

# Village of Lincolnshire



February 26, 2020

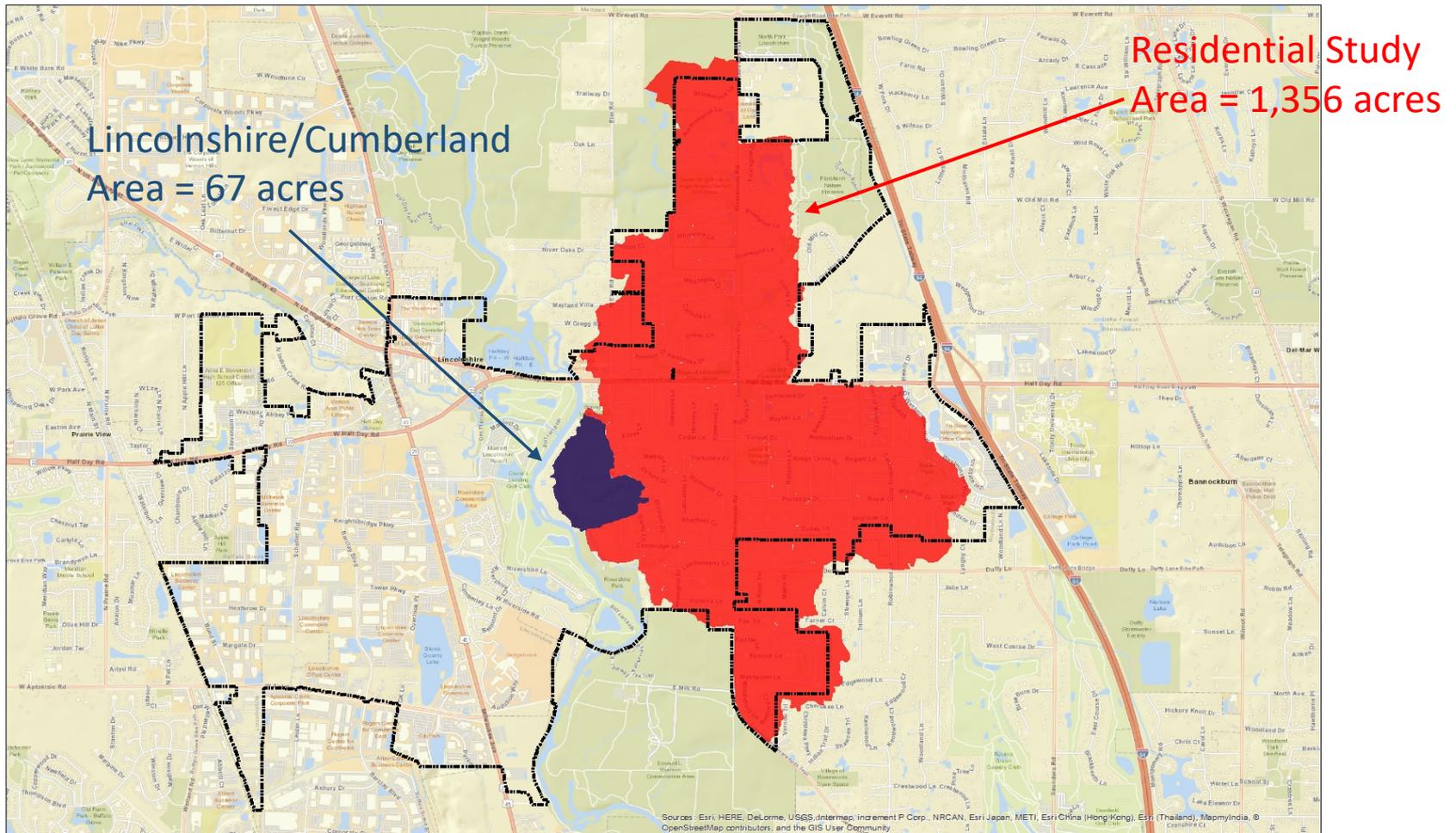
## Lincolnshire Drive & Cumberland Drive Drainage Meeting



# Outline of Presentation

- Scope of Village-Wide Stormwater Study
- Review Causes of Flooding
- Preview of Potential Drainage Improvements
  - Lincolnshire Drive & Cumberland Drive
  - Oxford Drive
- Additional Challenges to be Addressed in Stormwater Study

# Scope of Village-Wide Drainage Study



- Village Area = 2,992 acres

# Scope of Village-Wide Drainage Study

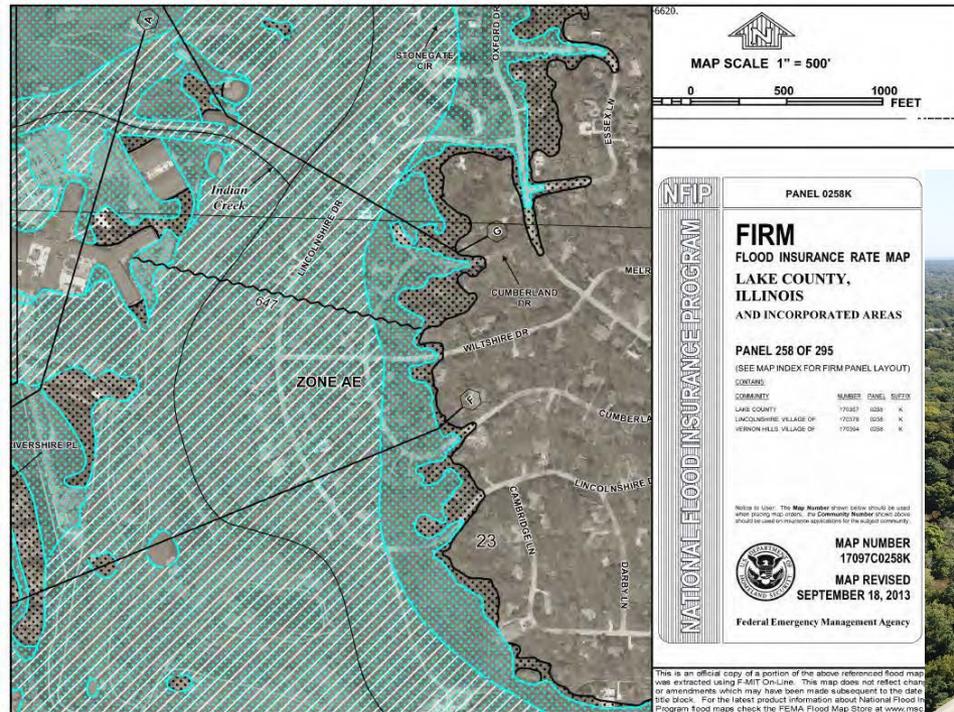
- Gather data
  - 168 survey responses and drainage complaints
  - 40 Open House attendees
  - Previous Village studies
  - Reconnaissance during September 2019 flood event
- Analyze existing stormwater system using hydrologic and hydraulic models
  - New rainfall data
  - Determine existing level of service
  - Identify areas subject to flooding
- Develop projects and strategies to reduce the risk of future flooding
  - Capital Improvement projects
  - Green Infrastructure
  - Homeowner Guidance
- Prioritize projects throughout Village
- Prepare Final Stormwater Master Plan Report

# Causes of Flooding – Lincolnshire Drive & Cumberland Drive

Des Plaines River Drainage Area = 325 mi<sup>2</sup> at Lincolnshire

≈125 mi<sup>2</sup> in Wisconsin

≈200 mi<sup>2</sup> in Illinois

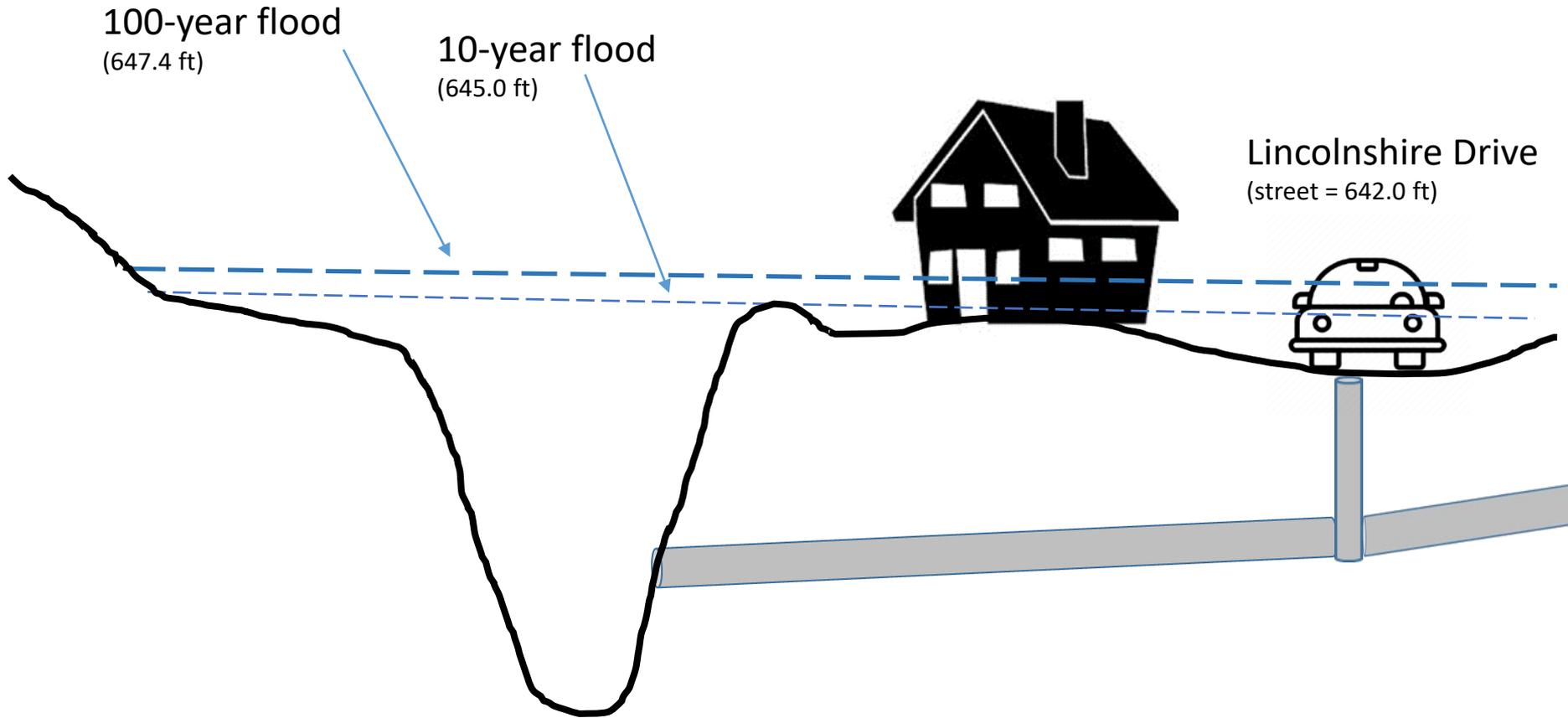


Des Plaines River Floodplain and Floodway

September 14, 2019 Flooding at IL22

# Causes of Flooding – Lincolnshire Drive & Cumberland Drive

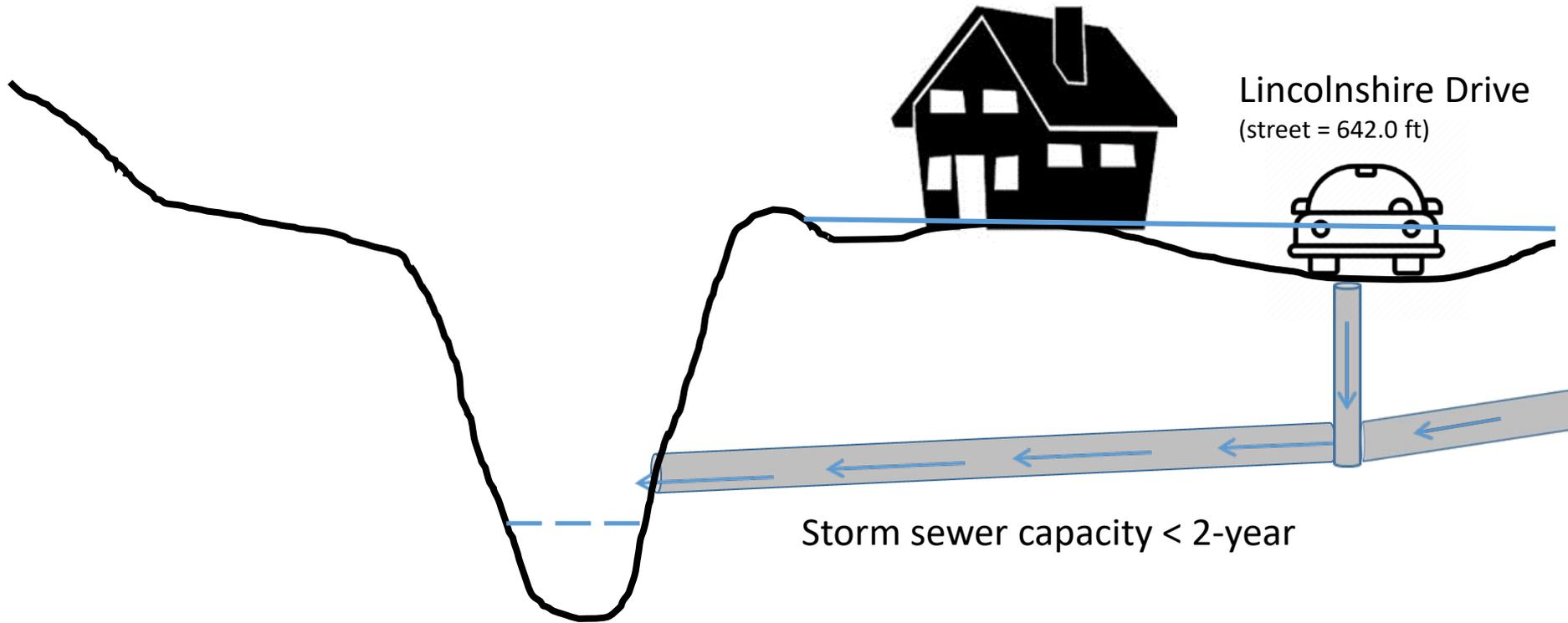
## Des Plaines River Flooding



Exaggerated Cross-Section of Des Plaines River and Lincolnshire Drive

# Causes of Flooding – Lincolnshire Drive & Cumberland Drive

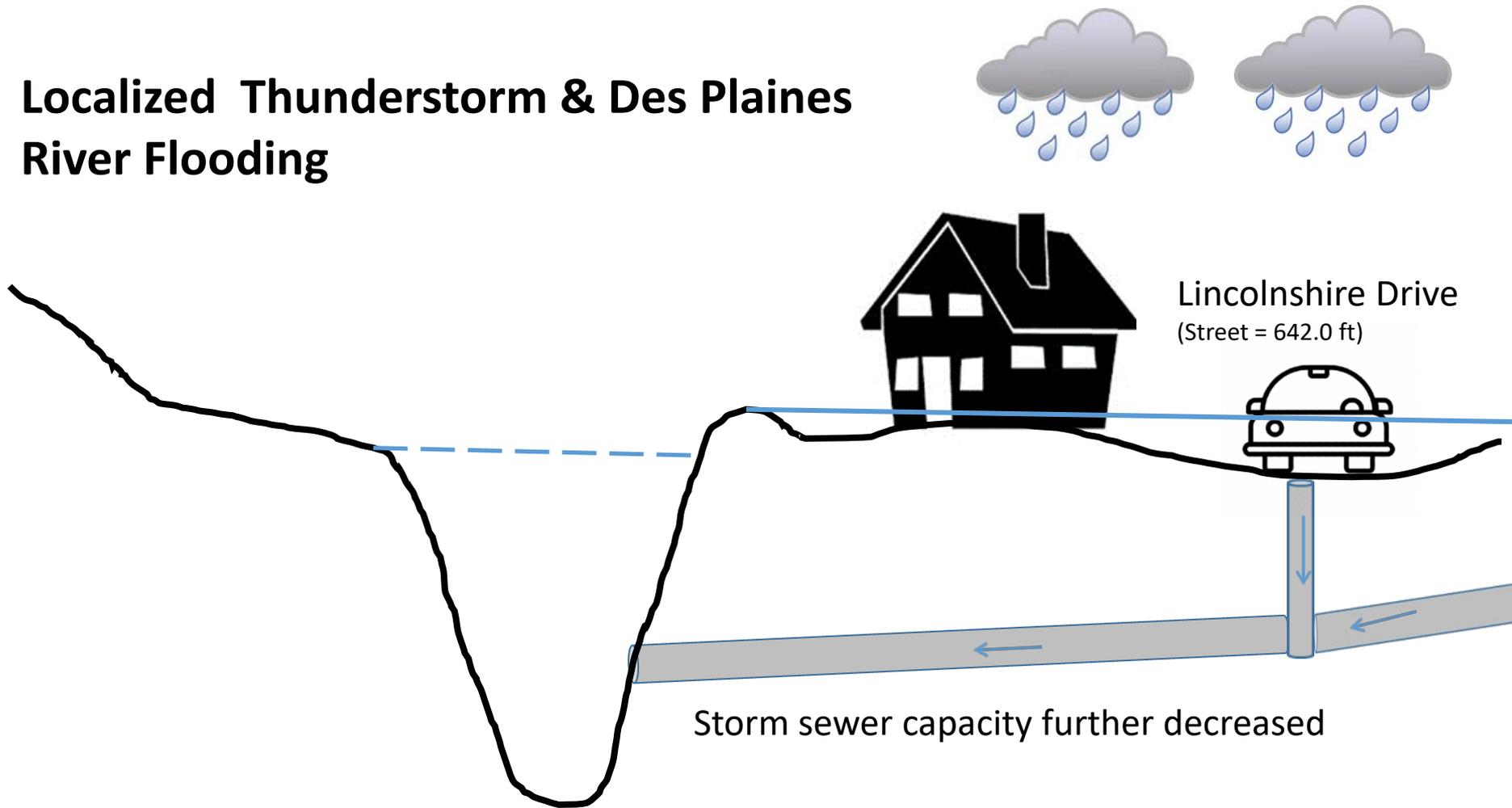
**Localized  
Thunderstorm**



Exaggerated Cross-Section of Des Plaines River and Lincolnshire Drive

# Causes of Flooding – Lincolnshire Drive & Cumberland Drive

## Localized Thunderstorm & Des Plaines River Flooding

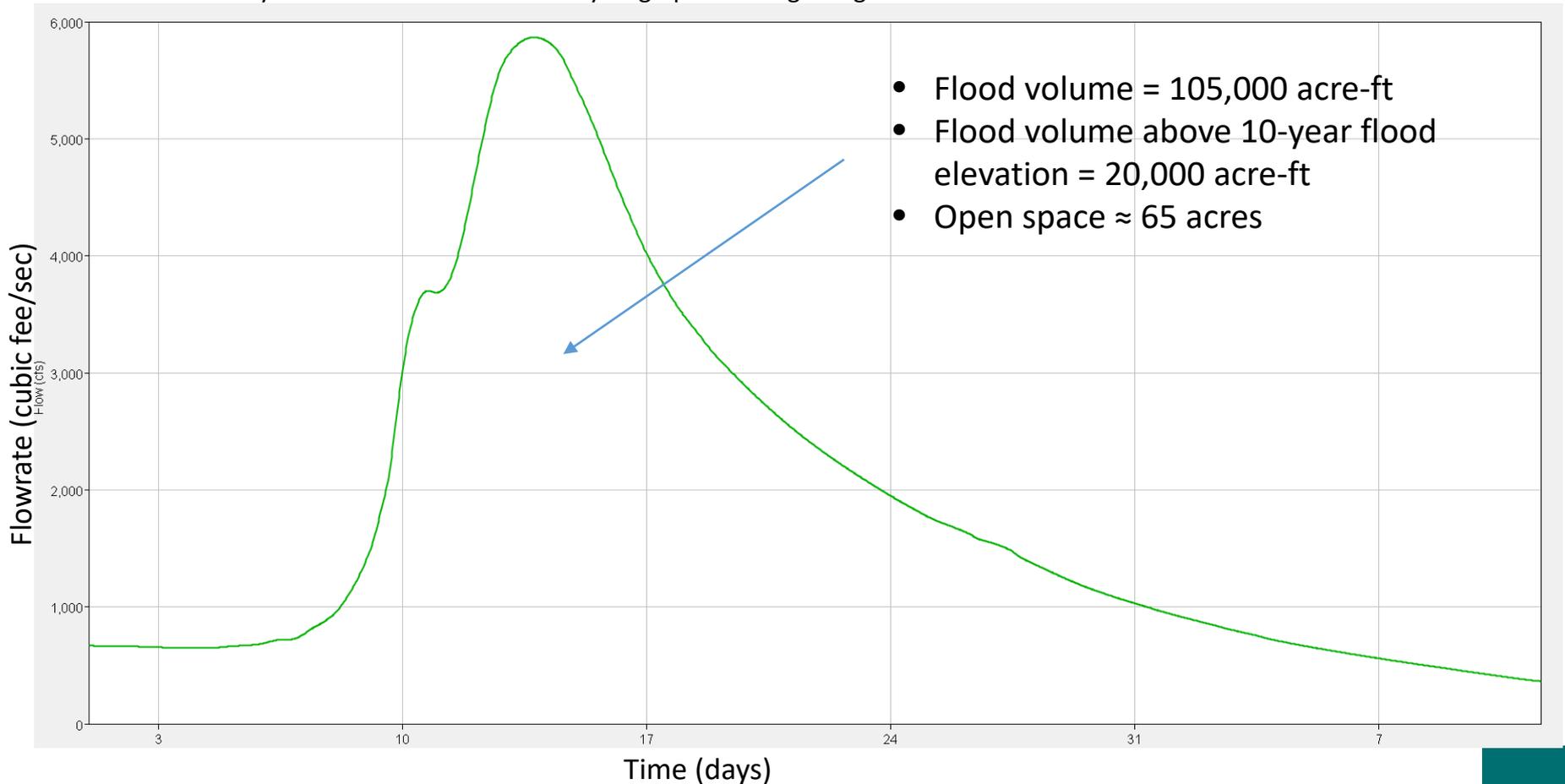


Exaggerated Cross-Section of Des Plaines River and Lincolnshire Drive

# Potential Drainage Improvements

Solving Des Plaines River Flooding is beyond scope of this study

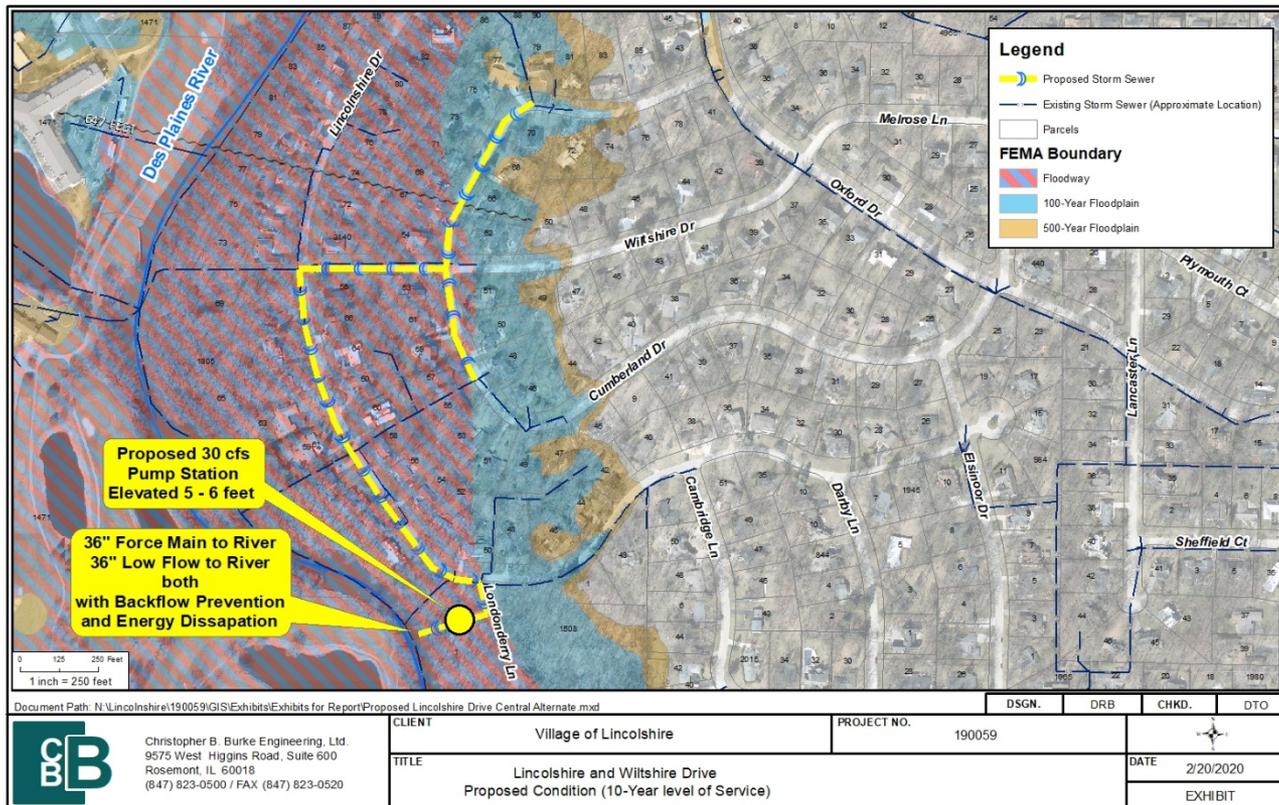
100-year Des Plaines River Flood hydrograph entering Village of Lincolnshire



# Potential Drainage Improvements - South

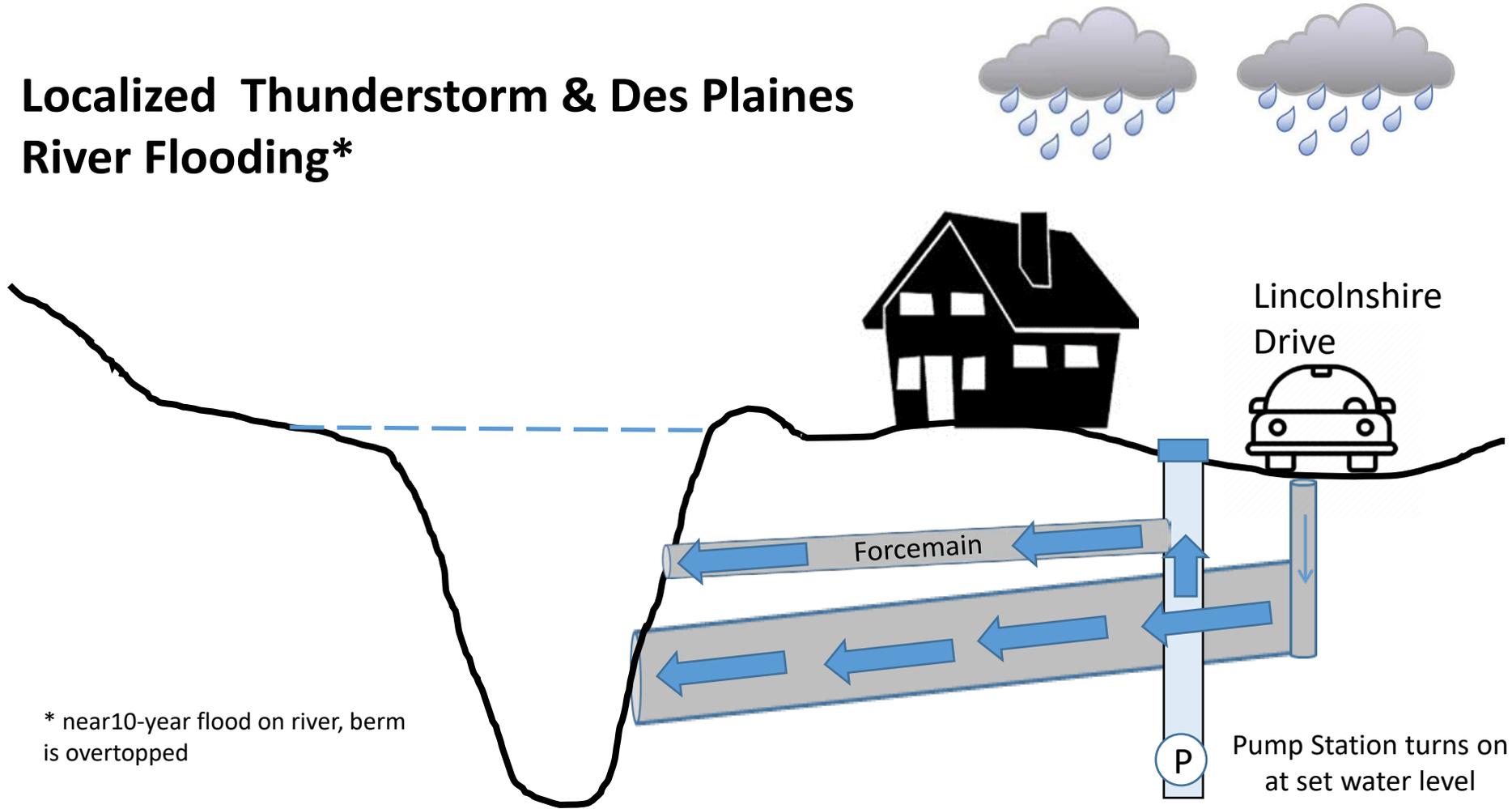
- Local Drainage Improvements

- 10-year level of service (similar to new subdivision standards)
- Engineer's Estimate of Cost = \$7.5M
- Pump station with single river discharge location
- Will function under river conditions up to  $\approx$  10-year flood elevation
- Large diameter storm sewers
- Pump capacity = 30 cfs
- Current PW pumps = 6-7 cfs



# Proposed Drainage Improvement - Lincolnshire Drive & Cumberland Drive

## Localized Thunderstorm & Des Plaines River Flooding\*



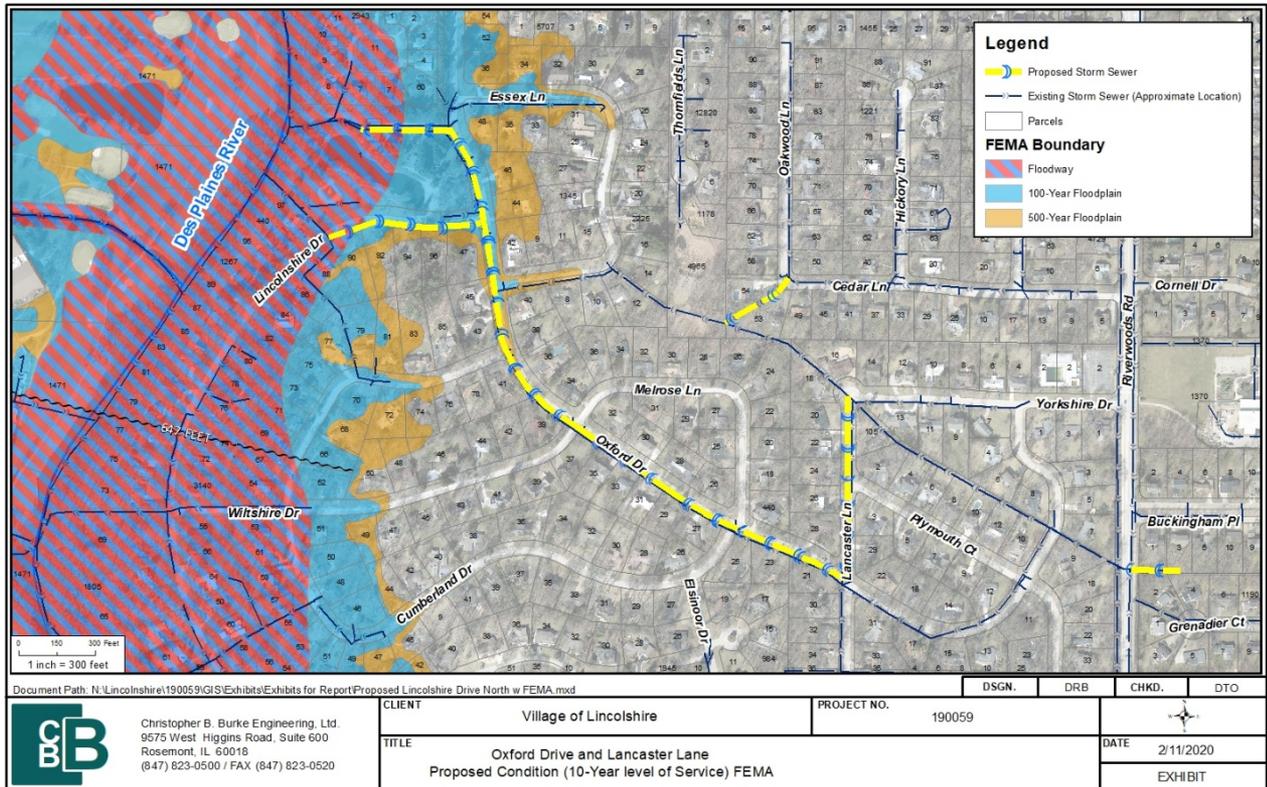
Exaggerated Cross-Section of Des Plaines River and Lincolnshire Drive

# Other Options Considered and Dismissed...

- More Pipes to the River
  - Drawbacks:
    - Would not function when River is elevated
    - Without upsizing all storm sewers, project would not reduce flooding on other internal streets
    - Cost for storm sewers portion of project is \$5.5M
- Internal Stormwater Storage
  - Drawbacks:
    - Only open spaces are below Des Plaines River 10-year flood elevation
      - Volume may not be available during a flood event
      - Storage basin would not discharge during flood event
    - Cost of excavation
    - Permitting requirements (floodway, wetlands)
    - Still requires cost of storm sewers to convey water to storage area at a cost of \$5.5M

# Potential Drainage Improvements - North

- Local Drainage Improvements
  - 10-year level of service
  - Large diameter storm sewers
  - Will function under river conditions up to 10-year flood elevation
  - Engineer's Estimate of Probable Cost = \$4.3M



## Additional Challenges to be Addressed in Study

- The History and Development of Lincolnshire



1946: Pre-Development



1961: Development in Progress

- Prior to Modern Stormwater Practices
- No Mass Grading
- Tree Preservation

# Additional Challenges to be Addressed in Study

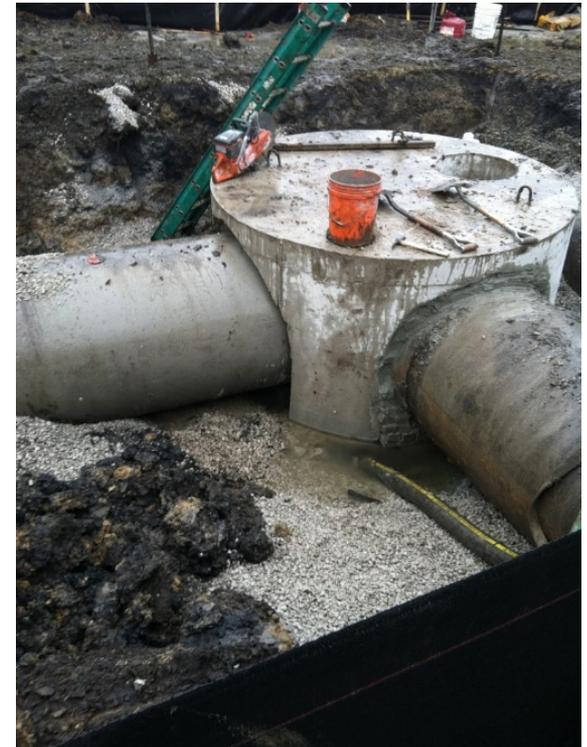
- Typical Subdivision Development



- Large Detention Basins
- Engineered Green Infrastructure
- Storm Sewer Capacity
- Dedicated Open Space Maintenance
- Engineered lot drainage
- Less overgrowth and accumulation of debris

# Challenges to be Addressed in Study

- Cost of retrofitting Village stormwater infrastructure
  - Accommodate runoff based on new rainfall standards
  - Level of Service
    - 10-year storm sewer
    - Roads will store and convey water in larger events
  - Retrofit Village system to accept drainage from private property
  - Overall order of magnitude for infrastructure improvements for all study areas > \$20M\*
  - Potential funding sources



\*does not include detention basin retrofits or private property work

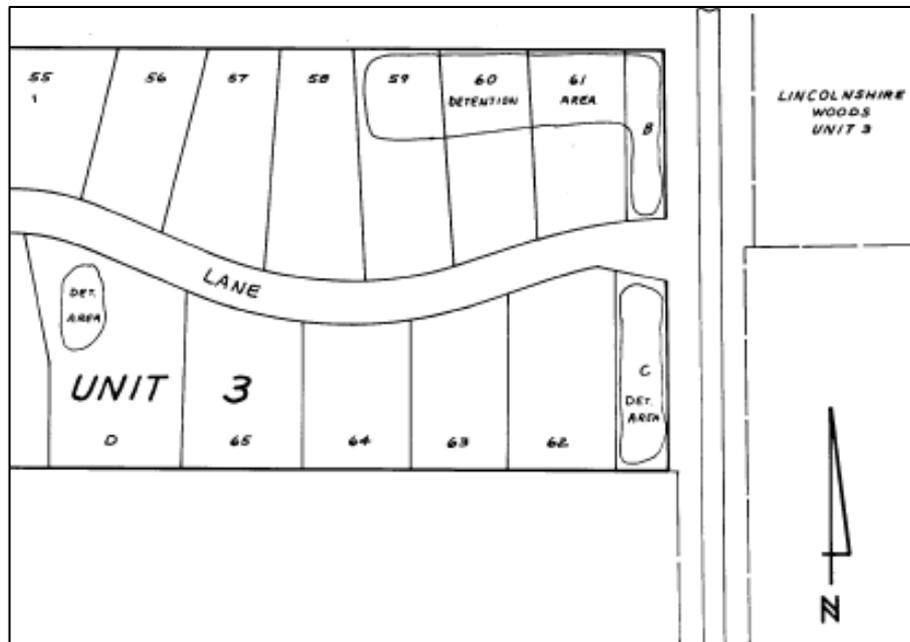
# Challenges to be Addressed in Study

- Private Property Maintenance
  - Dense vegetation and large lots
  - Lots designed to follow natural topography
  - Lot grades change over time
    - Accumulated debris
    - Landscaping
- Toolbox for residents
  - Green Infrastructure
  - Flood protection
  - Nuisance drainage



# Challenges to be Addressed in Study

- Existing Detention Basins
  - Nearly 130 detention basins within Village
  - Many designed prior to modern stormwater practices
  - Detention basin ownership uncertain
  - Maintenance history and responsibility uncertain



Typical Subdivision Plat prior to modern stormwater management practices

Questions?

Thank you for your time....