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Division of Water Resources

FEMA

WSP

Shawnee County

Floodplain Mapping Project Data Development Kickoff Meeting

April 25, 2023

While we are waiting, please enter your name and community in the chat box!

Your engagement in this process is important to the success of this project, so thank you for taking the time to be here today!

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Introductions

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Joanna Rohlf, CFM, GISP
Floodplain Mapping Coordinator

William Pace, CFM
Floodplain Mapping Specialist

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Floodplain Mapping Specialist

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State NFIP Coordinator

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NFIP Specialist

FEMA – Region VII

Dawn Livingston
Regional Project Officer

WSP USA Environment & Infrastructure Inc.

Ben Rufenacht, PE, CFM
Project Manager / Engineer

Erika Stanley
Sr. GIS Analyst

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Today's Goals

Share details on the mapping project

Get initial feedback on modeling methods

Review future steps

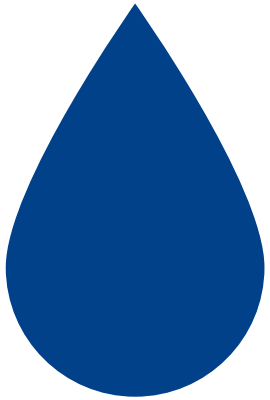
Background

Background

- Shawnee County Effective Mapping is dated September 29, 2011
- Upper Kansas Custom Watershed BLE Project
  - *Discovery Meeting and BLE Review: September 9 and 15, 2021*
- Lower Kansas Custom Watershed BLE Project
  - *Discovery Meeting and BLE Review: September 8 and 15, 2021*
- Shawnee County
  - *Proposed Floodplain Mapping Meeting November 9 , 2021*
- It was determined that updated modeling and mapping for portions of Shawnee County using newer Lidar and 2D modeling techniques, would be beneficial.

Review of the Work Ahead and How We Propose Doing It

Definitions



Hydrology

How Much Water?

Hydraulics

How High Will Water Get?

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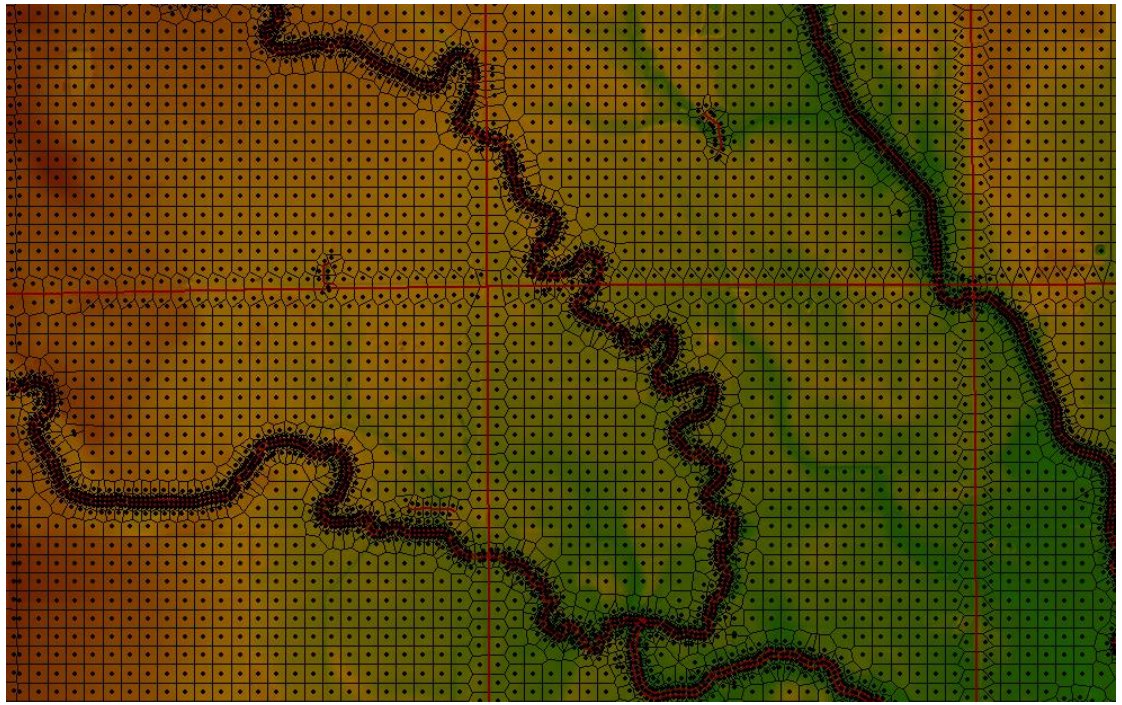
2D Modeling is being used



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Model Enhancements

- Enhancements will be made to the BLE modeling that was performed.
  - Lidar, flown in 2015, will be used.
  - Comments made will be used to enhance the modeling.
  - Additional review/refinement of mesh will be done to improve accuracy of modeling.
  - Enhanced Zone A, Zone AE with Floodway, Zone AE without Floodway, and Zone AH on selected streams will include field surveyed structure data, as-built survey plans, and additional landuse refinements.

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Model Enhancements

- The hydrology is built into the RAS modeling platform using excess rain-on-mesh modeling.
- HEC-RAS calculates the excess rainfall from an initial abstraction based on NRCS Curve Number methodology.
- Details added to 2D mesh as needed.
- Add detail to significant flood control dams as needed.
- Model flows will be compared to Kansas regression flows and gage (where available) for validation and calibration.

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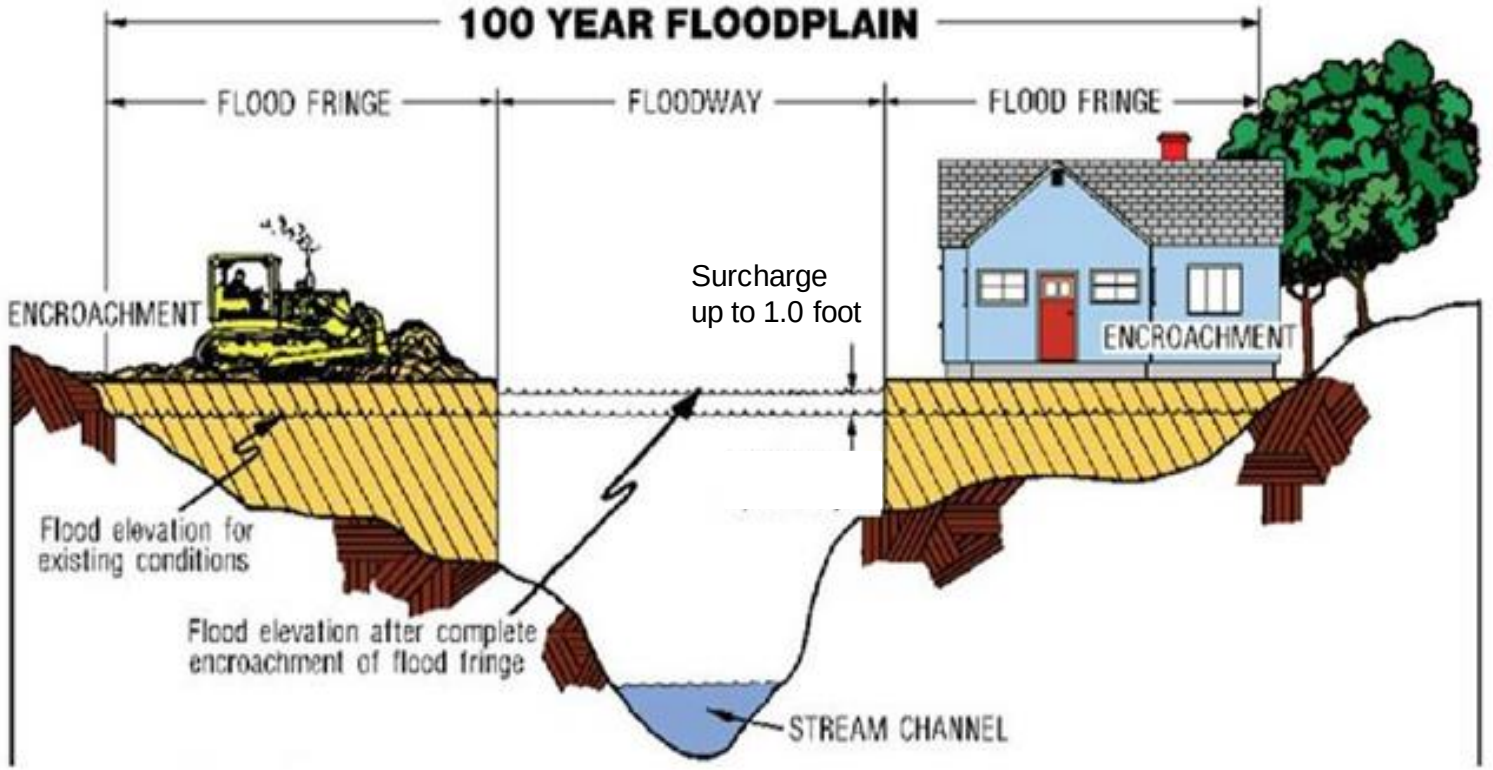
A portion of the Zone AE modeling includes the development of a floodway

A Floodway is the area within the floodplain that must be reserved in order to discharge the base flood without cumulatively increasing the WSE by more than 1.0 foot.



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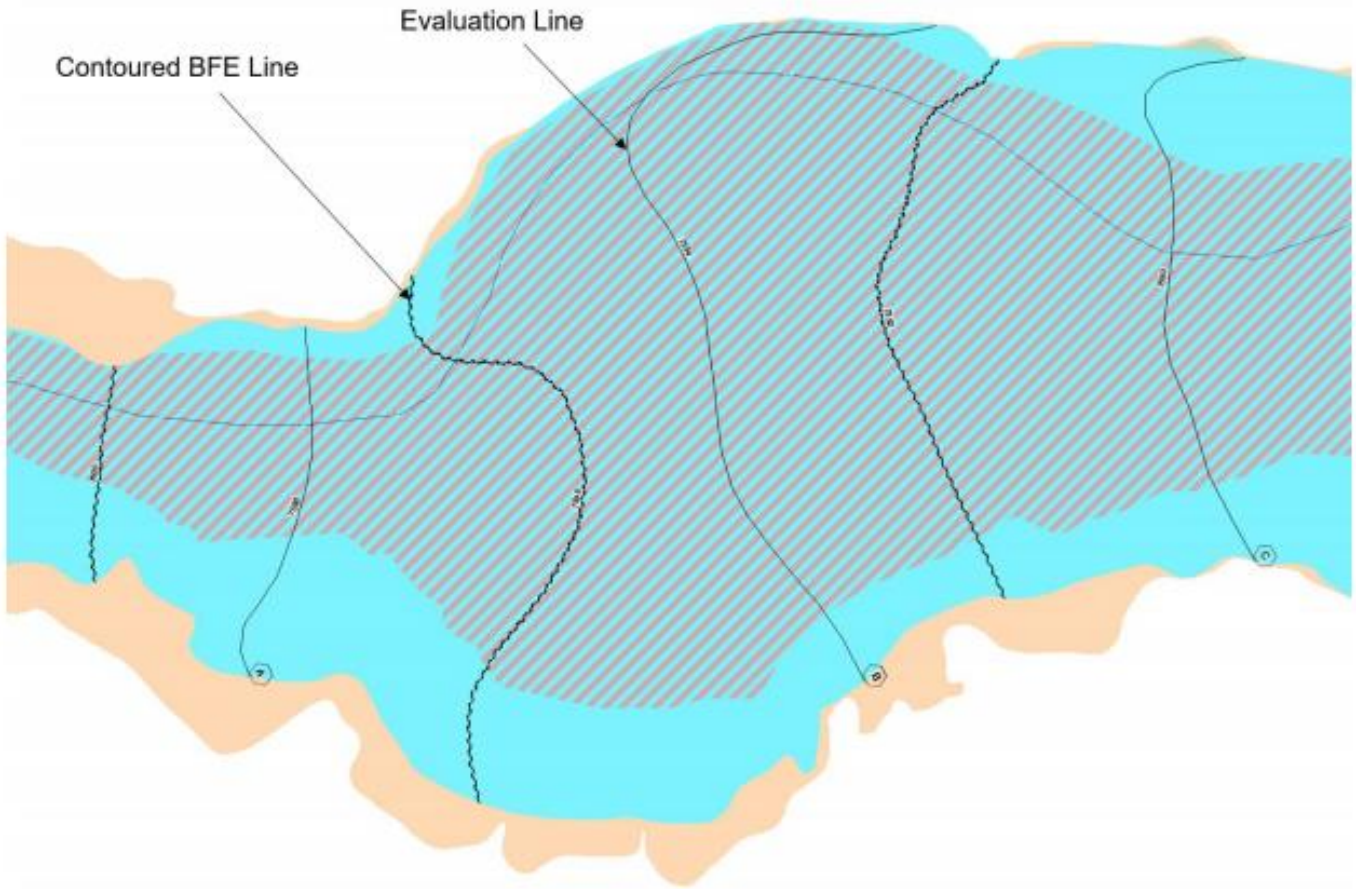
2D Floodways will be developed



Data Development Scope

Shawnee County 2023 Proposed Mapping Updates

New Zone A - Excess Rainfall on Grid

New Zone A studies will be developed for these streams using 2D HEC-RAS rain-on-mesh modeling.

New Zone A - Gage

New Zone A studies will be developed for these streamsusing 2D HEC-RAS rain-on-mesh modeling, calibrated to gage flows.

New Zone AE with Floodway - Gage

New Zone AE studies will be developed for these streams using 2D HEC-RAS rain-on-mesh modeling, calibrated to gage flows. Floodways will be developed. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

New Zone AE with Floodway

New Zone AE studies will be developed for these streams using 2D HEC-RAS rain-on-mesh modeling. Floodways will be developed. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

New Zone AE without Floodway

New Zone AE studies will be not be developed for these streams using 2D HEC-RAS rain-on-mesh modeling. Floodways will not be developed. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

New Zone AH

New Zone AH studies will be developed for these streams using 2D HEC-RAS rain-on-mesh modeling. Field measured structure data will be incorporated into the modeling. BFEs will be shown on the maps.

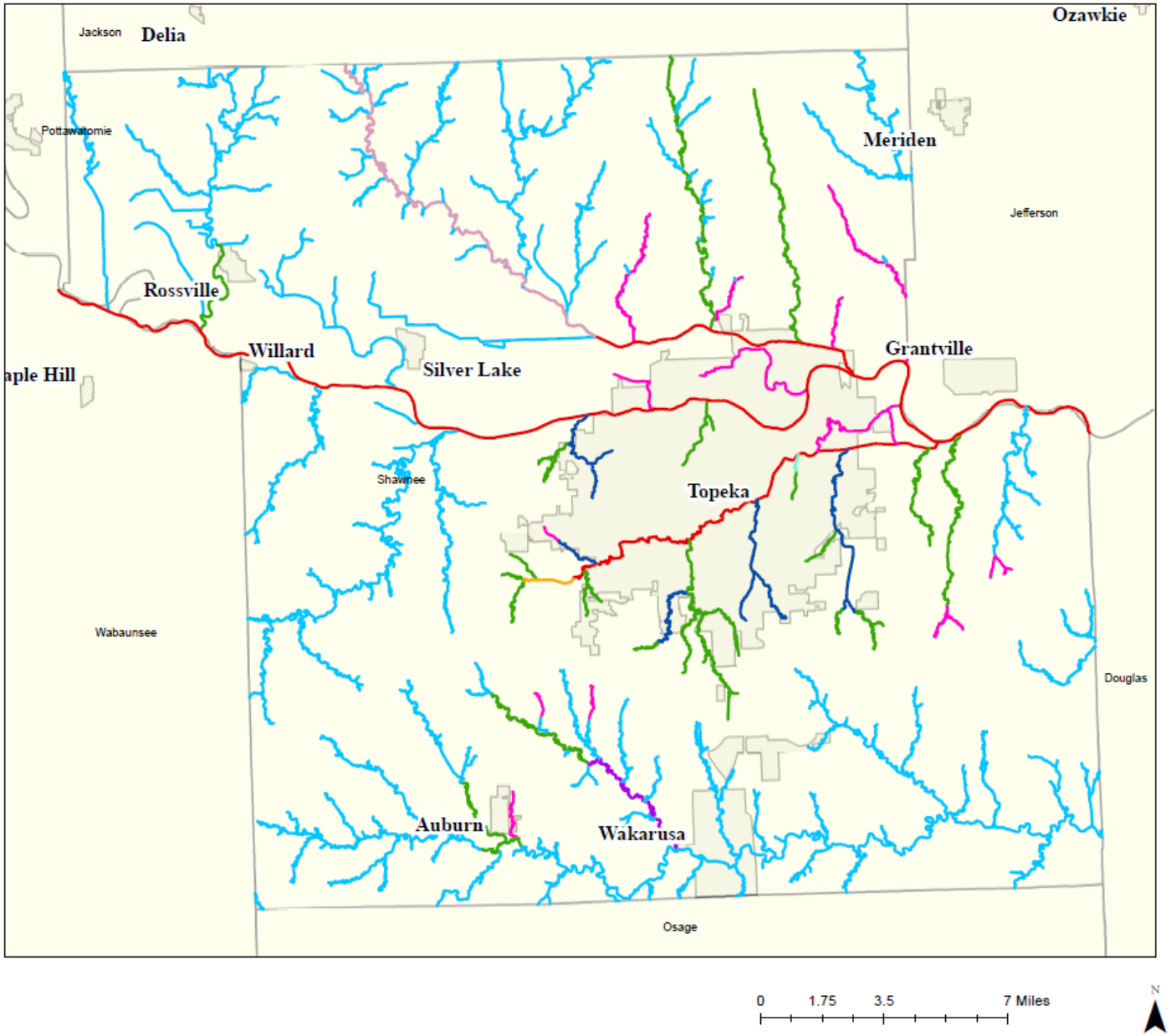
New Static AE - Statistical Analysis

New Static Zone AE studies will be developed for these streams using a HEC-HMS model to determine static water surface elevations.

New Enhanced Zone A - Excess Rainfall on Grid

New Enhanced Zone A studies will be developed for these streams using 2D HEC-RAS rain-on-mesh modeling. Field measured structure data will be incorporated into the modeling. BFEs will not be shown on the map.

Existing Studies - Will not be revised



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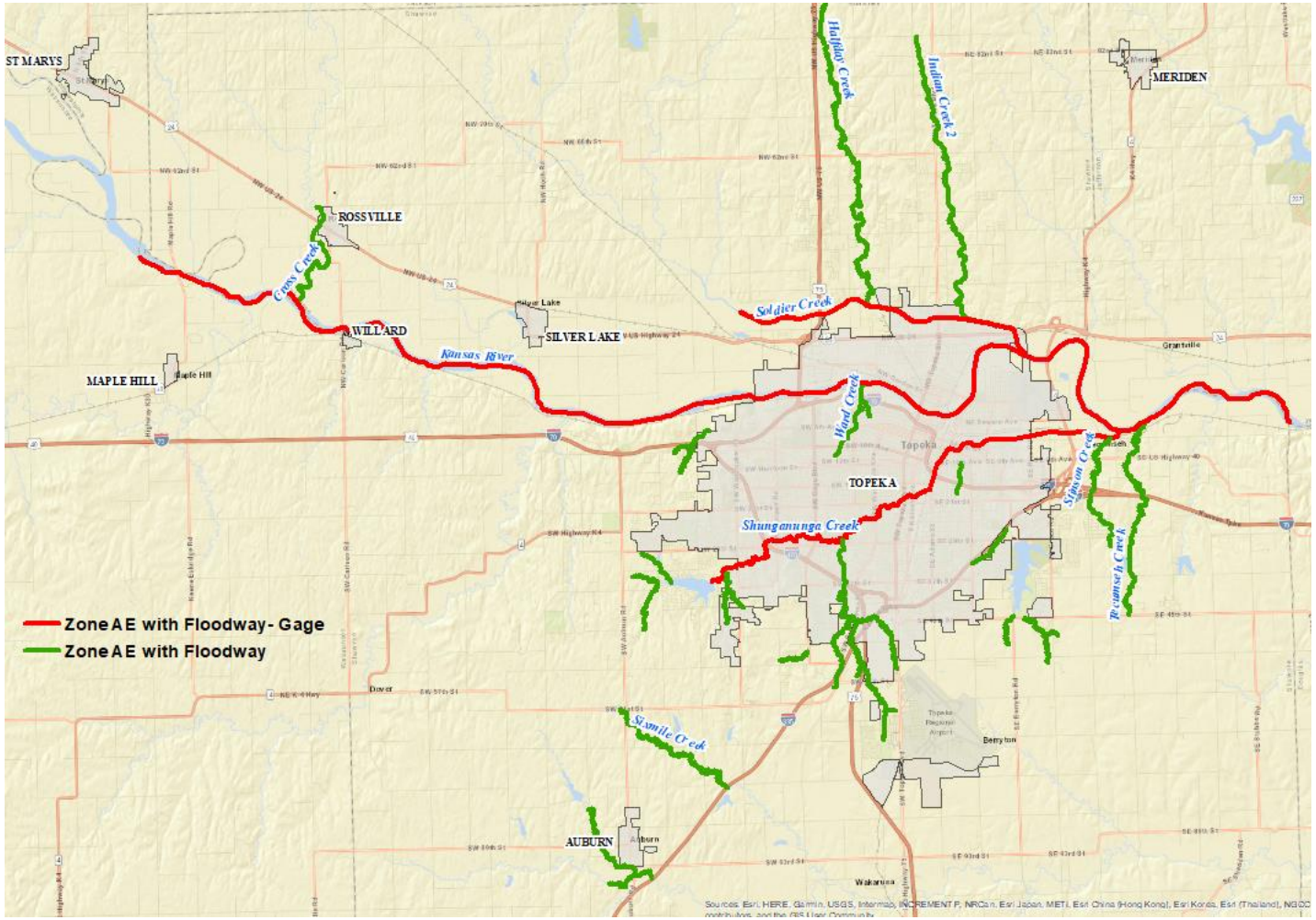
New Zone AE with Floodway

Shawnee County and Topeka

- Colly Creek
- Cross Creek
- Deer Creek and three tributaries
- Elevation Tributary
- Halfday Creek
- Indian Creek 2
- Kansas River
- North Branch Wakarusa River
- Shunganunga Creek and three tributaries
- Sixmile Creek
- Soldier Creek
- South Branch Shunganunga Creek and five tributaries
- Southeast Branch Elevation Tributary
- Southeast Branch Elevation Tributary
- Southwest Branch Elevation Trib
- Stinson Creek
- Tecumseh Creek
- Wakarusa River
- Two Wanamaker Main Branch Tribs
- Ward Creek and a tributary



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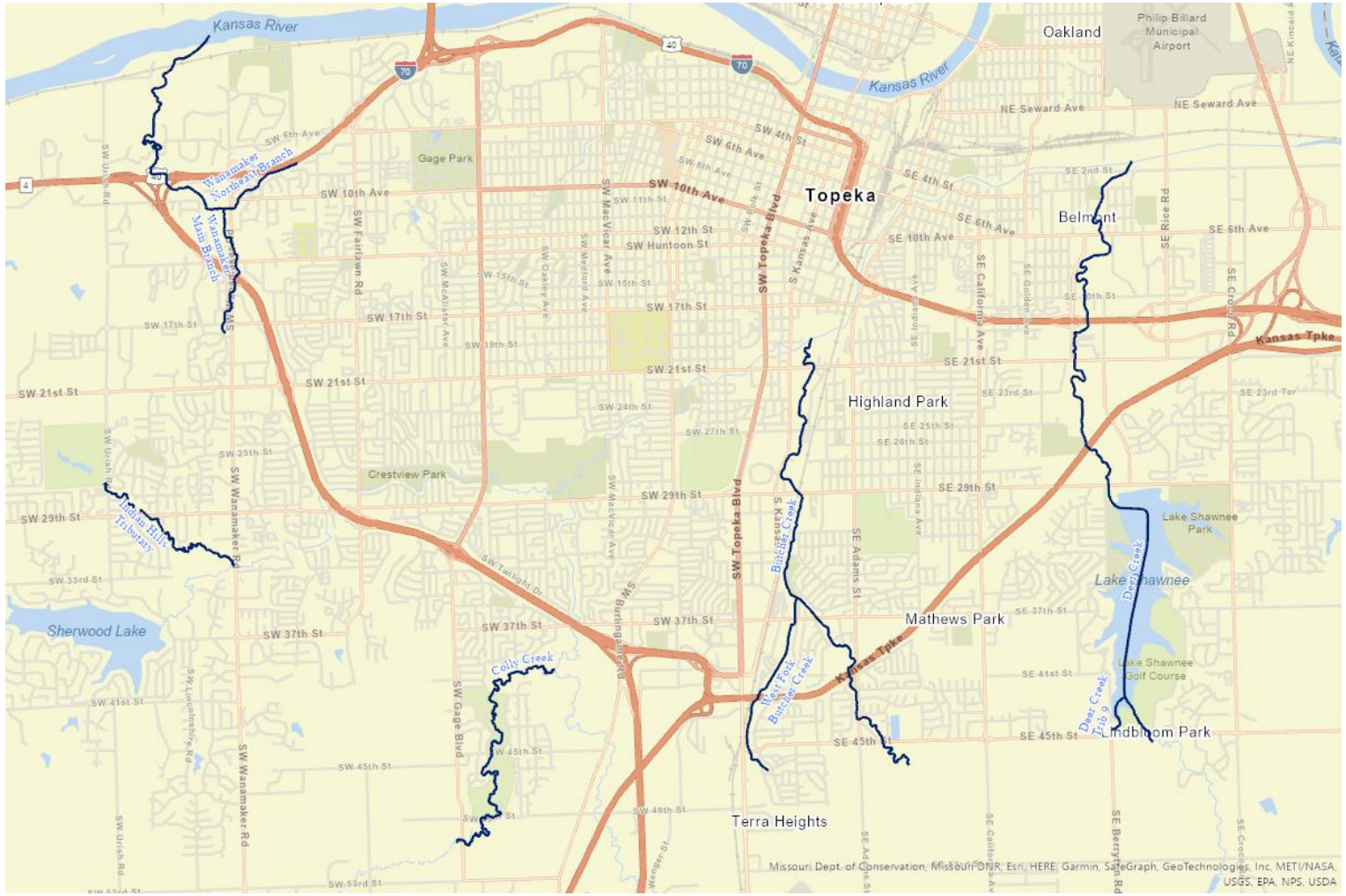
Incorporate Existing

Shawnee County and Topeka

- Butcher Creek
- West Branch Butcher Creek
- Deer Creek and Tributary
- Colly Creek
- Wanamaker Branch
- Indian Hills Tributary



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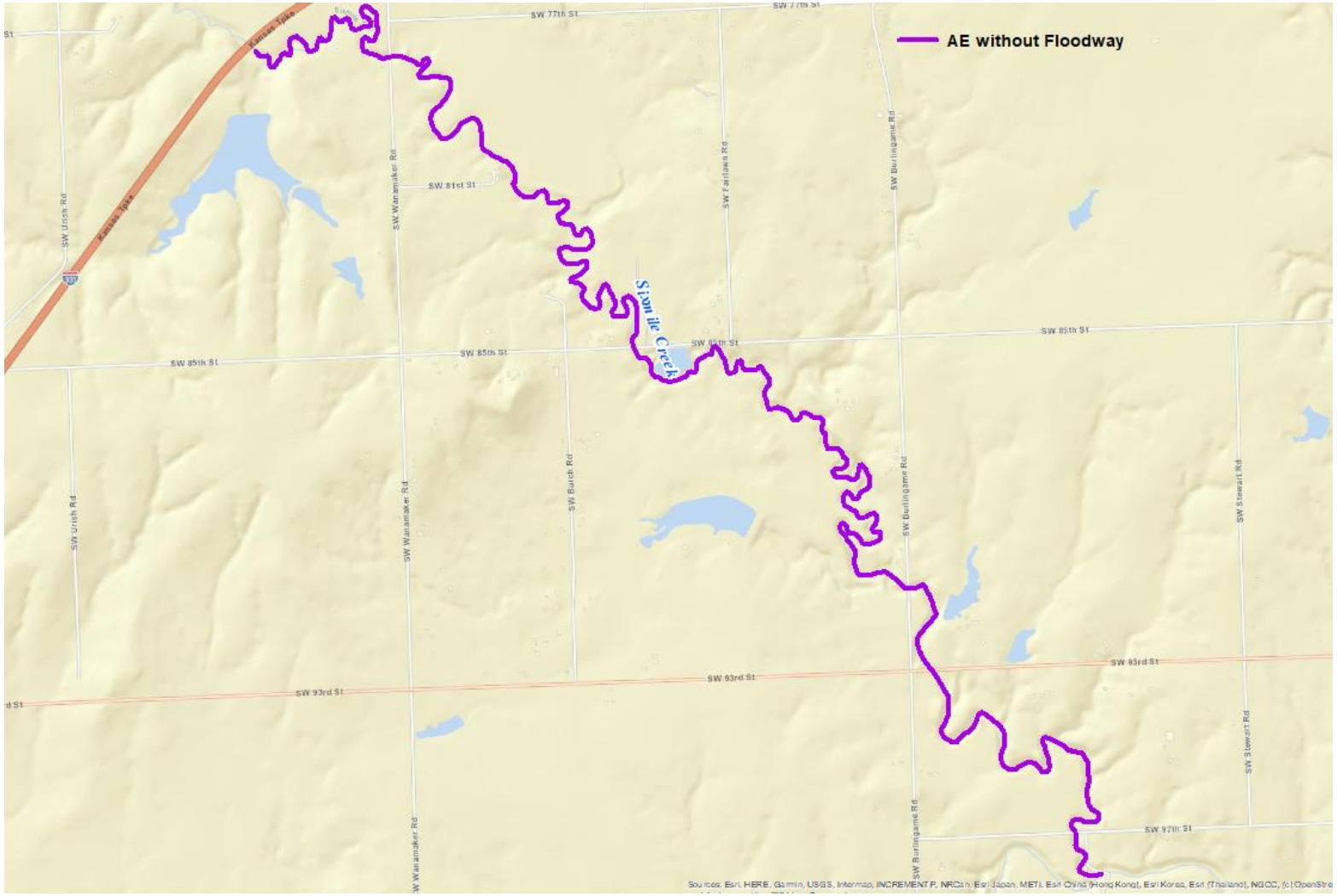
New Zone AE without Floodway

- Shawnee County
  - Sixmile Creek



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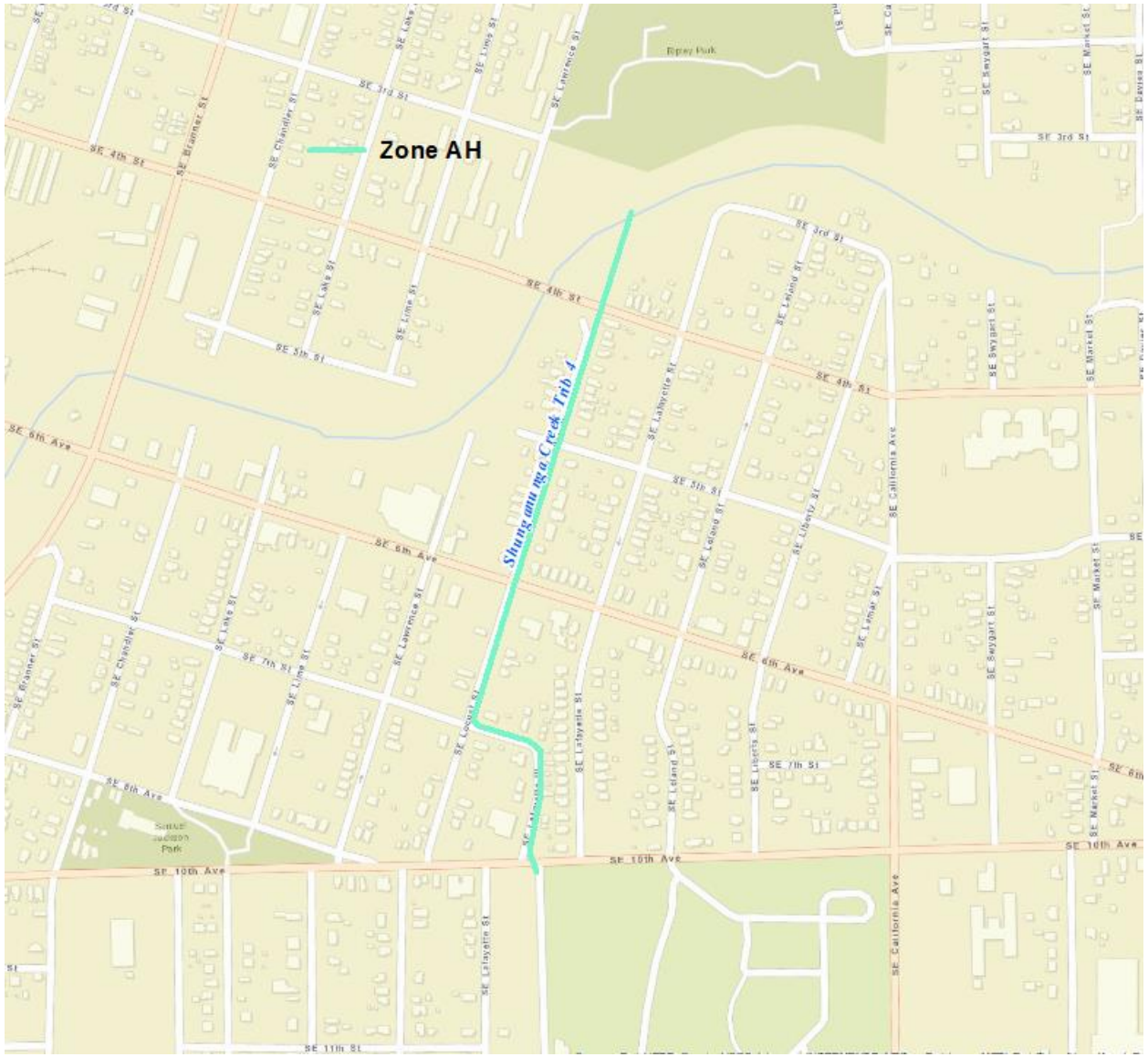
New Zone AH

- Topeka
  - Shunganunga Creek Tributary



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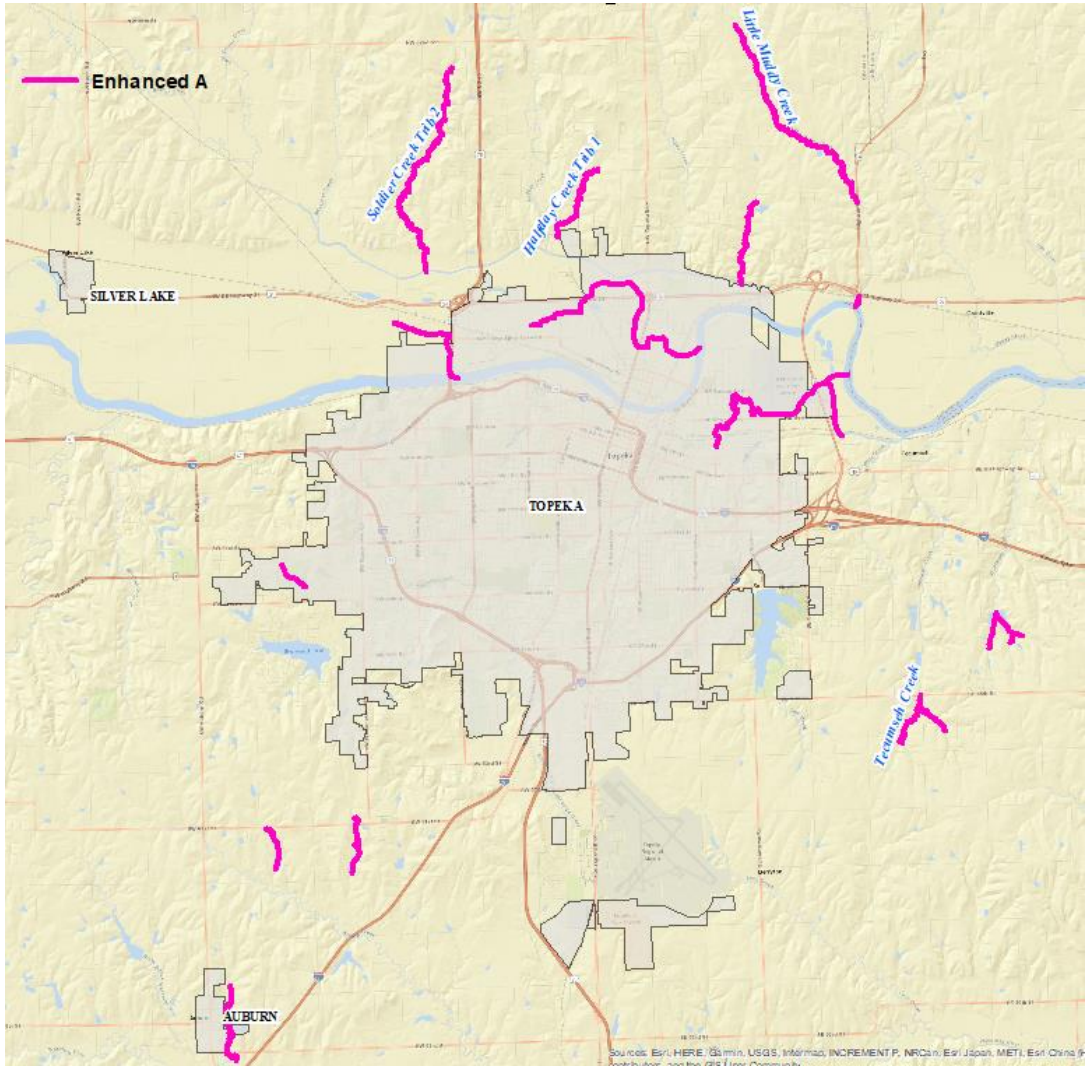
New Enhanced Zone A

- ## Shawnee County and Topeka

  - Halfday Creek Tributary
  - Indian Hills Tributary
  - Two Kansas River tributaries
  - Little Muddy Creek
  - Two Shunganunga Creek tributaries
  - Two Sixmile Creek tributaries
  - Two Soldier Creek tributaries
  - Tecumseh Creek and a tributary
  - Wakarusa River Tributary
  - Whetstone Creek and two tributaries



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New Static Zone AE

- Shawnee County
  - Shunganunga Creek – Sherwood Lake

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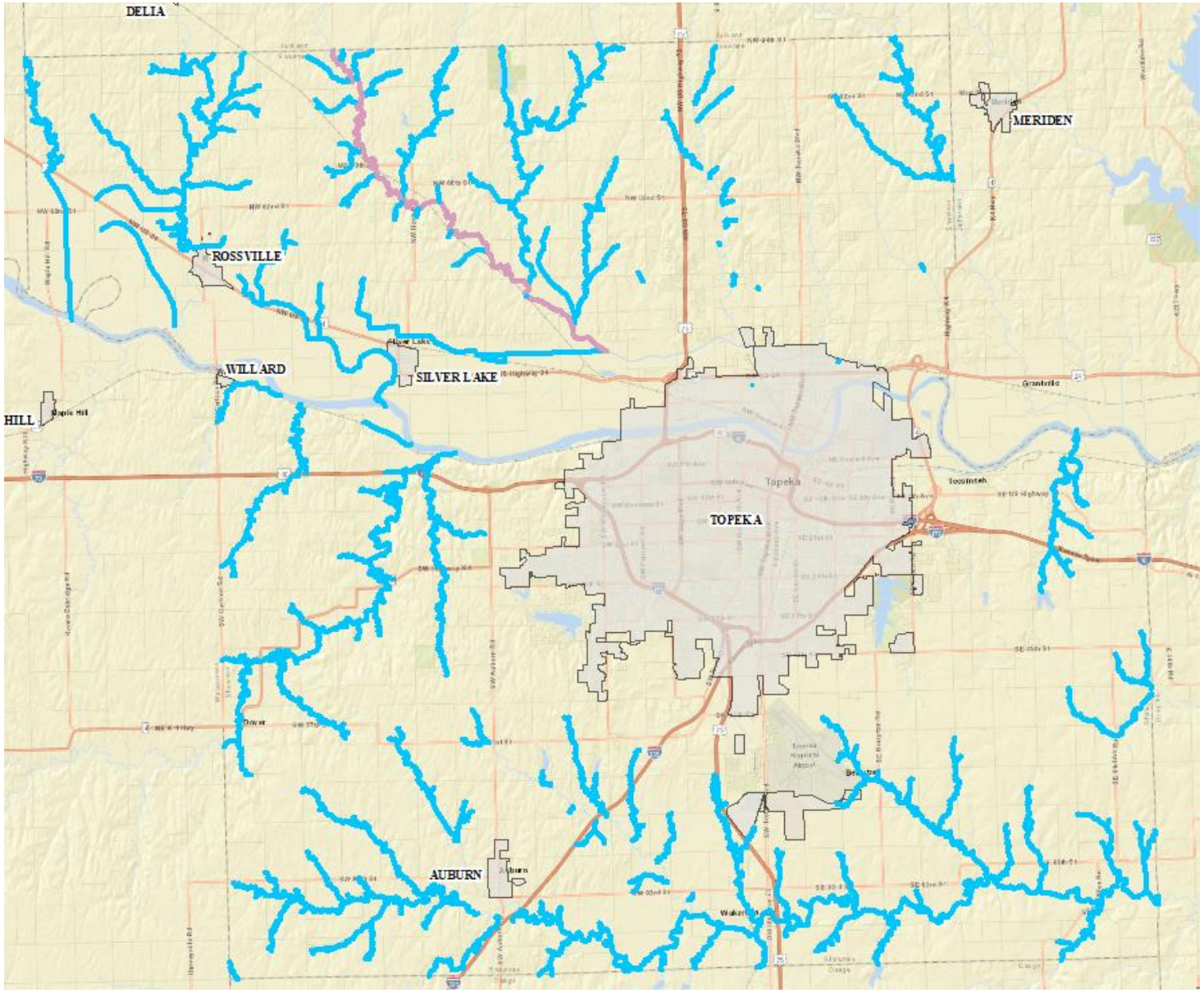
New Zone A

- Shawnee County



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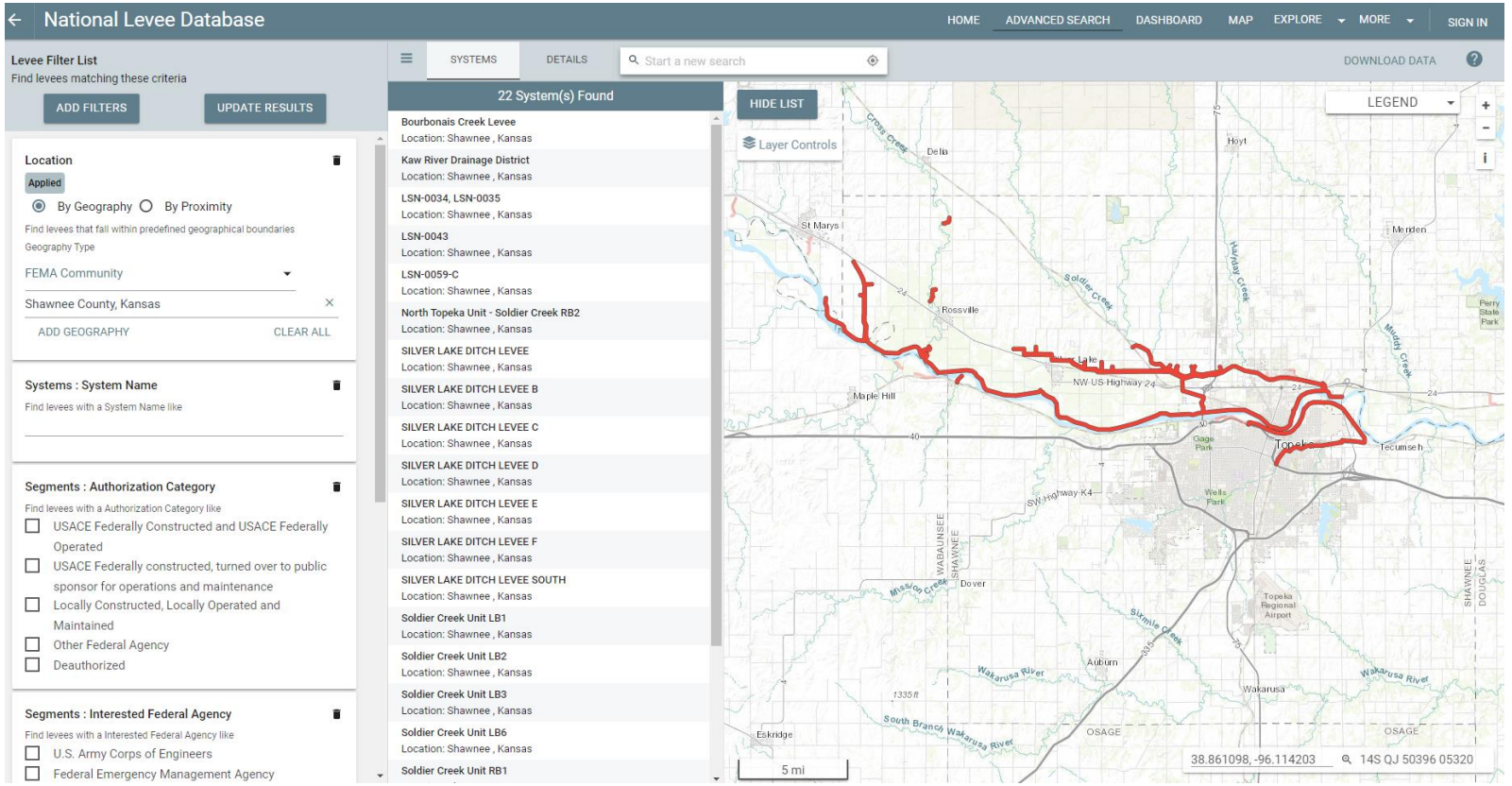
Levees

There are 22 levee systems in the project area.



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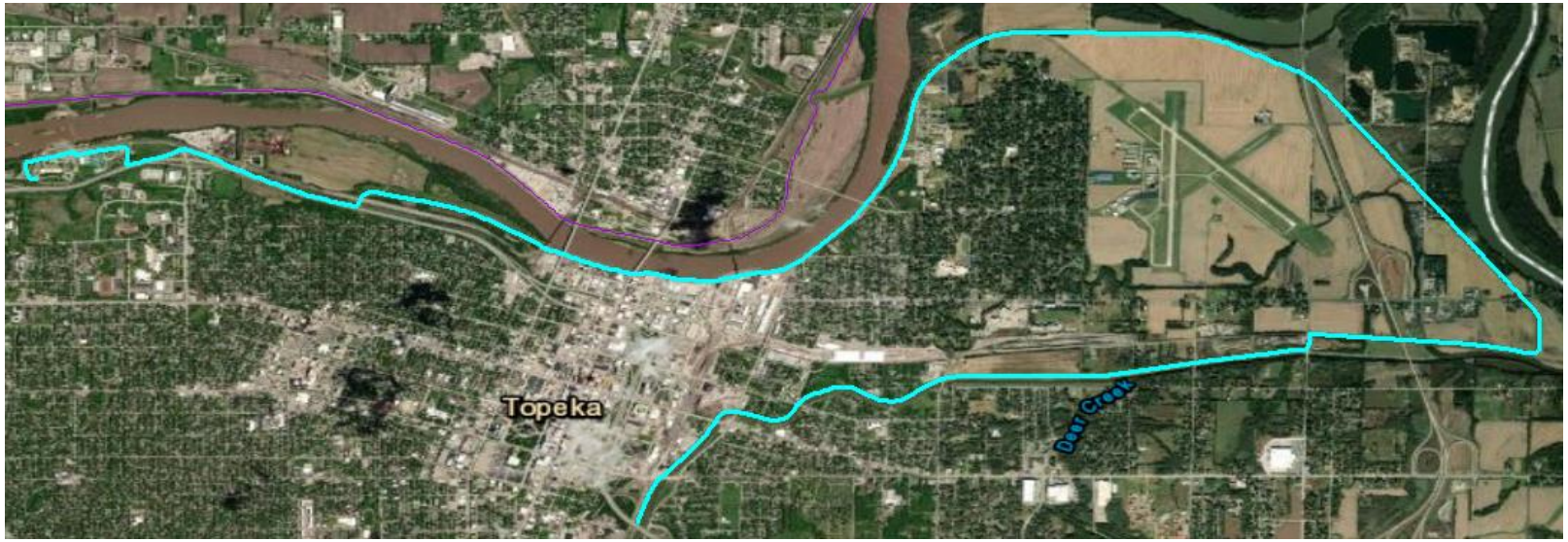
Levees

- Levees South of the Kansas River: Water Works Unit, Auburndale Unit, South Topeka Unit, Oakland Unit
  - FEMA Certification is complete, so these are fully accredited levees



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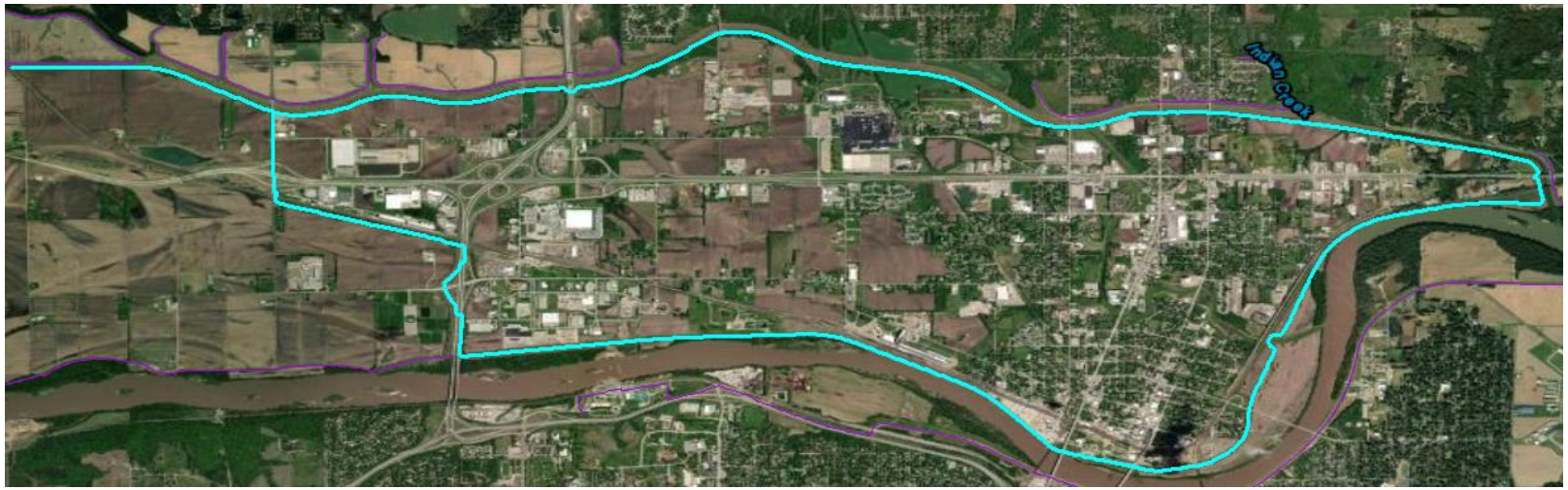
Levees

- North Topeka Unit- Soldier Creek Unit
  - Provisionally Accredited
  - Portion along Kansas River has a certification package prepared
  - Portion along Soldier Creek currently lacks freeboard for certification
  - Kansas River portion can not be certified until Solder Creek Right Bank 2 is certified



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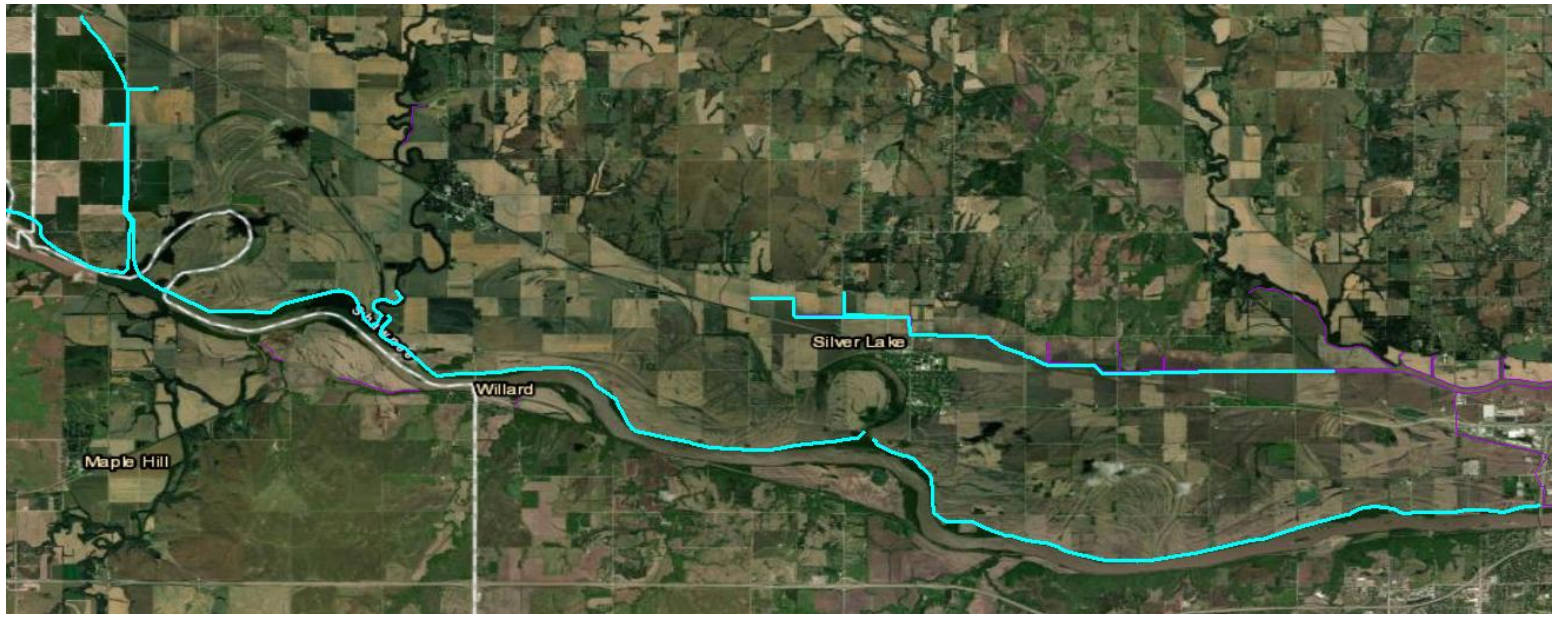
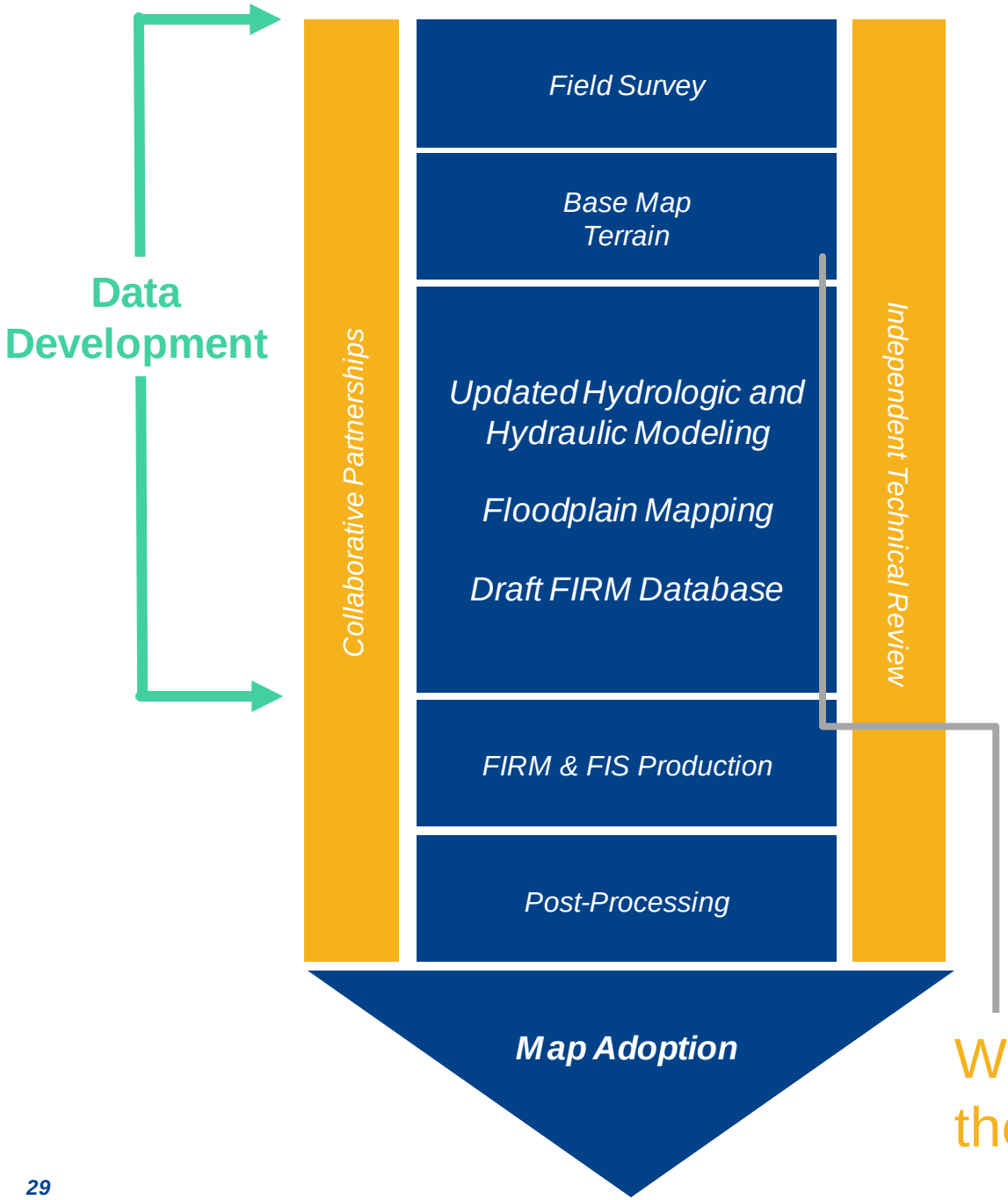
Levees

- Non-Accredited Levees are located along the Kansas River, the Silver Lake Ditch and Bourbonais Creek.
- Updated mapping will use a natural valley analysis on non-accredited levees.



Next Steps



Project Tasks

1. Field Survey
2. Base Map and Topography Preparation
3. Hydrologic and Hydraulic Modeling
4. Floodplain Mapping
5. DFIRM and FIS Production
6. Post-Preliminary

We are about to begin the modeling task

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Our Next Steps:

- We will complete the engineering analysis previously described.
- Several rounds of reviews will be completed.
- We will develop your draft regulatory floodplain maps.
  - Also known as your Flood Insurance Rate Map (FIRM)
- We will develop your draft Flood Insurance Study (FIS).
- We will have a community review period and a public review period

Project Timeline

Kick-off Meeting and Initial Community Feedback:
[TODAY!]

Data Development Work:
[Now until Summer of 2024]

- *Base Map*
- *Topographic Data*
- *Field Survey*
- *Develop Hydrologic and Hydraulic Models*
- *Floodplain Mapping*

Flood Risk Review Meeting:

[~April 2024]

- *Your **review** and **feedback** on the draft maps*

Project Timeline, continued

Community **comments** will be **addressed**

Public review of the draft maps

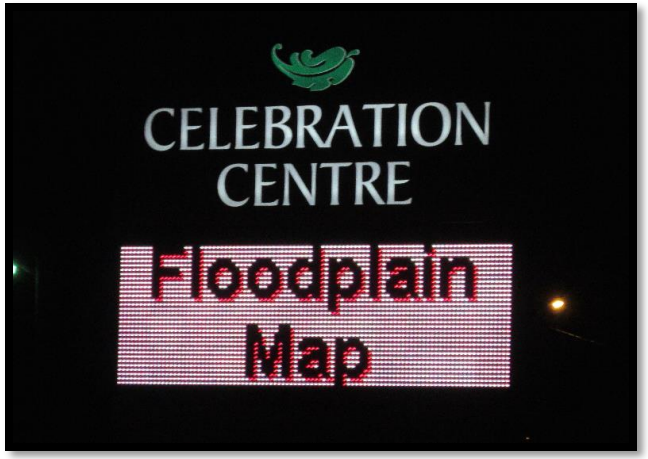
- *Includes Public Open House*

Not yet funded

Preliminary Map Products

- *Preliminary DFIRM Community Coordination Meeting*

Post-Preliminary Processing



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Key Takeaways

Floodplain Mapping Projects take time

Your involvement in this process will result in better flood information for your community

DON'T HESITATE TO CALL, WE ARE HERE TO HELP

Resources

Online Project Information

Project Website

- Scoping Maps, Project Timeline, Meeting Presentations, Newsletters, Technical Reports, Web Review Map
- https://agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping/mapping-projects/lists/mapping-projects/upper-kansas-custom-watershed

Web Review Map: https://gis2.kda.ks.gov/gis/shawnee/

- Provide comments on areas impacted by past floods, community needs, etc.
- Review of floodplain data

Story Maps

- Project Info
- “Floodplain Current”: Mapping Process ‘Nuts and Bolts’


Any Questions?