete necessary repairs
- Targeted private property inspections to eliminate clear water sources
- Continue MWRD interceptor investigation to determine that system's role in backups
- Reinstate cost-sharing program

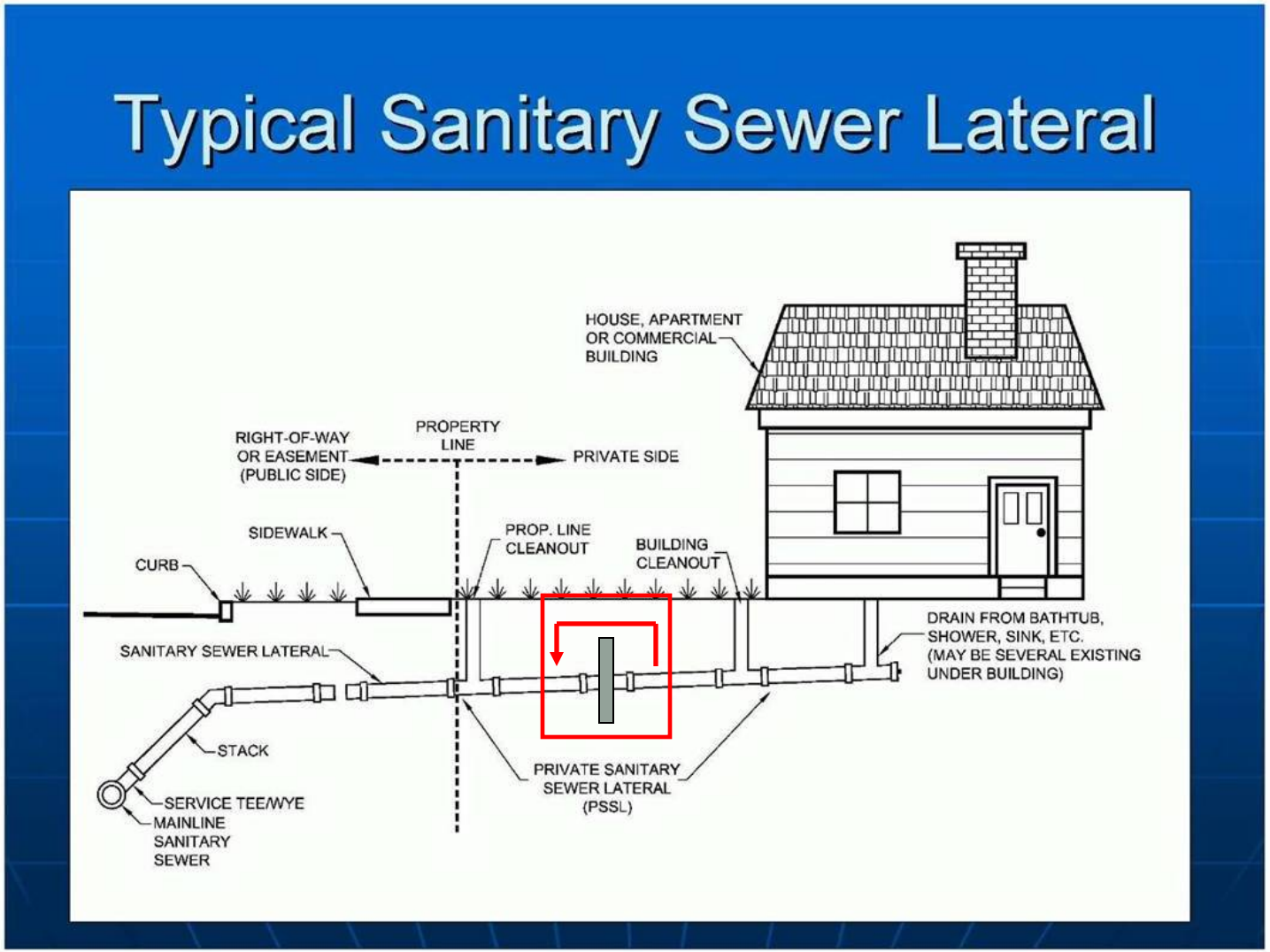
SANITARY SEWER BACKUP SIMULATION



OVERHEAD SEWER SCHEMATIC



SANITARY BACKFLOW PREVENTION SYSTEM



BACKFLOW PREVENTION/OVERHEAD SEWER

- Retrofit prevents basement backups from sanitary sewers surcharged by stormwater
- Village Code authorizes program
- Beginning in 2014, Council did not fund program
- Backflow prevention systems
  - Cost varies, less expensive systems $7,000-$8,000
  - Village reimburses 50% of cost up to $3,500
- Overhead sewer conversions
  - Depending on house design cost $10,000+
  - Village reimburses 50% of cost up to $5,000

POSSIBLE REINSTATEMENT

- Village could reinstate funding for program
  - Evaluation of budgeted capital projects indicates $50,000 could be allocated for this program
- Program benefits
  - Reduction of basements backups and attendant flood damage, insurance claims, and health risks
  - Provides relief to residents plagued by frequent backups
  - Allows entry to basements to correct cross-connections or code violations
  - Can be more cost-effective on a per-home basis than basin-wide improvements
- Possible drawbacks
  - May increase flooding of unprotected homes
  - No system is foolproof, and flooding is still a possibility

QUESTIONS AND DISCUSSION