

# Village of Winnetka Flood Risk Reduction Assessment

October 11, 2011

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# Introduction

- The September 2008 storm event prompted a flood risk reduction assessment of Western Winnetka.
  - Results were presented in September 2009
- Remaining portions of the Village were analyzed and presented in July 2011



# Purpose of this Study

- July 23-24<sup>th</sup> 2011 storm event produced widespread flooding and prompted the analysis of the Village for the 25-, 50-, and 100-year design storms for all 8 study areas
- Previous analyses were performed for the 10-year design storm for all 8 study areas

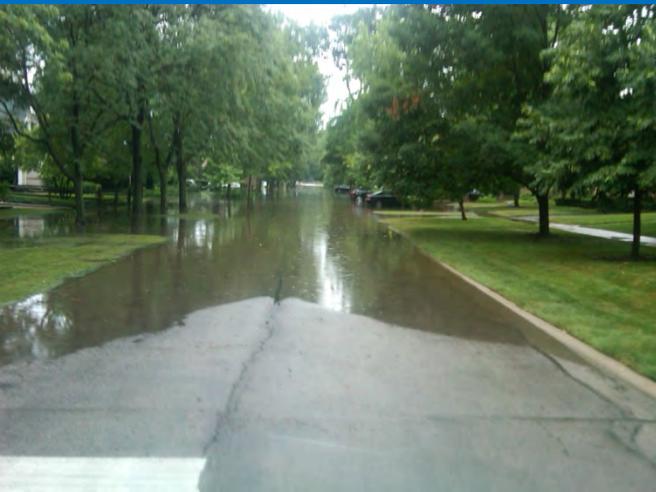
# Purpose of the Meeting

- Present study findings
  - Proposed improvements to reduce flood risk
  - Identify regulatory and permitting requirements
  - Identify intergovernmental partners
- Obtain Board's input and public comment
- Next steps



# Scope of Flood Risk Reduction Assessment

- Analysis of all 8 study areas for the 25-, 50-, and 100-year design storms
- Identify drainage improvements to provide the required level of protection for each design storm
- Develop conceptual plans and cost estimates for drainage projects for each design storm



Village of Winnetka

# Design Level of Protection

- Storm sewers sized for 10-year design storm (10% chance of occurring in any given year)
- Runoff exceeding storm sewer capacity flows overland
- To obtain greater level of protection:
  - Larger storm sewers, detention, outfalls and pumps
    - 25 yr design = 4% probability of occurring in any given yr
    - 50 yr design = 2% probability of occurring in any given yr
    - 100 yr design = 1% probability of occurring in any given yr

# Information Analyzed

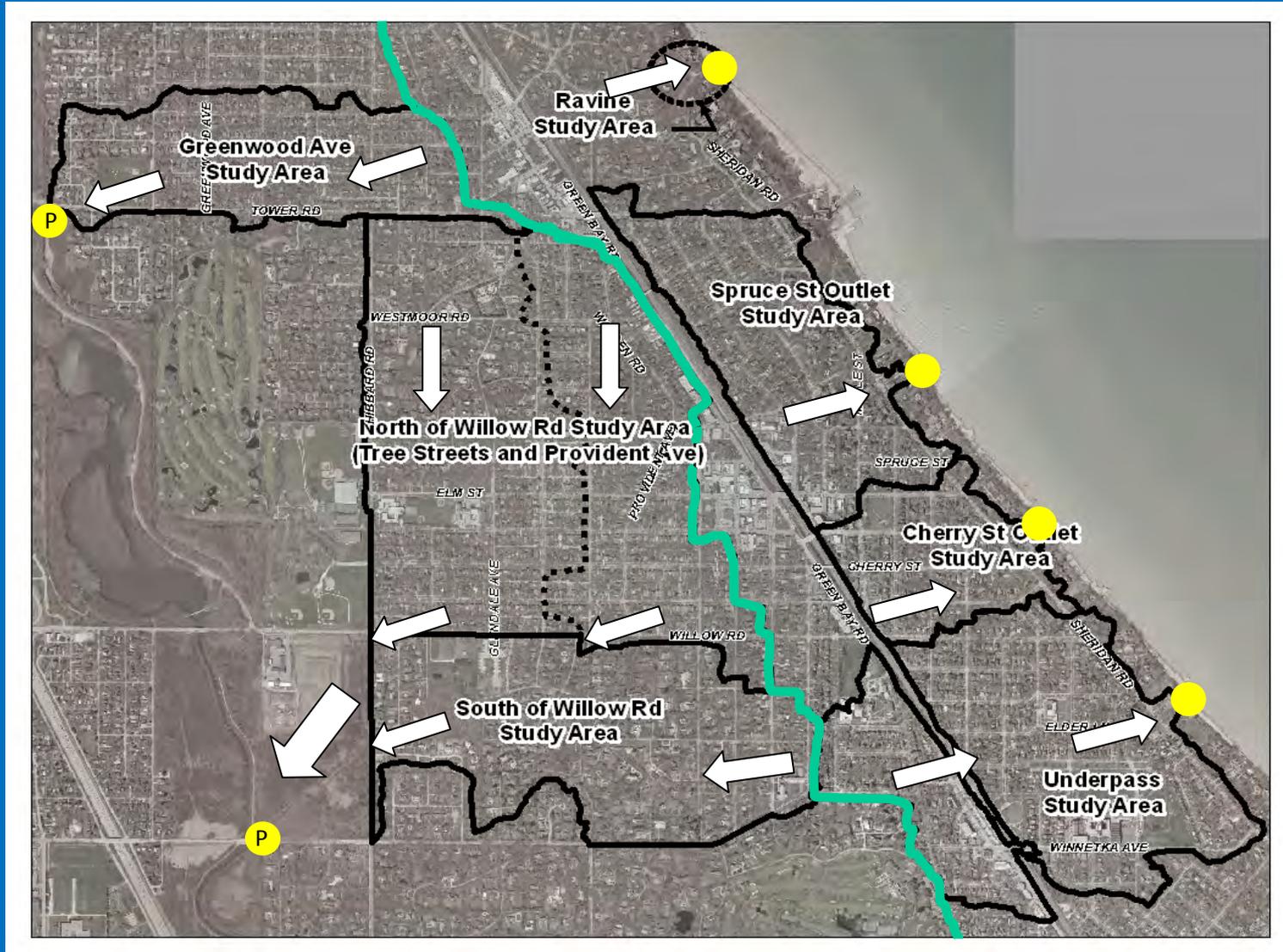
- Field investigations by Village and CBBEL staff during and after storm events
- 857 flood questionnaires
- Information provided by Village Staff
- Village of Winnetka storm sewer atlas
- Cook County aerial topographic mapping

# Information Analyzed

- Computer Modeling (XP-SWMM)
  - Dynamic hydrologic / hydraulic analyses
  - Critical duration
  - Data included in modeling
    - Tributary areas
      - Runoff curve numbers
      - Time of concentration
    - Storm sewer network data
    - Overland flow paths
      - Streets and yards
    - Depressional storage areas



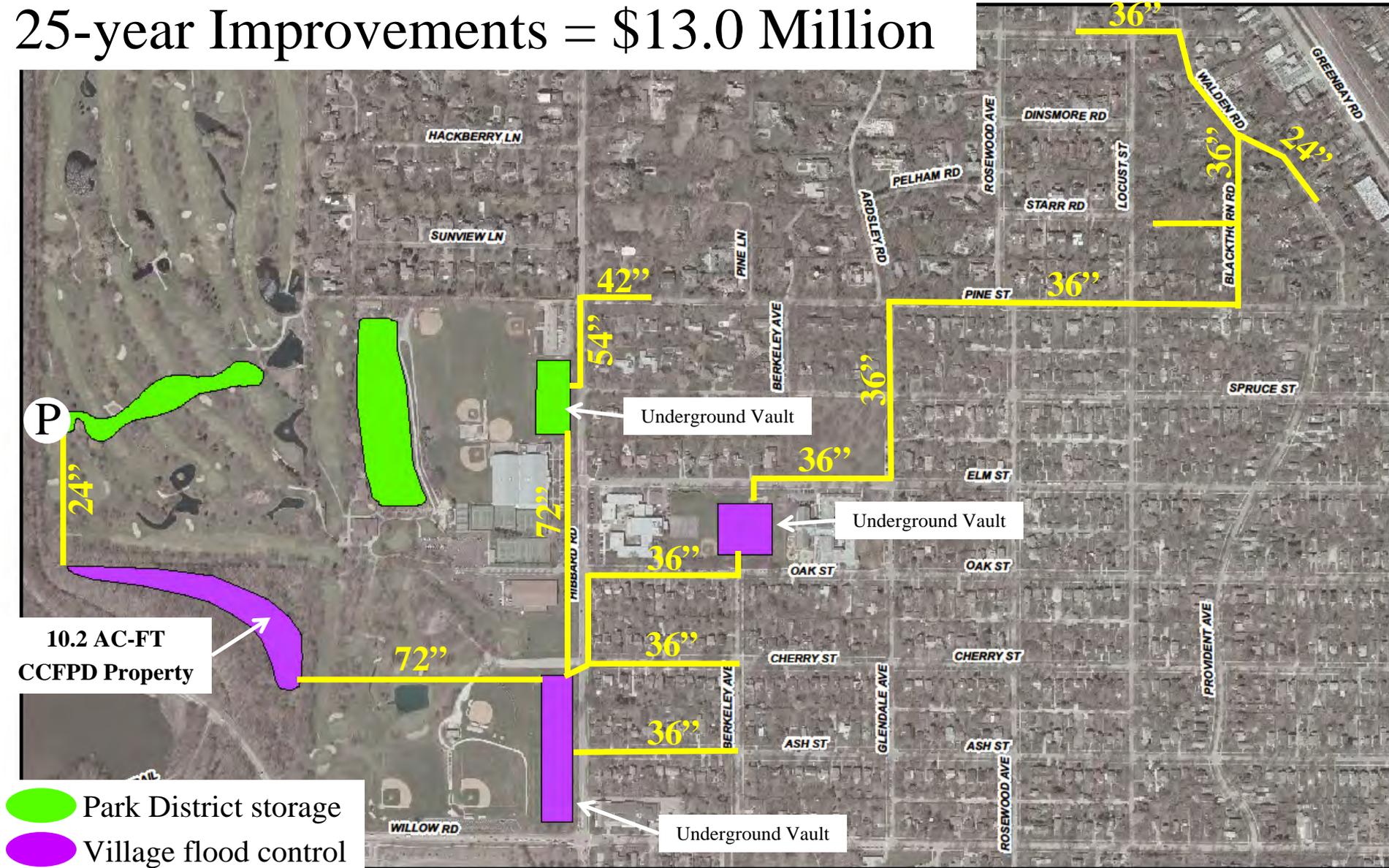
# Overall Drainage





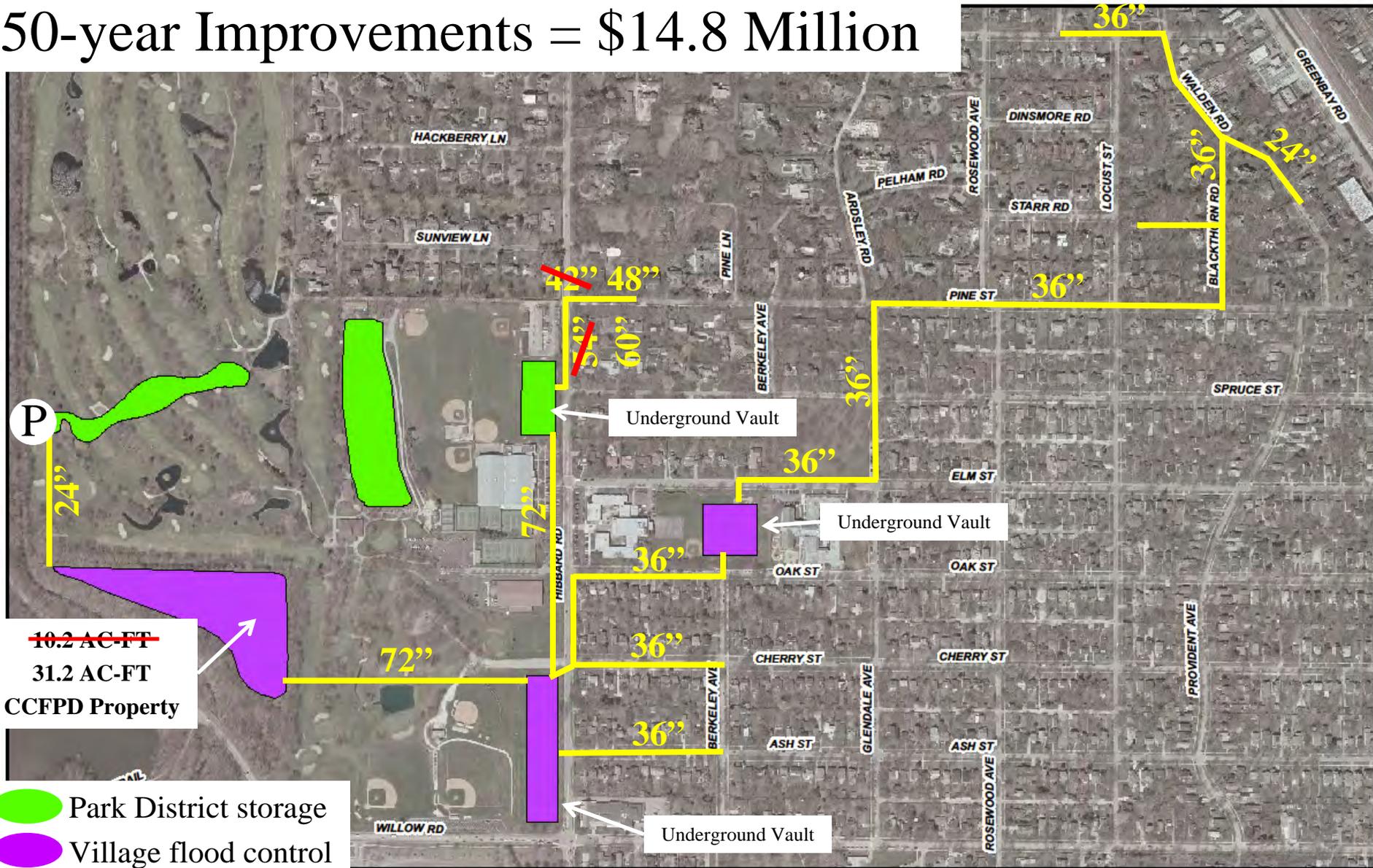
# North of Willow Road Study Area

25-year Improvements = \$13.0 Million



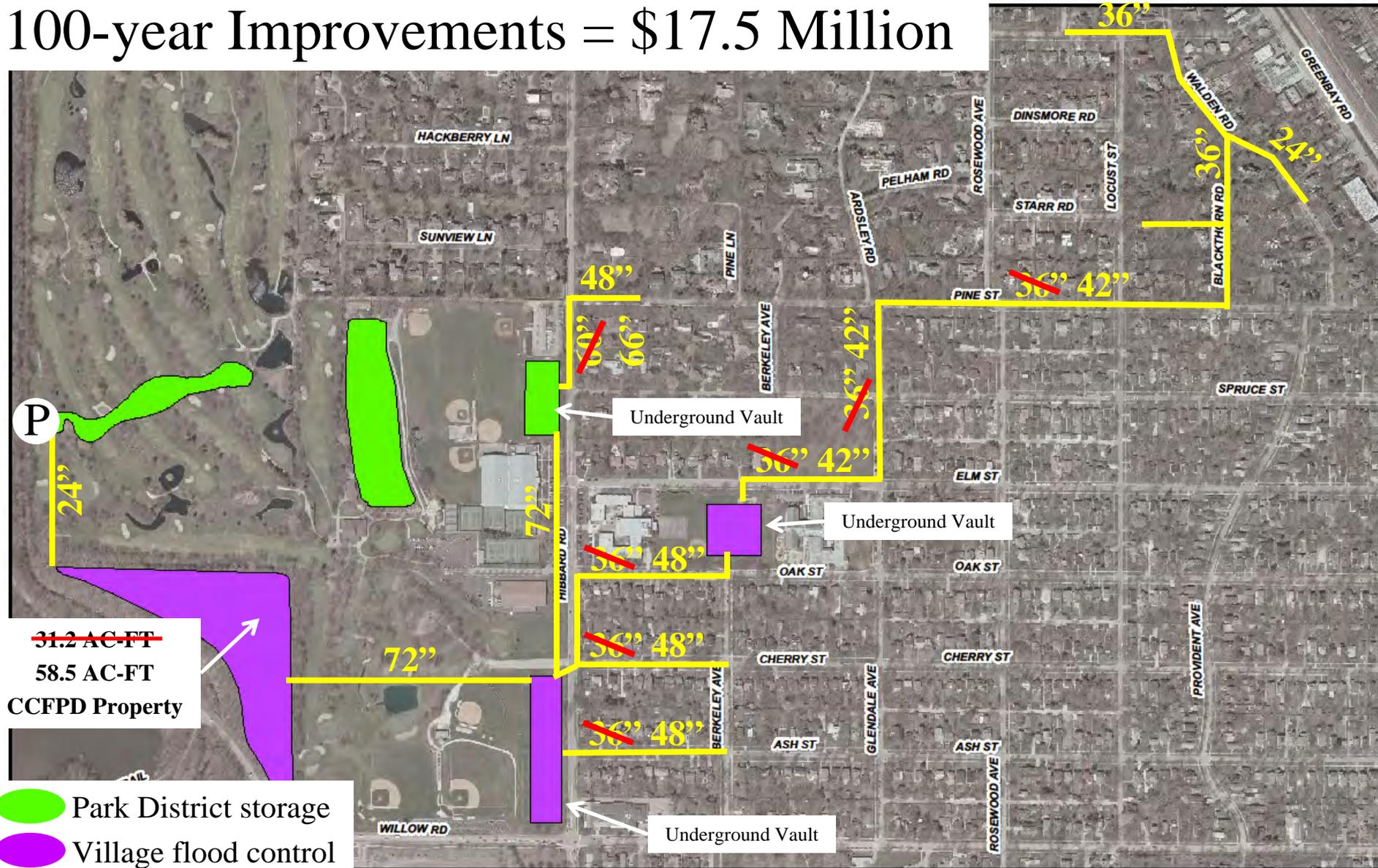
# North of Willow Road Study Area

50-year Improvements = \$14.8 Million

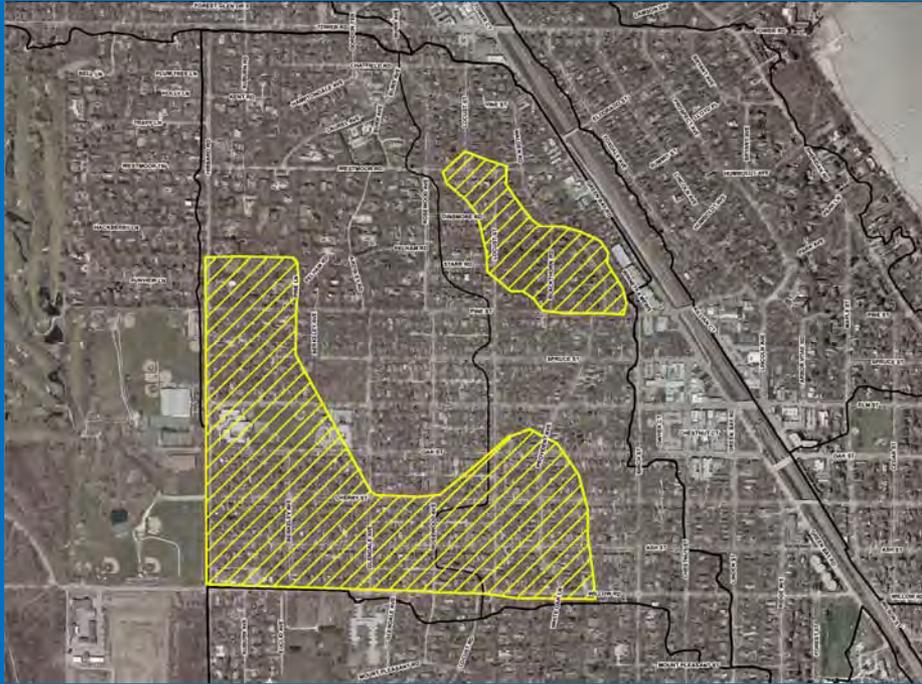


# North of Willow Road Study Area

100-year Improvements = \$17.5 Million



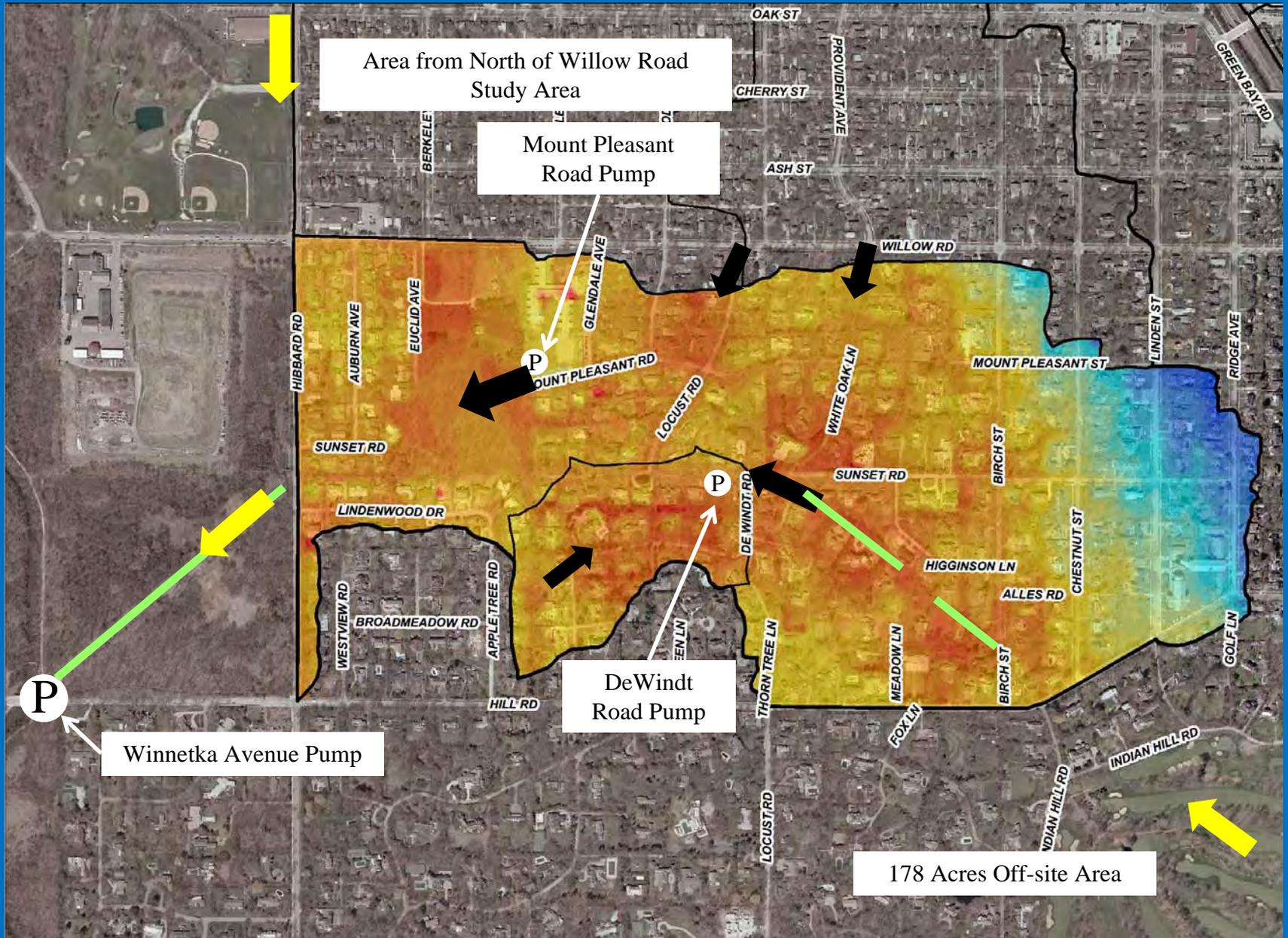
# North of Willow Road Benefits



Level of Protection	Engineer's Estimate of Probable Cost (Millions)
10-year	\$6.8
25-year	\$13.0
50-year	\$14.8
100-year	\$17.5

- CCFPD approval and land acquisition
- Park District
- IDOT
- MWRDGC
- Winnetka School District 36

# South of Willow Road Study Area



# South of Willow Road Study Area

25-year Improvements = \$9.7 million



Crow Island Park

15 AC-FT  
Underground vault

Relocate Mount  
Pleasant Rd Pump

400 feet of ditch  
re-grading and lowering

36"

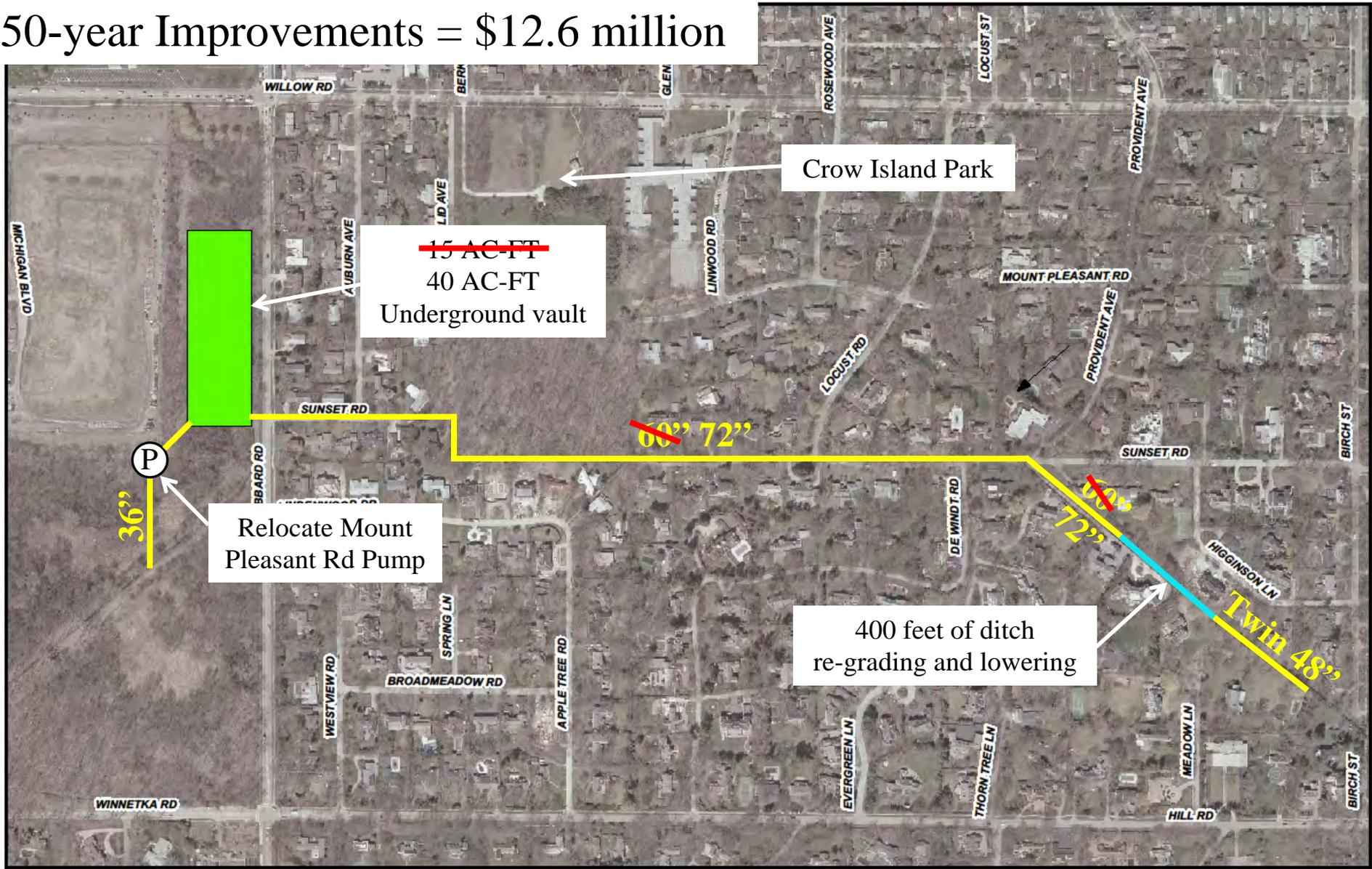
60"

60"

Twin 48"

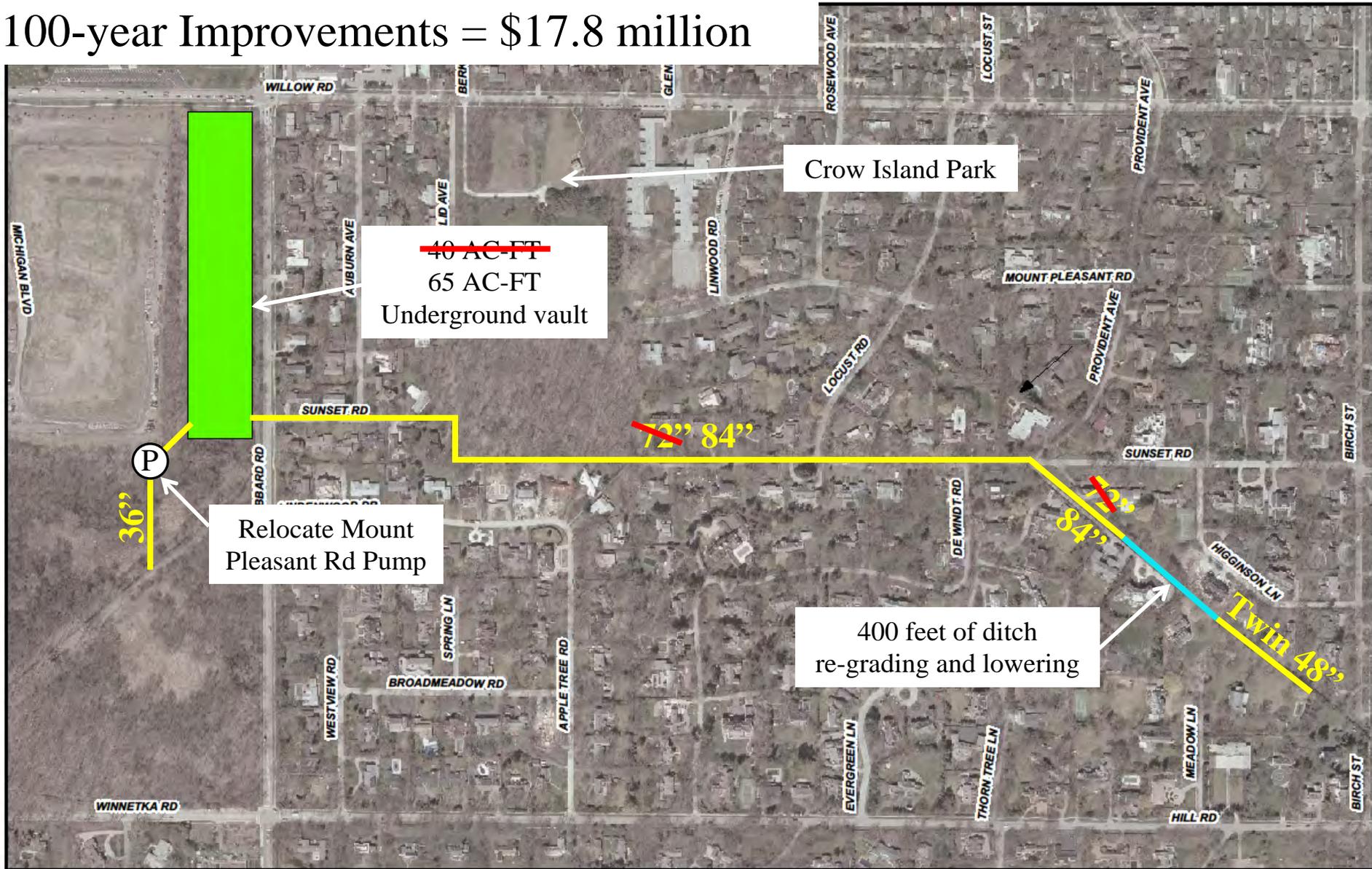
# South of Willow Road Study Area

50-year Improvements = \$12.6 million



# South of Willow Road Study Area

100-year Improvements = \$17.8 million



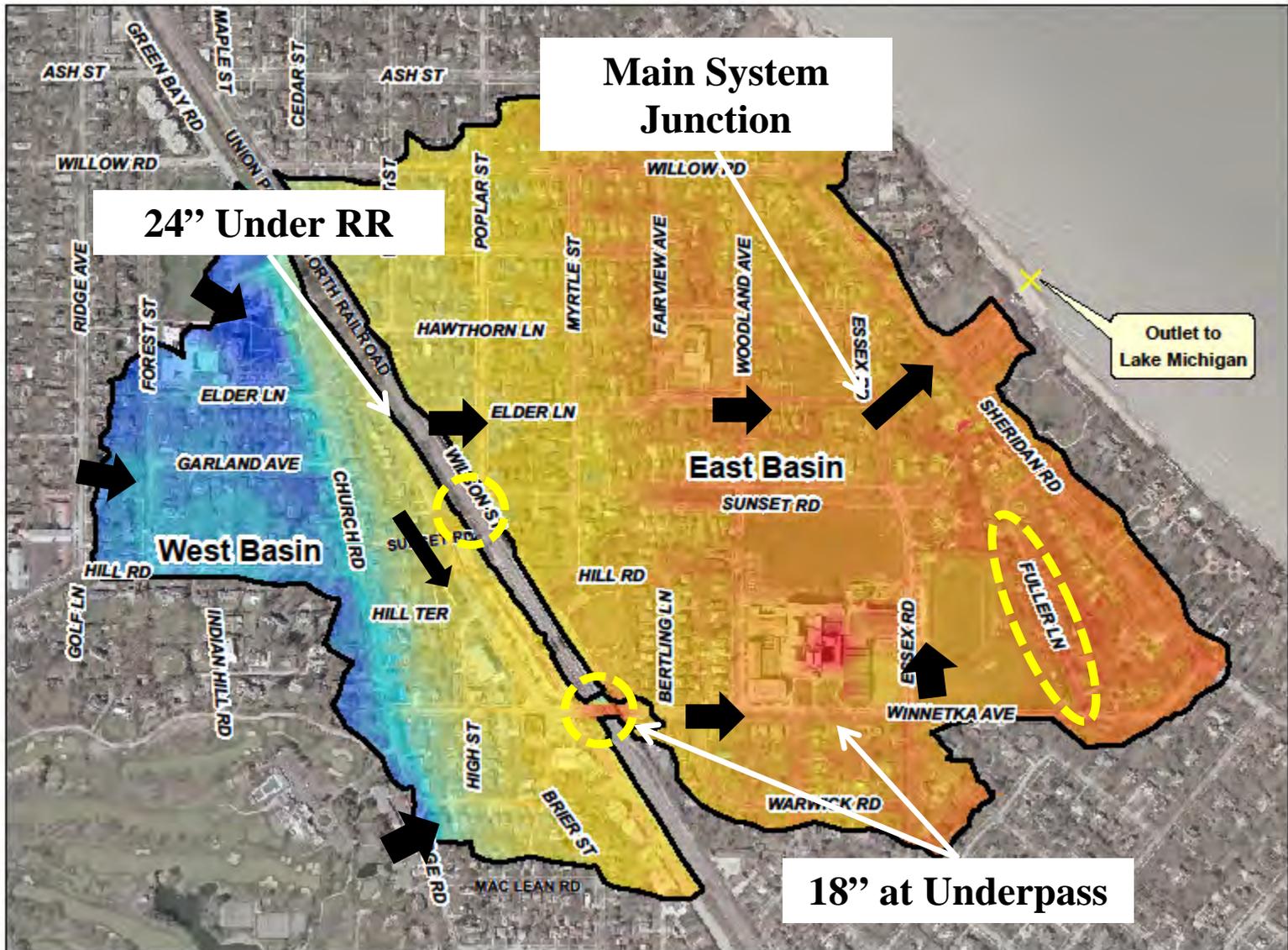
# South of Willow Road Benefits



Level of Protection	Engineer's Estimate of Probable Cost (Millions)
10-year	\$6.8
25-year	\$13.0
50-year	\$14.8
100-year	\$17.5
100-year (above ground storage)	\$9.6

- CCFPD approval and land acquisition
- MWRDGC
- US Army Corps of Engineers

# Underpass Study Area



# Underpass Study Area

- Three Alternatives
  - **Alt 1: Increase pipe sizes for each design storm**
    - Does not benefit pedestrian underpass
  - Alt 2: Underground storage along Green Bay Rd
    - Benefits both underpasses
    - Reduces required pipe sizes
  - Alt 3: Underground storage at New Trier
    - Does not benefit pedestrian underpass
    - Reduces required pipe sizes

# Underpass Study Area

25-year Improvements (Alt 1) = \$2.9 Million



# Underpass Study Area

50-year Improvements (Alt 1) = \$3.4 Million



# Underpass Study Area

100-year Improvements (Alt 1) = \$4.4 Million

