



# Proposed Floodplain Management Overlay Zoning District September 1, 2020

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# Flood Management Zoning Overly District

A flood damage prevention ordinance that establishes higher building standards in the floodplain with the intent to minimize public and private losses due to flood conditions.

Recommended by:

- 2007 Flood Mitigation Plan
- 2012 Hazard Mitigation Plan
- 2017 Hazard Mitigation Plan Update

# Reasons for a New Floodplain Management Overlay Zoning District

- Slightly more vulnerable community in floodplain
- Changing Weather Patterns causing higher risk
- Rising Economic Flood Damage
- More structures in the future floodplain
- Rising Flood Insurance Rates
- Improve Community Rating System (CRS) score
- Apply the Michigan Department of Environment, Great Lakes, and Energy (EGLE) floodway restrictions equally across the City

# Floodplain Terms

- Floodplain consists of a **floodway** and a **flood fringe**

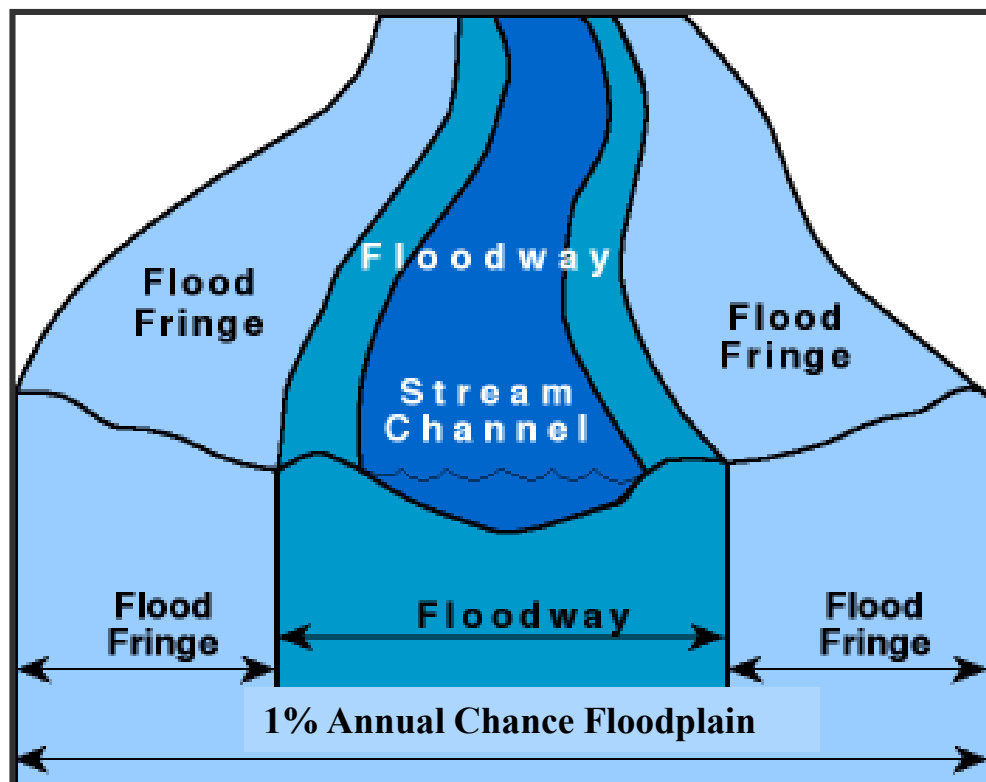
- **1% Annual Chance**

- 1% chance of flooding every year
- Also called the 100-year floodplain.
- Doesn't mean once every hundred years

- **Base Flood Elevation**

- **0.2% Annual Chance**

- Also called the 500-year floodplain



# EGLE Floodplain Requirements

## **The Michigan Department of Environment, Great Lakes, and Energy (EGLE).**

- Requires permitting for new fill or structures, and other floodplain modifications
- **Prohibits residential construction in the floodway**
- **HOWEVER**, the EGLE only has jurisdiction where the contributing drainage area is greater than 2 sq miles.

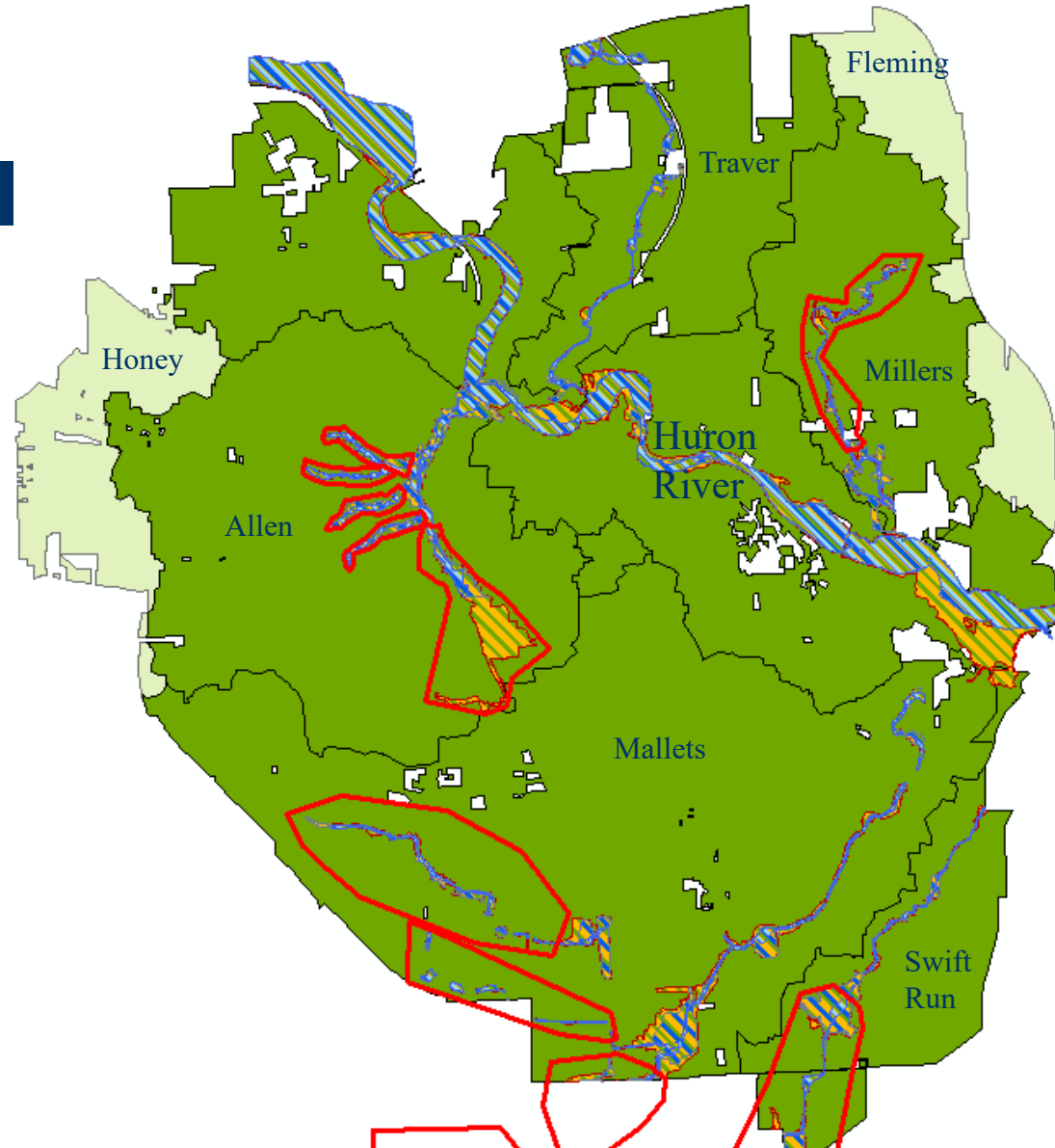
# Areas of Non-EGLE Jurisdiction

## Total Floodplain Area

- 2.79 sq miles
- 10% of the City
- 1169 Parcels
- 490 Buildings

## Non-EGLE Regulated

574 Parcels or 49%  
248 Buildings or 51%

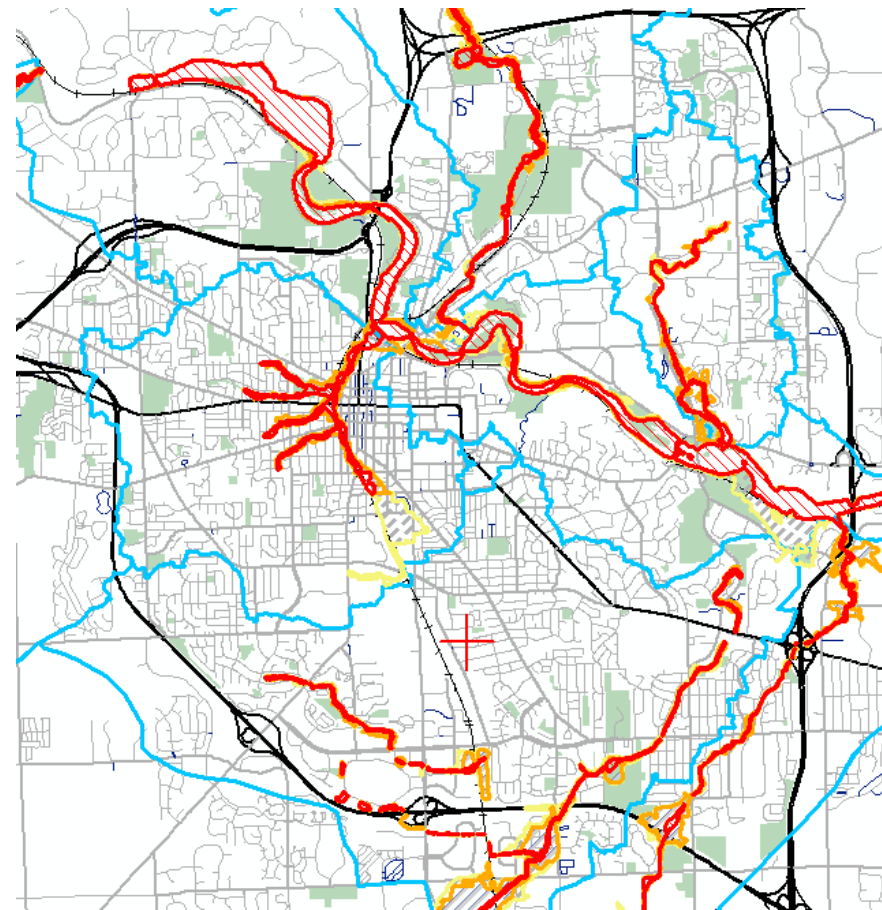


# Floodplain quantities per FIRM dated April 3, 2012

Total Floodplain Area 2.79 sq miles or 10% of the City, 1169 Parcels with Floodplain Area

## # of Structures by FEMA Flood Source Segment

FEMA Flood Source	# of Structures
<b>Allen Creek</b>	<b>373</b>
• Allen Creek Main Branch =	199
• Eberwhite Drain Overflow =	70
• Murray Washington Overland Flow =	77
• West Park Miller Drain Branch =	28
• West Park Miller Drain South Branch =	9
<b>Malletts Creek</b>	<b>51</b>
<b>Swift Run Drain</b>	<b>20</b>
<b>Huron River</b>	<b>22</b>
<b>Traver Creek</b>	<b>21</b>
<b>Millers Creek</b>	<b>4</b>
<b>TOTAL</b>	<b>490</b>



# Current Basic Floodway Regulations

- The State (EGLE) prohibits residential uses in the floodway, but only in areas under EGLE jurisdiction.
- The lowest floor of any new non-residential structure must be elevated or floodproofed to an elevation 1 foot above the 1%-annual-chance flood elevation (BFE).
- For all development in the floodway, the developer must submit an hydrologic study certifying that the development will not raise the BFE.



# Current Basic Flood Fringe Regulations

- **Standards for new buildings in flood fringe**
  - The lowest floor of any new residential structure must be elevated 1 foot above the BFE.
  - The lowest floor of any new non-residential structure must be elevated or flood-proofed to 1 foot above the BFE.
- **Standards for Substantially Improved buildings**
  - If the value of the improvements exceeds 50% of the market value of the structure, the standards for new buildings applies.
  - **Note:** Historic structures are exempt from the substantial improvement requirement, provided that the historic character of the structure is maintained.

# Proposed Floodway Restrictions

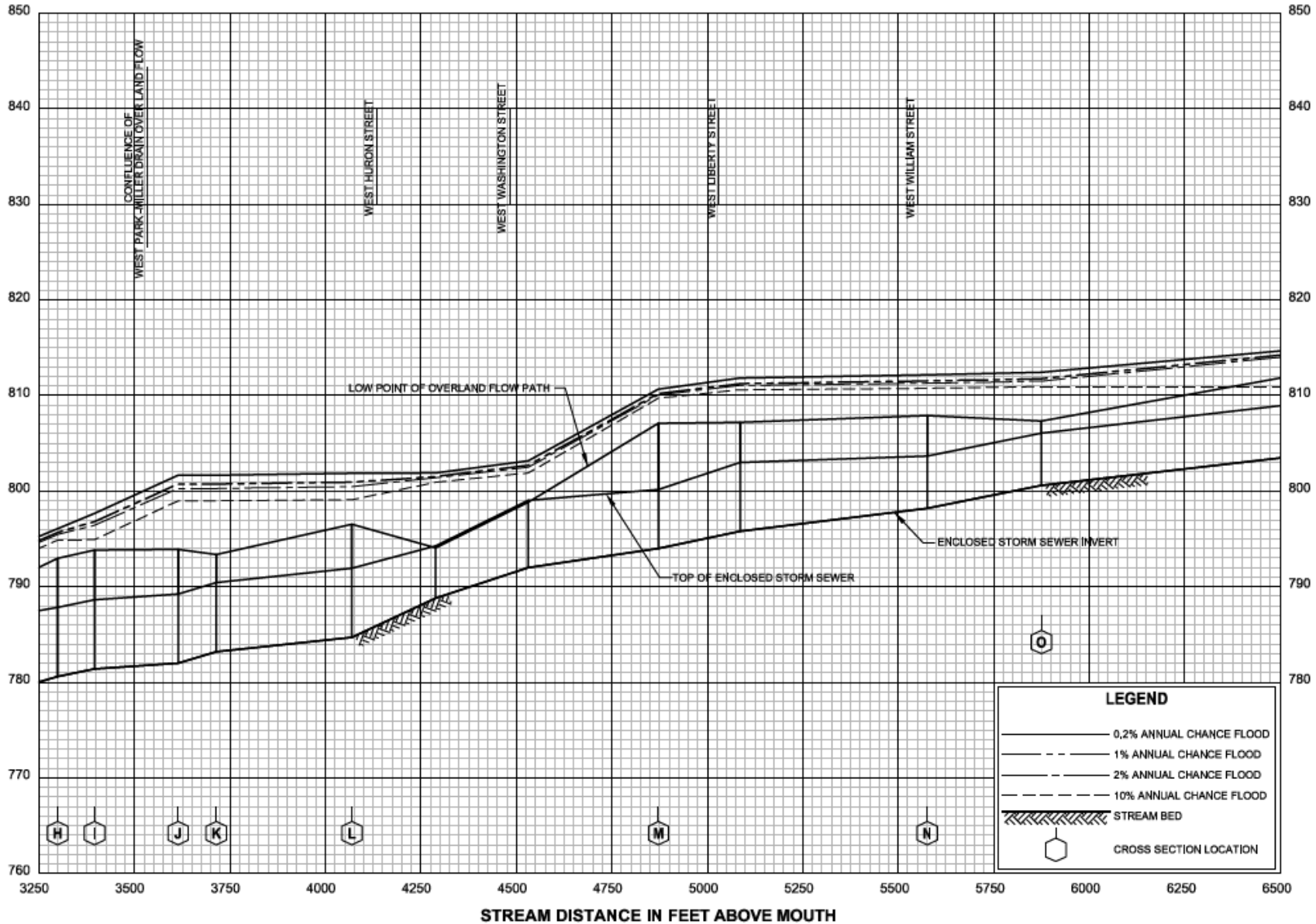
- No new structures
  - \*Exemption section for redevelopment
- No additions
- No new residential uses
- No critical facilities
- No structures without foundations
- No accessory structures
- No new parking where depth greater than two feet

## \*Floodway Redevelopment Parameters (New or Substantial Improvement)

- No residential use
- No Critical Facilities
- Not larger than existing footprint within the floodway
- If new, structure placed on the lot to minimize the floodway and/or floodplain encroachment.
- Hydrologic study shows no raise of the BFE, and will not reduce the conveyance of the floodway.
- Elevate lowest floor to one foot above the 0.2% annual chance elevation (no floodproofing).

# Why above the 0.2% annual chance elevation

- Acknowledges Climate Change
  - Within 50 years we can expect the current 0.2% flood elevation to be the future 1% flood elevation
- Currently required for Critical Facilities
- Becoming common in costal communities
- Only adds about a foot in most areas



STREAM DISTANCE IN FEET ABOVE MOUTH

## Costs of Building Higher

Under the rules of the National Flood Insurance Program, buildings must be protected to the Base Flood Elevation (BFE). Therefore, the cost of freeboard is just the additional cost of building higher than the minimum NFIP standard.

A study conducted by ASFPM in February 2017 estimated the approximate cost of building higher for a 2,000-square foot house. The study assumed the house was constructed to NFIP standards and then estimated the additional cost of building higher than the BFE (see table below).

Foundation Type*	Cost per add'l foot
Concrete block piers	\$890
Crawlspace with concrete block walls	\$1,850
Crawlspace with poured concrete walls	\$2,155
Stem wall with fill	\$2,345
Fill only	\$4,470

Using a house on fill with a stem wall (as illustrated on the cover), here are the average construction costs for building higher:

1 foot: \$2,345

2 feet:  $\$2,345 \times 2 = \$4,690$

3 feet:  $\$2,345 \times 3 = \$7,035$

*\*Costs are lower for other foundations.*

## Return on Investment

The owner of a building built higher will realize savings in two ways. The most important is when the area floods again and the building is not damaged. Also, the owner doesn't have to relocate, repair and rebuild.

Another form of savings is a reduced cost in flood insurance, which is required by most lenders. For example, using a 2,000-square foot home with a stem wall foundation with the floor 2 feet above the BFE (with fill underneath).

Additional cost of construction: \$4,690

Annual flood insurance premium built to the BFE: \$2,147

Annual flood insurance premium built 2 feet above the BFE: \$734

Annual flood premium savings: \$1,413

Number of years to pay off \$4,690 via premium savings: 3.3 years

Added savings realized during a 30-year mortgage: \$37,300\*

Another benefit of building higher is potentially increase in value at the time of sale due to lower risk and lower insurance costs.

*\*Savings are greater for other foundations.*

## The Costs & Benefits of Building Higher



Assn. of State Floodplain Managers

[www.floods.org](http://www.floods.org)

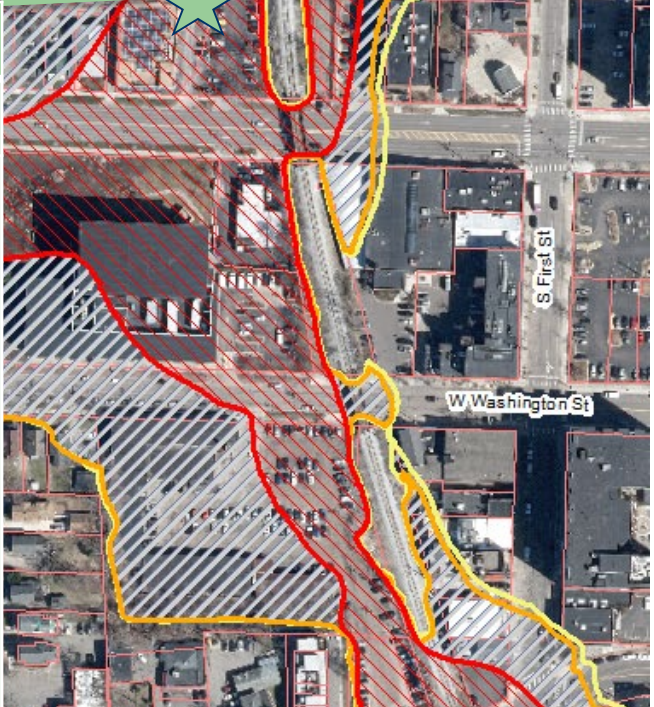
ASFPM – February 2018





# Floodway EGLE Jurisdiction

Current	Proposed
Residential Prohibited	Residential Prohibited
Non-Residential elevate or floodproof 1 foot above 1% Hydro Study required by EGLE	No New Structures *Exception for redevelopment elevate 1 foot above 0.2% w/ Hydro Study for EGLE
Critical Facilities elevate 1 foot above 0.2%	Critical Facilities Prohibited  No new House Trailers No structures without foundations No accessory structures No new parking where depth > 2 ft





## Floodway City Jurisdiction

### Current

Residential elevate 1 foot above 1%  
Hydro Study required by City

Non-Residential elevate or floodproof 1  
foot above 1%  
Hydro Study required by City

Critical Facilities elevate 1 foot above  
0.2%

### Proposed

Residential Prohibited

No New Structures \*Exception for  
redevelopment elevate 1 foot above  
0.2%  
w/ Hydro Study for City

Critical Facilities Prohibited

No new House Trailers  
No structures without foundations  
No accessory structures  
No new parking where depth > 2 ft



# Proposed Flood Fringe Restriction

- No Critical Facilities.
- No structures without foundations.
- Limit storage of hazardous materials.
- Elevate or floodproof to one foot above the 0.2%-annual-chance elevation

# Flood Fringe

## Current

Residential elevate 1 foot above 1%

Non-Residential elevate or floodproof 1 foot above 1%

Critical Facilities elevate 1 foot above 0.2%

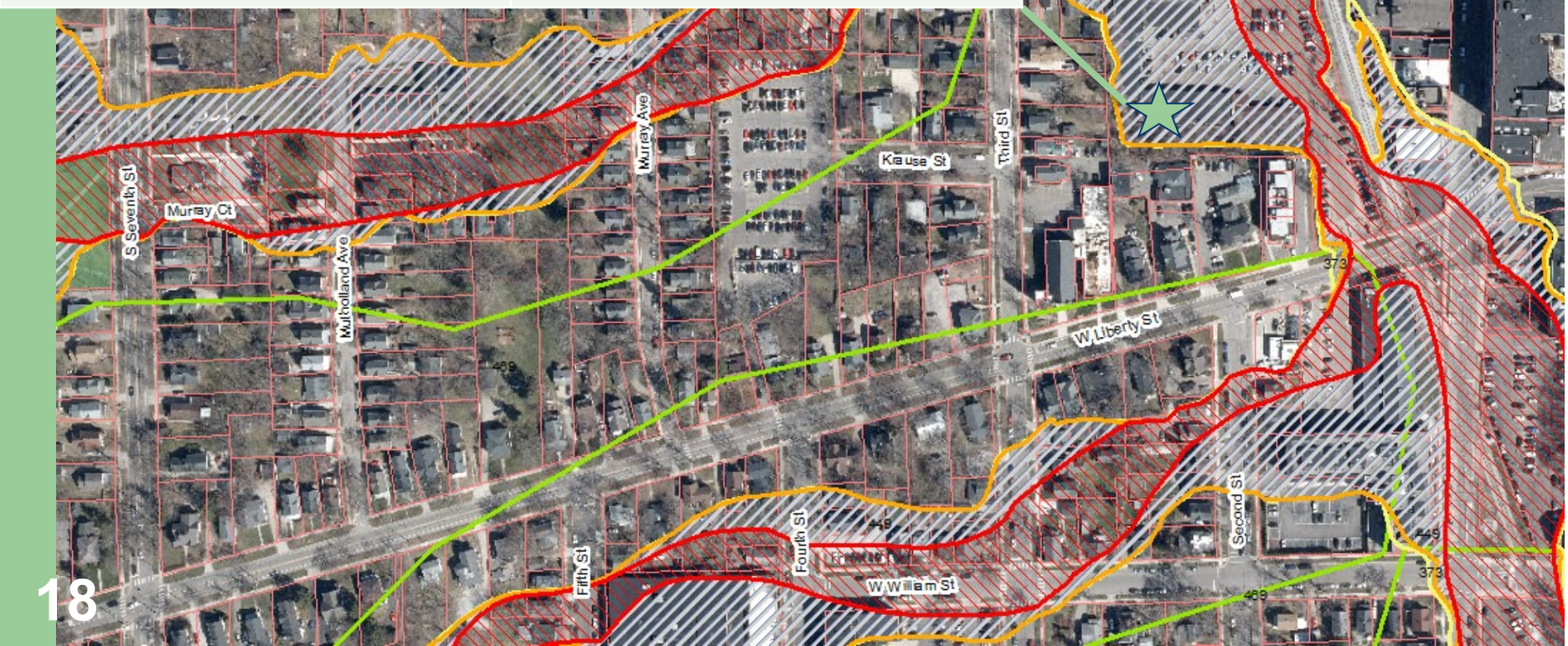
## Proposed

Residential elevate 1 foot above 0.2%

Non-Residential elevate or floodproof 1 foot above 0.2%

Critical Facilities Prohibited

No new House Trailers  
No structures without foundations





# Other Proposed Regulations

- Define Market Value  
City Assessor
- Cumulative Substantial Improvement Standard  
10 year period
- Equivalent Compensation  
Hydrologically equivalent



# Proposed Ordinance Benefits

- Improve safety and welfare
- Reduce loss of life and property
- Save money and resources necessary for emergency response
- Clearer permit process
- State regulations applied more consistently
- Lower flood insurance rates / Improve City of Ann Arbor CRS Rating

# General Overview

	Current	Proposed
<b>Floodway EGLE</b>	<p>Residential Prohibited</p> <p>Non-Residential elevate or floodproof 1 foot above 1% Hydro Study required by EGLE</p> <p>Critical Facilities elevate 1 foot above 0.2%</p>	<p>Residential Prohibited</p> <p>No New Structures *Exception for redevelopment elevate 1 foot above 0.2% w/ Hydro Study for EGLE</p> <p>Critical Facilities Prohibited</p>
<b>Floodway City</b>	<p>Residential elevate 1 foot above 1% Hydro Study required by City</p> <p>Non-Residential elevate or floodproof 1 foot above 1% Hydro Study required by City</p> <p>Critical Facilities elevate 1 foot above 0.2%</p>	<p>No new House Trailers</p> <p>No structures without foundations</p> <p>No accessory structures</p> <p>No new parking where depth &gt; 2 ft</p>
<b>Flood Fringe</b>	<p>Residential elevate 1 foot above 1%</p> <p>Non- Residential elevate or floodproof 1 foot above 1%</p> <p>Critical Facilities elevate 1 foot above 0.2%</p>	<p>Residential elevate 1 foot above 0.2%</p> <p>Non-Residential elevate or floodproof 1 foot above 0.2%</p> <p>Critical Facilities Prohibited</p> <p>No new House Trailers</p> <p>No structures without foundations</p>

# Questions

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