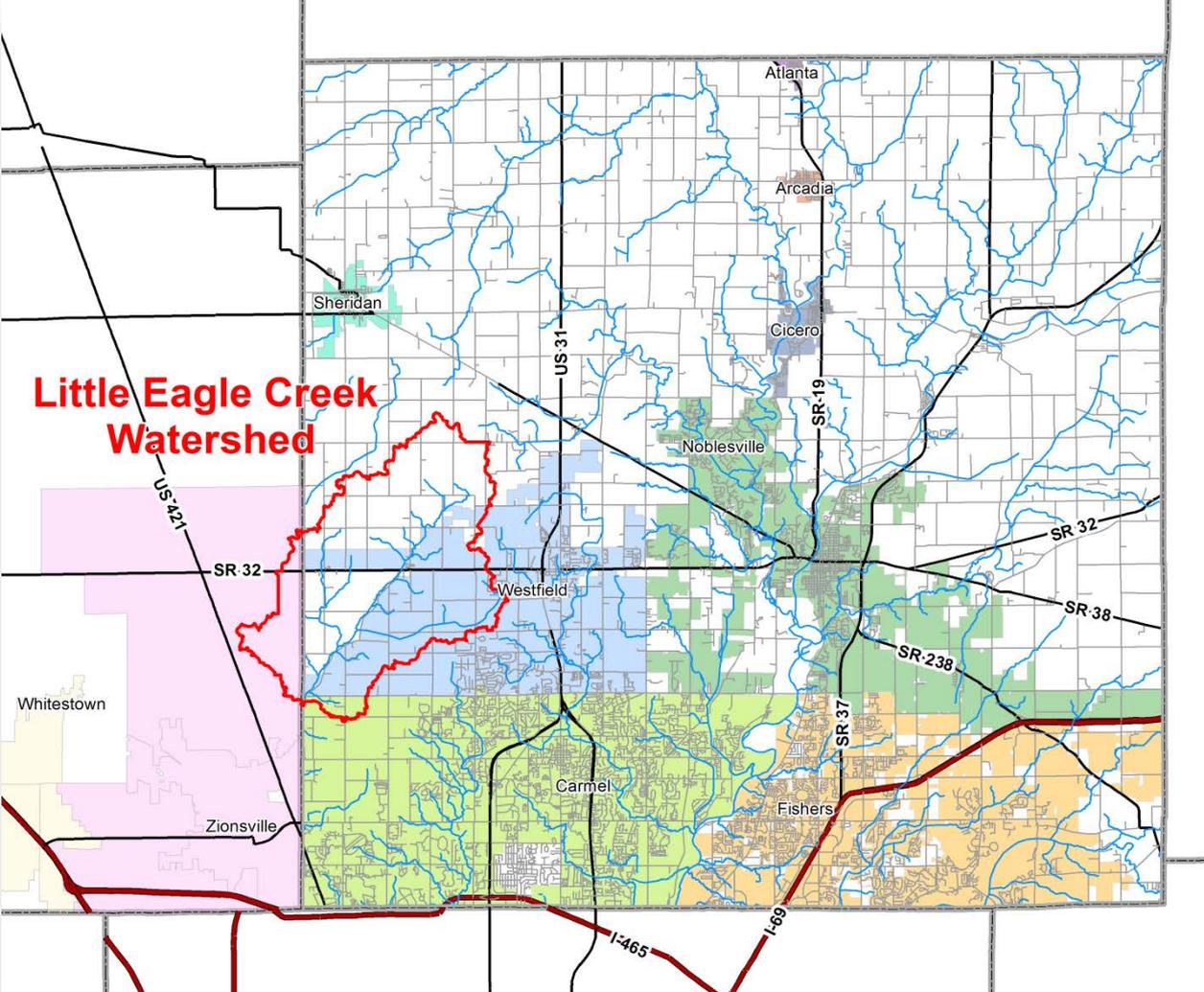


Summary of Little Eagle Creek Watershed Master Plan

Public Meeting
July 28, 2015

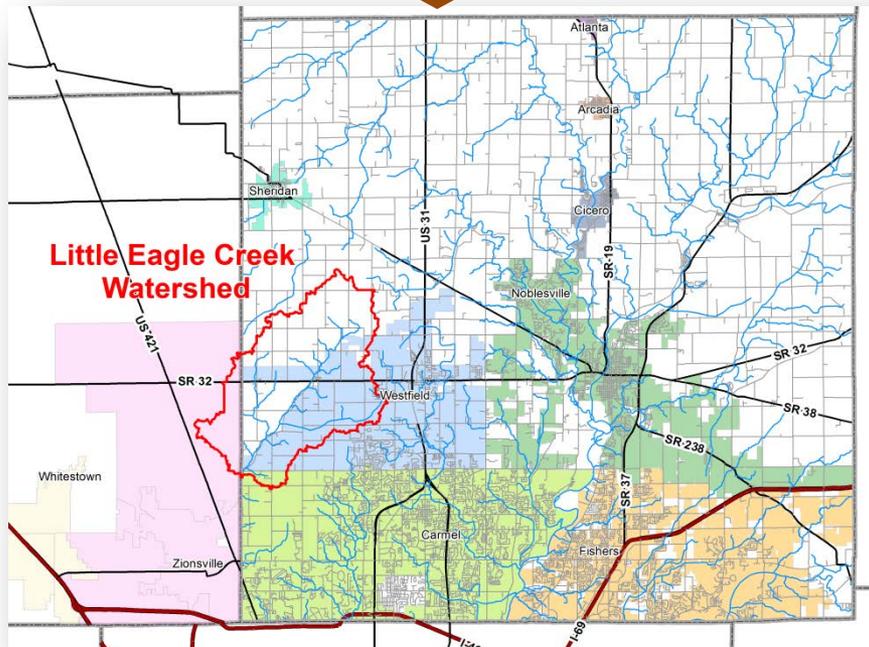
Prepared by:



Benefits of Watershed Planning in Hamilton County

CONCERN:

As Carmel and Westfield continue to grow and expand, **watersheds** in Western Hamilton County face increased urbanization which could lead to **environmental and flooding concerns**.



RESPONSE:

Holistic-based watershed planning provides a proven framework to **identify stormwater management concerns** and provide a **recommended plan** so that new stormwater problems are not created and existing problems can be addressed.

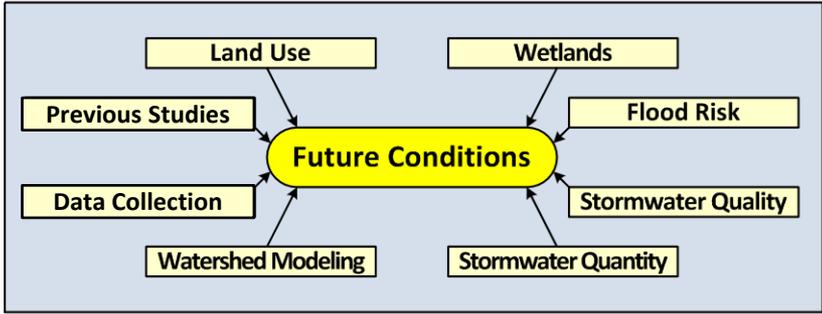
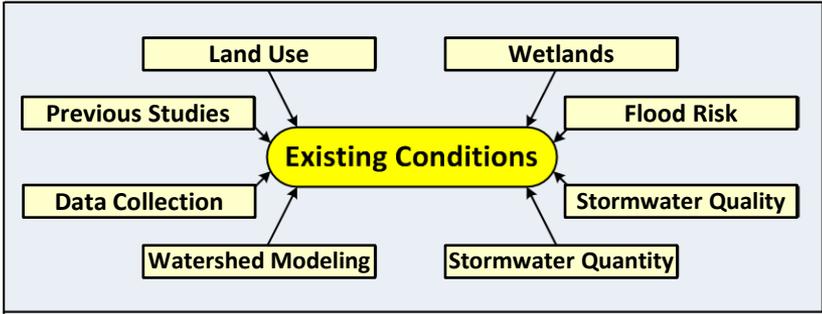


WATERSHED MASTER PLAN

- **Guide proper stormwater management as development occurs to:**
 - Preserve natural & beneficial functions of the natural drainage systems
 - Preserve & enhance stormwater quality
- **Provide long term guidance to local officials for:**
 - Stormwater regulatory decisions
 - Zoning decisions
 - Other development-related decisions



Watershed Master Planning: 7 Components

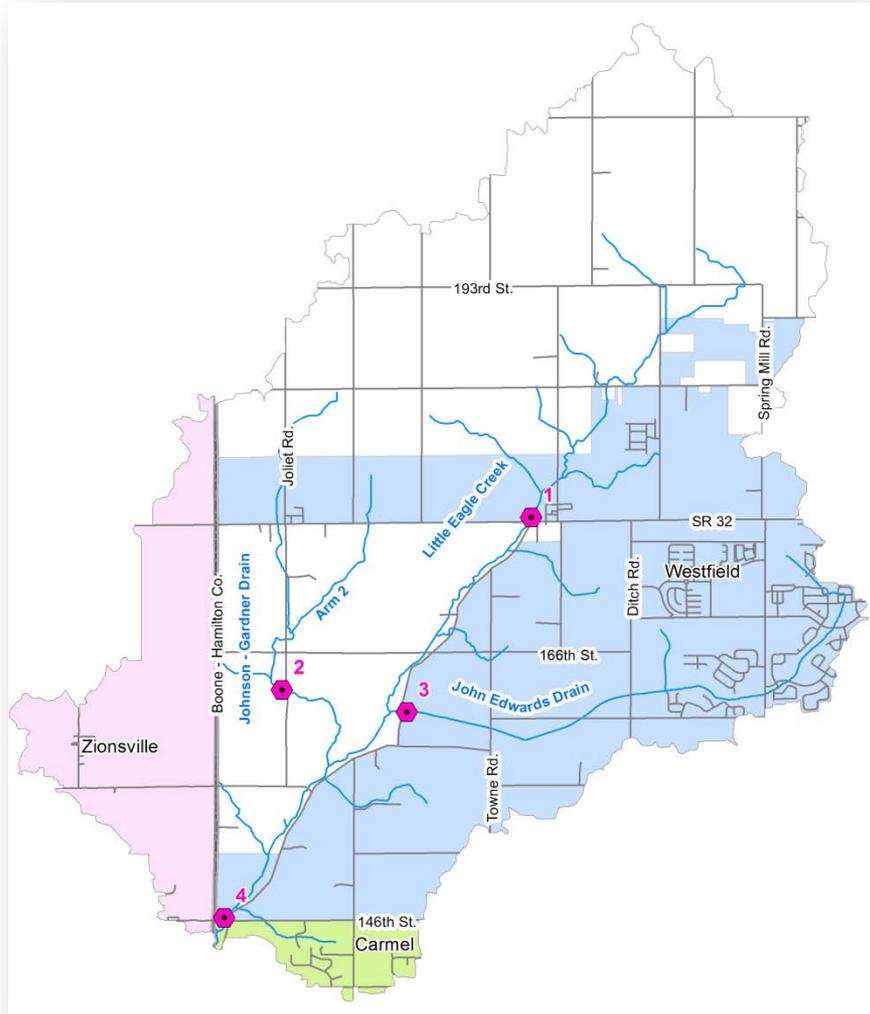


GOALS	EVALUATION CRITERIA
Reduce existing extent of flooding & drainage problems	Technical Criteria
Improve water quality of stormwater runoff	Economic Criteria
Protect, enhance & restore natural conveyance & storage	Environmental Criteria
Prevent future increased vulnerability to watershed problems	Institutional Criteria

A vertical flowchart with a blue background and yellow text boxes. The steps are:

- Categorize all problems as: "Isolated" or "Large Scale" Problem
- For each "Large Scale" Problem: list "Potential Solutions"
- Screen "Potential Solutions" down to "Promising Solutions"
- Table of "Promising Solutions"
- Detailed analysis of "Promising Solutions"
- Perform Hydrologic and/or Hydraulic Analysis (as required)
- Yes/No Recommendation for Master Plan
- For each recommended Master Plan Component:
 - Identify Problem Addressed ↔ List Positive Impacts
 - Identify Disadvantages ↔ Provide Estimated Cost
- Implementation Plan
- Final Recommended Plan Components
- Specific Action List with Implementation Order

1 EXISTING CONDITIONS: STORMWATER QUALITY



Location of Four Sampling Sites

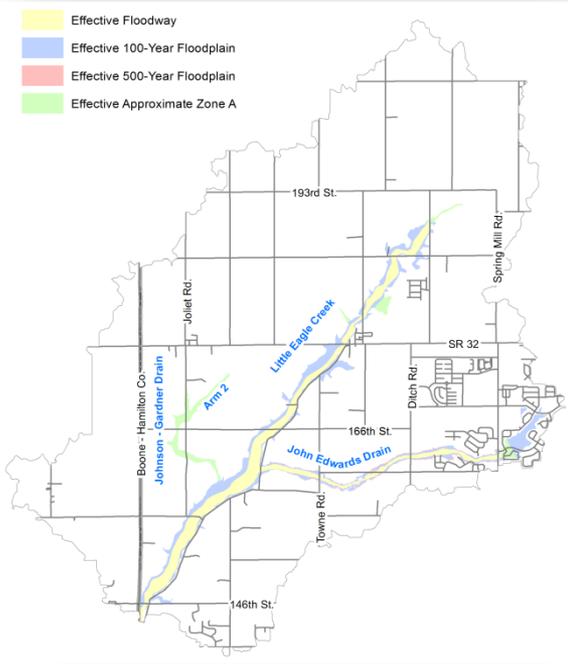
Site	QHEI	Total P (mg/L)	E. Coli (CFU/100ml)	Site Score	Overall Rank
1	66	0.322	500.3	9	2
2	62	0.240	132.7	7	1b
3	52	<0.10	162.3	7	1c
4	65.5	0.210	169.0	7	1a
Goal	58	0.3	235		

- Physical
- Chemical
- Chemical

- **Red** values represent scores less than IDEM/EPA water quality standards

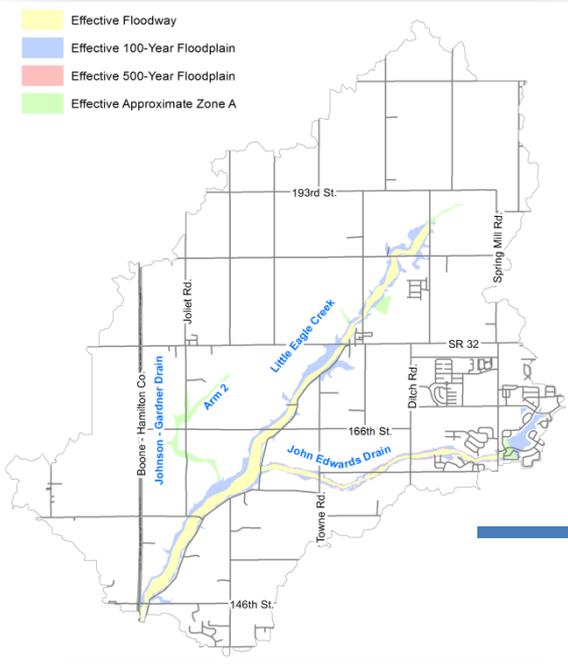
1 EXISTING CONDITIONS: GENERAL FLOOD CHARACTERISTICS

Effective Flood Insurance Study Map

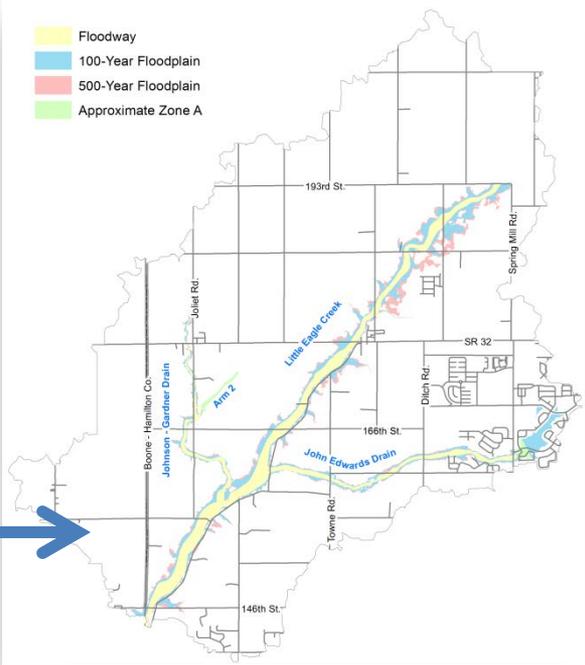


1 EXISTING CONDITIONS: GENERAL FLOOD CHARACTERISTICS

Effective Flood Insurance Study Map



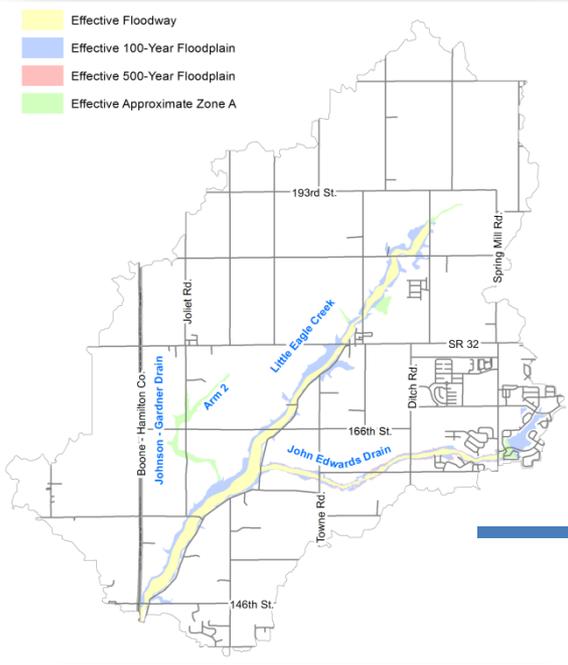
Proposed Floodplain Delineation



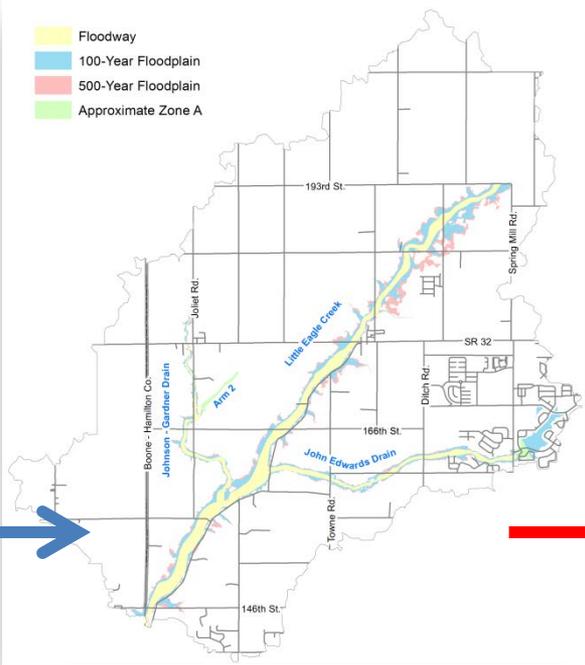
Using more detailed topography and extending modeling northward, we can better delineate current floodplains.

1 EXISTING CONDITIONS: GENERAL FLOOD CHARACTERISTICS

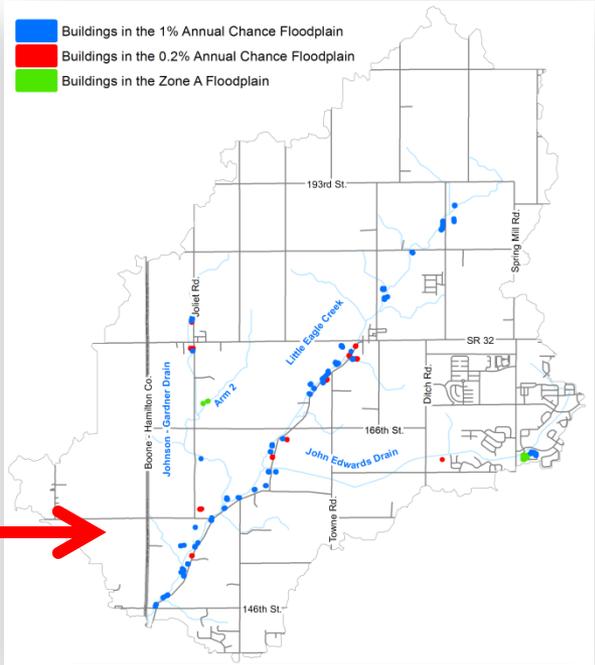
Effective Flood Insurance Study Map



Proposed Floodplain Delineation



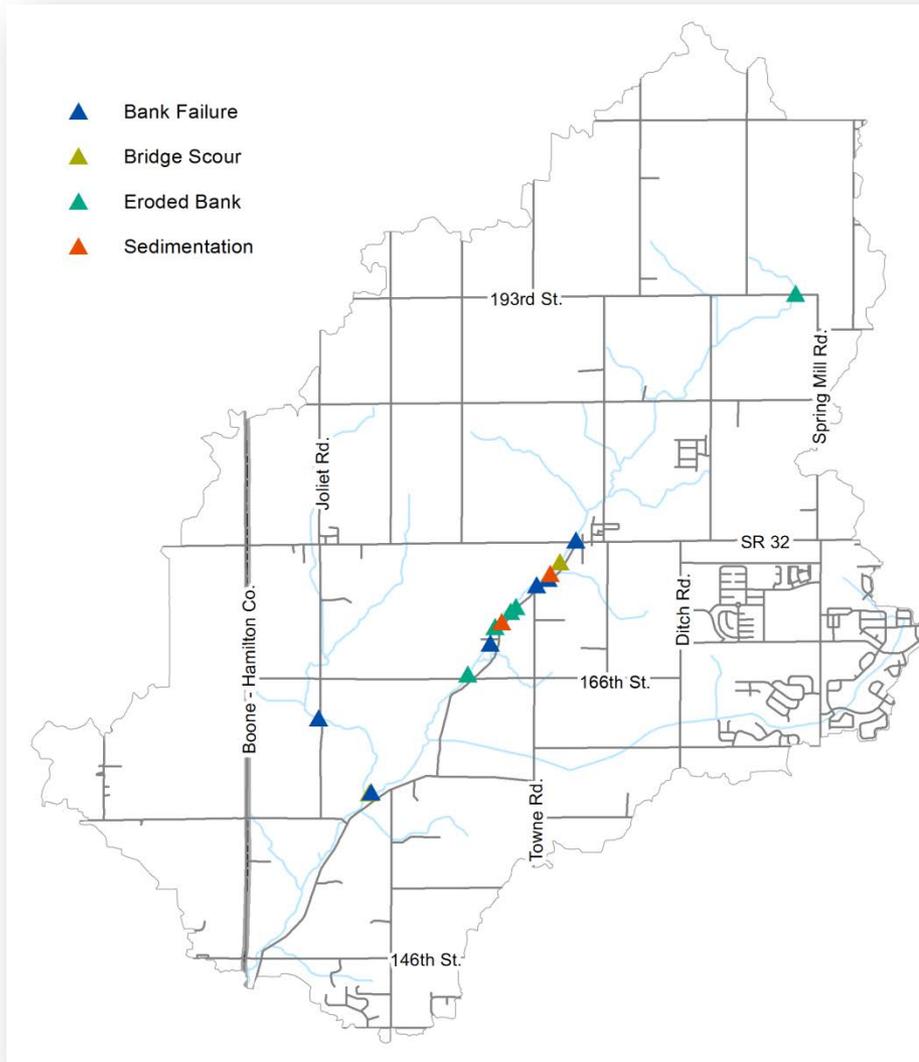
Flooding Concerns



Using more detailed topography and extending modeling northward, we can better delineate current floodplains.

Overlaying proposed floodplains on aerial photography shows 65 buildings in/near the edge of the 1% (100 yr.) floodplain; and 13 other buildings in/near the edge of the 0.2% (500 yr.) floodplain.

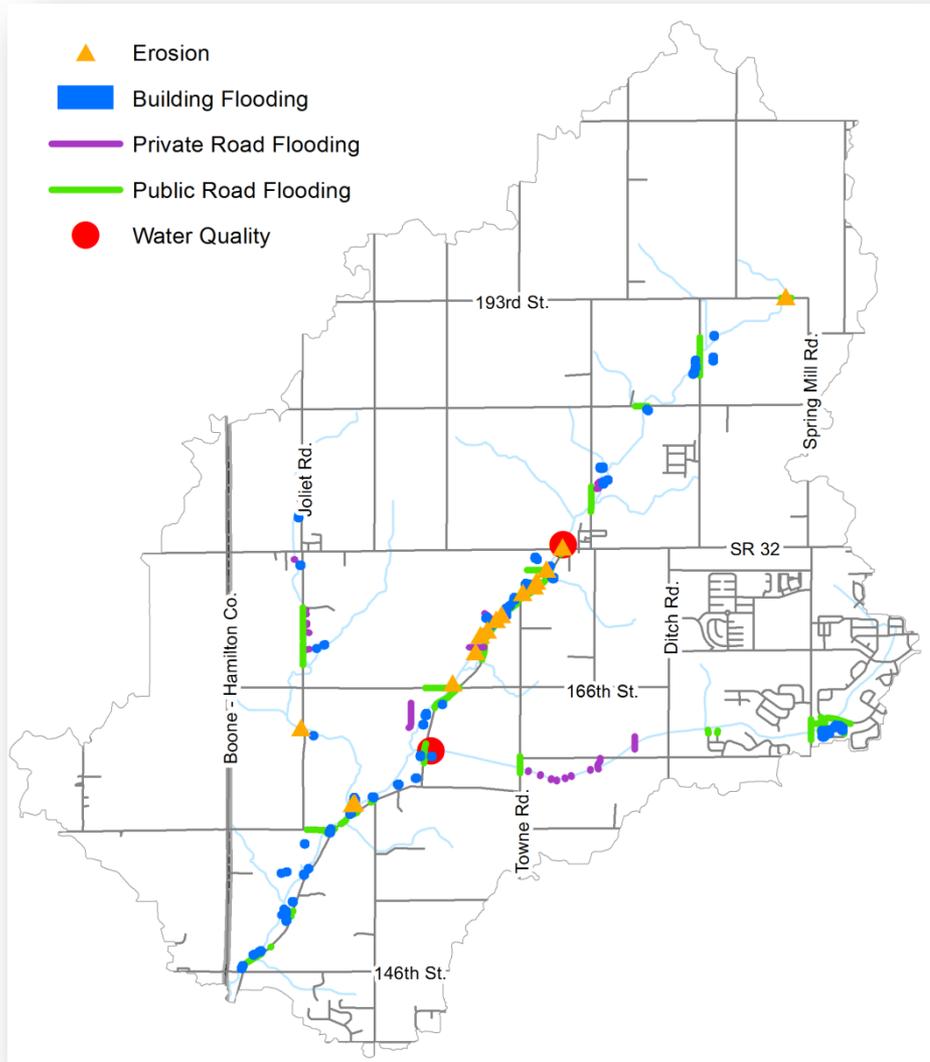
1 EXISTING CONDITIONS: EROSION



- Localized erosion problems
- Not system-wide sediment issues
- Numerous vegetated mid-channel sand bars indicate a mostly stable stream



1 EXISTING CONDITIONS: SUMMARY OF CONCERNS



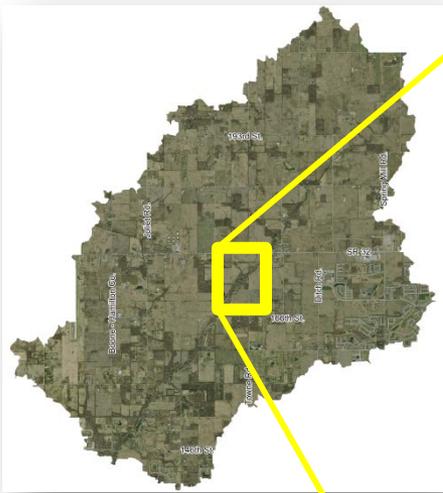
- See Master Plan text for tabular list

Map of Areas of Concern

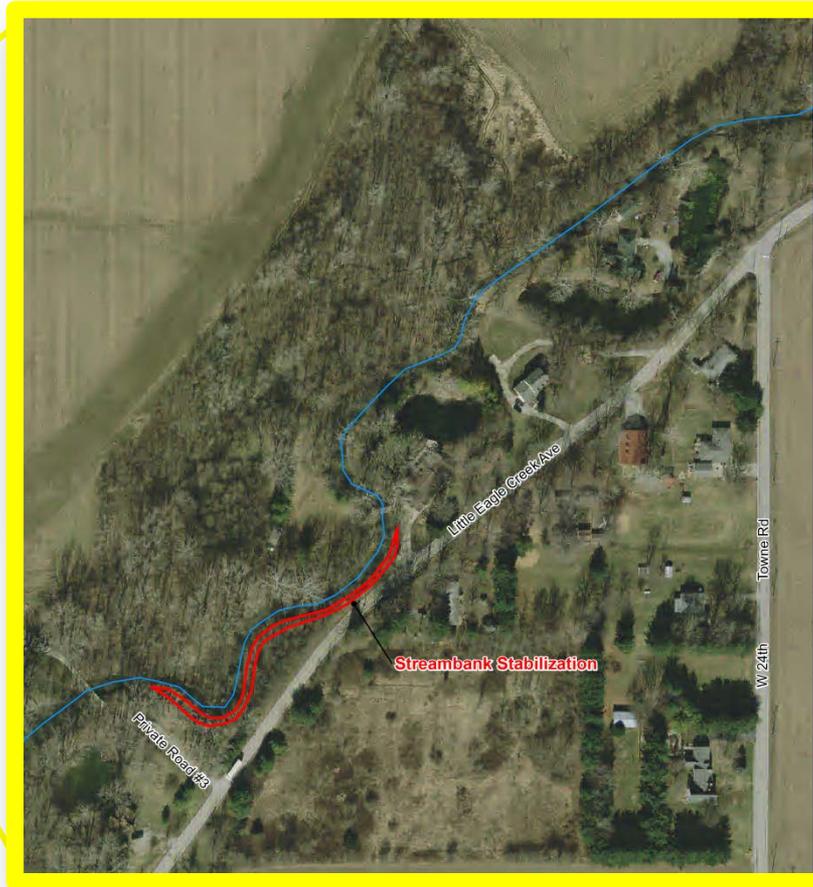
6 SAMPLE SOLUTION: UPDATE ORDINANCE & TECHNICAL STANDARDS

- Add Channel Protection Volume Requirements and Allowance for LID/Green Practices
 - Reduce future increase in channel bank erosion
 - Reduce nuisance flooding
 - Lessens the impact of development on water quality
- Update Pollutant Removal Requirements
 - Lessens the impact of development on water quality

6 SAMPLE SOLUTION: STABILIZE STREAMBANK ALONG LITTLE EAGLE CREEK



Watershed Aerial View

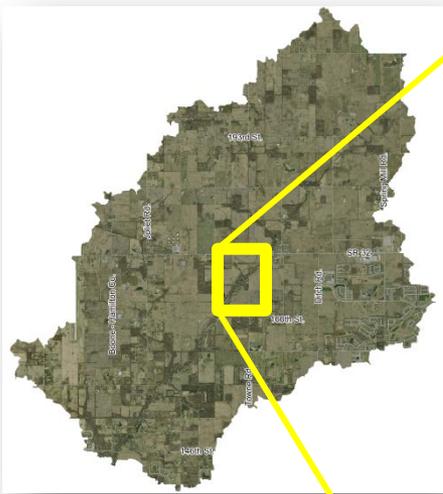


Streambank Stabilization Location

- Stabilization isn't necessary unless public or private infrastructure is threatened
- Stabilize in this location due to proximity of erosion to Little Eagle Creek Avenue
- Minor amount of grading work to restore streambank
- Stream velocities are slow enough for vegetated erosion control

Approximate Cost: \$420,000.

6 SAMPLE SOLUTION: DECREASE LOW-FLOW CHANNEL WIDTH



Watershed Aerial View



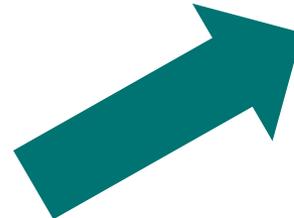
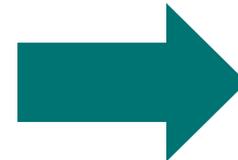
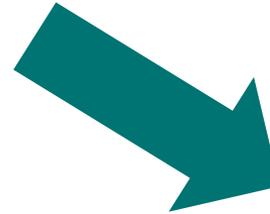
Decrease Low-Flow Channel Width Location

- Overly wide channel sections can cause sediment imbalance and instability
- Will reduce likelihood of downstream erosion
- Modify stream in these areas to similar cross sectional area upstream and downstream

Approximate Cost: \$412,000.

6 SAMPLE SOLUTION: MODIFY AGRICULTURAL PRACTICES

- Increase use of cover crops
 - Can reduce runoff and soil loss by 50%
 - Some cover crops varieties with long roots can pull nutrients up through soil for primary crop
- Increase use of no-till
 - Can reduce runoff and soil loss by 90% when combined with cover crops
- Increase use of grassed waterways
 - Useful where gullies have/will form
 - Cost-share programs available through NRCS
 - Waterway must be in place for a minimum of 10-years with cost-share



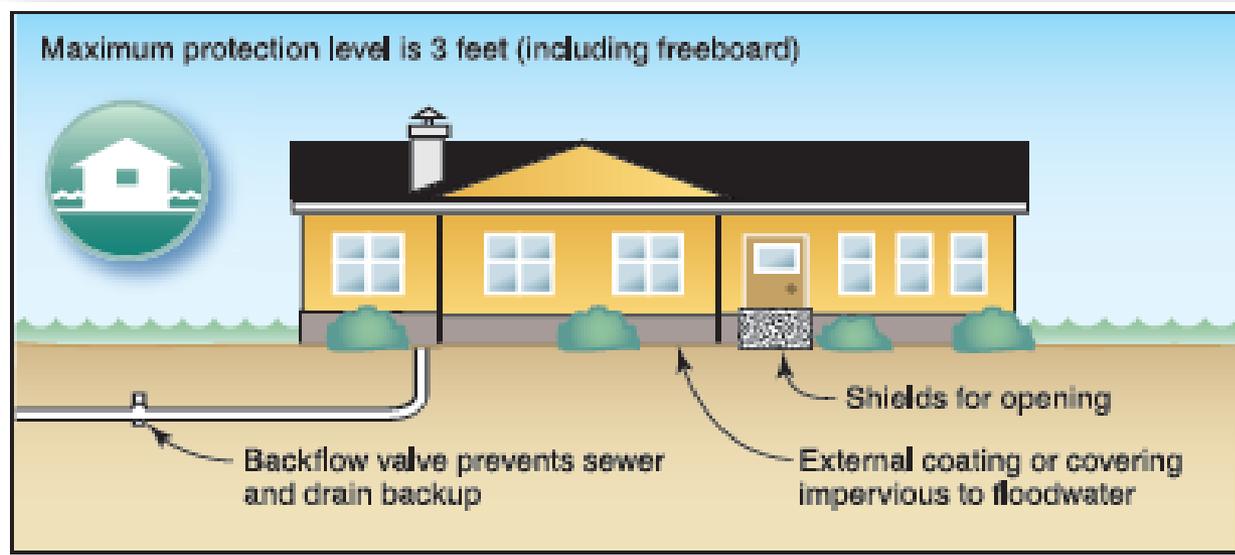
Will reduce likelihood of erosion and improve water quality

6 SAMPLE SOLUTION: FLOODPROOF STRUCTURES IN THE FLOODPLAIN

- Limited grant/cost-share funding available to individual homeowners
- Small retrofits can reduce flood insurance premiums
- Examples:
 - Raise electrical outlets above Base Flood Elevation
 - Raise mechanical systems above Base Flood Elevation
 - Create /increase size of crawl space openings to allow flood waters to pass through

See “Homeowner’s Guide to Retrofitting”

<http://www.fema.gov/media-library/assets/documents/480>



Questions?

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