# Mendota-Grassman Greenway

**Public Information Meeting #2**
**by City of Madison Engineering Division**
**October 3 , 2022**

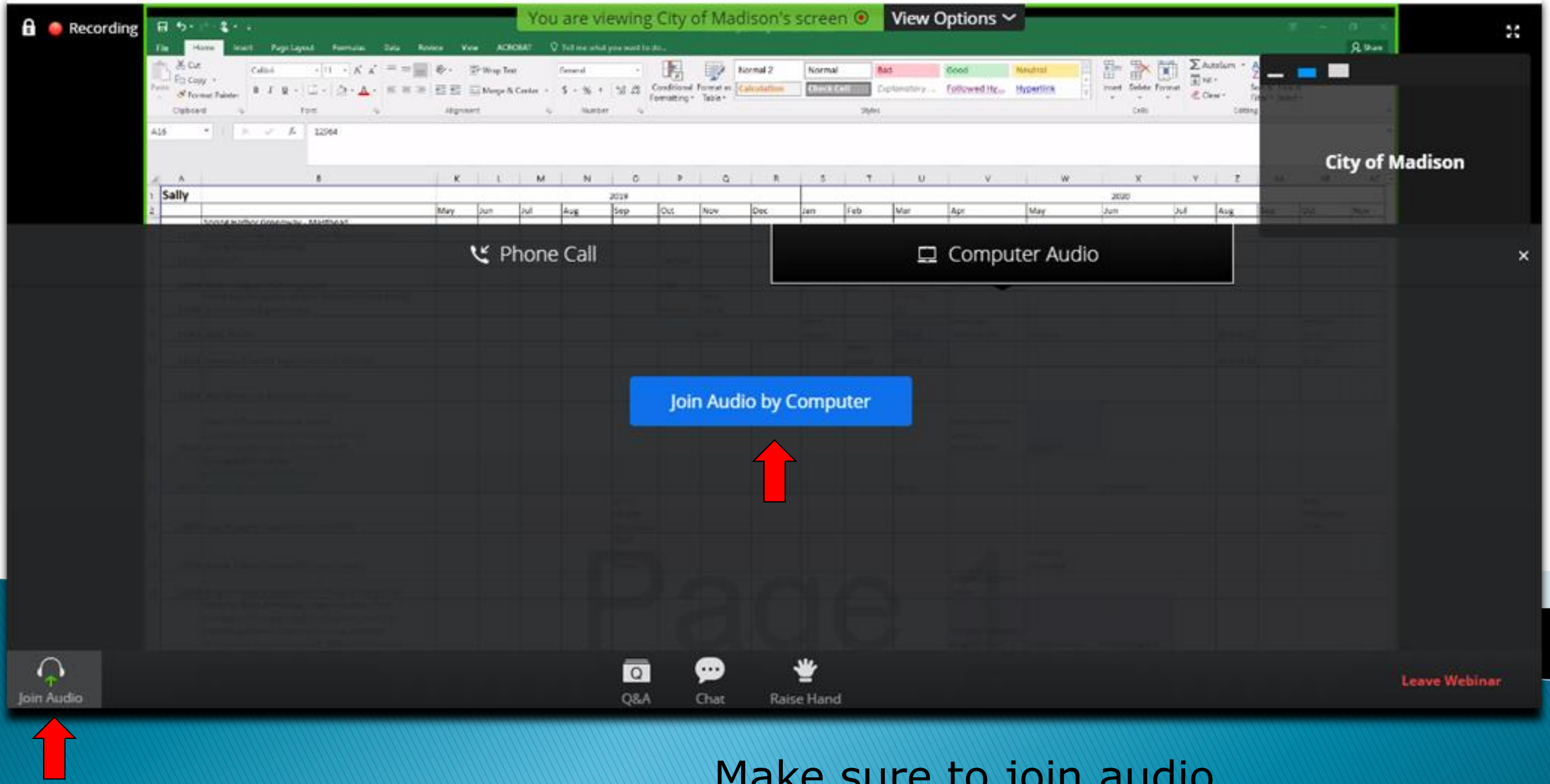
- ✓ This meeting will be **recorded** and posted to the City's project page.
- ✓ All attendees should stay be **muted** to keep background noise to a minimum.
- ✓ You may use the **"raise hand"** option at the bottom if you have something that required immediate clarification.
- ✓ Use **"chat"** option if you are having technical issues and a staff person can try to assist.
- ✓ Please use the **"Q&A"** option at the bottom of the screen to type your question. Questions will be answered at the end of the presentation. Inappropriate questions may be dismissed.
- ✓ If you cannot ask via typing your question, use the "raise hand" option and you will be unmuted when it is your turn.

**This meeting is being recorded.**

**It is a public record subject to disclosure.**

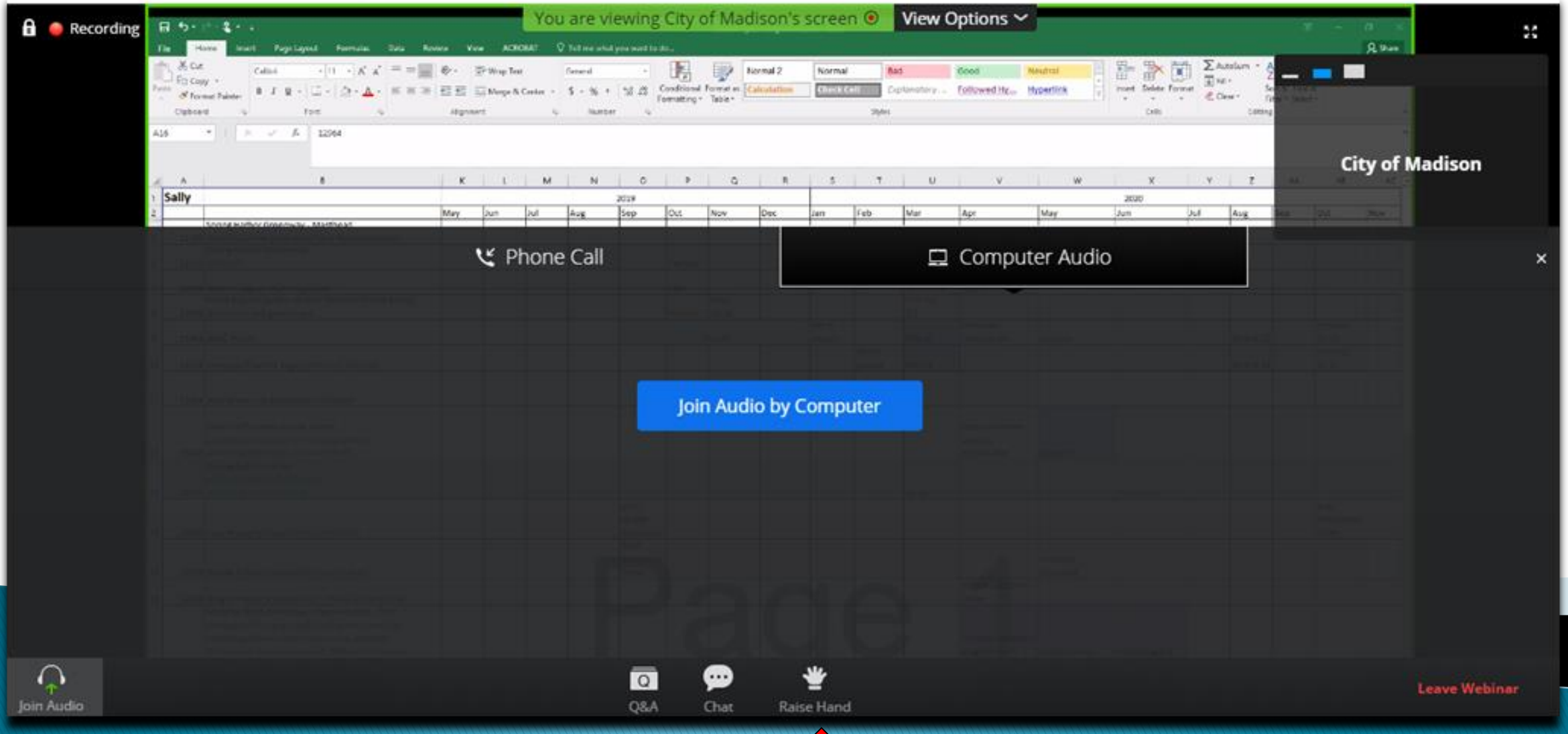
By continuing to be in the meeting, you are consenting to being recorded and consenting to this record being released to public record requestors.

# How to Participate




Make sure to join audio

# How to Participate




Raise your hand to be unmuted
For comments or ask additional questions.

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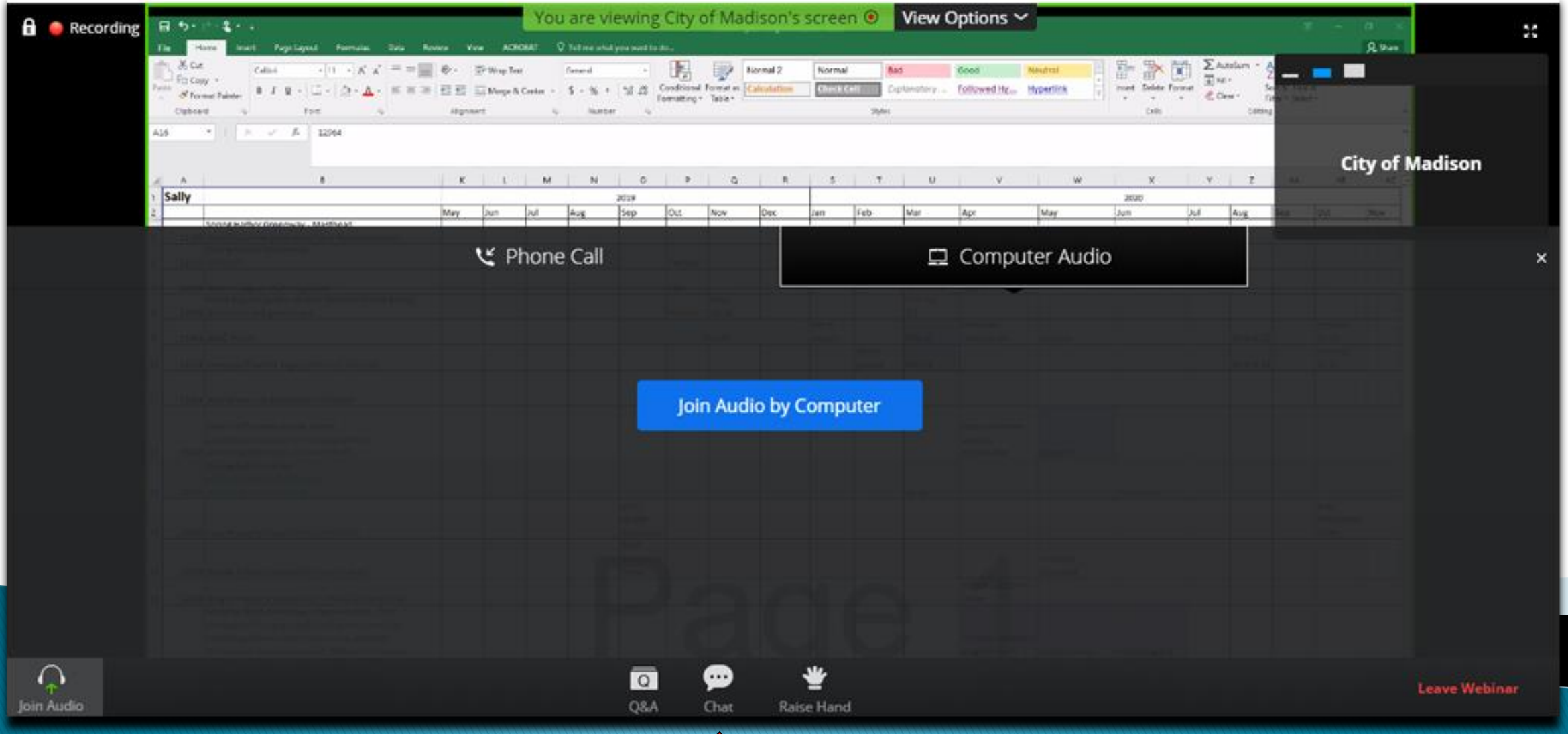


Use chat if you have technical issues or a question for the panelists

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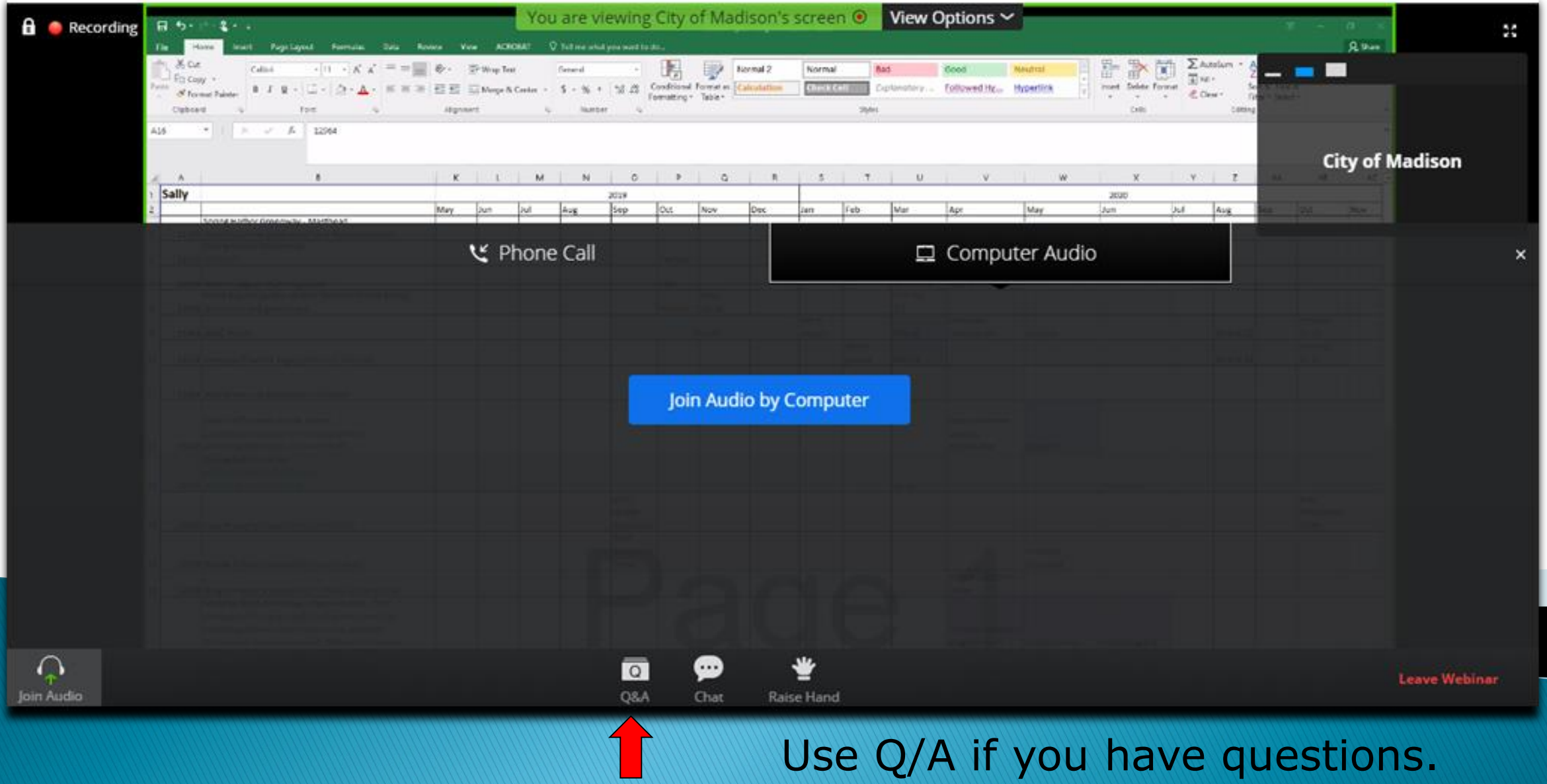


Use Q/A if you have questions.
We will answer after the presentation

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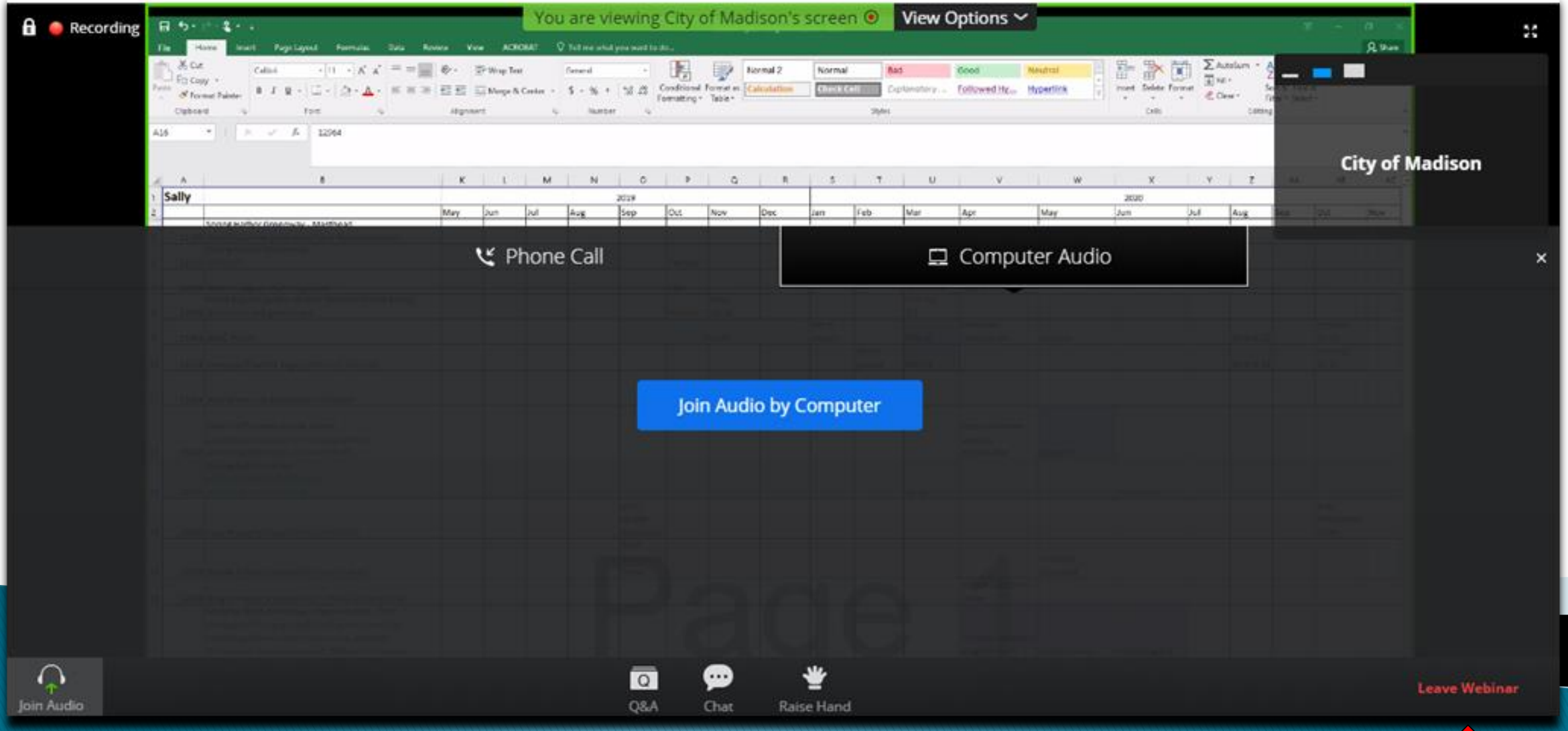


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# Presentation Agenda

- Project Team
- Strickers/Mendota Watershed Study
- Mendota-Grassman Greenway Design Scope
  - Current Design Overview
  - Design Features
  - Anticipated Flood Benefits
- Tree Preservation & Restoration
- Traffic Impacts
- Construction Schedule and Duration

# Project Team

- *Jojo – City of Madison project manager* - Graduated from UW-Madison with a BS in Biological Systems Engineering & Environmental Studies, and a focus in Natural Resources & Environmental Engineering. She has worked for City Engineering designing ponds, shorelines and greenways and managing watershed studies for 6 years. Prior to joining the City, Jojo worked as a project manager for a non-profit providing health care and clean water to a river tributary system in Colombia.
- *Jeff – MSA (Consultant) project manager –* 2007 graduate from the University of Wisconsin-Madison with a B.S. Degree in Civil & Environmental Engineering, and a UW-Madison B.S. Degree in Zoology and Conservation. Jeff has worked on numerous streambank stabilization projects in southern Wisconsin in addition to doing stormwater management and culvert design. He is also a wetland delineator.
- *Eric – MSA Team Leader –* Graduated from University of Minnesota with B.S. and M.S. Degrees in Civil Engineering. Eric has 30+ years experience in and stormwater management design and culvert hydrology and hydraulics. He is a certified floodplain manager and the Water Resources Group Team Leader at MSA.
- *Janet Schmidt- City of Madison Stormwater Principal Engineer* - 1994 graduate from the University of Wisconsin-Madison with a B.S. Degree in Civil & Environmental Engineering with an emphasis in construction management. Janet joined the City of Madison in 1995 and is currently a Principal Engineer for the City Stormwater section.

# Project Team

- *Sarah Lerner –Landscape Architect* - Graduated from UW– Madison with a Bachelor of Science in Landscape Architecture. She is a licensed landscape architect with over 15 years of experience in planting design and ecological restoration. Prior to joining Engineering, she worked for over 10 years at Madison Parks designing large scale restoration plans, initiating citywide restoration management processes, and managing the replanting of thousands of trees across the city as a result of the emerald ash borer. Prior to joining the City, Sarah worked in the private sector designing planting plans for stormwater management ponds and greenways. (not present today)
- *Maddie Dumas –Greenway Vegetation Coordinator* - Master of Science in Landscape Architecture from the University of Wisconsin-Madison. Her studies focused on ecological restoration with an emphasis on the tallgrass prairie-savanna-wetland systems native to southern Wisconsin. Her work for Engineering has focused on improving the biodiversity and ecosystem services provided by the stormwater system through a variety of ecological restoration approaches. Prior to working for the City, Maddie worked as the land steward for a non-profit managing 660 acres of restored prairie and wetland in southern Columbia Co., WI.
- *City of Madison Forestry* – Certified arborists (not present today)
- *Tree Health Management (Consultant)* – Certified arborists (not present today)

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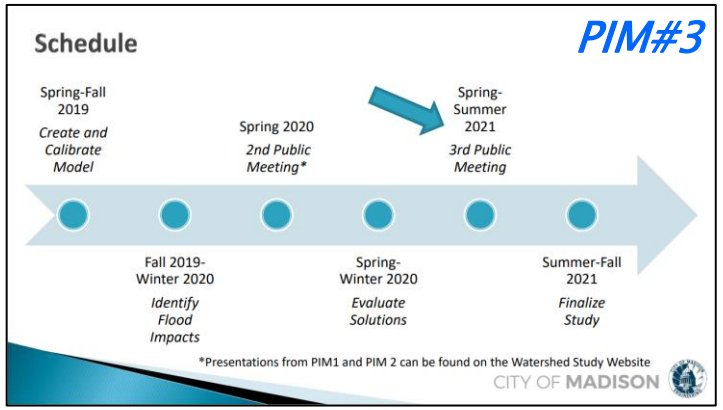
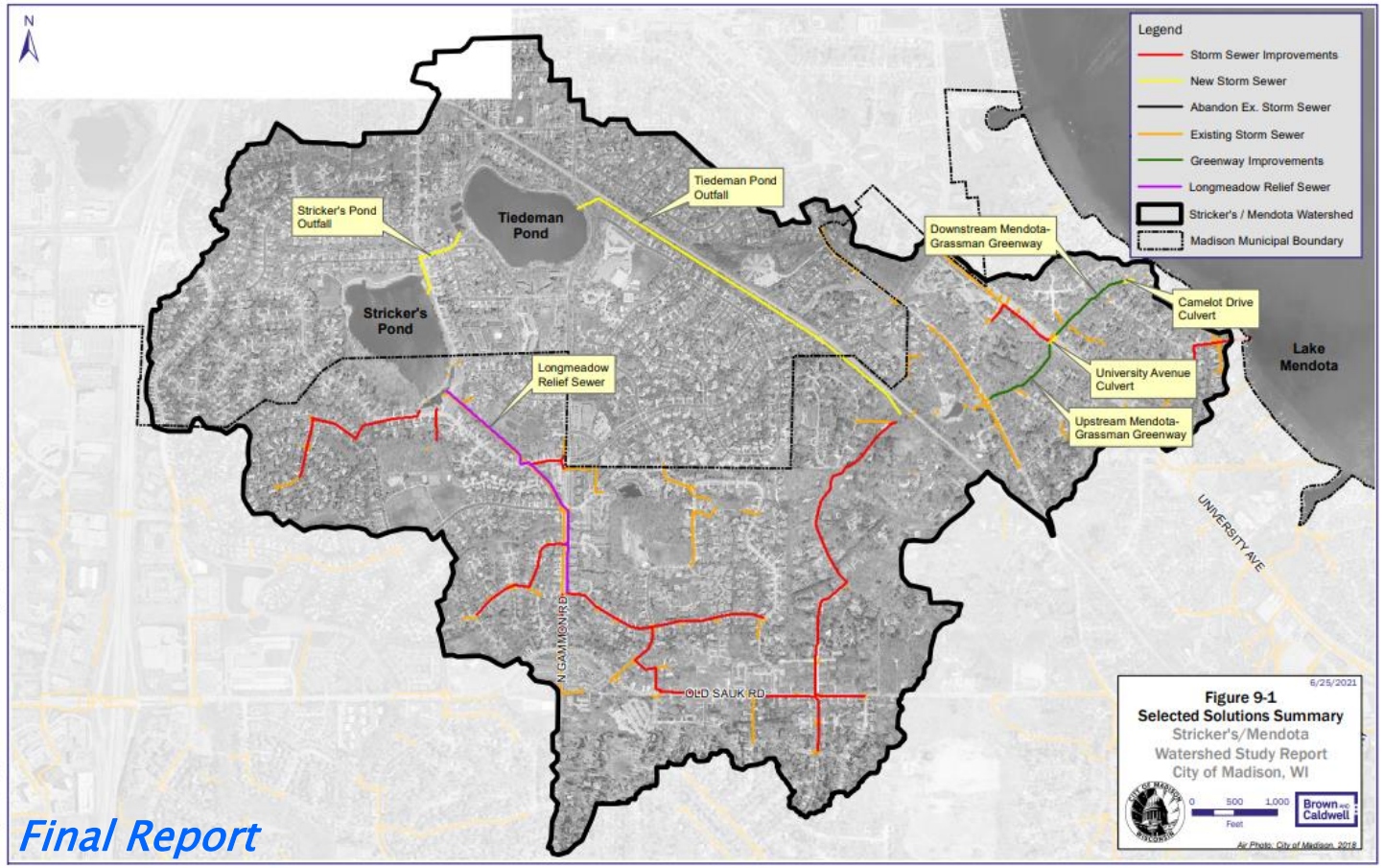
# Strickers/Mendota Watershed Study








*https://www.cityofmadison.com/engineering/projects/strickers-mendota-watershed-study*

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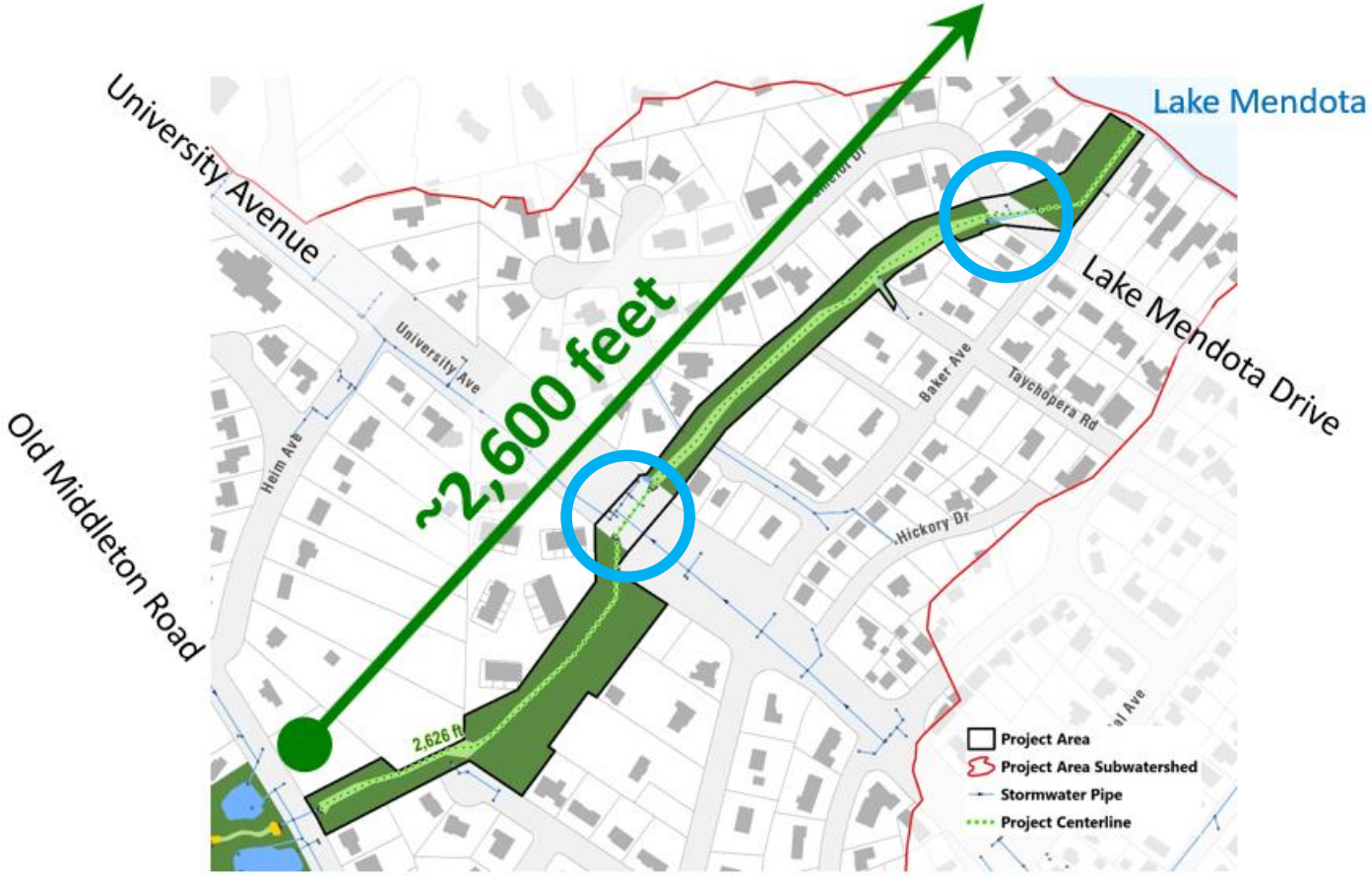


## Flood Mitigation Targets

1% Chance Event (6.66" rain/24 hours)

- No structure (home/building) flooding
- No greenway crossing overflow

## Project Scope

Increase capacity at University Avenue
Increase capacity at Camelot Drive
2,600 feet of channel improvement

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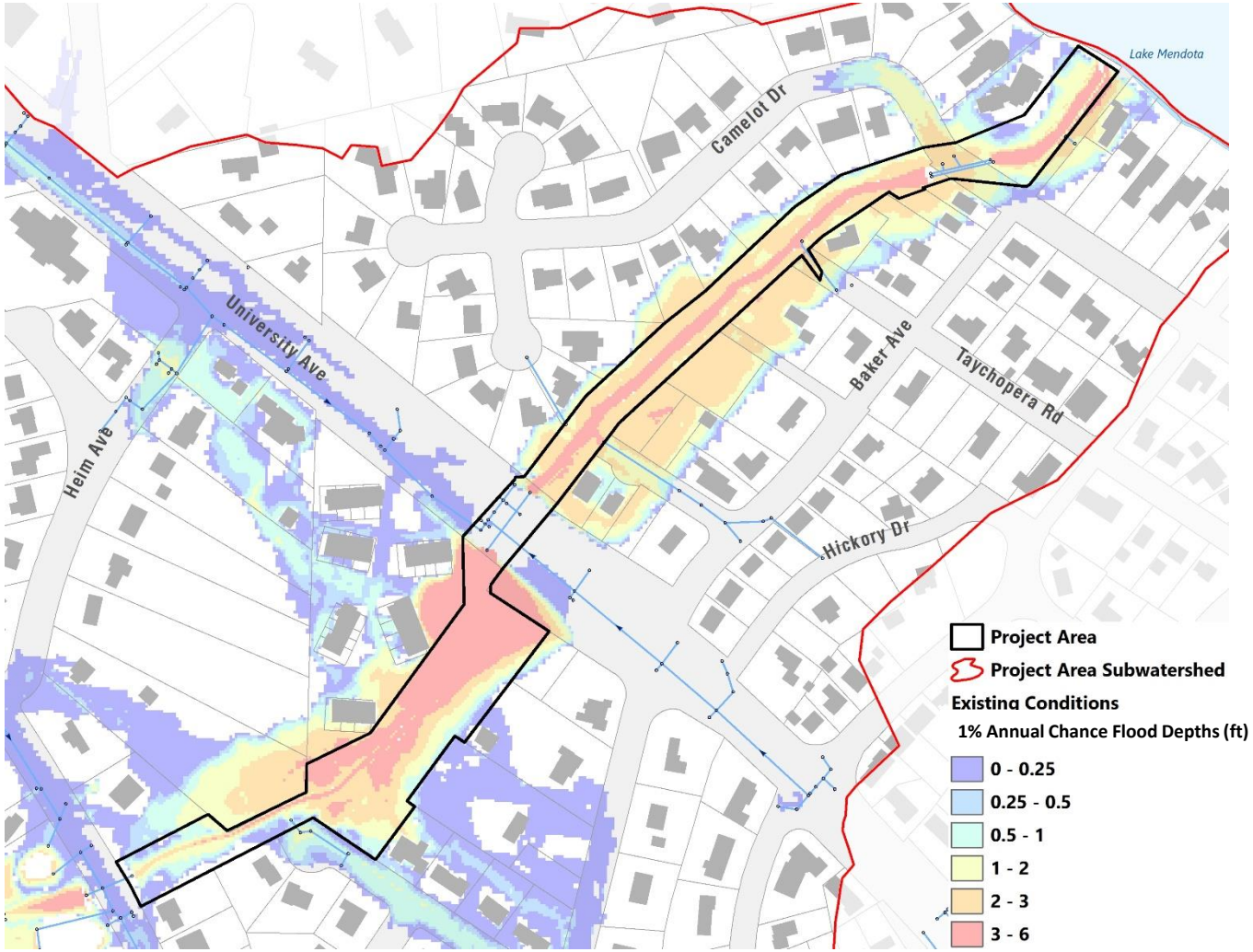
# Existing Conditions 1% Annual Chance Flood & Scope of this Project



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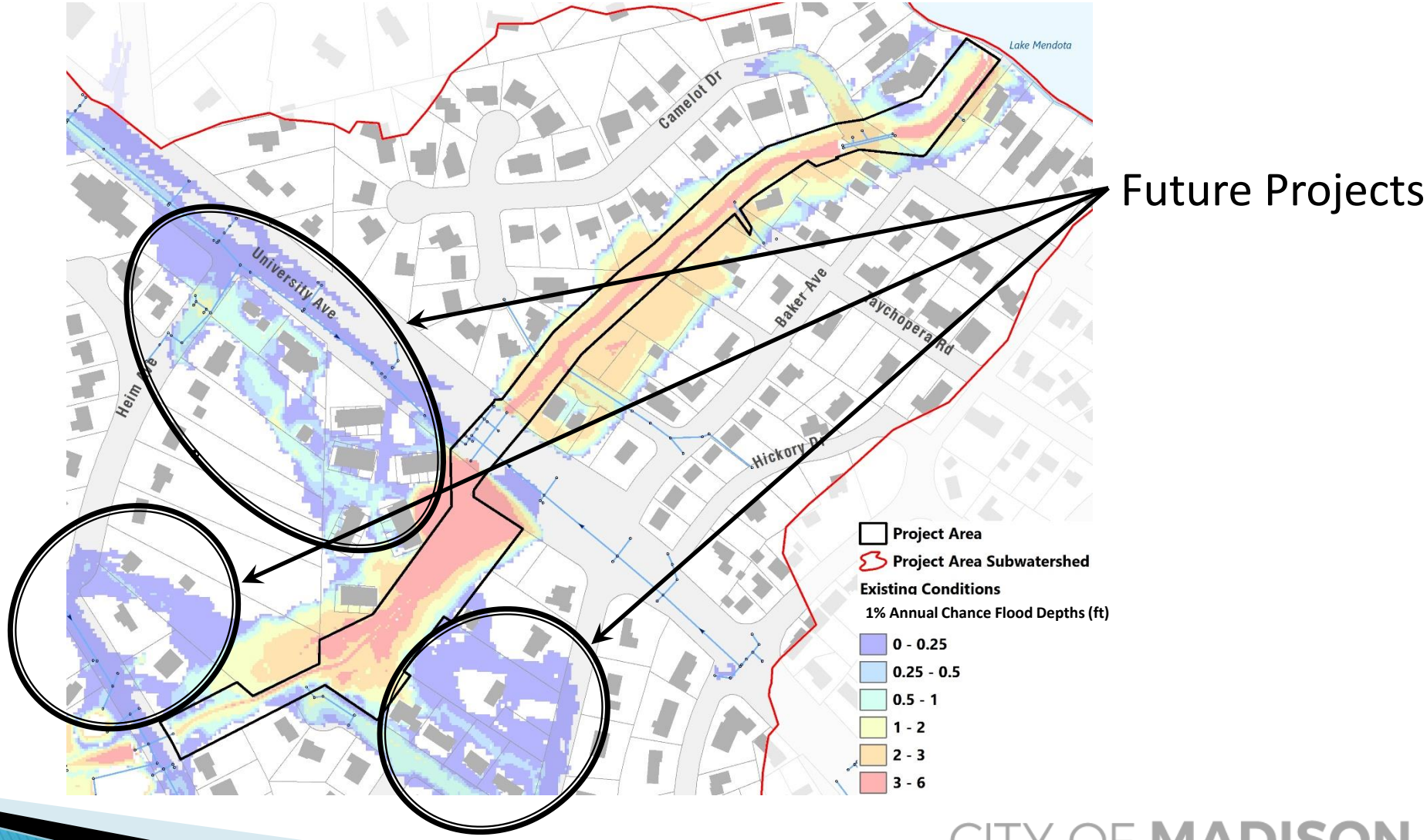


Future Projects

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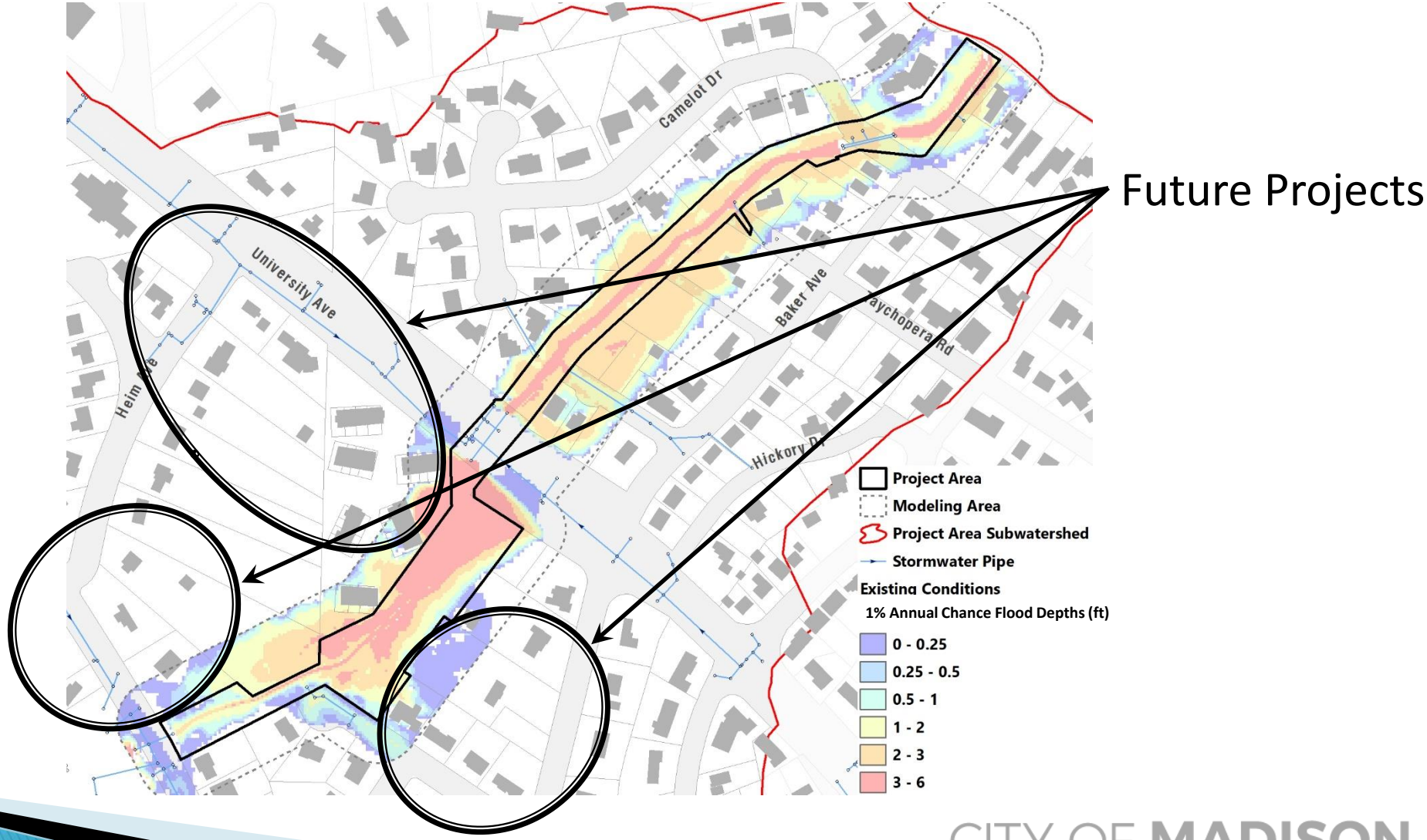
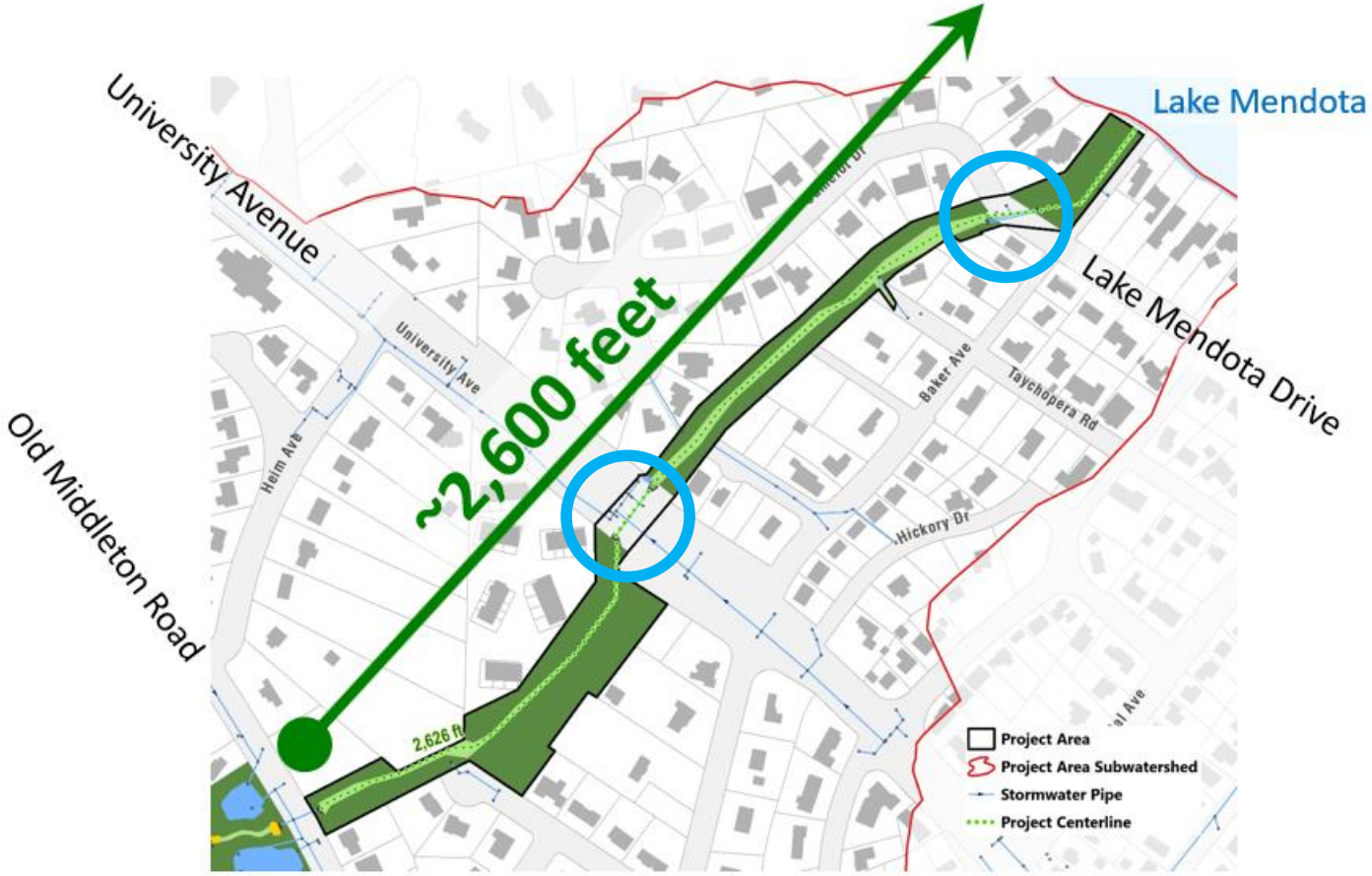
# Existing Conditions 1% Annual Chance Flood & Scope of this Project



# Current Design Overview

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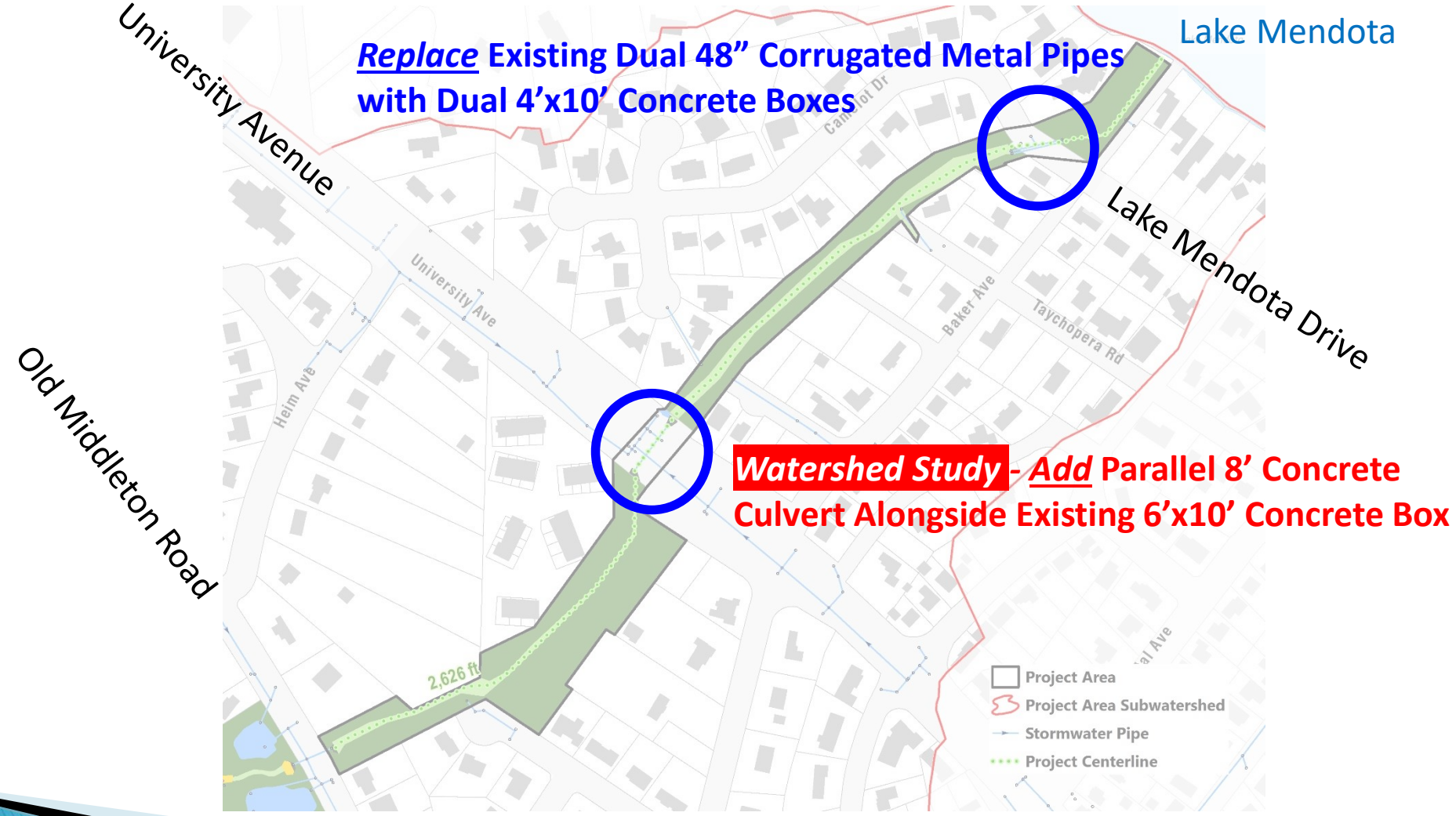
# Project Segments – Pipe Work

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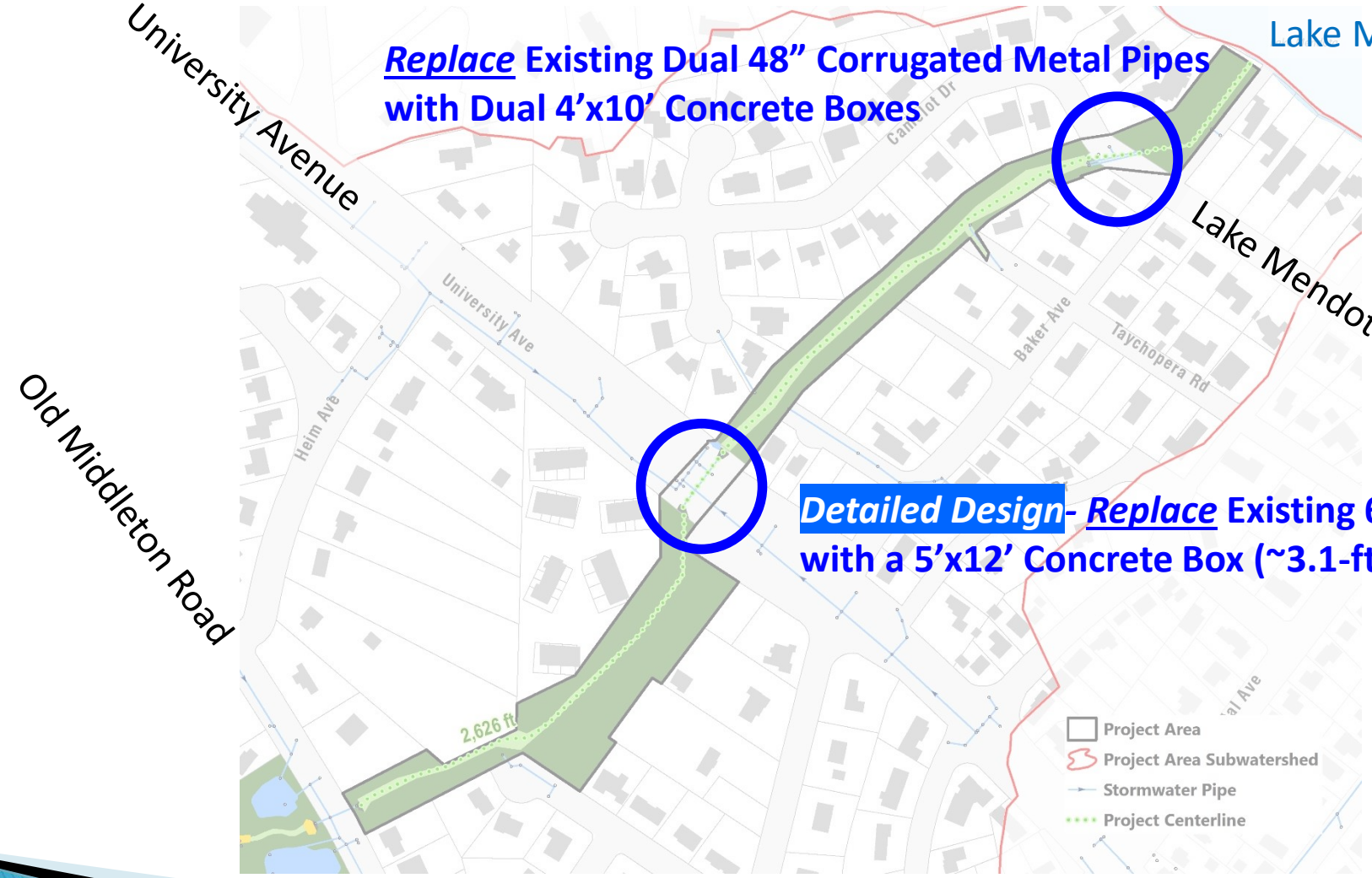


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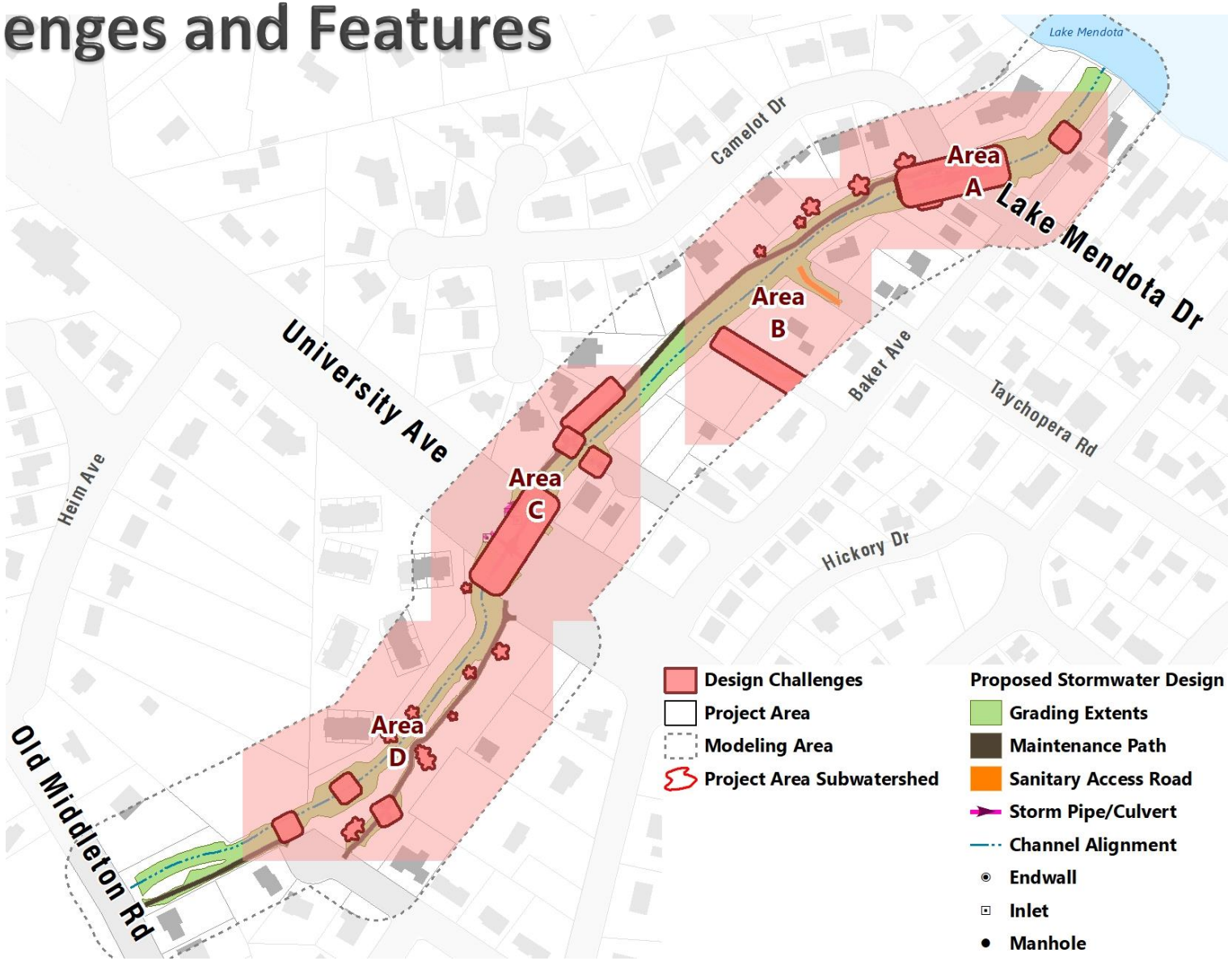
# Design Challenges and Features

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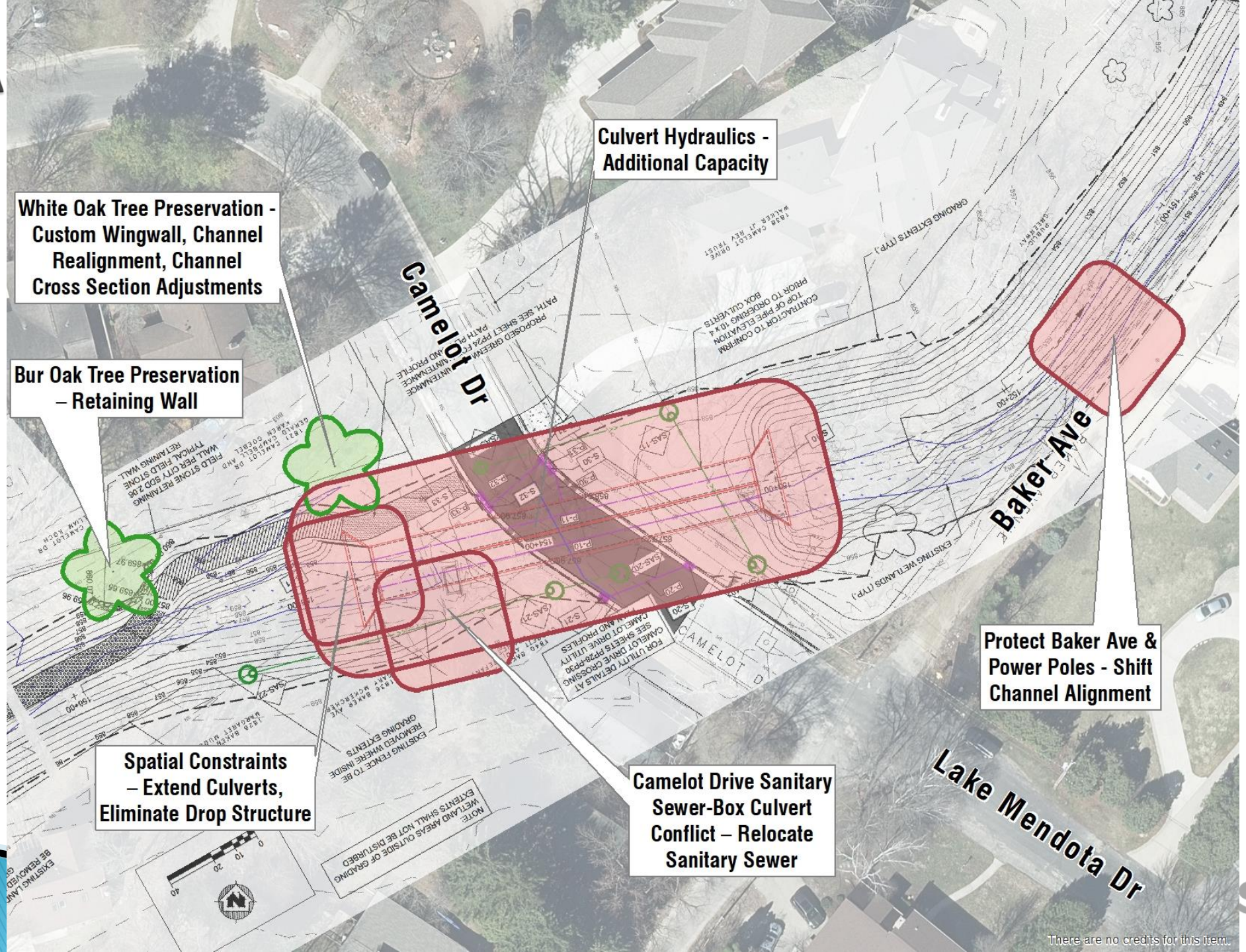
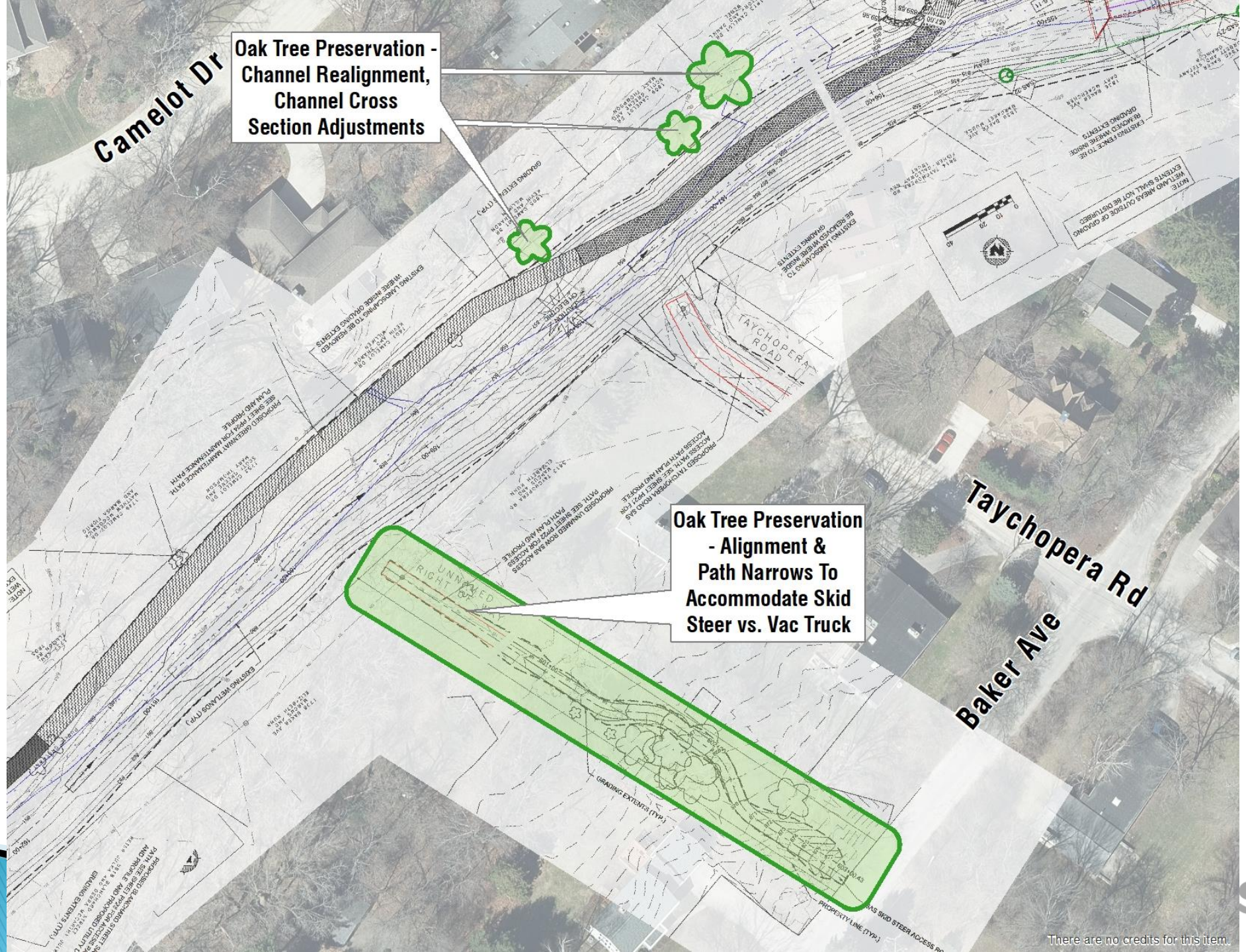
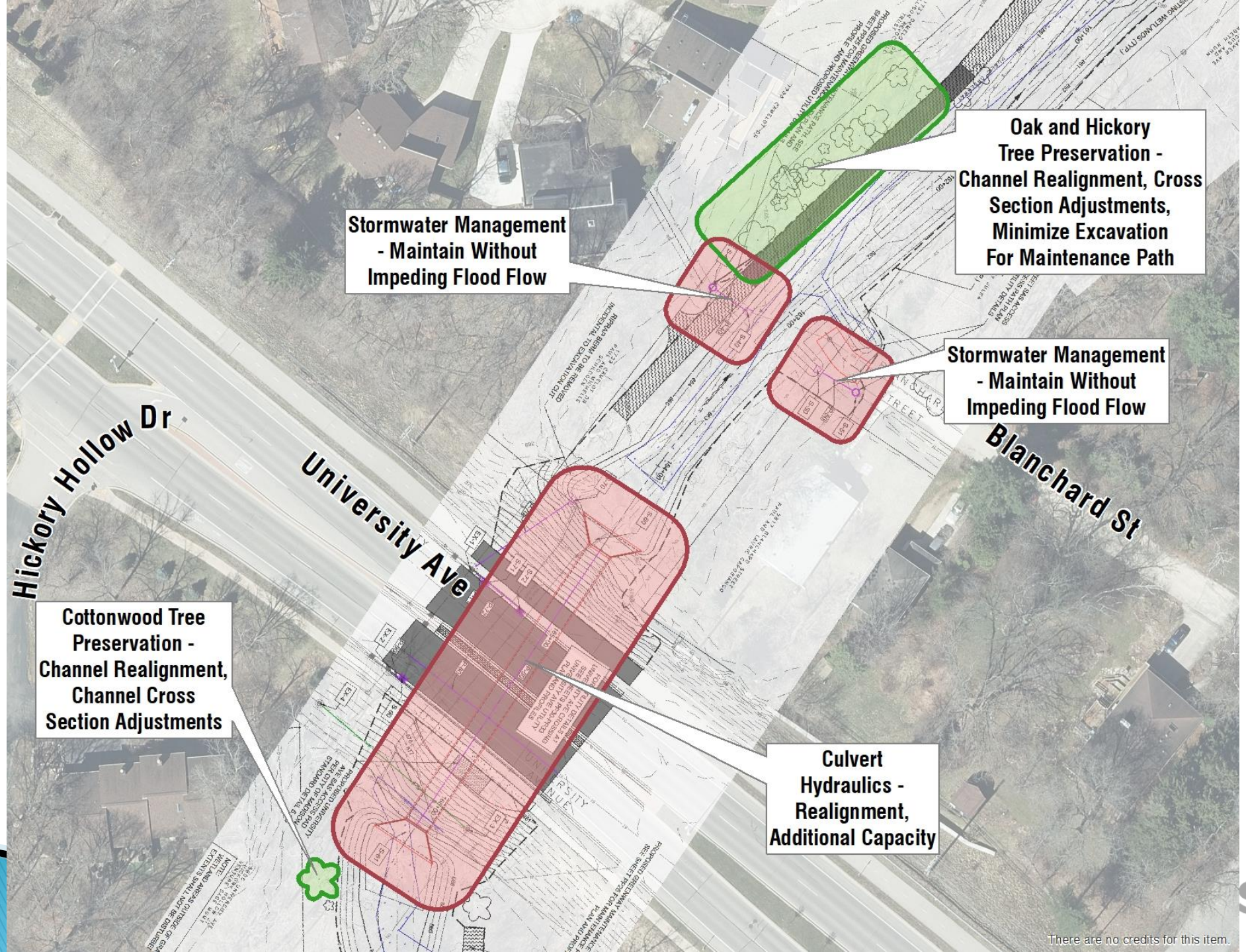
# Area A



# Area B



# Area C

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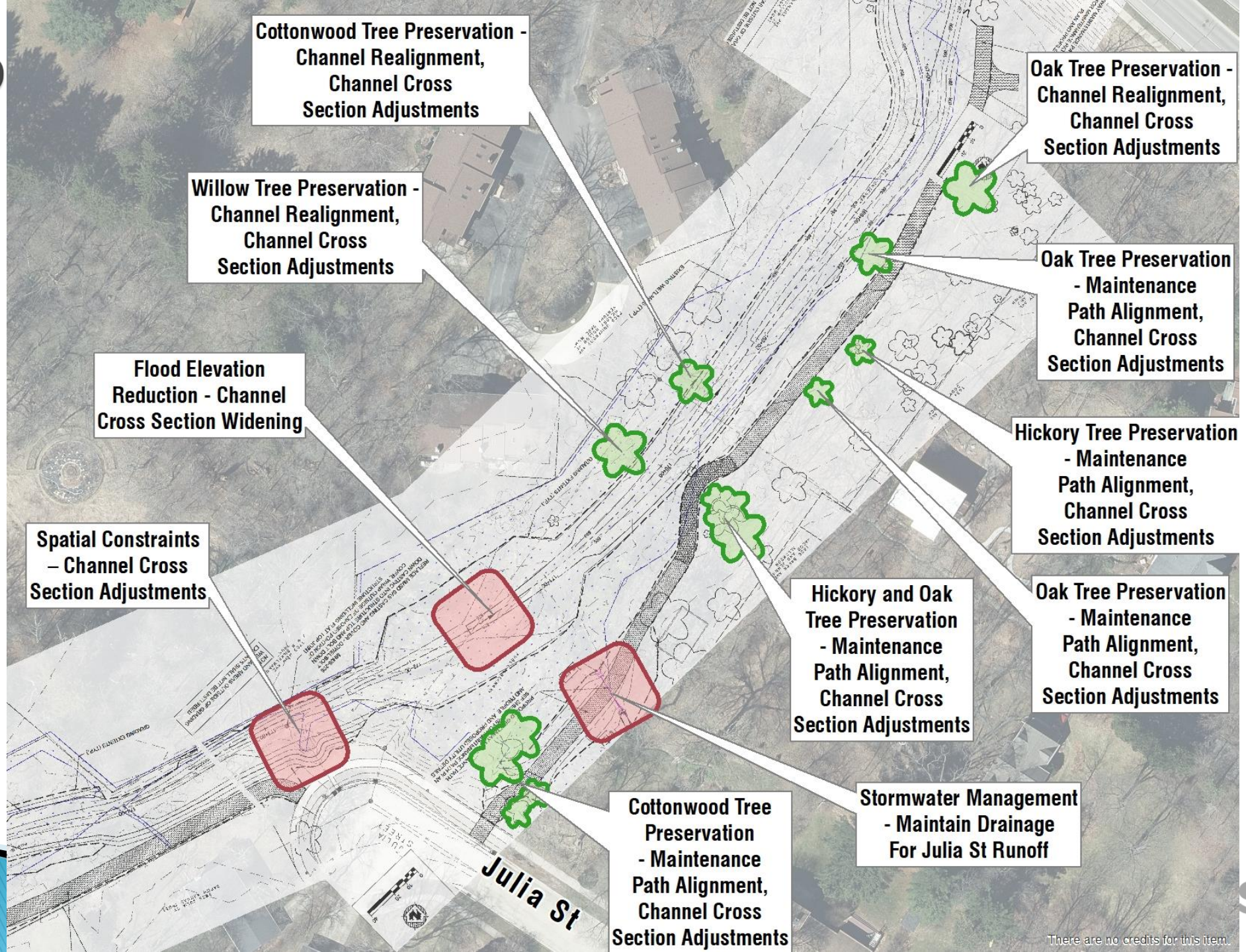
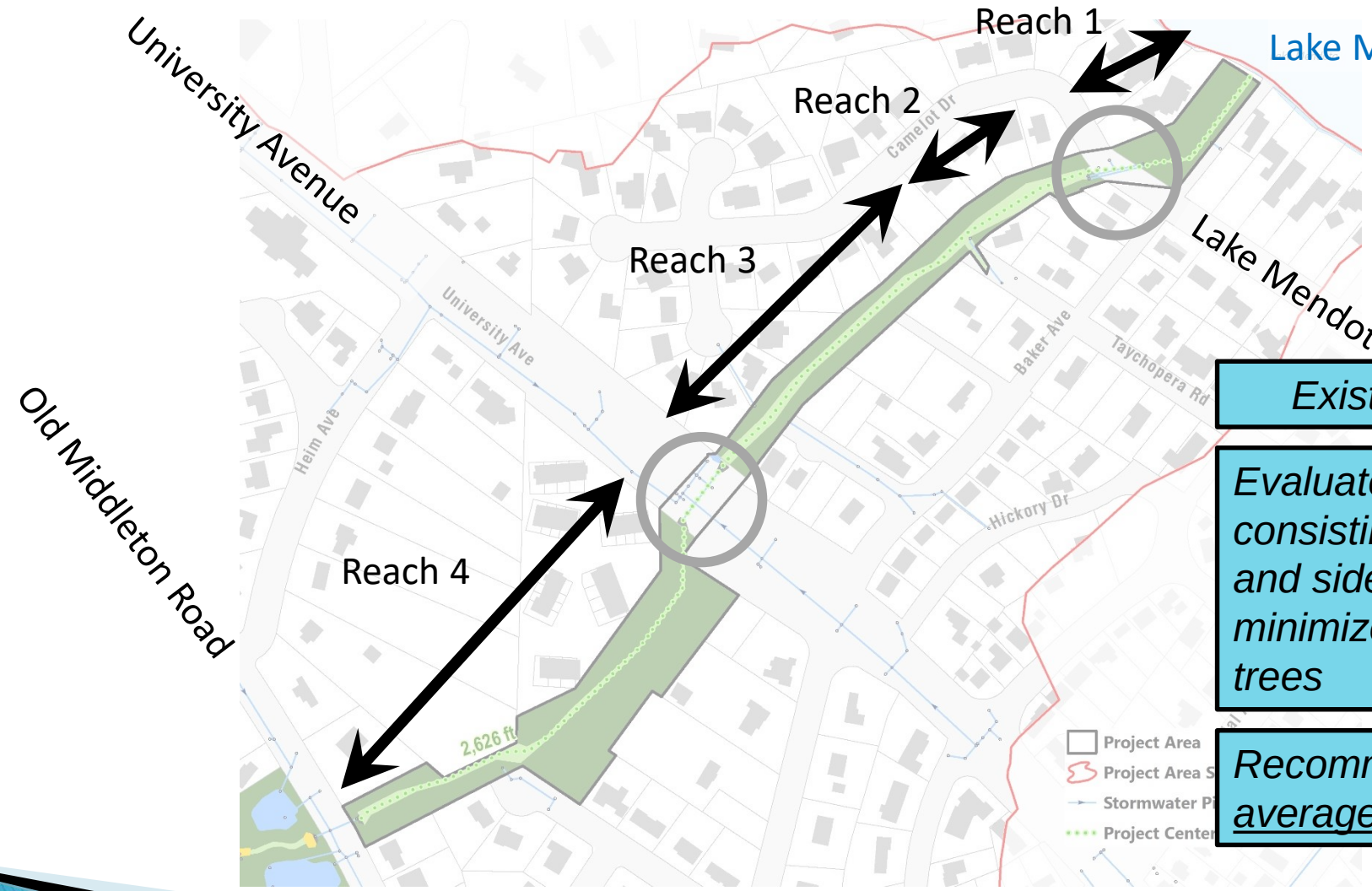
# Area D



# Project Segments – Channel Work




*Existing Width ~ 20 feet*

*Evaluated three alternatives consisting of different widths and side-slopes with intent to minimize impacts to desirable trees*

*Recommendation ~ 39-foot <u>average</u> width*

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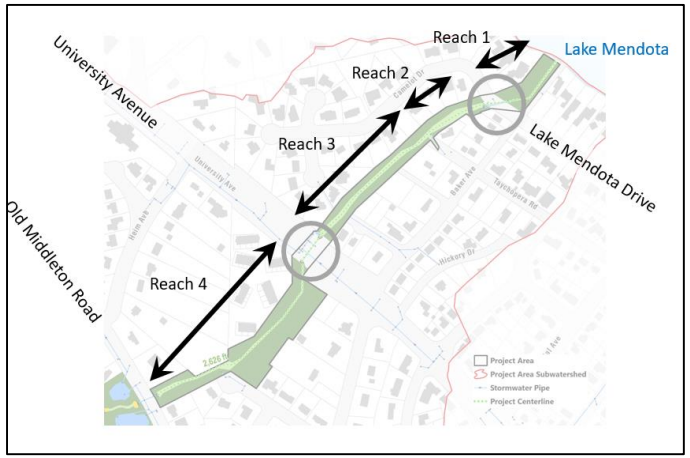
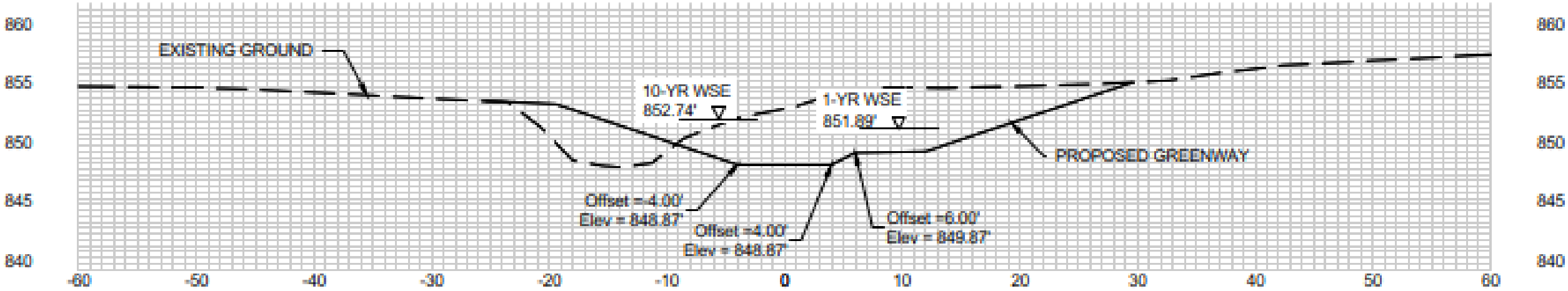
# Reach #1 – Typical Section




Width at Bottom = 8 ft
Width at Shelf = 19.4 ft
Low Flow Side Slope = 2:1
Main Channel Side Slope = 3:1
Width at Top ~ 53 ft




STA 151+50

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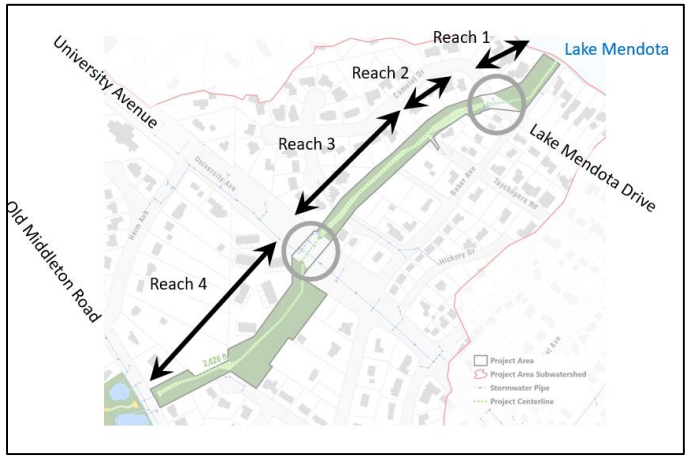
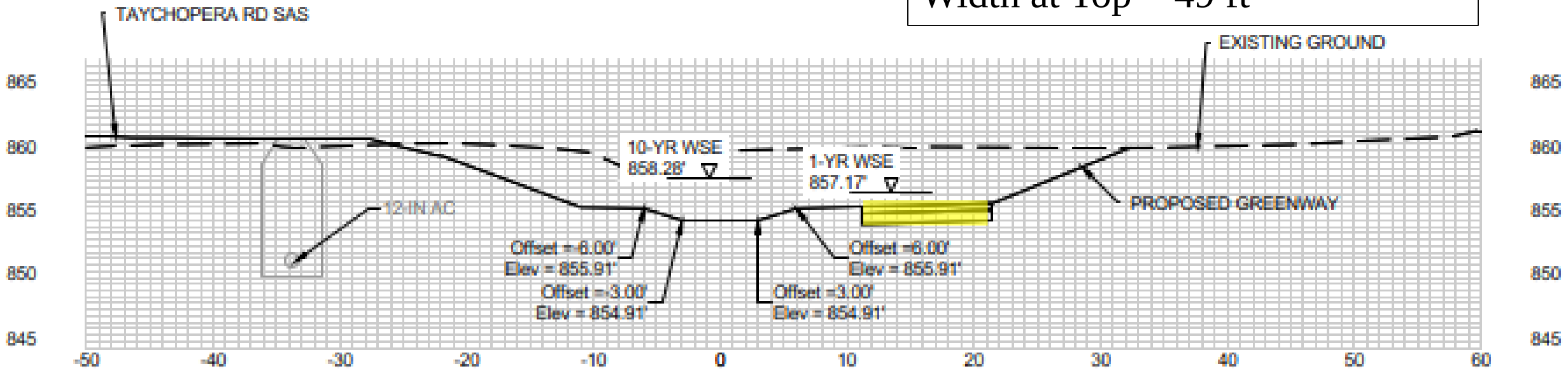
# Reach #2 – Typical Section




Width at Bottom = 6 ft
Width at Shelf = 20.6 ft
Low Flow Side Slope = 2:1
Main Channel Side Slope = 2.8:1
Width at Top ~ 49 ft




STA 157+50

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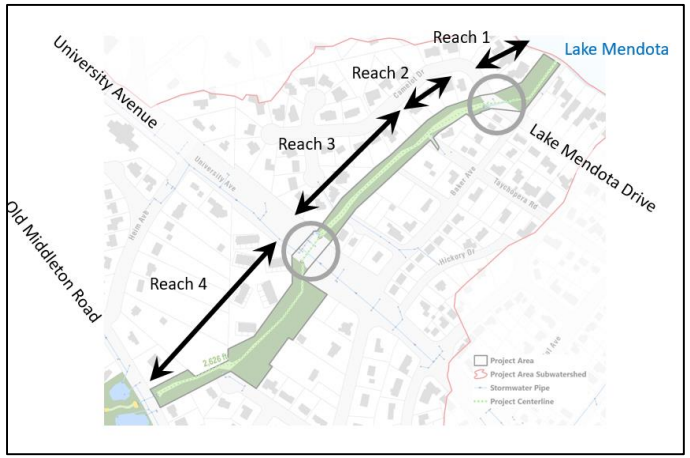
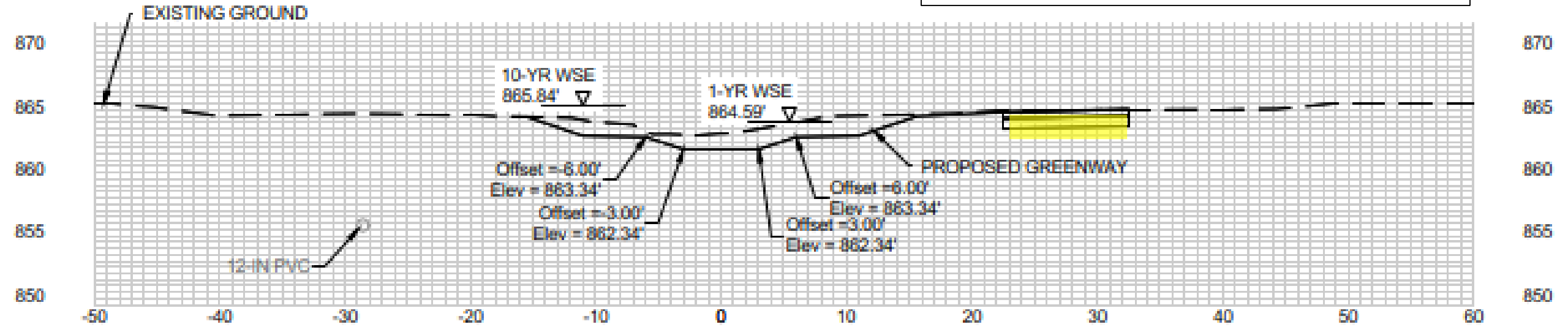
# Reach #3 – Typical Section




Width at Bottom = 6 ft
Width at Shelf = 22 ft
Low Flow Side Slope = 3.5:1
Main Channel Side Slope = 3:1
Width at Top ~ 39

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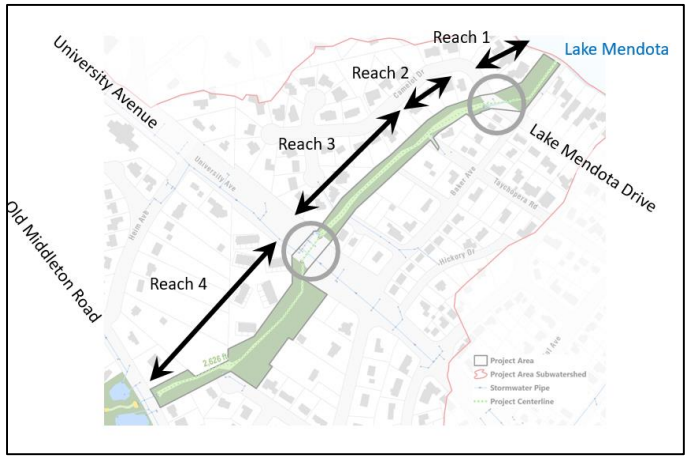
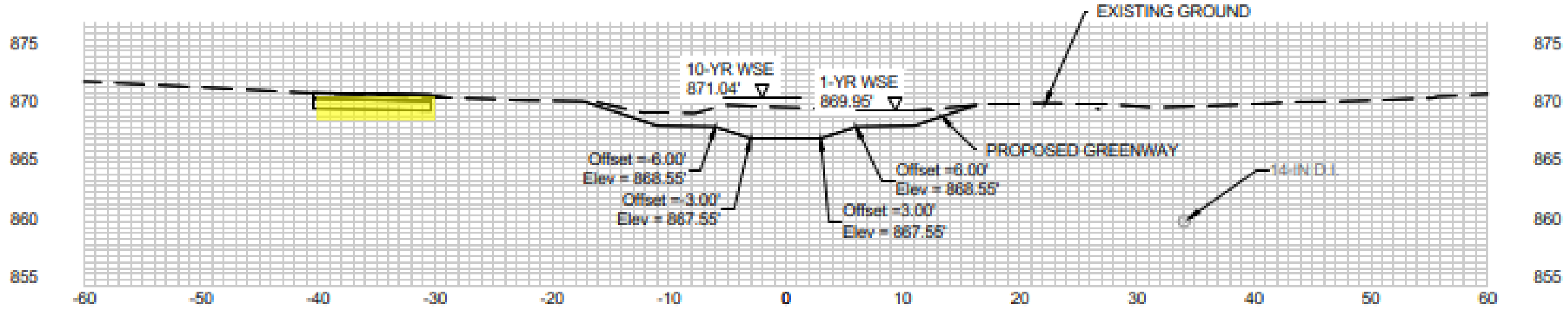
# Reach #4 – Typical Section




Width at Bottom = 6 ft
Width at Shelf = 22 ft
Low Flow Side Slope = 3:1
Main Channel Side Slope = 3:1
Width at Top ~ 30

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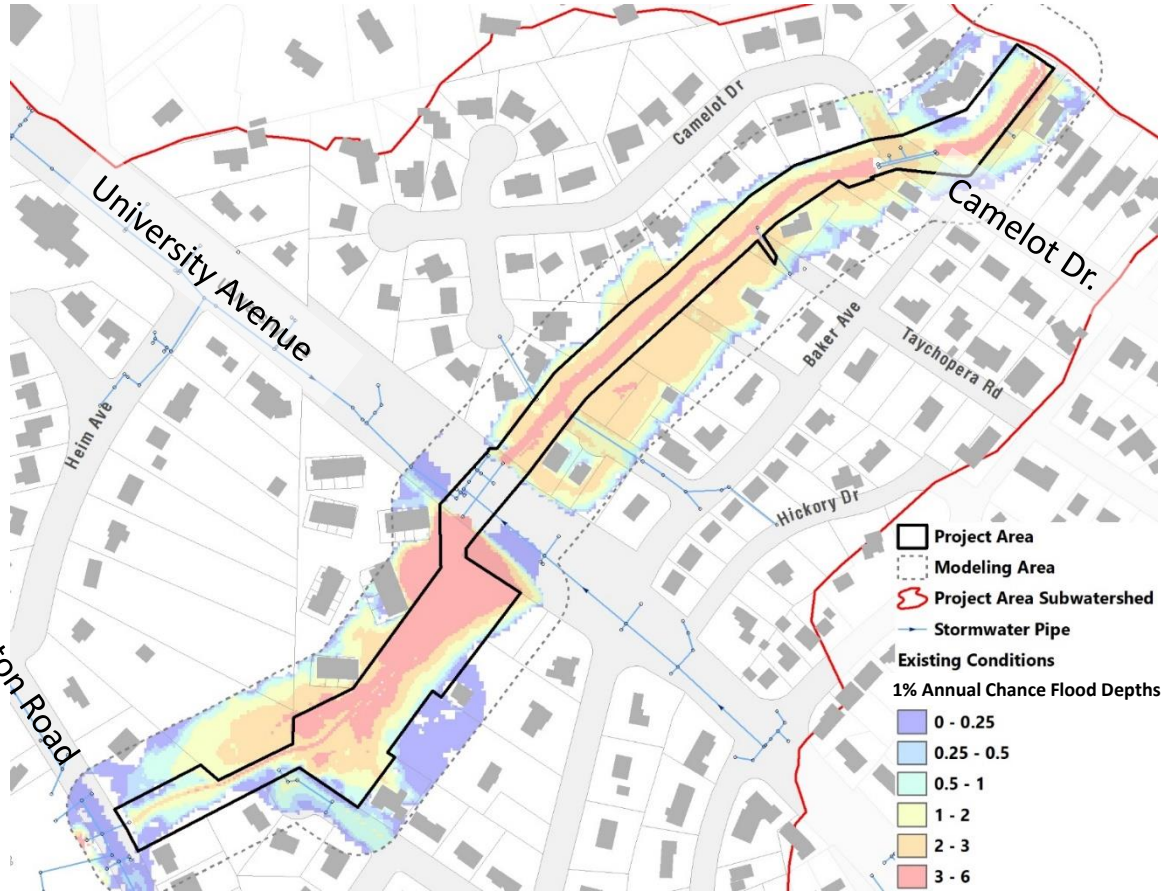
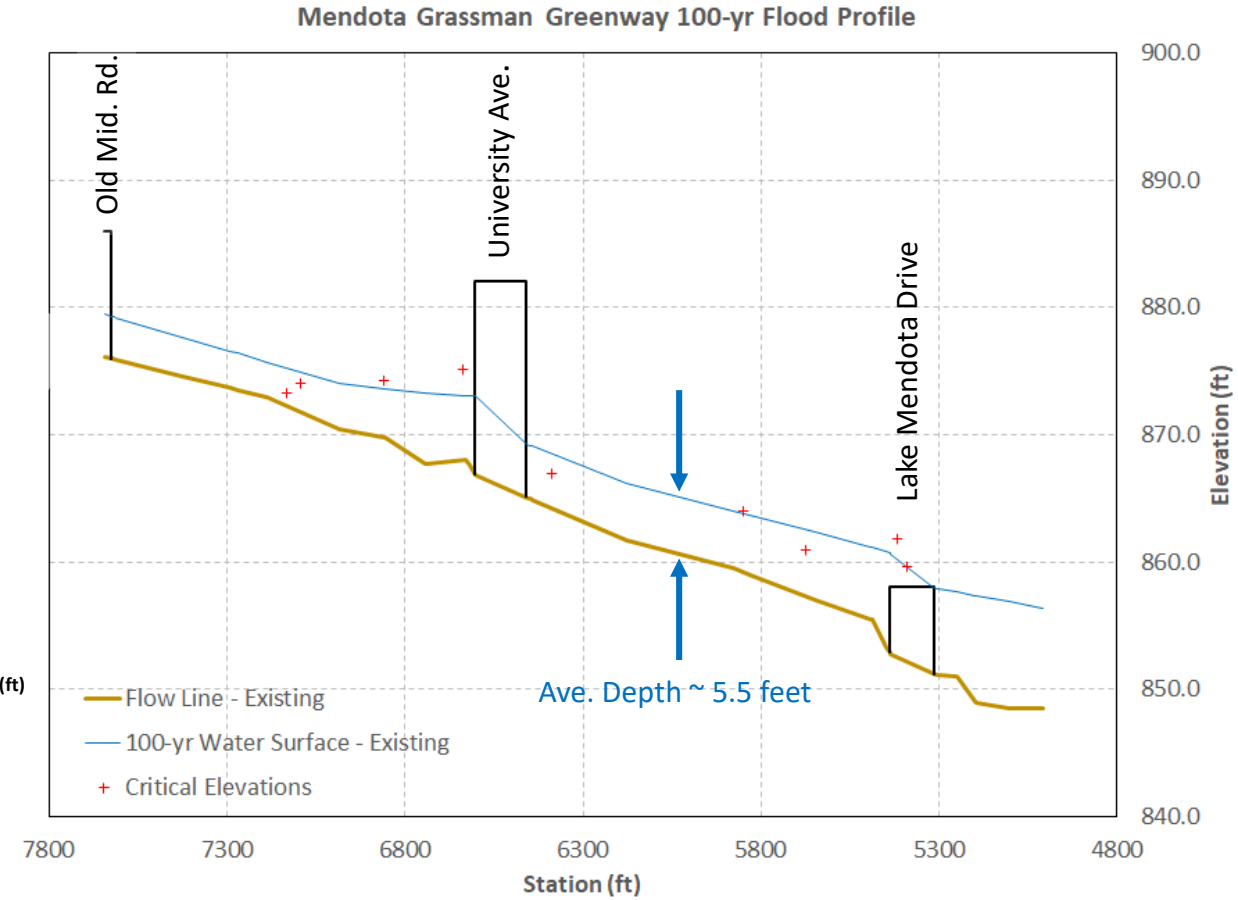
# Targeted Flood Reduction

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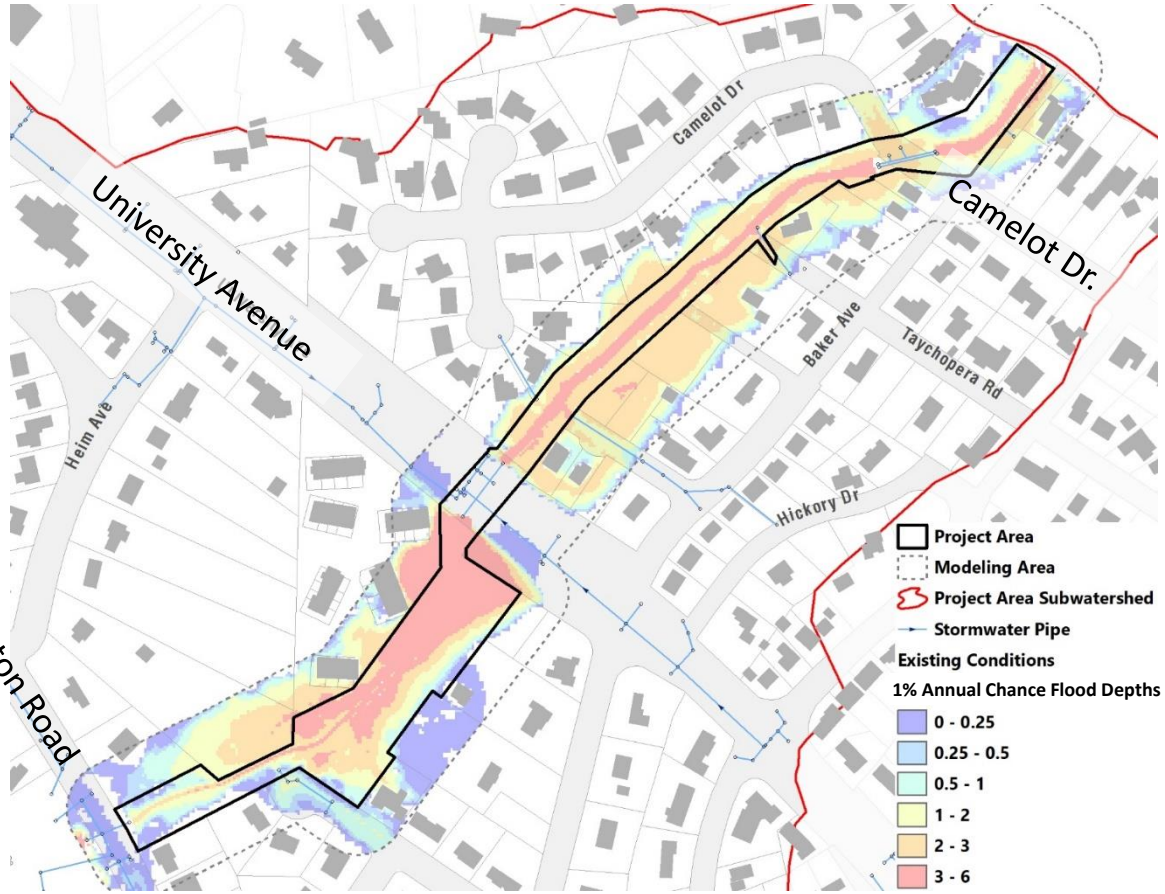


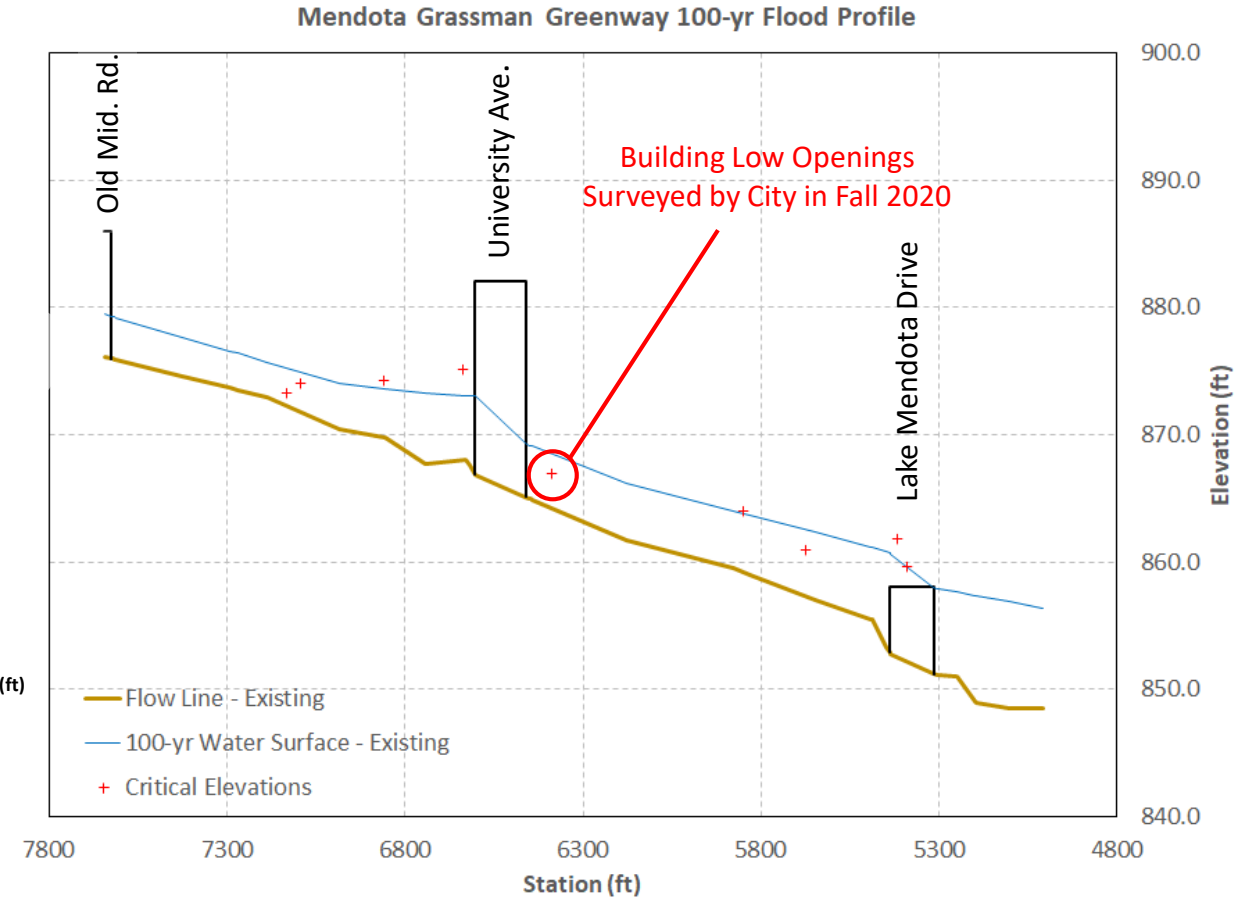


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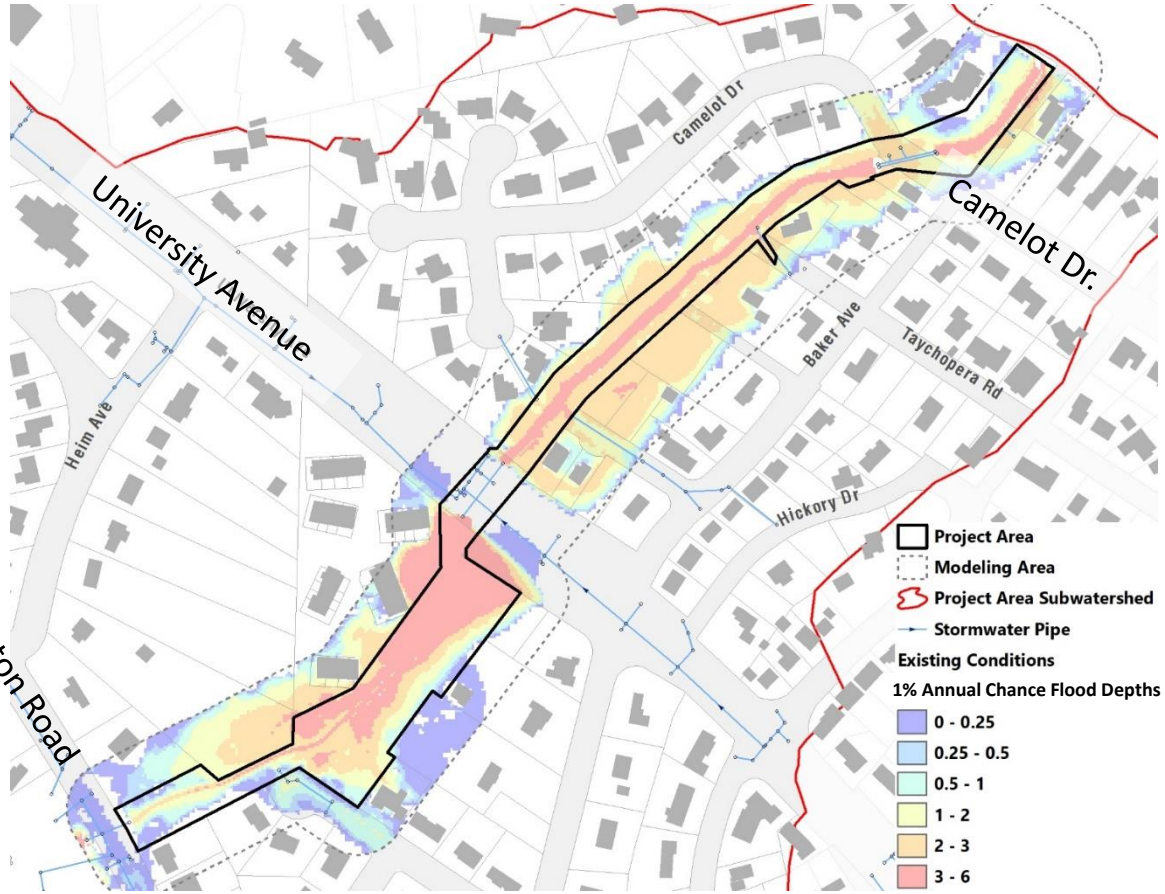


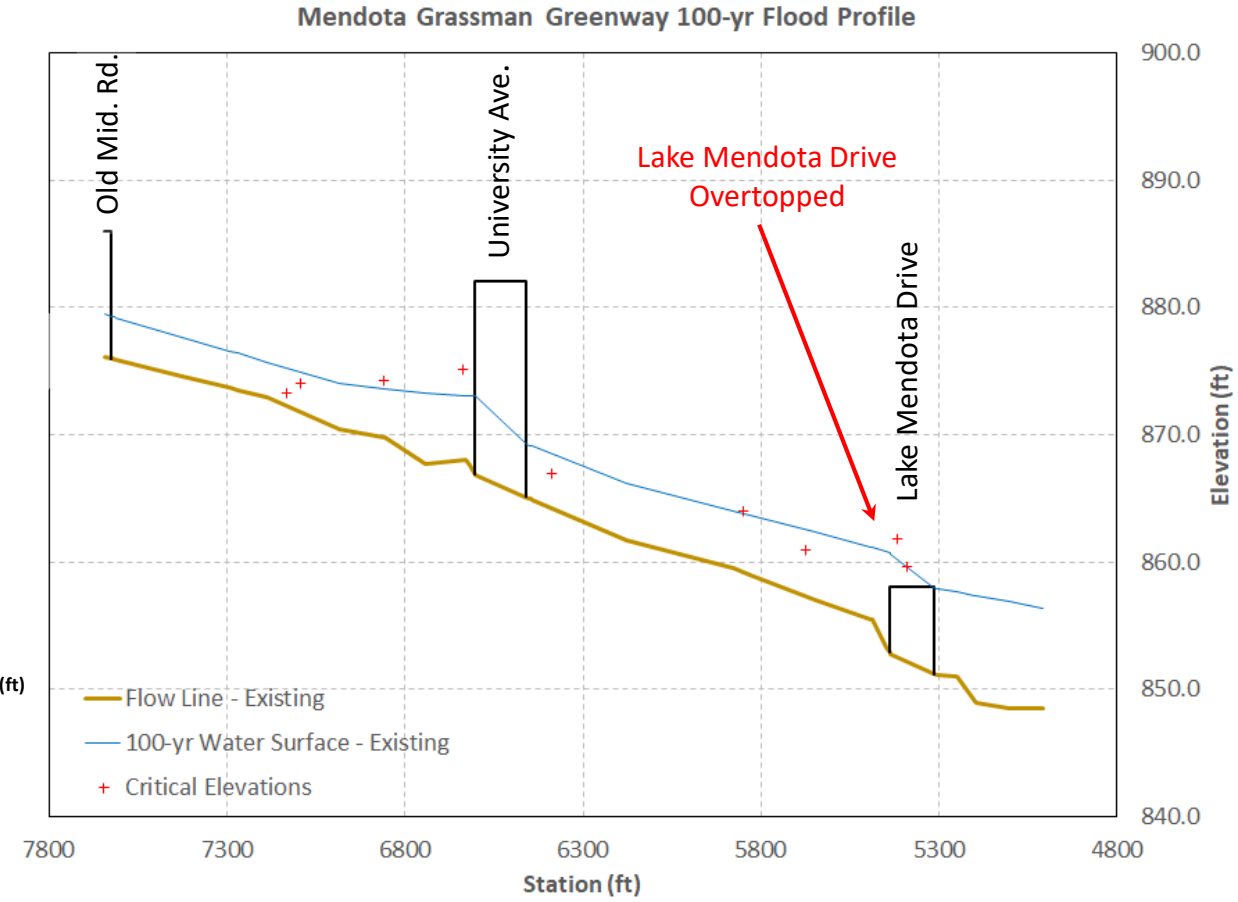


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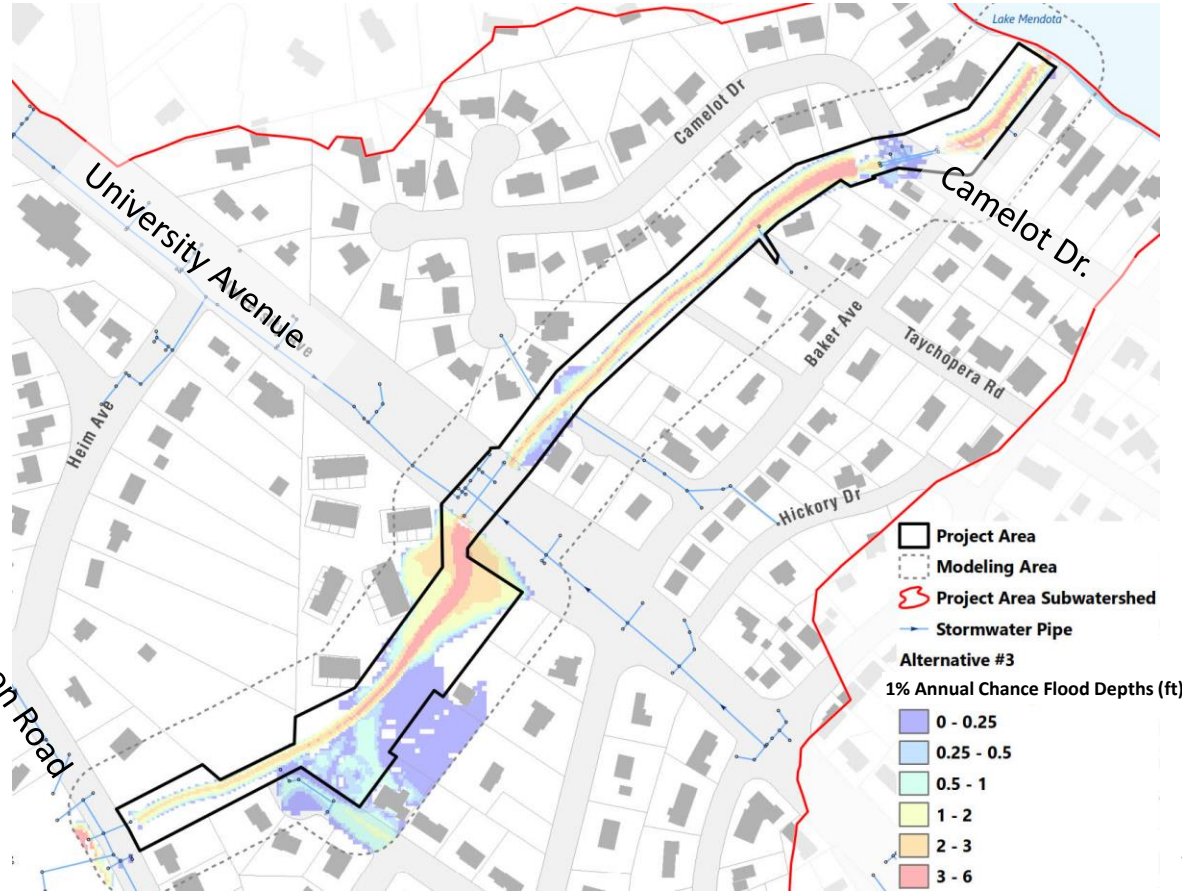
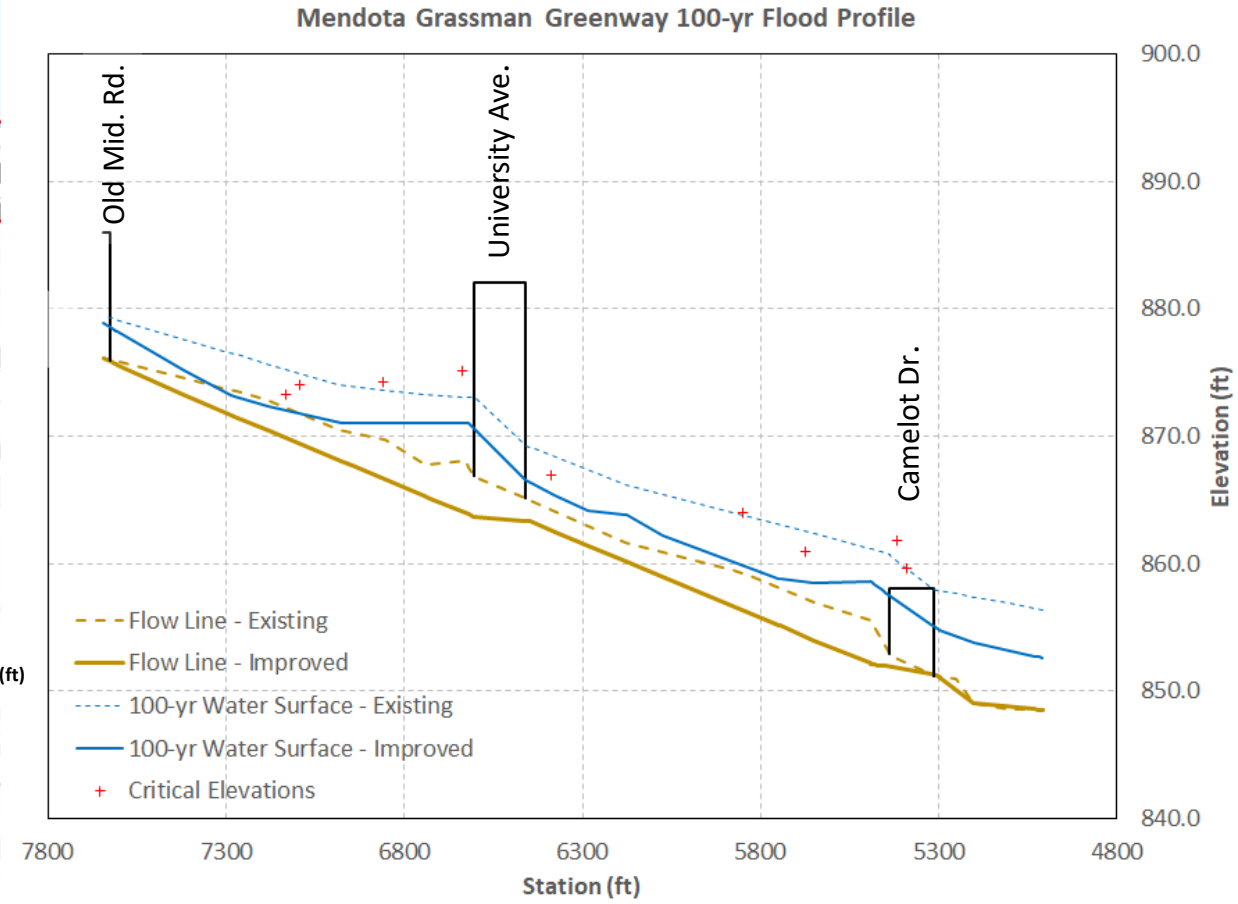
# 30% Design - 1% Annual Chance Inundation

*Average Inundation Elevation Reduction = 2.8 feet*

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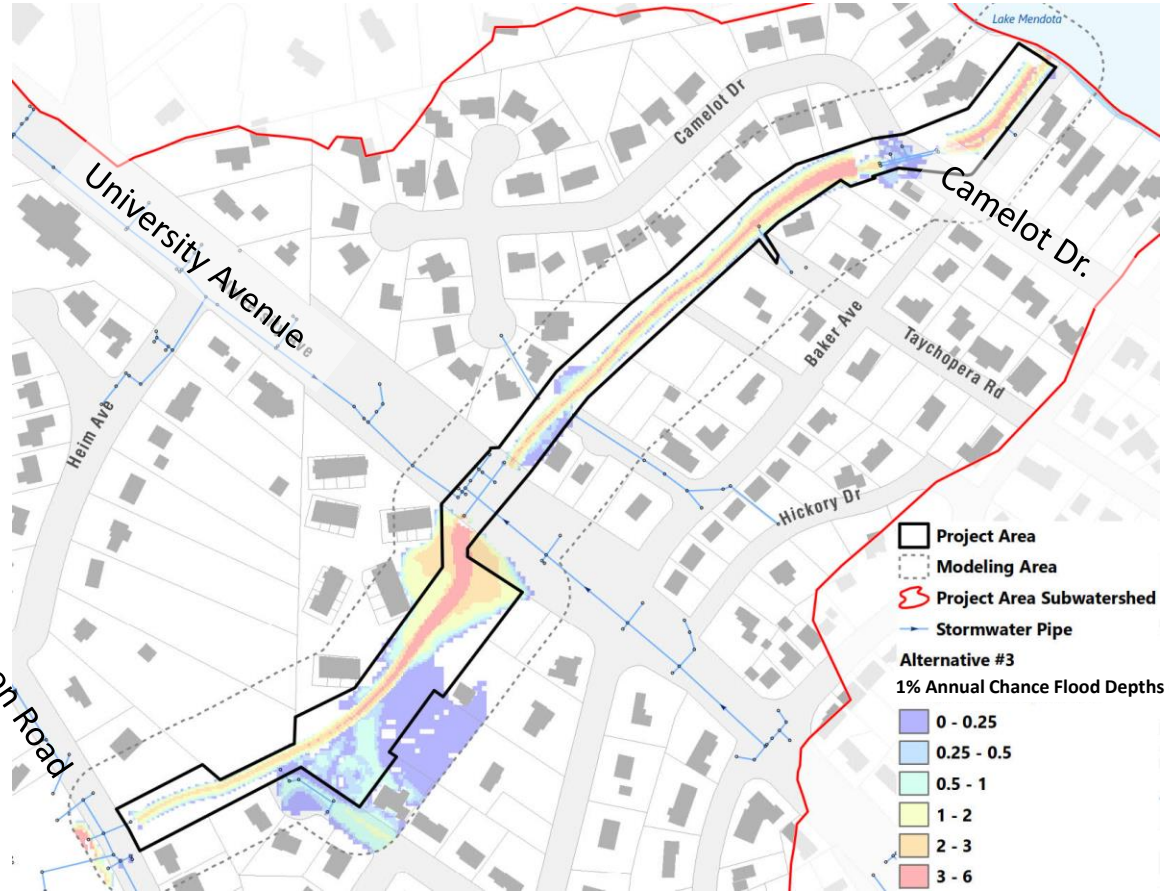
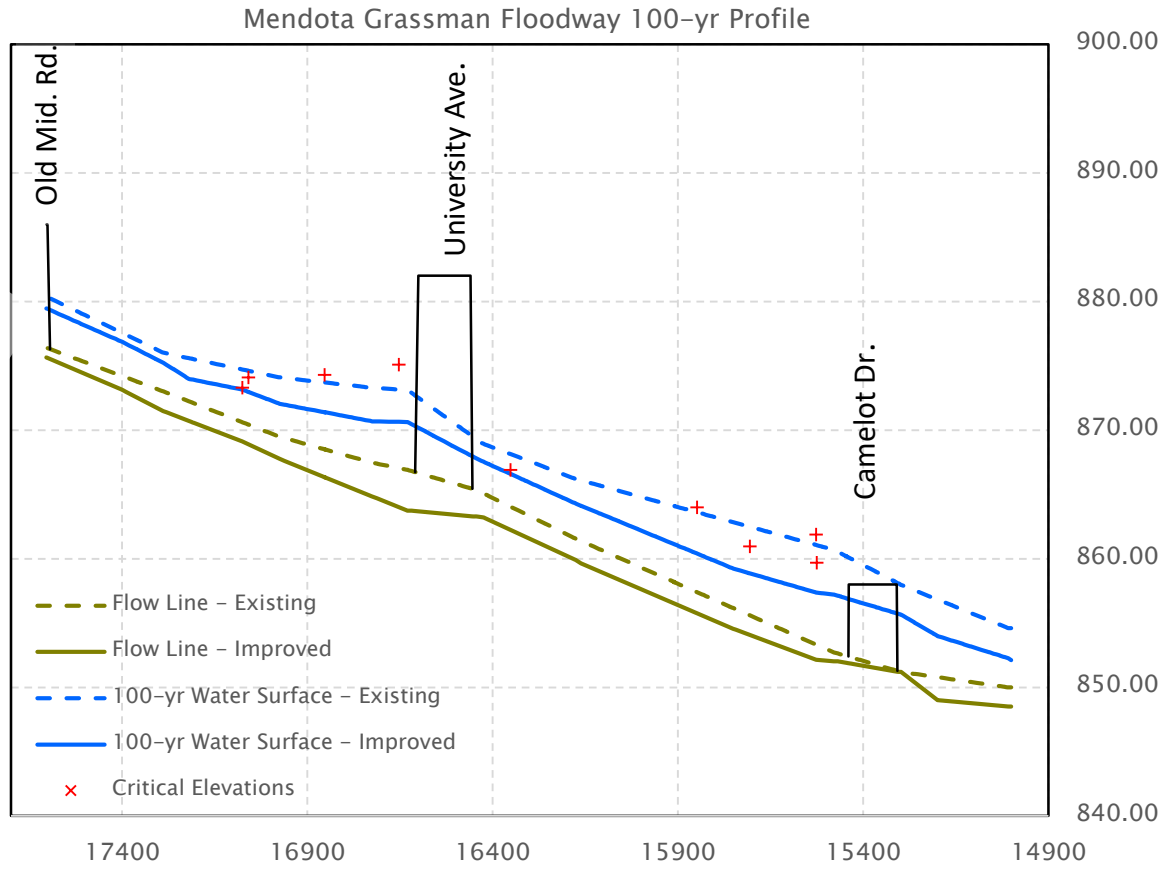
# Current Design - 1% Annual Chance Inundation

*Average Inundation Elevation Reduction = 2.2 feet*

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# Ecological Restoration

## Remove Invasive Plants

- density to replicate wetland and sedge meadow ecological conditions that support fluctuating water.

## Install native shrubs, forbs and grasses

- within areas of higher velocity to quickly establish root structure to stabilize soil.
- Native forbs and grasses have the root structure necessary to stabilize soil and increase infiltration in wet conditions.

## Seed with aggressive native seed

- mixes based on flood tolerances, sun, and soil moisture to create quick forming native understory that is less susceptible to invasive species takeover.

## Ongoing removals of invasives

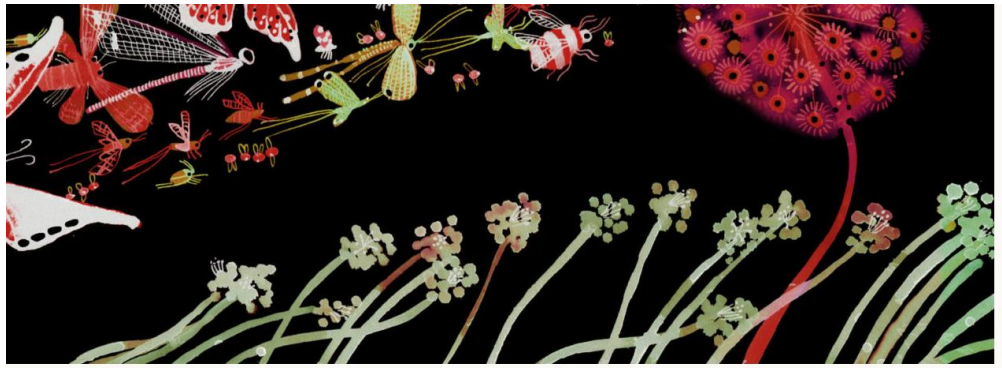
- Include in multi-year ecological restoration contract to get native understory started
- Manage with minimal mowing, prescribed burn, targeted invasive treatment

# Ecological Restoration

- Benefits
  - Biodiversity
    - Insects– Specialist species that need specific habitat plants are particularly helped by ecological restoration (e.g. monarch butterfly)
      - "Ninety percent of the insects that eat plants can develop and reproduce only on the plants with which they share an evolutionary history," Doug Tallamy
    - Habitat
  - Soil Health
    - Reducing erosion and nutrients runoff that enter our lake and impair our waters
  - Carbon Impact
    - Studies are finding that native grasslands act as carbon sinks

Plummeting insect numbers 'threaten collapse of nature'

The Guardian, Feb 10, 2019



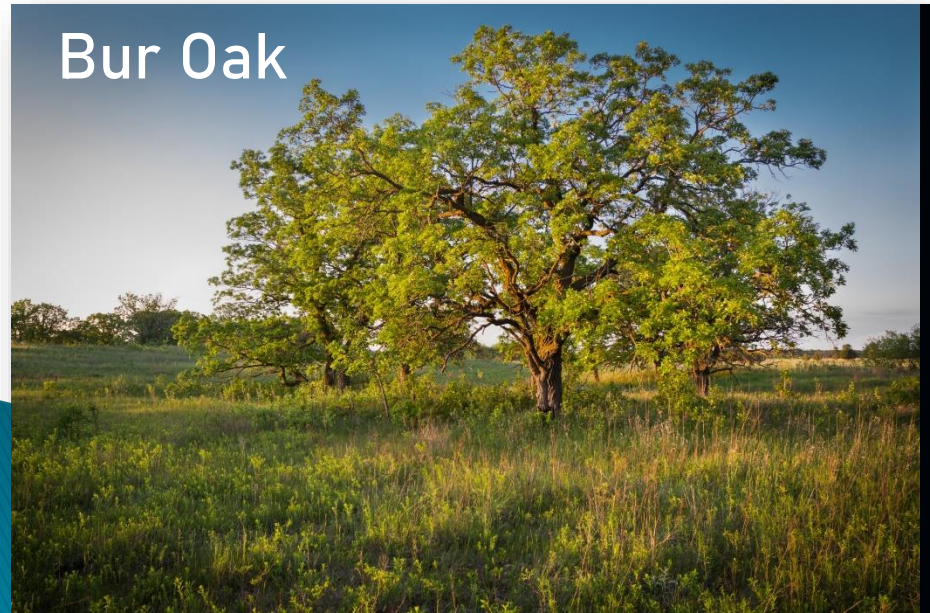
NZO PÉRÈS-LABOURDETTE / YALE E360

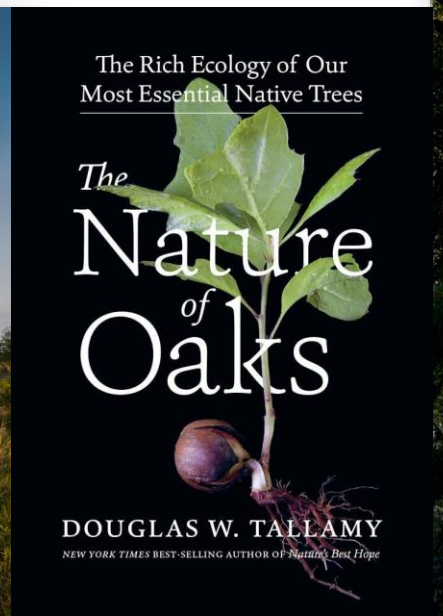
How Non-Native Plants Are Contributing to a Global Insect Decline

Yale School of the Environment E360, December 8, 2020

# Ecological Restoration

- Trees
  - Bur Oak (Quercus macrocarpa)
  - White Oak (Quercus alba)
  - Swamp White Oak (Quercus bicolor)
  - Shagbark Hickory (Carya ovata)
  - Bitternut Hickory (Carya cordiformis)




# Ecological Restoration

- Shrubs
  - Black Chokecherry (Aronia melanocarpa)
  - Witchhazel (Hamamelis virginiana)
  - Swamp Rose (Rosa palustris)
  - Elderberry (Sambucus canadensis)
  - Meadowsweet (Spirea alba)
  - Buttonbush (Cephalanthus occidentalis)
  - Bladdernut (Staphlea trifolia)
  - Dogwood (Cornus sericea)
  - Nannyberry viburnum (Viburnum lentago)


# Ecological Restoration

- Live Plugs
  - Sneezeweed
  - Blue lobelia
  - Northern blue flag iris
  - Swamp milkweed
  - Porcupine sedge
  - Bebb's sedge
  - Brown fox sedge
  - Canada blue joint grass
  - Ostrich fern
  - Canada mayapple
  - Solomon's plume

# Ecological Restoration

- Native Seed

| WOODLAND SEED MIX | |
|---|---|
| Blue cohosh | Caulophyllum thalictroides |
| Wild geranium | Geranium maculatum |
| Elm-leaved goldenrod | Solidago ulmifolia |
| Virginia wild rye | Elymus virginicus |
| Bottlebrush grass | Hystrix patula |
| Common wood sedge | Carex blanda |

Blue cohosh and Solomon's plume (L); Wild geranium (R)

| MESIC SUNNY SEED MIX |
|---|
| City of Madison Standard Specifications for "Infiltration Basin Side Slopes and Tallgrass Prairie Seed Mix" section 207.2(a) 3 |

| MESIC AGGRESSIVE SEED MIX |
|---|
| Agrecol's "CITY OF MADISON WET-MESIC UNDERSTORY CUSTOM MIX" |

| GRASSES, SEDGES & RUSHES | COMMON NAME |
|---|---|
| Andropogon gerardii | Big Bluestem |
| Bouteloua curtipendula | Side Oats Grama |
| Carex vulpinoidea | Brown Fox Sedge |
| Poa palustris | Fowl Bluegrass |
| Elymus virginicus | Virginia Wild Rye |
| Bromus ciliatus | Fringed Brome |
| Sorghastrum nutans | Indian Grass |
| Scirpus atrovirens | Dark-Green Bulrush |
| Glyceria striata | Fowl Manna Grass |
| | GRASSES, SEDGES & RUSHES TOTAL |

| WILDFLOWERS | COMMON NAME |
|---|---|
| Heliopsis helianthoides | Early Sunflower |
| Achillea millefolium | Native Yarrow |
| Agastache scrophulariaefolia | Purple Giant Hyssop |
| Allium cernuum | Nodding Onion |
| Cassia hebecarpa | Wild Senna |
| Monarda fistulosa | Wild Bergamot |
| Napaea dioica | Glade Mallow |
| Oenothera biennis | Common Evening Primrose |
| Helenium autumnale | Sneezeweed |
| Echinacea purpurea | Purple Coneflower |
| Rudbeckia hirta | Black-Eyed Susan |
| Silphium perfoliatum | Cup Plant |
| Solidago ohioensis | Ohio Goldenrod |
| Vernonia fasciculata | Ironweed |
| Verbena hastata | Blue Vervain |
| Asclepias incarnata | Marsh (Red) Milkweed |
| Liatris spicata | Marsh Blazing Star |
| Eupatorium perfoliatum | Boneset |
| Hypericum pyramidatum | Great St. John's Wort |
| Lobelia siphilitica | Great Blue Lobelia |

| WET AGGRESSIVE SEED MIX | |
|---|---|
| Dark green bulrush | Scirpus atrovirens |
| Virginia wild rye | Elymus virginicus |

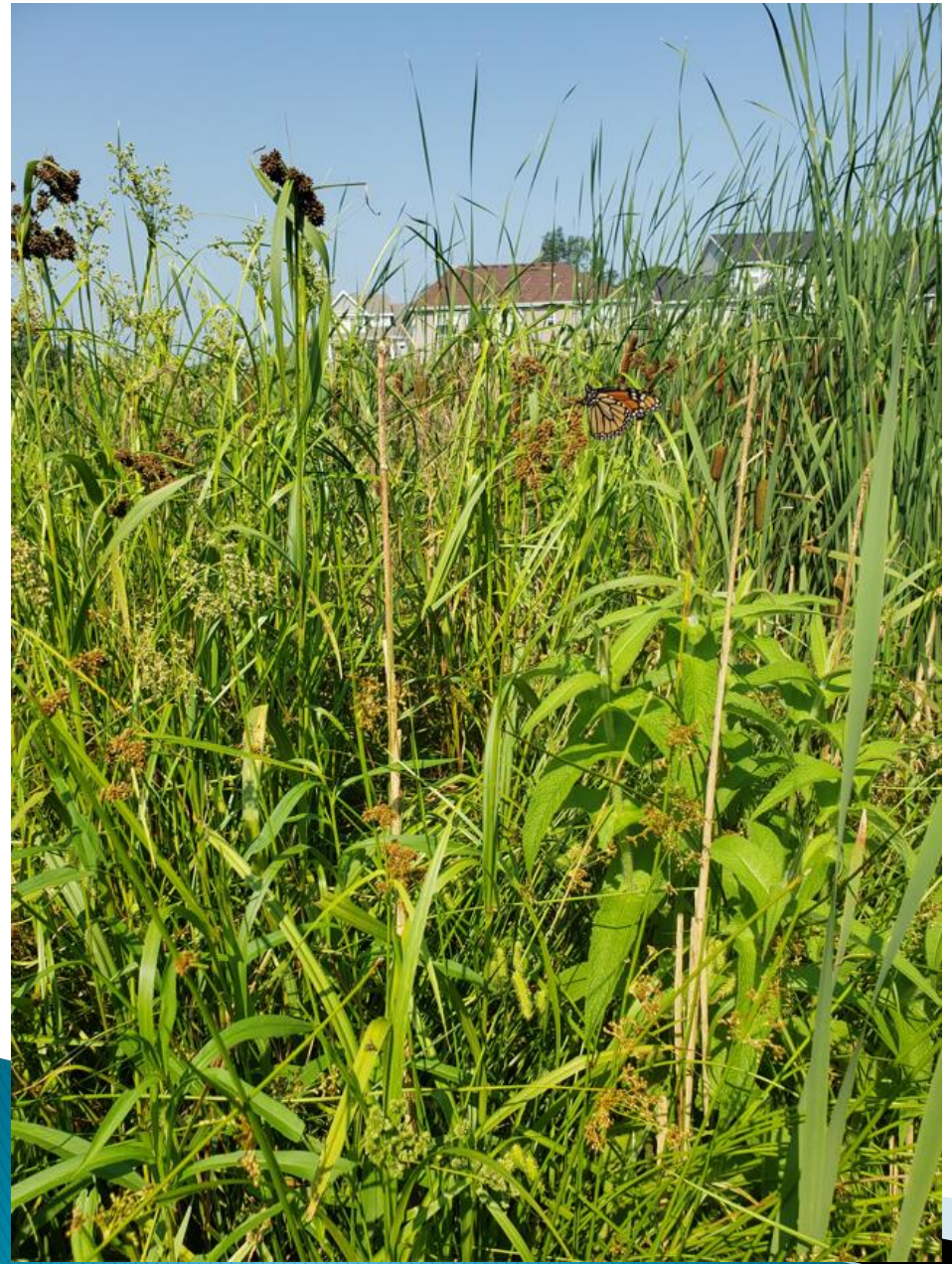
# Potential Future Conditions (Woodland)

Desirable woodland vegetation: mayapple and ostrich fern (L); bottlebrush grass and Virginia wild rye (R)

# Potential Future Conditions (Partial Shade/Channel)

Greenway two years into restoration

# Potential Future Conditions (Partial Shade/Channel)

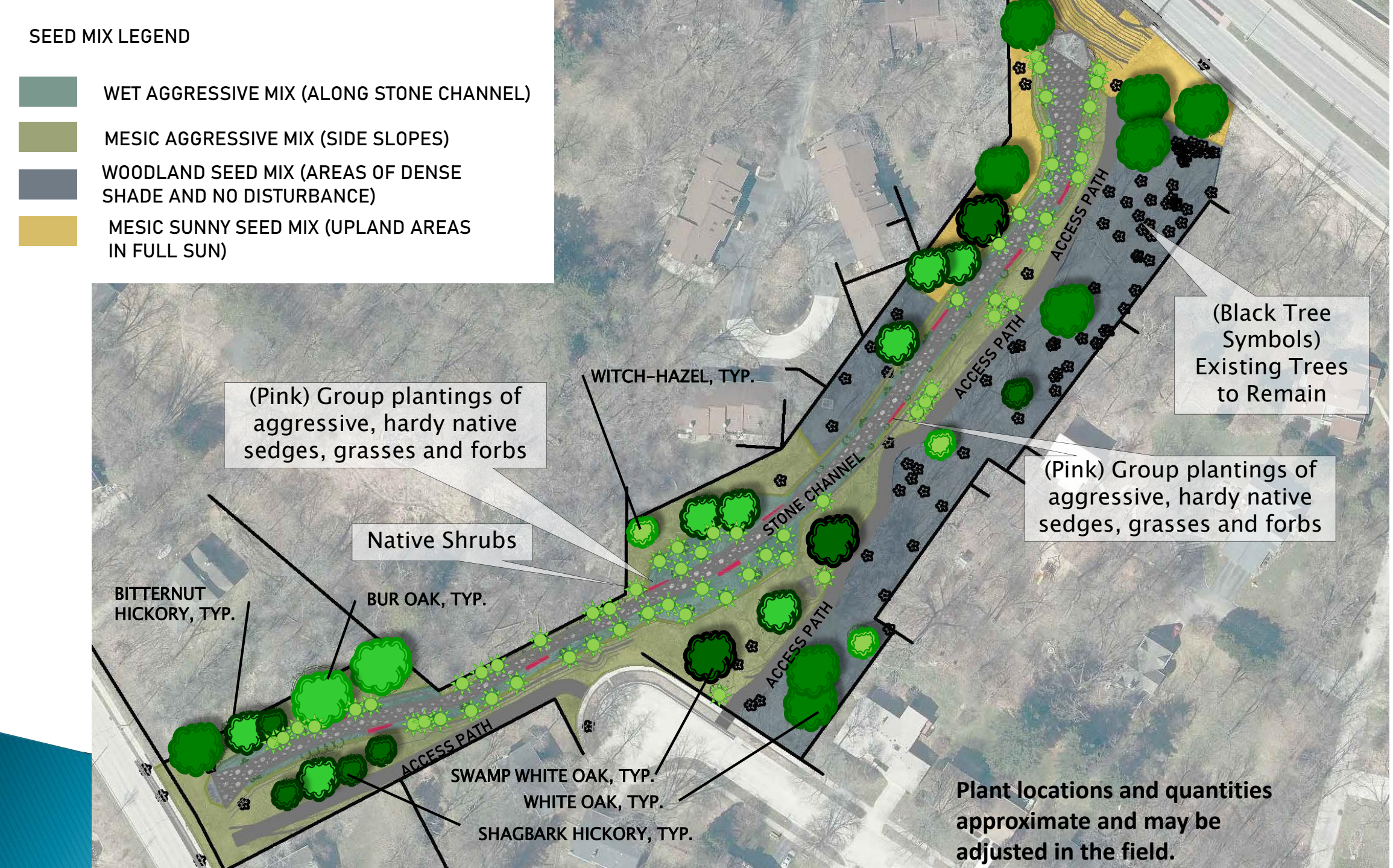


Monarch butterfly on dark green bulrush with native sedge, boneset etc. (L); early sunflower, cup plant, Indian grass (R)

CITY OF MADISON

# Current Vegetation

Woody volunteers: ash, buckthorn, box elder, honeysuckle. Little to no oak regeneration. Low herbaceous veg. diversity: Virginia stickseed, Virginia creeper, burdock, curly dock, jewelweed, garlic mustard.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Plant locations and quantities approximate and may be adjusted in the field.
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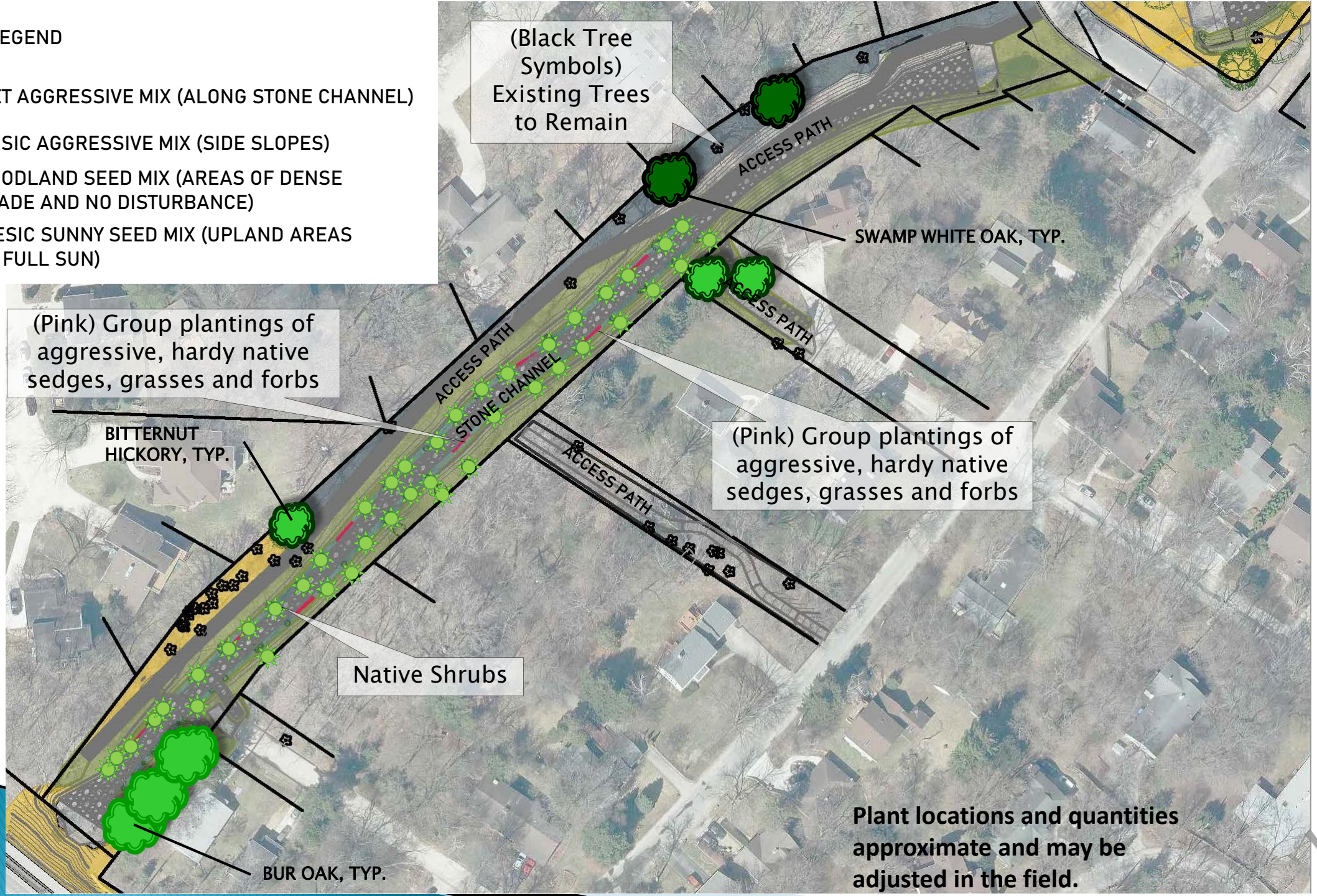


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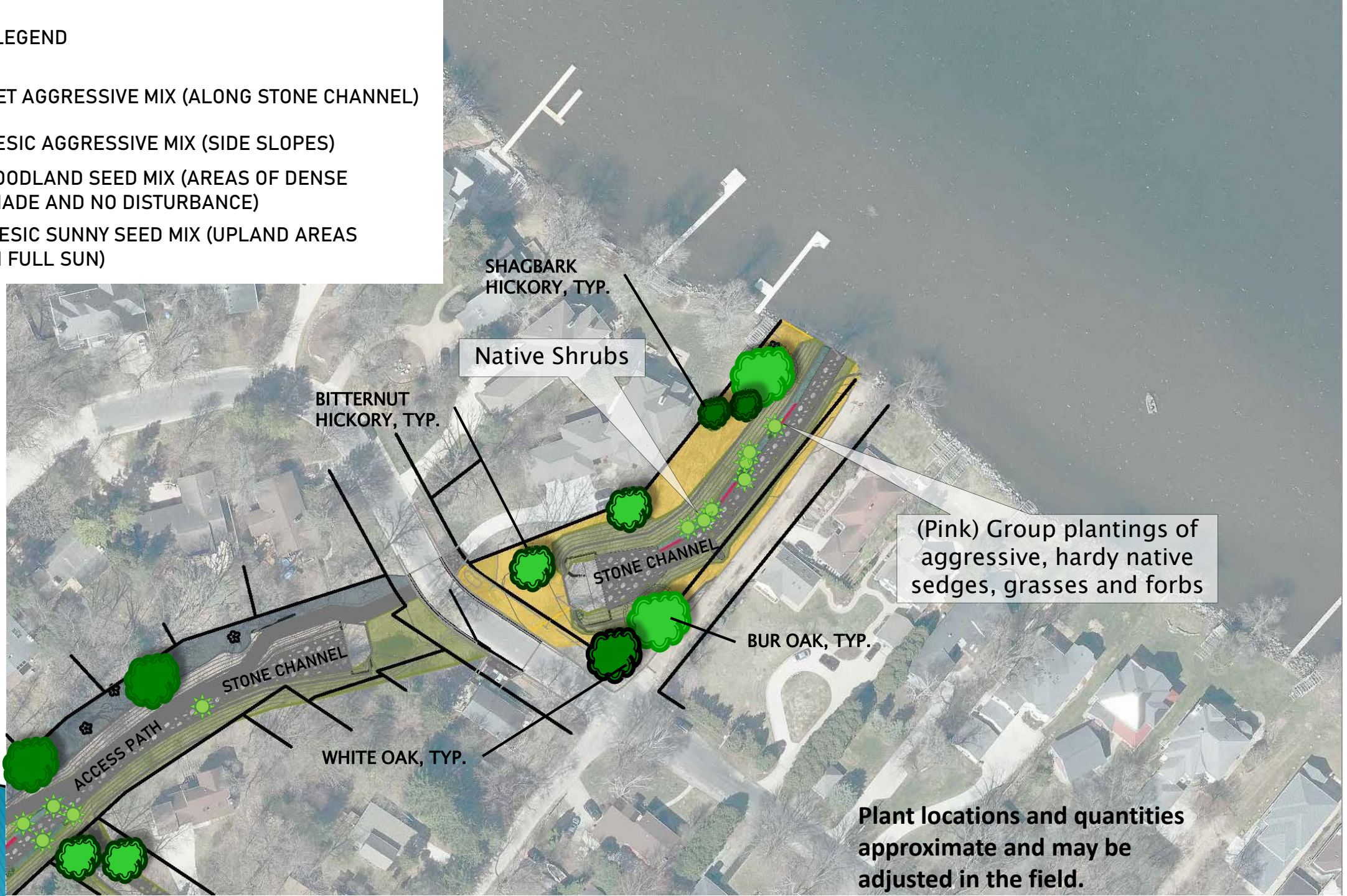
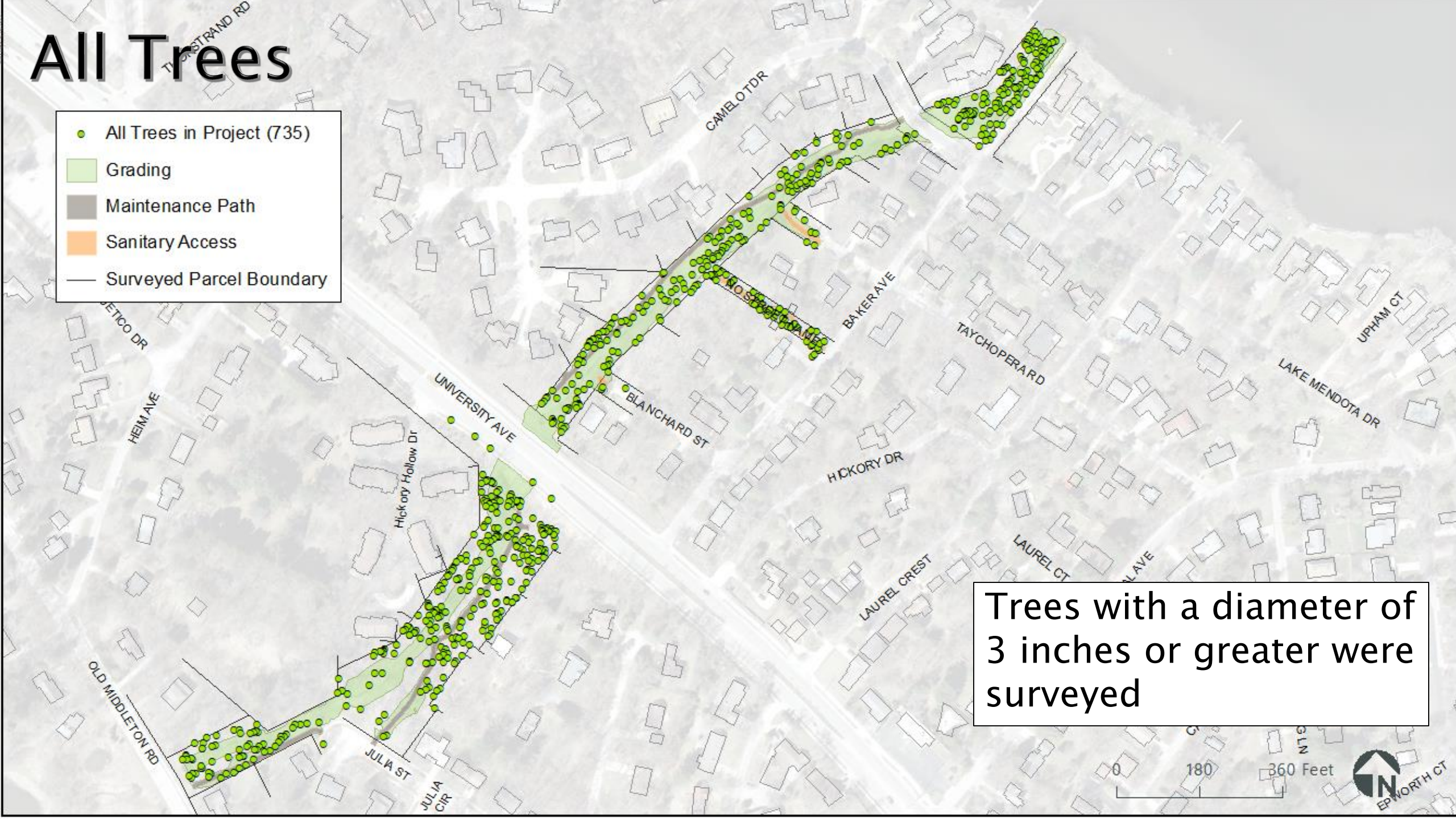
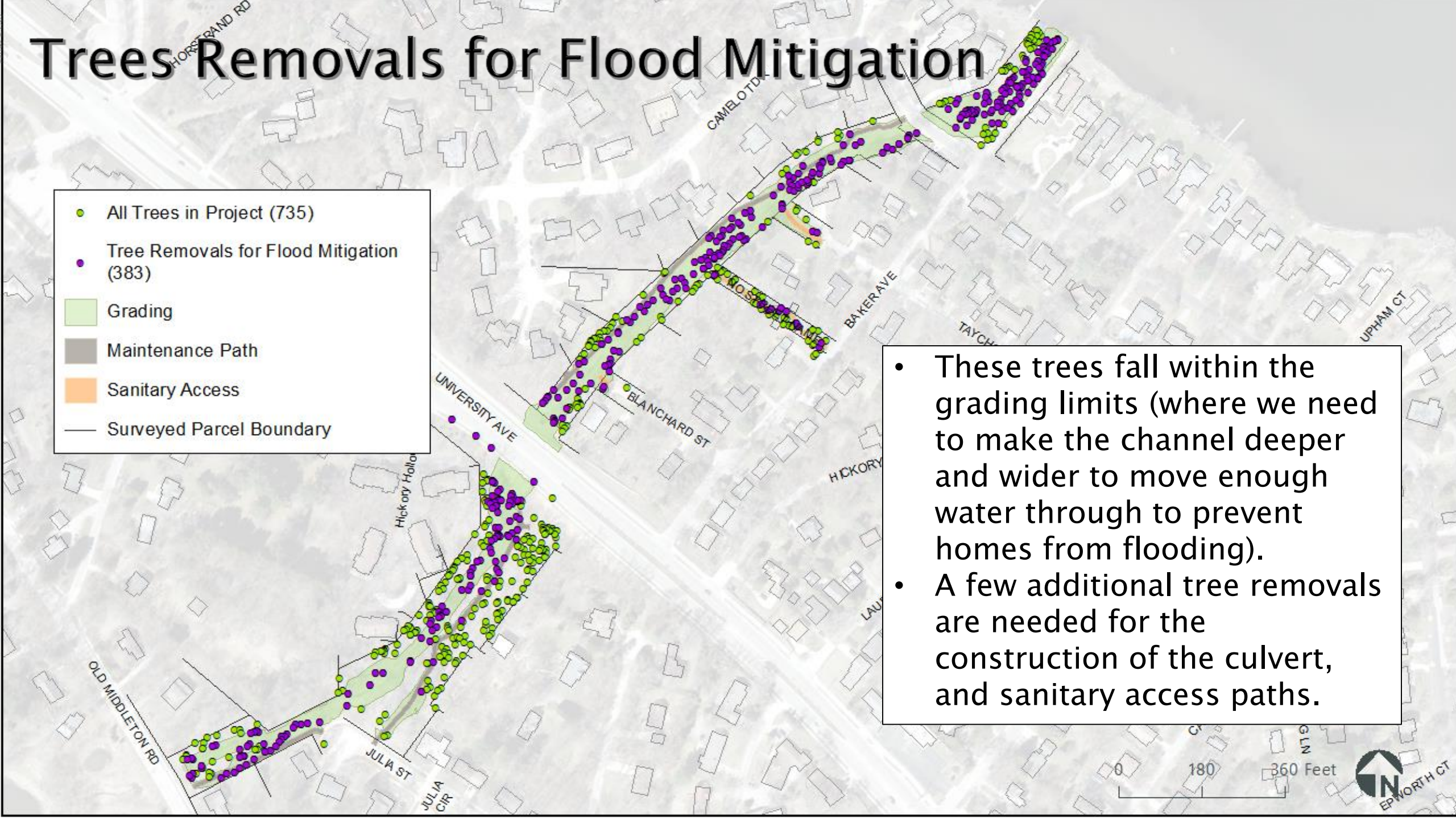


# All Trees



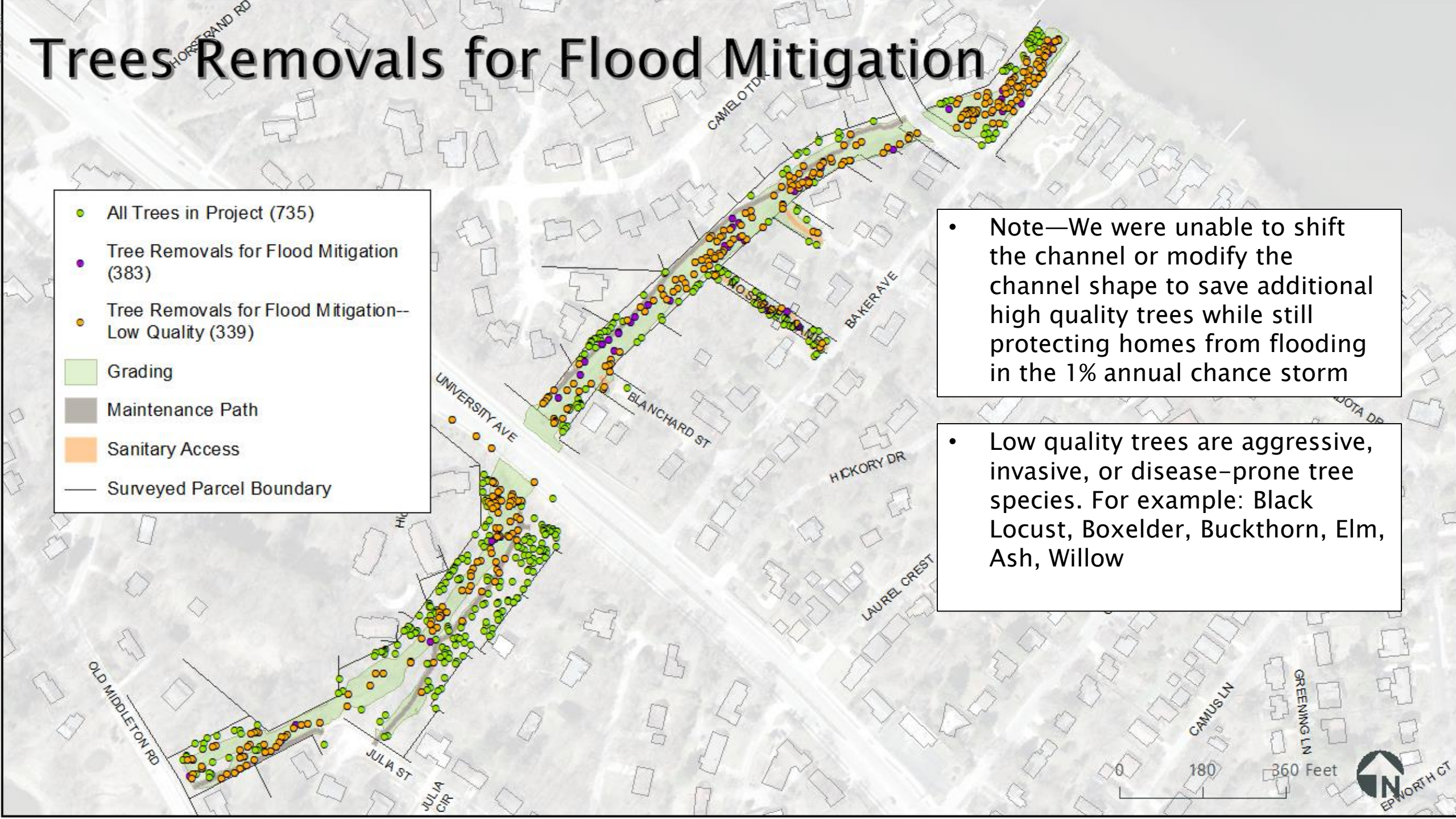

Trees with a diameter of 3 inches or greater were surveyed

# Trees Removals for Flood Mitigation




- These trees fall within the grading limits (where we need to make the channel deeper and wider to move enough water through to prevent homes from flooding).
- A few additional tree removals are needed for the construction of the culvert, and sanitary access paths.

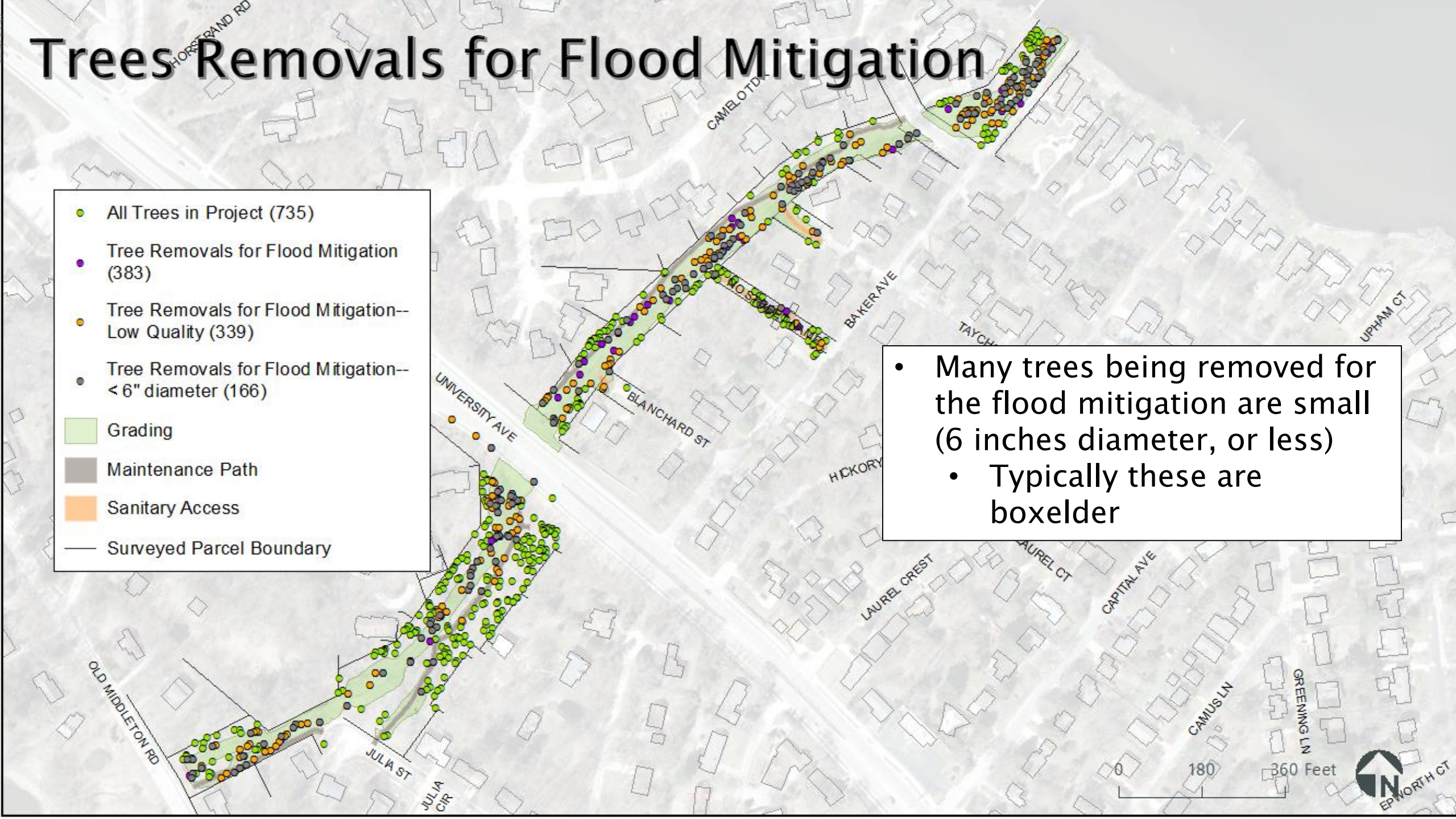
# Trees Removals for Flood Mitigation




- Note—We were unable to shift the channel or modify the channel shape to save additional high quality trees while still protecting homes from flooding in the 1% annual chance storm

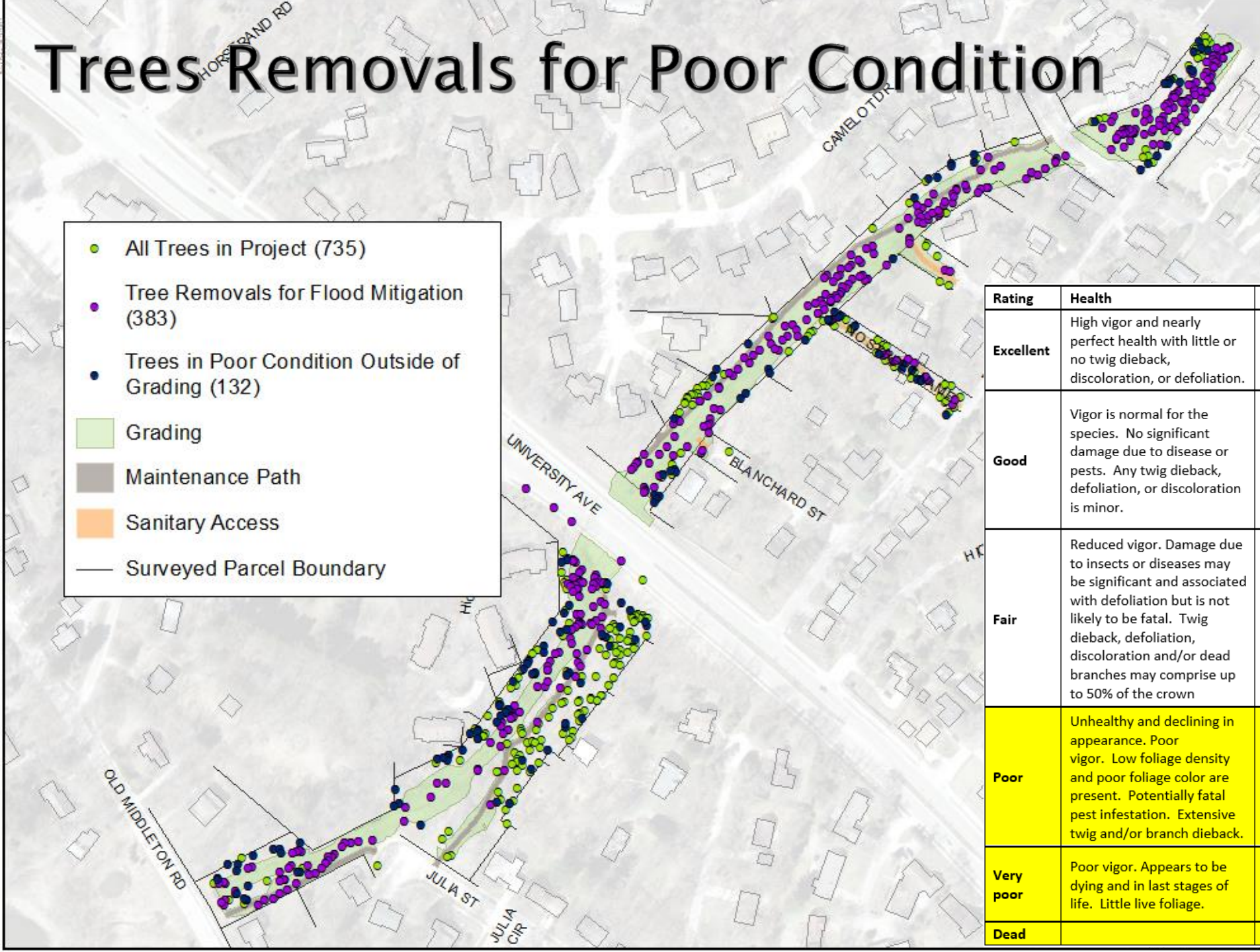
- Low quality trees are aggressive, invasive, or disease-prone tree species. For example: Black Locust, Boxelder, Buckthorn, Elm, Ash, Willow

# Trees Removals for Flood Mitigation




- Many trees being removed for the flood mitigation are small (6 inches diameter, or less)
  - Typically these are boxelder

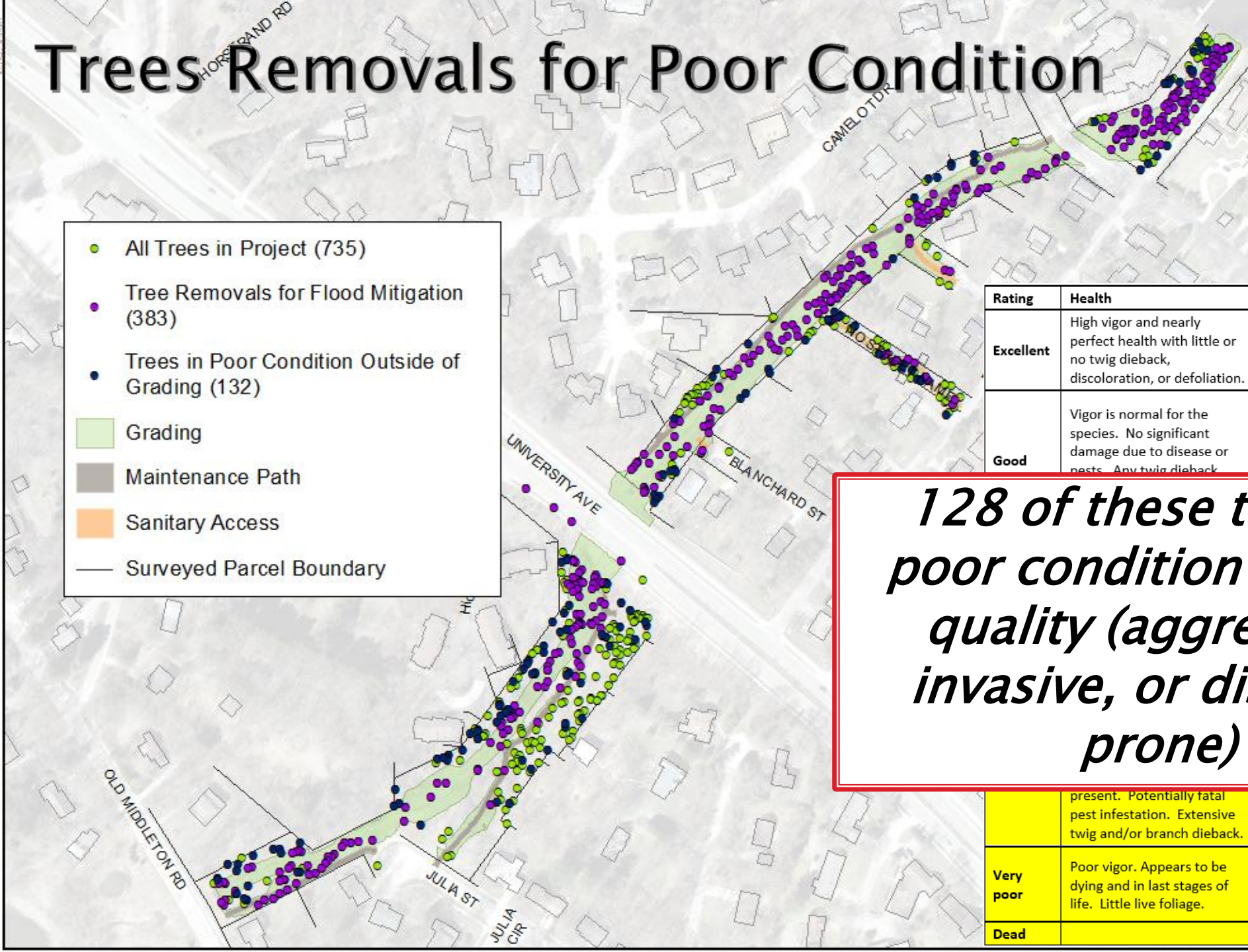
# Trees Removals for Poor Condition




***Each tree was assessed and given a rating by a certified arborist***

| Rating | Health | Structure | Form | % Rating |
|---|---|---|---|---|
| **Excellent** | High vigor and nearly perfect health with little or no twig dieback, discoloration, or defoliation. | Nearly ideal and free of defects. | Nearly ideal for the species. Generally symmetric. Consistent with the intended use. | 81% to 100% |
| **Good** | Vigor is normal for the species. No significant damage due to disease or pests. Any twig dieback, defoliation, or discoloration is minor. | Well-developed structure. Defects are minor and can be corrected. | Minor asymmetries/deviations from species norm. Mostly consistent with the intended use. Function and aesthetics are not compromised. | 61% to 80% |
| **Fair** | Reduced vigor. Damage due to insects or diseases may be significant and associated with defoliation but is not likely to be fatal. Twig dieback, defoliation, discoloration and/or dead branches may comprise up to 50% of the crown | A single defect of a significant nature or multiple moderate defects. Defects are not possible to correct or would require multiple treatments over several years. | Major asymmetries/ deviations from species norm and/or intended use. Function and/or aesthetics are compromised. | 41% to 60% |
| **Poor** | Unhealthy and declining in appearance. Poor vigor. Low foliage density and poor foliage color are present. Potentially fatal pest infestation. Extensive twig and/or branch dieback. | A single serious defect or multiple significant defects. Recent change in tree orientation. Observed structural problems cannot be corrected. Failure may occur at any time. | Largely asymmetric/abnormal. Detracts from intended use and/or aesthetics to a significant degree. | 21% to 40% |
| **Very poor** | Poor vigor. Appears to be dying and in last stages of life. Little live foliage. | Single or multiple severe defects. Failure is probable or imminent. | Visually unappealing. Provides little or no function in the landscape. | 6% to 20% |
| **Dead** | | | | 0% to 5% |

# Trees Removals for Poor Condition

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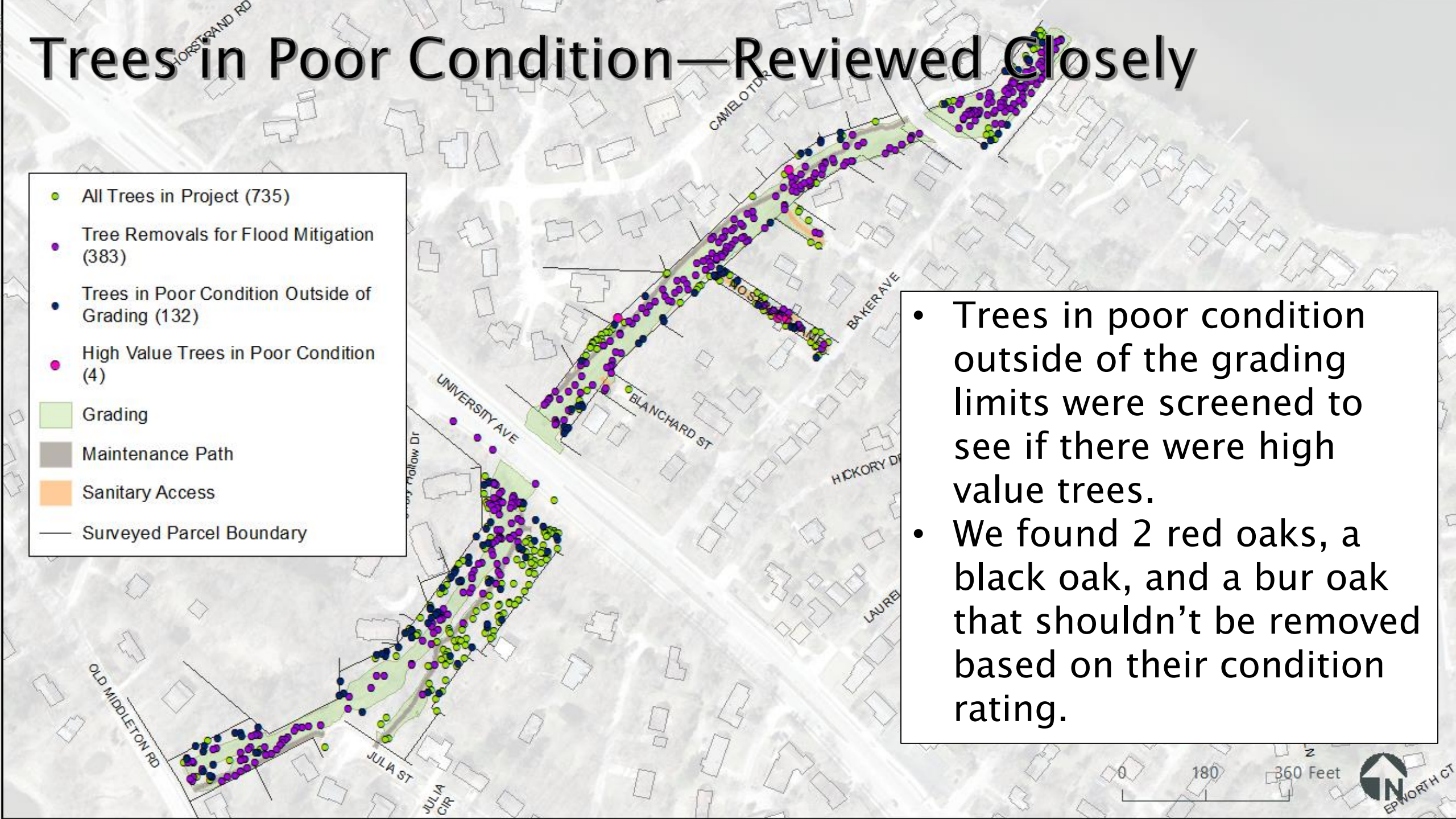
***128 of these trees in poor condition are low quality (aggressive, invasive, or disease-prone)***

# Trees in Poor Condition—Reviewed Closely



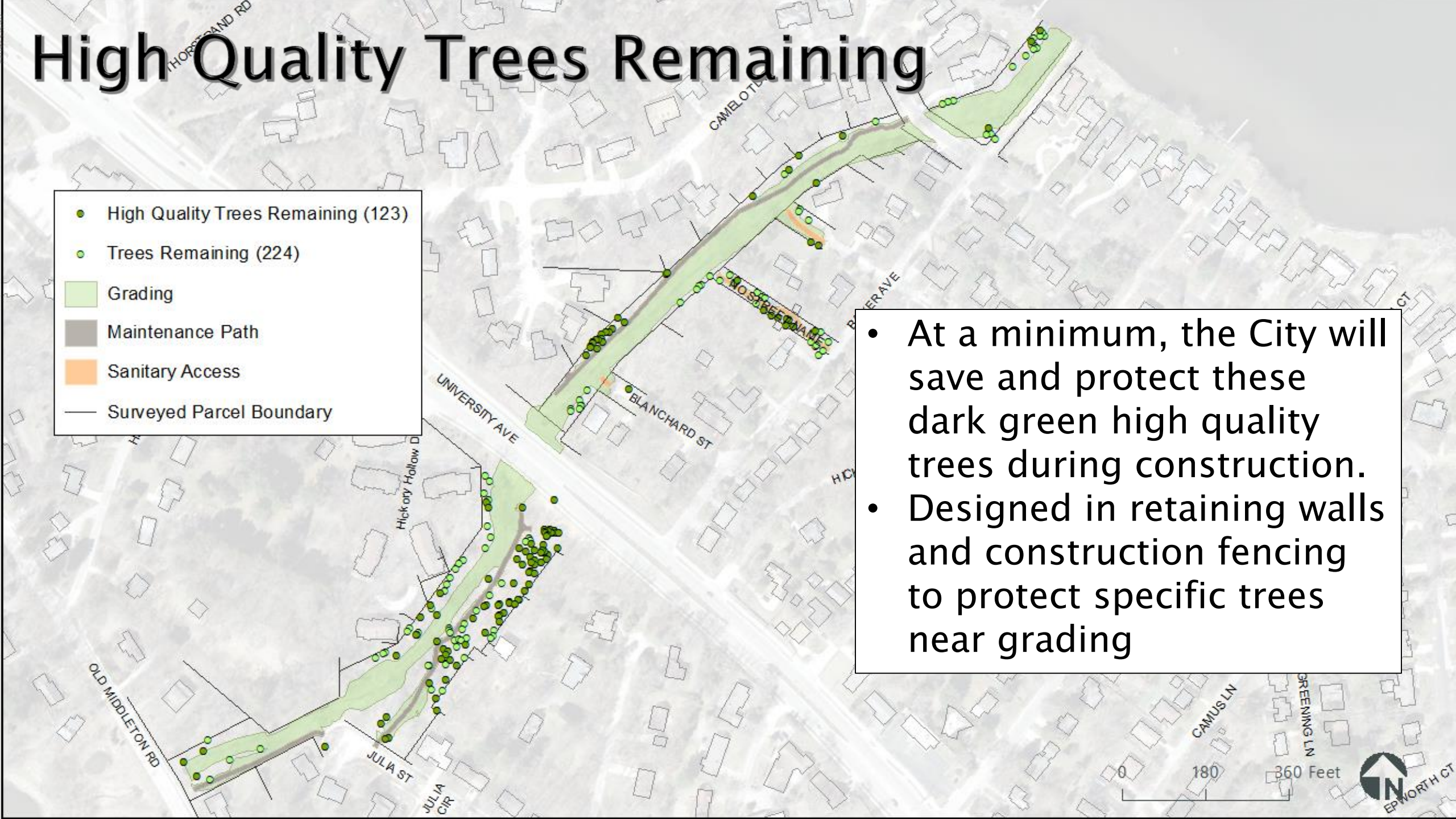

- Trees in poor condition outside of the grading limits were screened to see if there were high value trees.
- We found 2 red oaks, a black oak, and a bur oak that shouldn't be removed based on their condition rating.

# Trees Remaining


Trees remaining include:

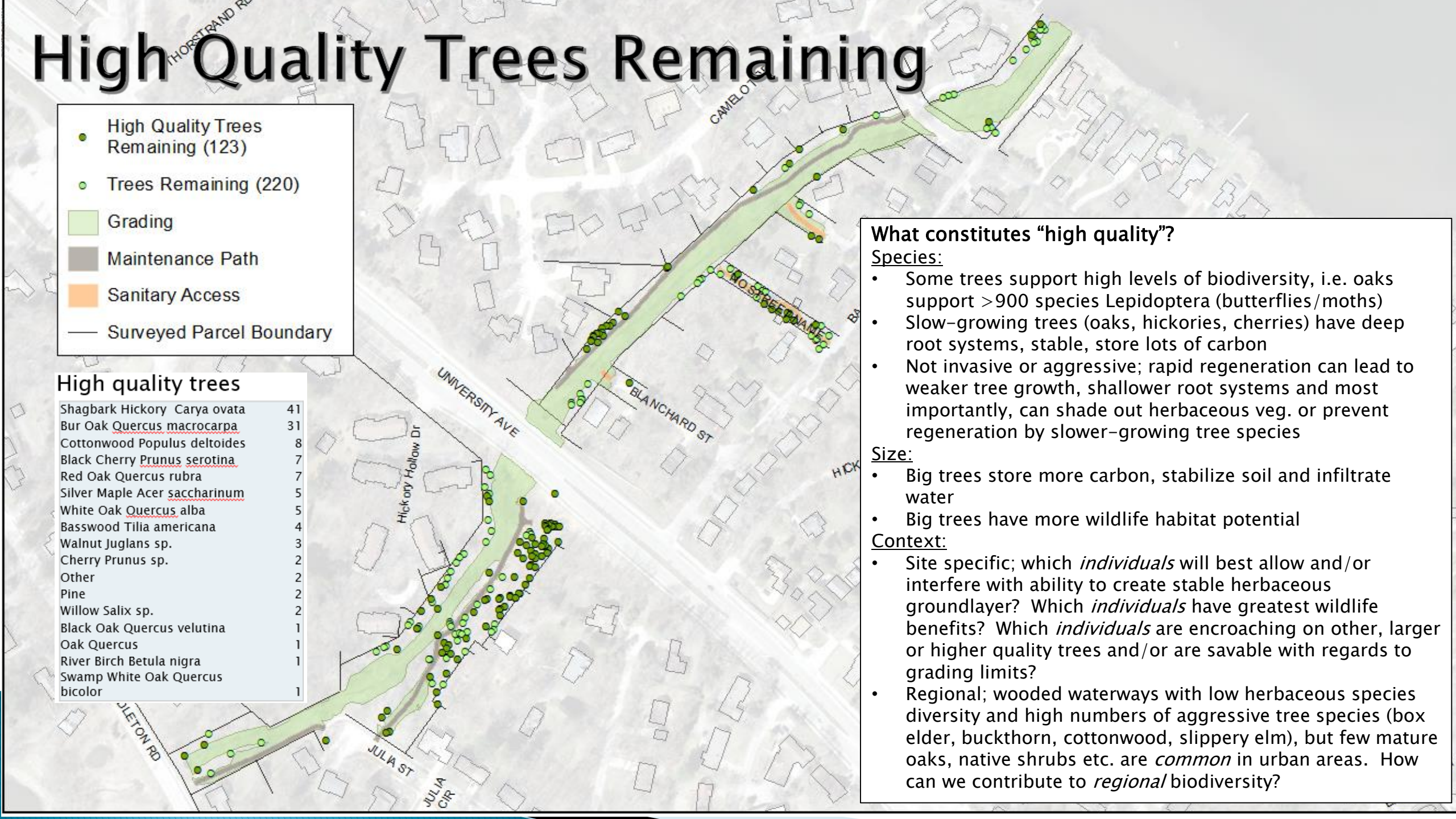
- Trees outside of the grading limits and traffic control impacts
- Trees in fair, or better, condition
- Select high value trees in poor condition

# High Quality Trees Remaining




- At a minimum, the City will save and protect these dark green high quality trees during construction.
- Designed in retaining walls and construction fencing to protect specific trees near grading

# High Quality Trees Remaining




## High quality trees

| | |
|---|---|
| Shagbark Hickory Carya ovata | 41 |
| Bur Oak Quercus macrocarpa | 31 |
| Cottonwood Populus deltoides | 8 |
| Black Cherry Prunus serotina | 7 |
| Red Oak Quercus rubra | 7 |
| Silver Maple Acer saccharinum | 5 |
| White Oak Quercus alba | 5 |
| Basswood Tilia americana | 4 |
| Walnut Juglans sp. | 3 |
| Cherry Prunus sp. | 2 |
| Other | 2 |
| Pine | 2 |
| Willow Salix sp. | 2 |
| Black Oak Quercus velutina | 1 |
| Oak Quercus | 1 |
| River Birch Betula nigra | 1 |
| Swamp White Oak Quercus bicolor | 1 |

**What constitutes "high quality"?**

Species:

- Some trees support high levels of biodiversity, i.e. oaks support >900 species Lepidoptera (butterflies/moths)
- Slow-growing trees (oaks, hickories, cherries) have deep root systems, stable, store lots of carbon
- Not invasive or aggressive; rapid regeneration can lead to weaker tree growth, shallower root systems and most importantly, can shade out herbaceous veg. or prevent regeneration by slower-growing tree species

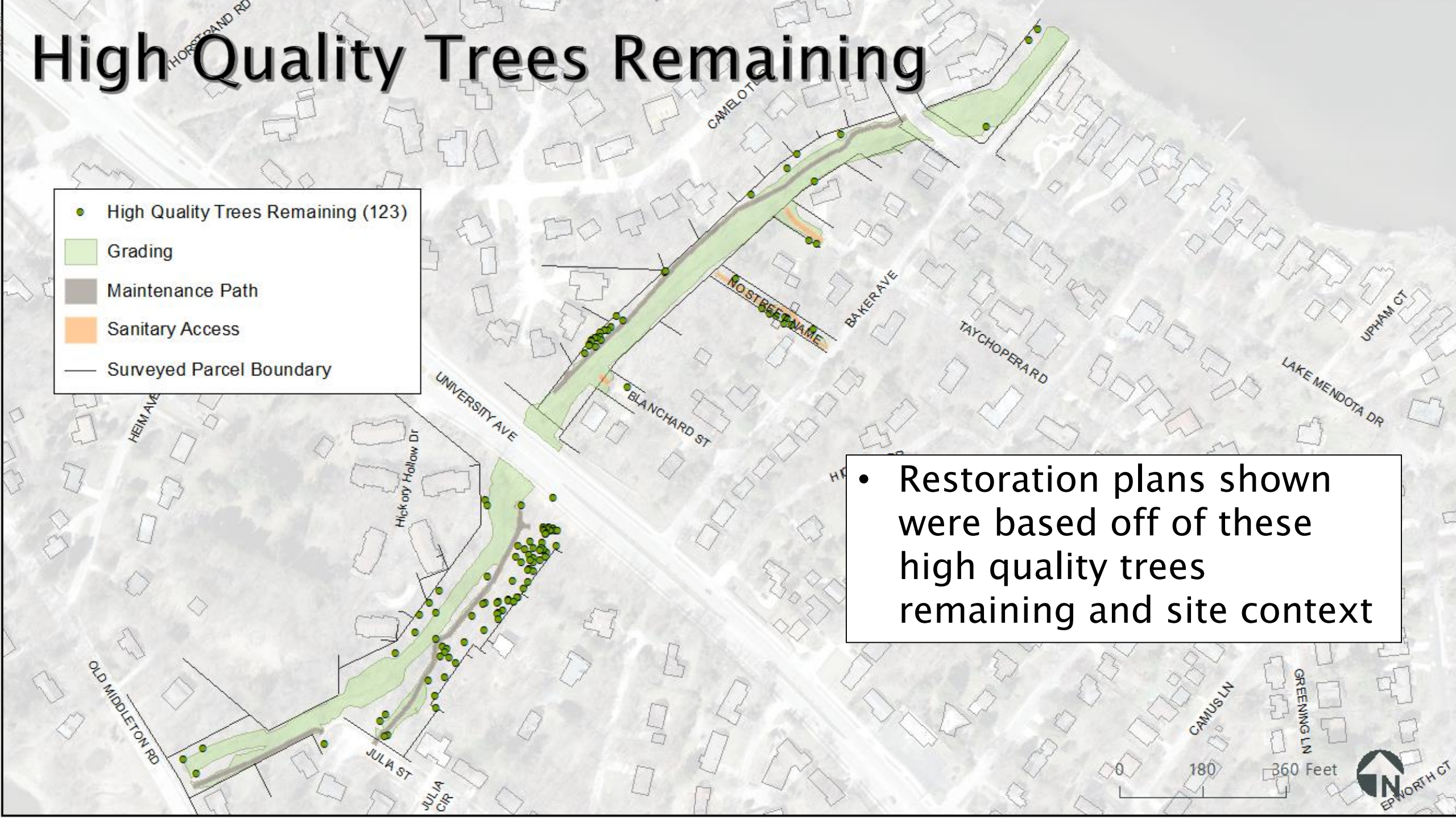
Size:

- Big trees store more carbon, stabilize soil and infiltrate water
- Big trees have more wildlife habitat potential

Context:

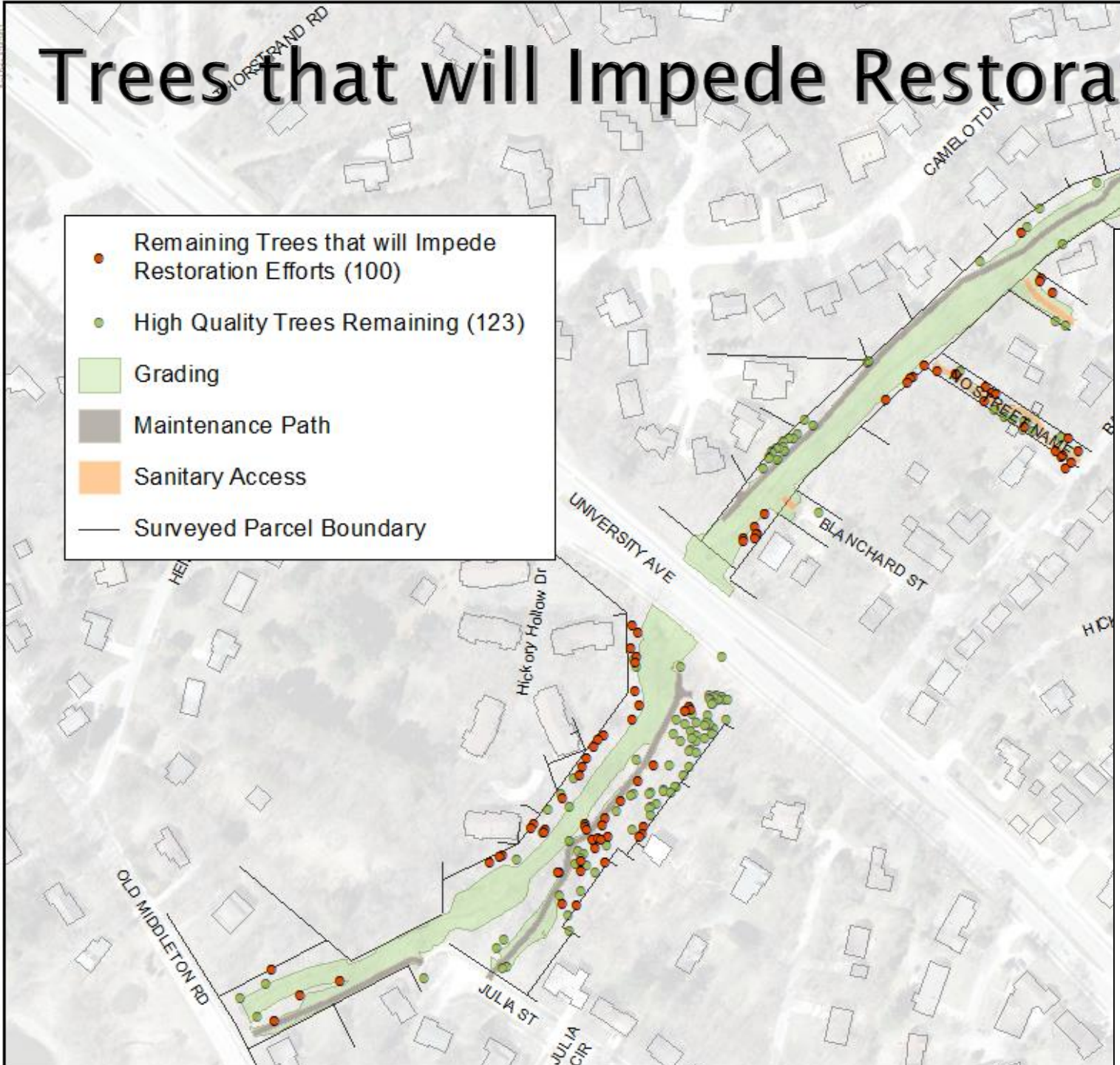
- Site specific; which *individuals* will best allow and/or interfere with ability to create stable herbaceous groundlayer? Which *individuals* have greatest wildlife benefits? Which *individuals* are encroaching on other, larger or higher quality trees and/or are savable with regards to grading limits?
- Regional; wooded waterways with low herbaceous species diversity and high numbers of aggressive tree species (box elder, buckthorn, cottonwood, slippery elm), but few mature oaks, native shrubs etc. are *common* in urban areas. How can we contribute to *regional* biodiversity?

# High Quality Trees Remaining




- Restoration plans shown were based off of these high quality trees remaining and site context

# Trees that will Impede Restoration




- Restoration work begins immediately following construction
- A main goal is to quickly establish vegetation to hold the soil in place and help infiltrate water. All vegetation added back to site is native.
- The trees in red make this work more challenging:
  - Box elder, buckthorn, black locust, mulberry: spread and grow rapidly, shade out groundlayer exposing bare soil
  - Elm and ash: disease prone and if not removed during construction may require later removal and further disturbance later
  - Cottonwood, silver maple: grow rapidly, weaker growth drop limbs and more prone to windfall, particularly in absence of trees removed due to grading work, also shade out groundlayer

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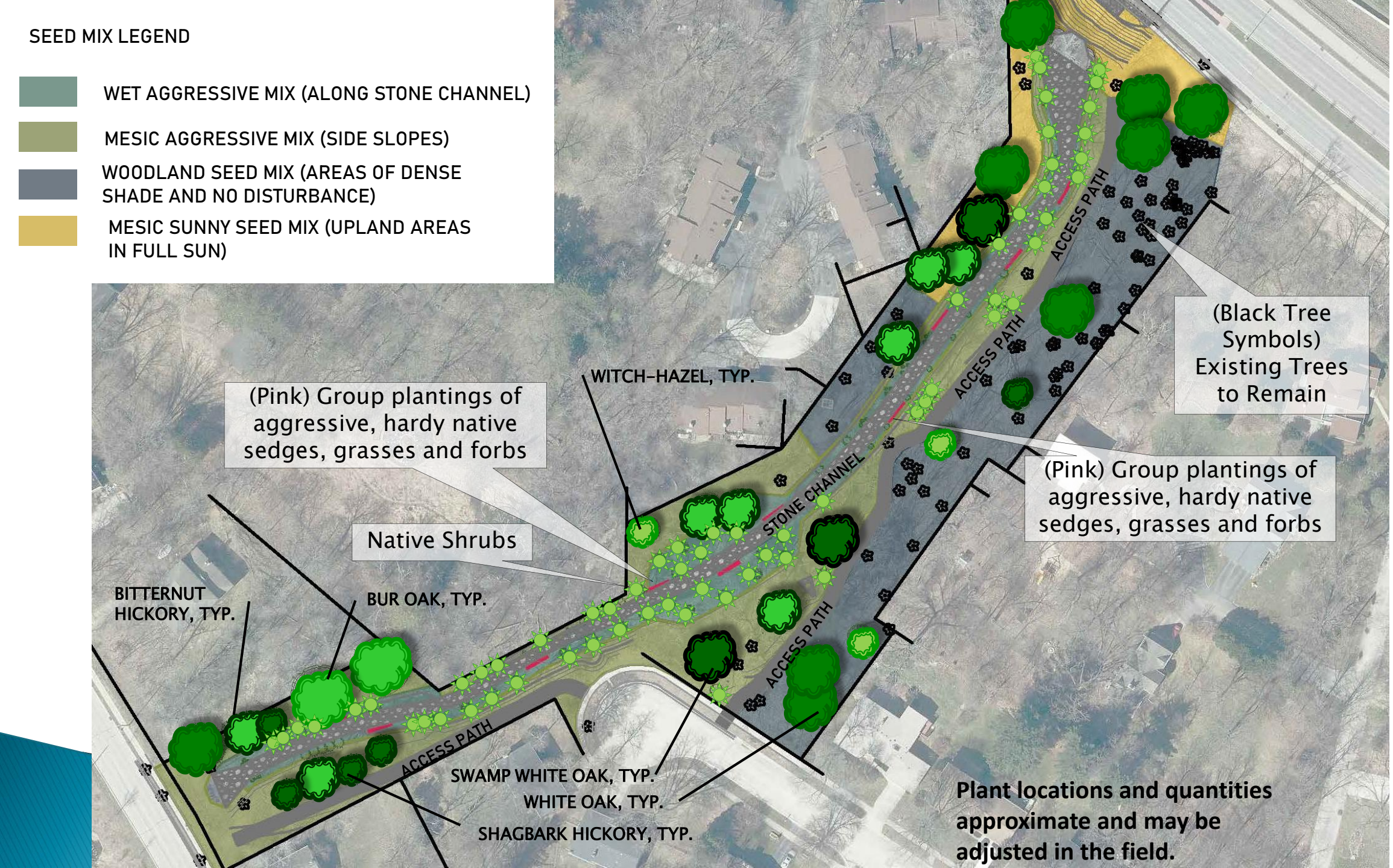
**Box elder, buckthorn, black locust, mulberry**: spread and grow rapidly, shade out groundlayer exposing bare soil

**Elm and ash**: disease prone and if not removed during construction may require later removal and further disturbance later

**Cottonwood, silver maple**: grow rapidly, weaker growth drop limbs and more prone to windfall, particularly in absence of trees removed due to grading work, also shade out groundlayer

**Walnut**: allelopathic, i.e. suppress plant growth

**Conifers**: Not adapted to high velocity or standing water, poor health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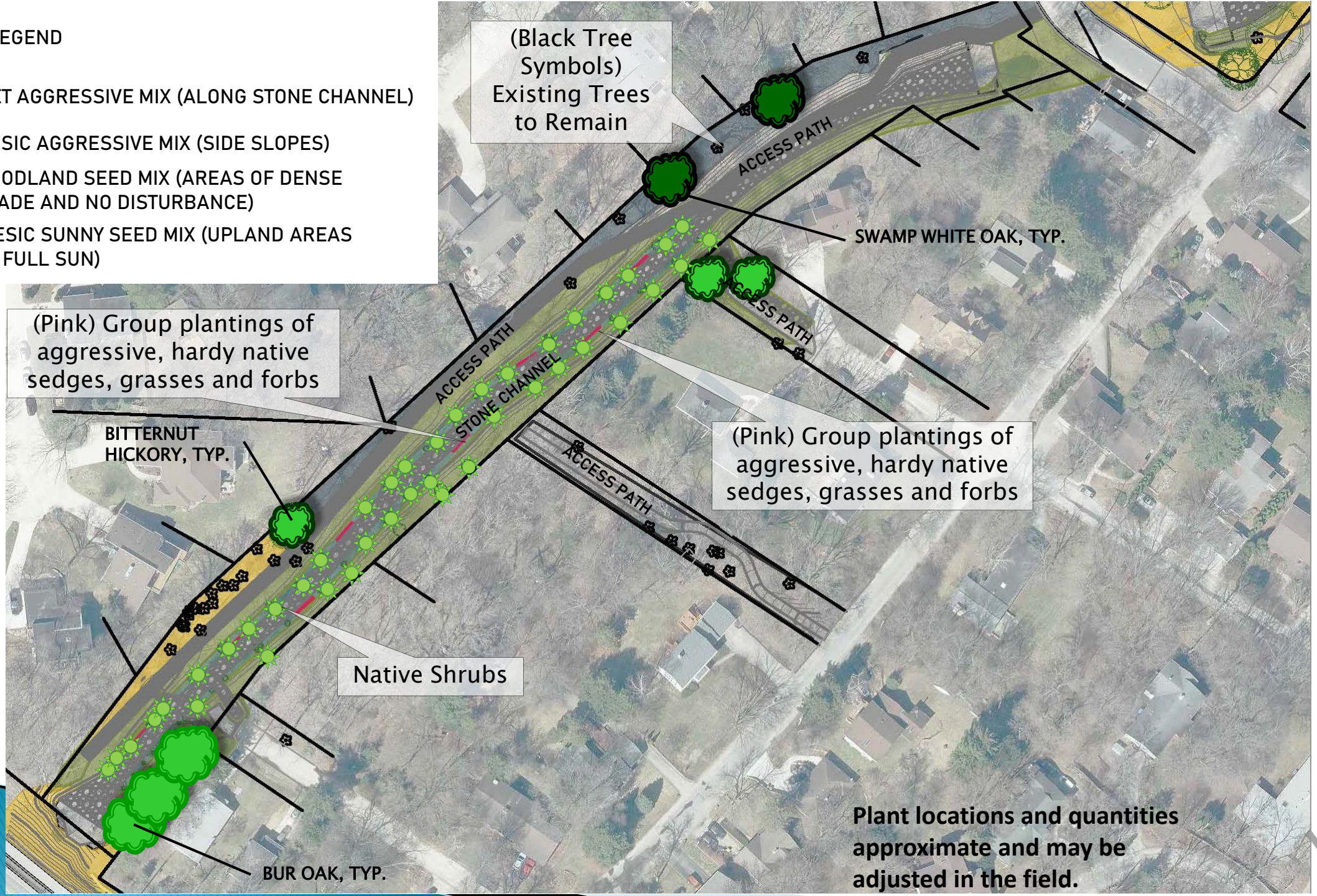


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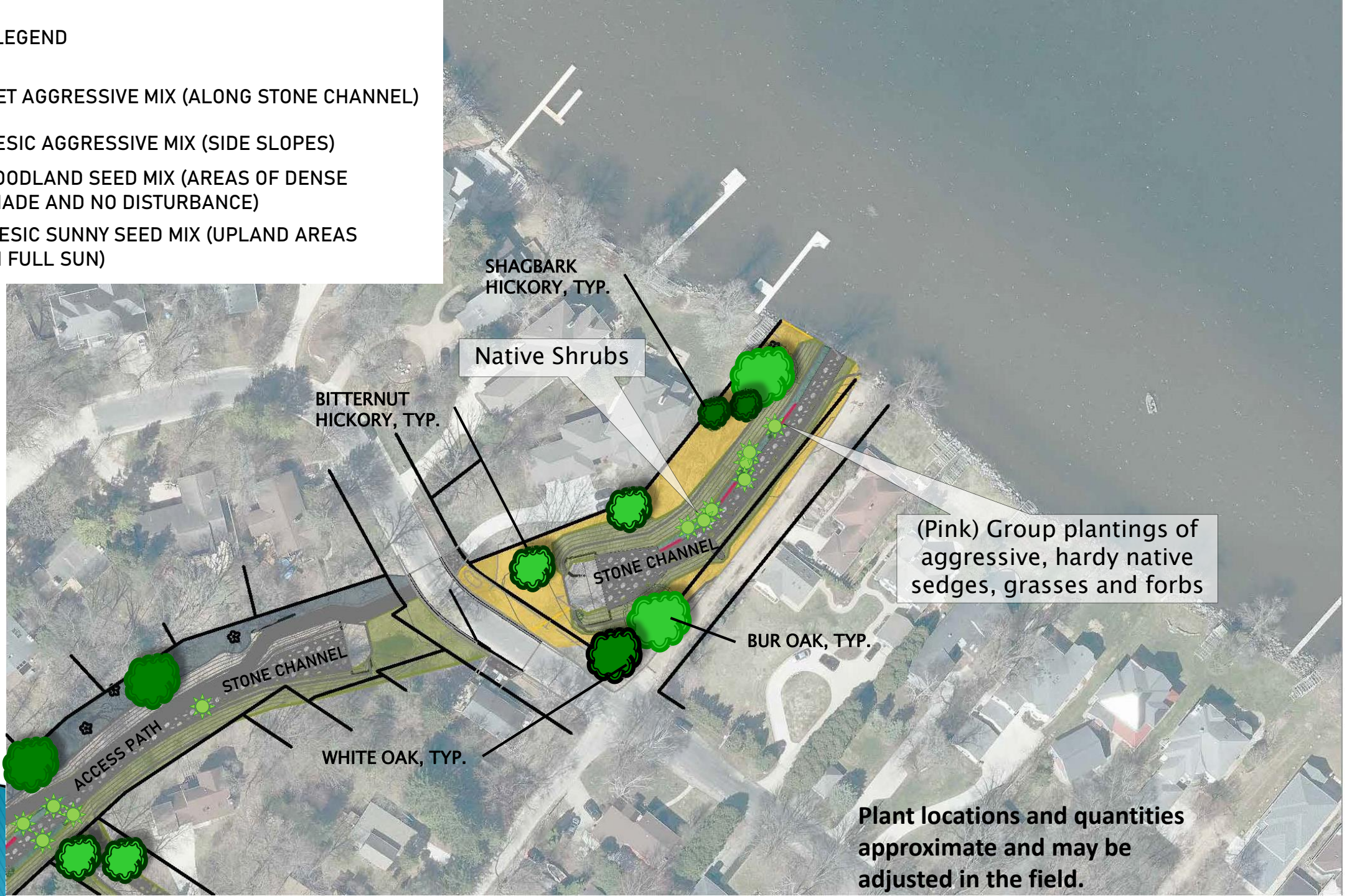

# What If We Don't Complete the Project

- If we don't do the project…
  - 10+ homes flood in 1% annual chance storm
  - Low quality and poor health trees continue to fall down and impede flows (increasing flooding risk), potential to damage adjacent homes
    - City had to enter greenway for tree removal multiple times in past few years
      - Remove trees that had fallen and damaged private property
      - Unplanned response—large equipment often results in removing more trees
        - Often can't be done in ideal conditions (i.e. on frozen ground)
- If we don't remove the trees per the restoration plan…
  - More soil will erode into the lakes, makes water quality worse
    - Invasive seedlings will outcompete native vegetation
  - Can't invest same amount of native restoration resources because area can't be maintained as functional natural community
    - Area won't support as much biodiversity and wildlife
  - Future tree removals for trees that fall on private property or damage neighboring high quality trees

# Tree Removal Plan

- Interested in feedback on the approach
- We plan to incorporate your feedback in a final tree removal plan we work on with forestry
  - We will present tree removal and restoration plan at a Habitat Stewardship Subcommittee (HSS) meeting
    - 11/6/22 or February 2023 (meeting date is TBD)
  - You'll be notified that the project will be presented to HSS in the mail and you'll be able to comment on the plans at the hearing at HSS
  - Subscribe to the website to stay up-to-date

# Presentation Agenda

- Project Team
- Strickers/Mendota Watershed Study
- Mendota-Grassman Greenway Design Scope
  - Current Design Overview
  - Design Features
  - Anticipated Flood Benefits
- Tree Preservation & Restoration
- Traffic Impacts
- Construction Schedule and Duration

# Traffic Impacts

- Camelot Drive
  - Anticipated as early as Spring/Summer 2023
  - Single lane traffic lane maintained for all traffic
- University Avenue
  - Anticipated as early as Summer/Fall 2023
  - Single traffic lane maintained for eastbound and westbound traffic
  - Sidewalk and bike lane maintained throughout construction
- Start work letter will be sent prior to construction providing more concrete timeframes

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# Construction Schedule and Duration

- Anticipated project start – Spring 2023
  - Tree Removal and Greenway and Channel Grading
    - Winter/Spring
    - 15-18 weeks
  - Camelot Culverts
    - Spring/Summer
    - 10-12 weeks
  - University Culvert
    - Summer/Fall
    - 15-17 weeks
  - Restoration
    - Ongoing throughout project

# Contact Information & Resources

- Engineering
  - Project Manager, Jojo O'Brien, jobrien@cityofmadison.com

- Project Website:

cityofmadison.com/engineering/projects/mendota-grassman-greenway-flood-mitigation-and-restoration-design

  - Sign-up for project email updates on the website
  - Updates on work progress will be posted to the project website

- Facebook – City of Madison Engineering
- Twitter – @MadisonEngr
- Engineering Podcast: Everyday Engineering on iTunes, GooglePlay

# Poll Questions & Q&A

CITY OF MADISON