CITY OF MADISON – PROPOSED PROJECT

East Mendota Pheasant Branch (Sauk Creek) Greenway Restoration

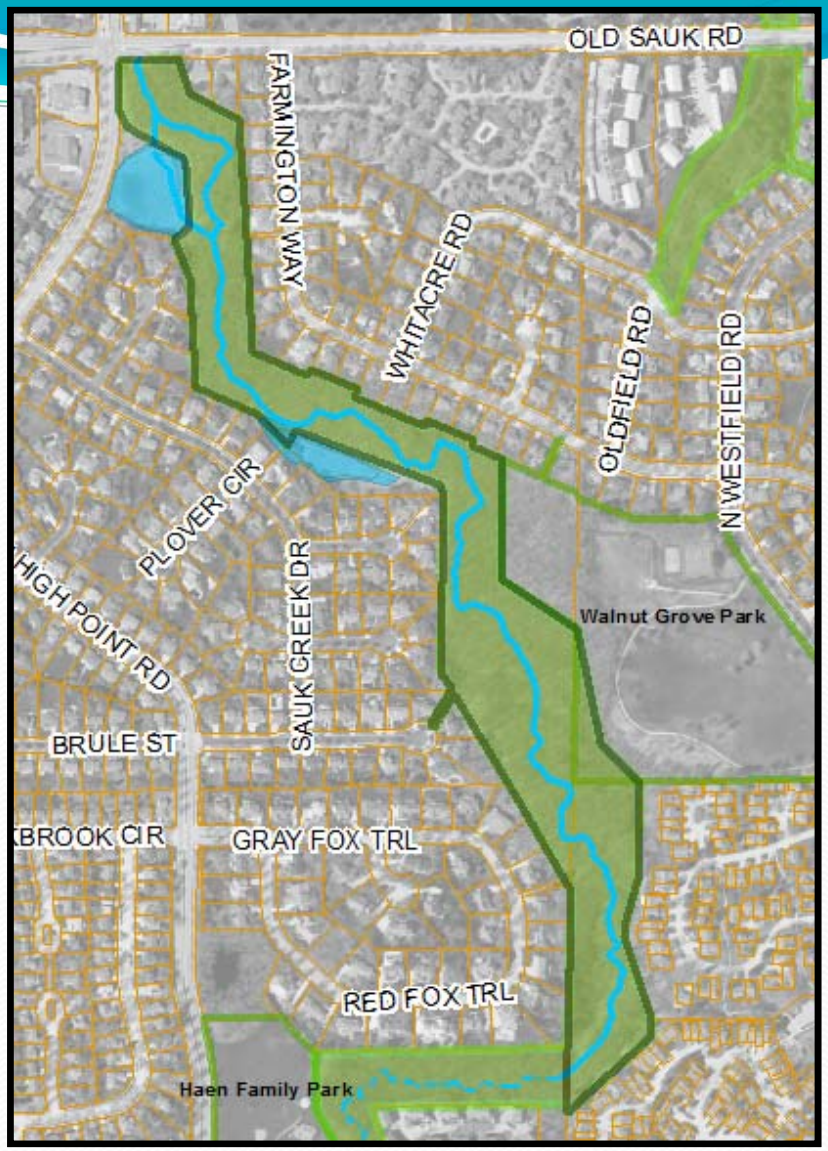
Tree Lane to Old Sauk Road Section

CITY OF MADISON ENGINEERING

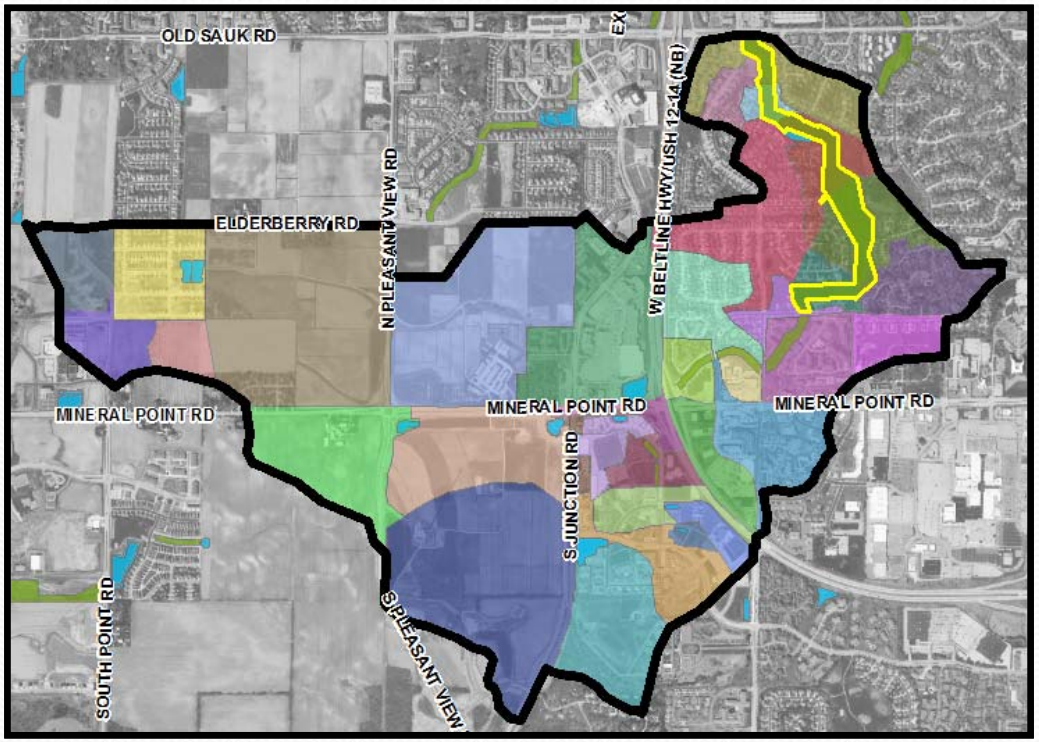
Overview

- Need for Project
  - Greenway Function
  - Condition of Sauk Creek greenway
- Data Collected
  - Drone Survey Data
  - Tree Survey Data
- Water Quality Treatment
- Other Amenities
- Additional Tree Data
  - General Forest Health/Restoration

Greenway -Location

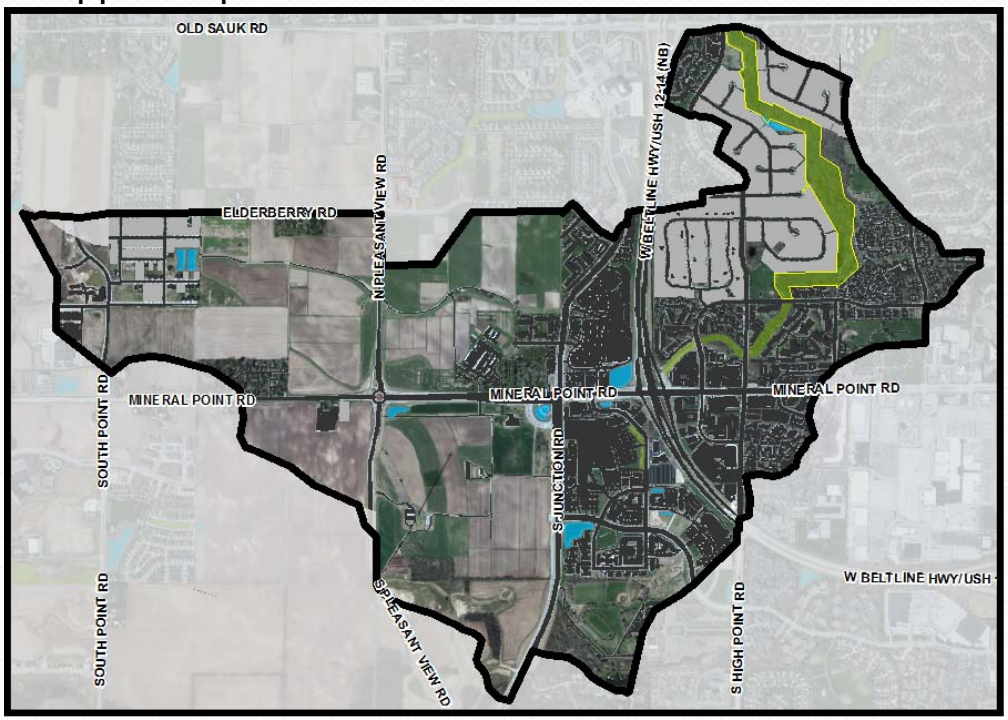


Greenway Watershed -Overview



Area: 1,317.6 Acres

Mapped Impervious Area

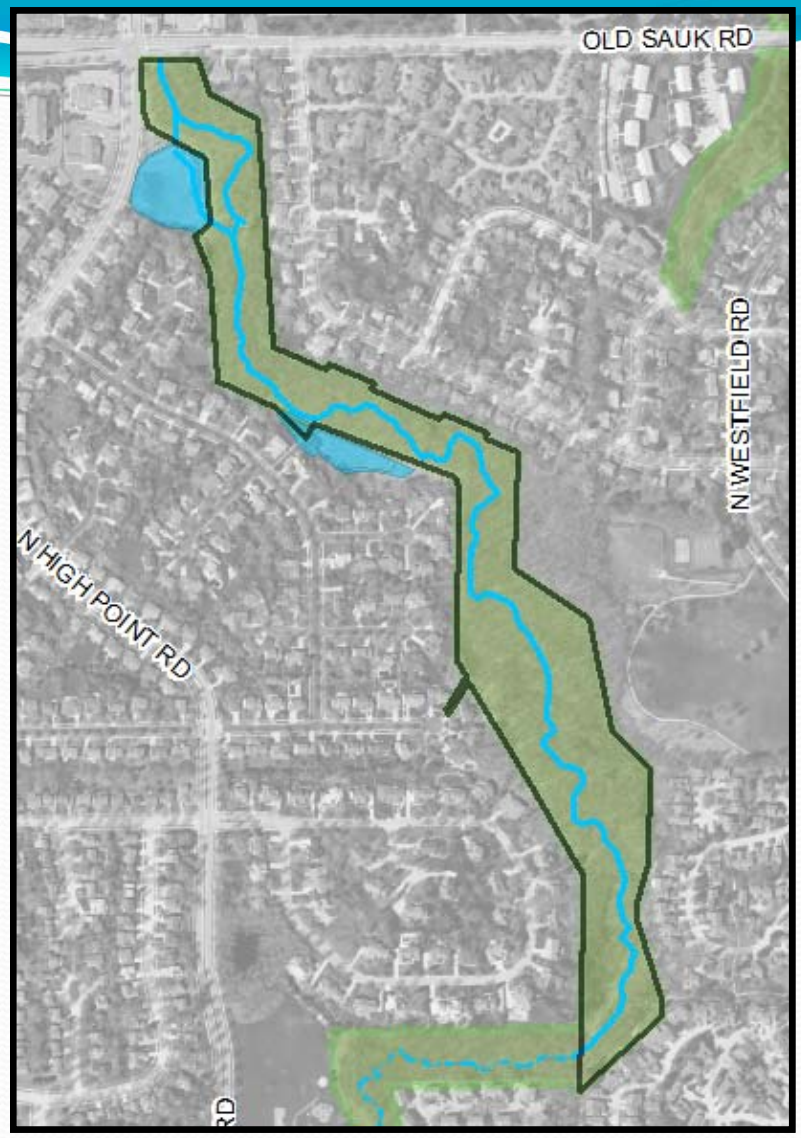


Why do we have Greenways?

- As watersheds are urbanized, vegetation is replaced by impervious surfaces
  - Less area for infiltration→increases the volume of storm water runoff
- The stormwater system provides stormwater drainage and conveyance
  - Improves water quality
  - Minimizes potential for flooding
- Madison has a 1,500+ acre system of greenways and ponds designed to slow the velocity of stormwater and promote infiltration of stormwater
  - Greenways provide a buffer that captures sediment, nutrients and pollutants before they reach lakes and rivers

Sauk Creek Greenway

- Greenway Parcel
  - Area: 26.4 acres (not including detention basins)
  - Channel Length=5386’ in first section (over 1 mile!)



Greenway Condition-Inlet

Channel Erosion-Tree Impact

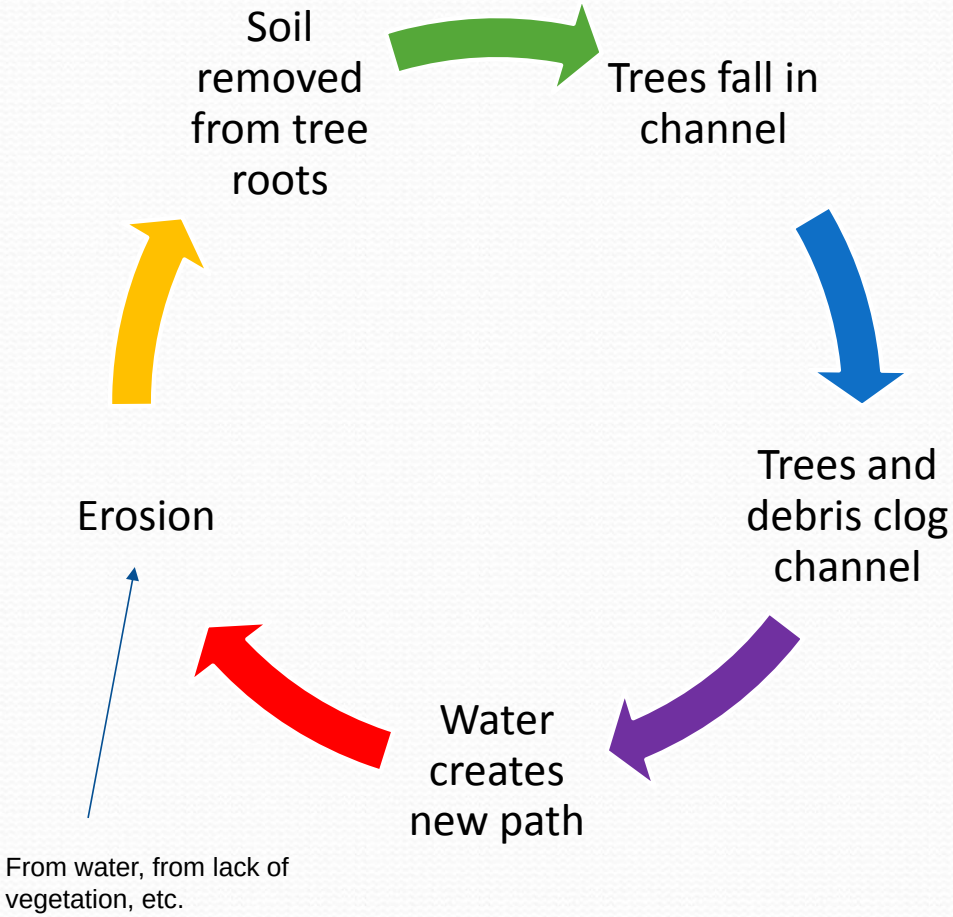
Channel Erosion-Tree Impact

Channel Erosion-Tree Impact

Channel Erosion→ Backups

Backups from Lack Of Access

Channel Erosion Cycle



Greenway Condition-Sand Deposition

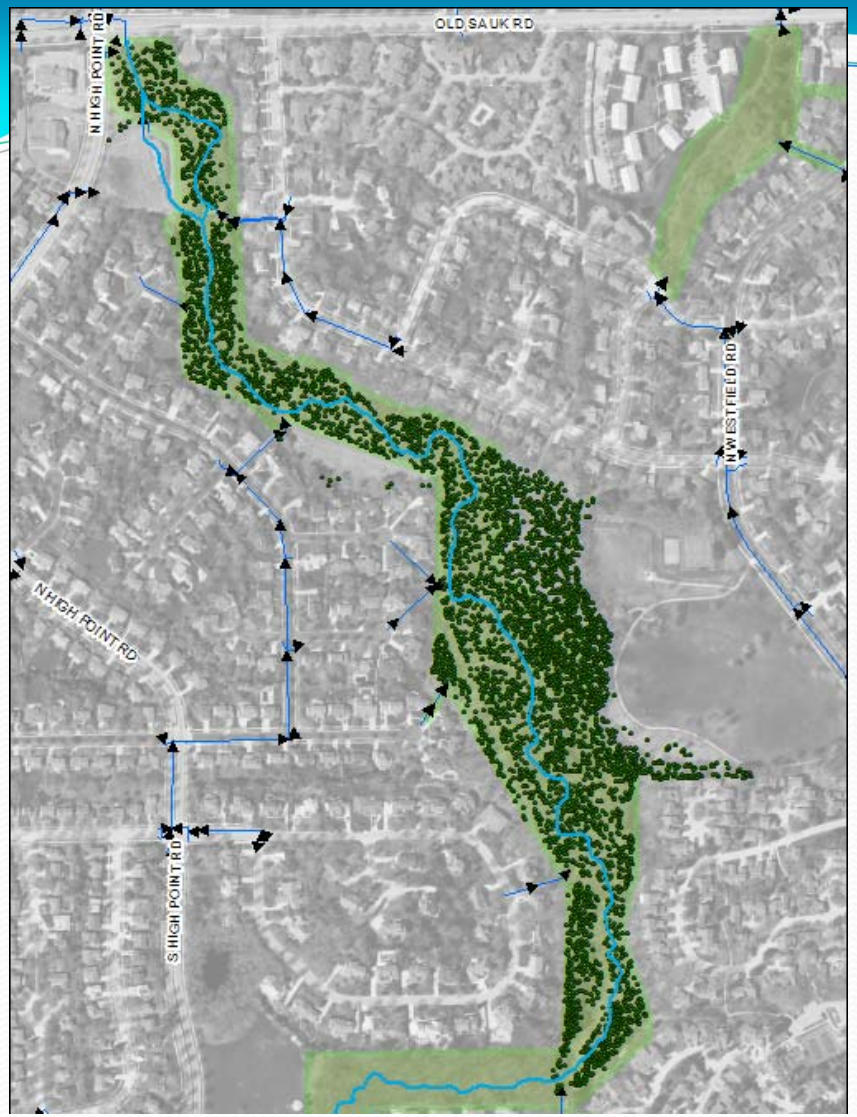
Greenway Condition-Sand Deposition

Data Collected-Drone Survey

Can see trees down over channel

Data Collected-Drone Survey

**Can see network of "unofficial trails" crossing Sauk Creek*



Data Collected-Tree Survey

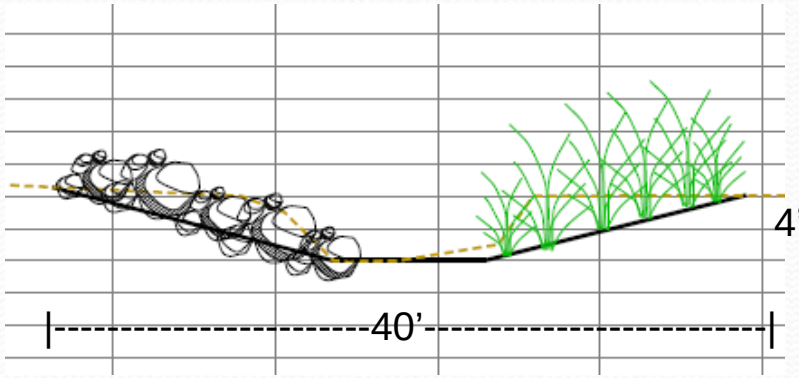
- Total Trees Surveyed: 5,595
- All trees have tags, will help contractor ID specific trees in the field
  - Allows us to design around trees
- Trees have GPS point + data
  - Species
  - Rating 0-100 (health, risk, age, location, canopy opportunity)
  - Diameter
  - Notes on condition

Channel Design Considerations

- Convey flow without flooding
- Stabilize slopes to prevent erosion
- Provide access for maintenance purposes
  - Allow crews to easily remove trees that fall across channel
- Improve water quality
- Aesthetically pleasing
- Maintain habitat for wildlife

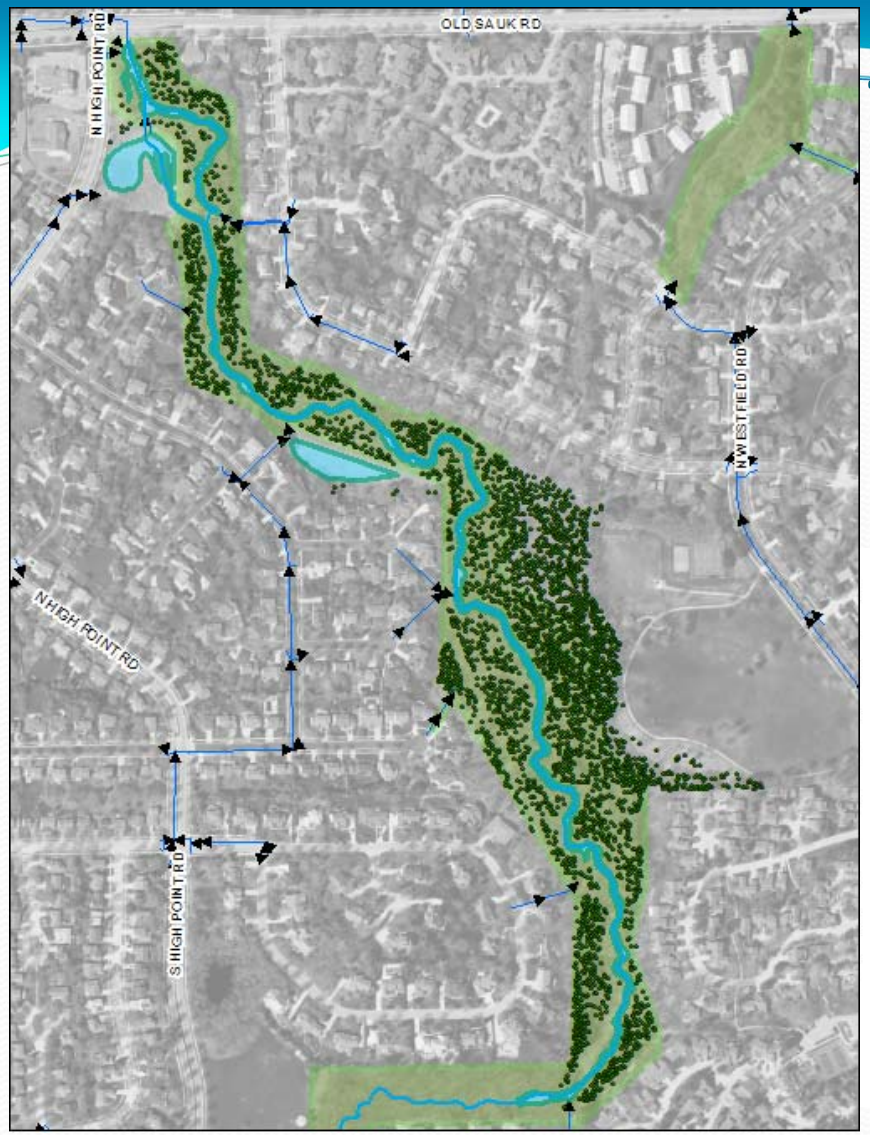
Design Plan

- Create a channel to convey low-flows
  - Stay within current channel footprint
  - Disturb areas with least desirable trees
- Create an access path for maintenance
  - 10’ gravel path along side channel
- Stabilize slopes with natives grasses and rock (riprap) wherever necessary
  - Outside banks on bends, to keep channel within City property
  - Model channel, find velocities and shear forces
- Remove undersized check dams
- Enhance existing water quality treatment



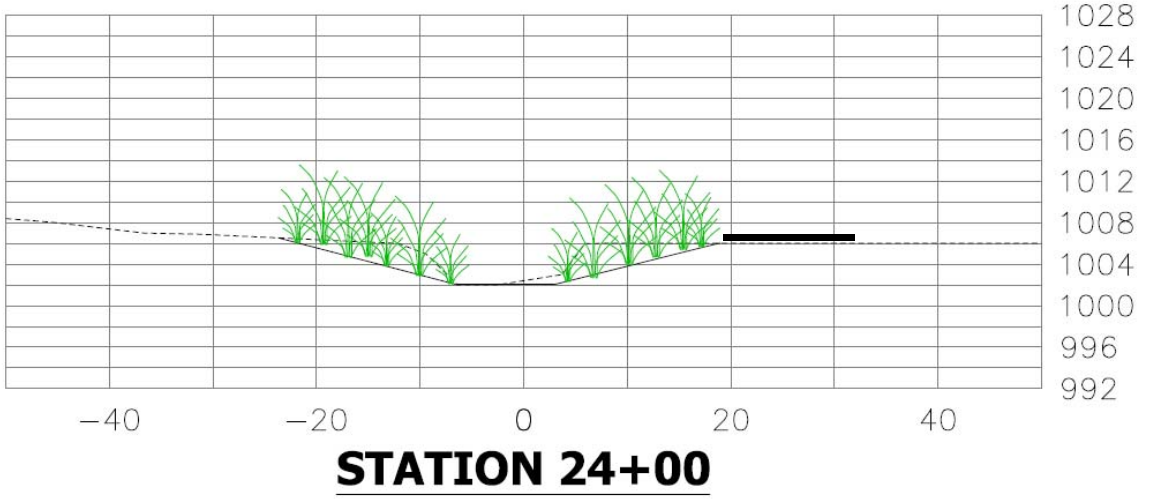
Notable Design Results

- Reduce impacts of flooding
- Greenway will look considerably different
  - Much less cover in first few years before grasses and vegetation grow up
- Keeping snags for wildlife
  - Swallows, woodpeckers, wood ducks, squirrels, etc



Tree Impacts

- Trees will be removed near channel so that slopes can be graded and replanted
- Maintenance access path

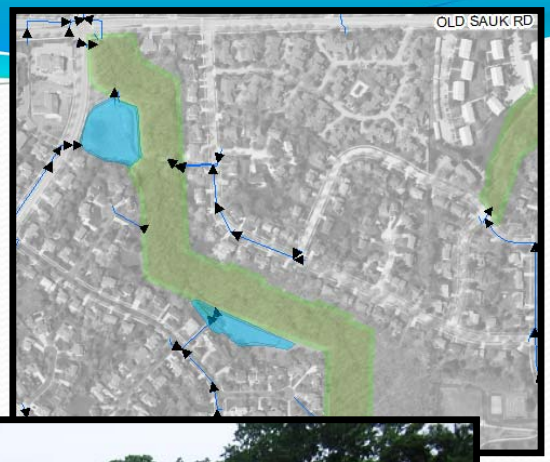


Water Quality Treatment

- Two existing locations built for water treatment
  - Filled with sediment (good!)
    - Need revamp
      - Will increase effectiveness in removing phosphorus and “total suspended solids” (TSS)
- Greenway system outlets to Lake Mendota
  - Improving water quality upstream will help prevent harmful algae blooms downstream

Water Quality Issues-Sediment

Water Quality Treatment



Water Quality Treatment

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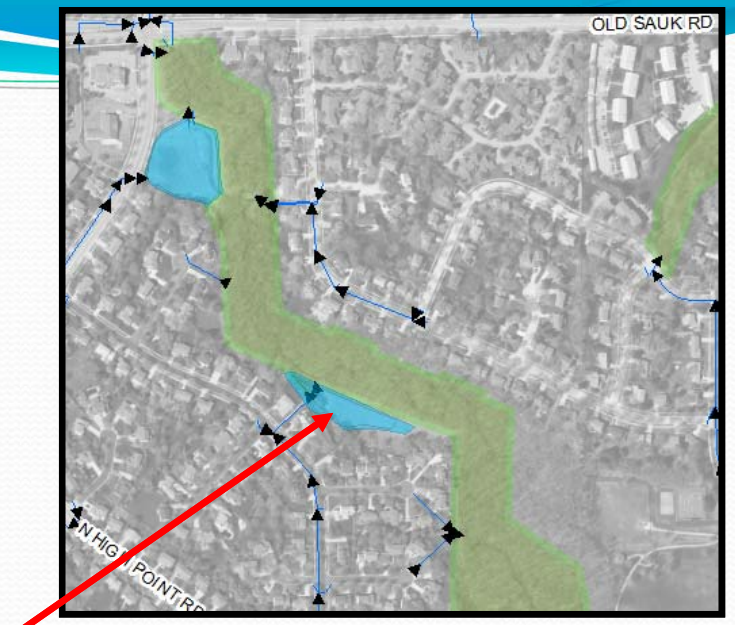


- Enhance existing biofilter
- It will look similar once established

Potential Restoration

- City will hire restoration expert to maintain Sauk Creek for foreseeable future
  - Attack seed bank to reduce invasives
  - Help greenway to stabilize
- Native grasses and shrubs will be planted
- Will work in other sections of Sauk Creek Greenway owned by City while greenway system stabilizes
  - Will reduce ability of invasives to spread
  - Goal to prevent downstream erosion

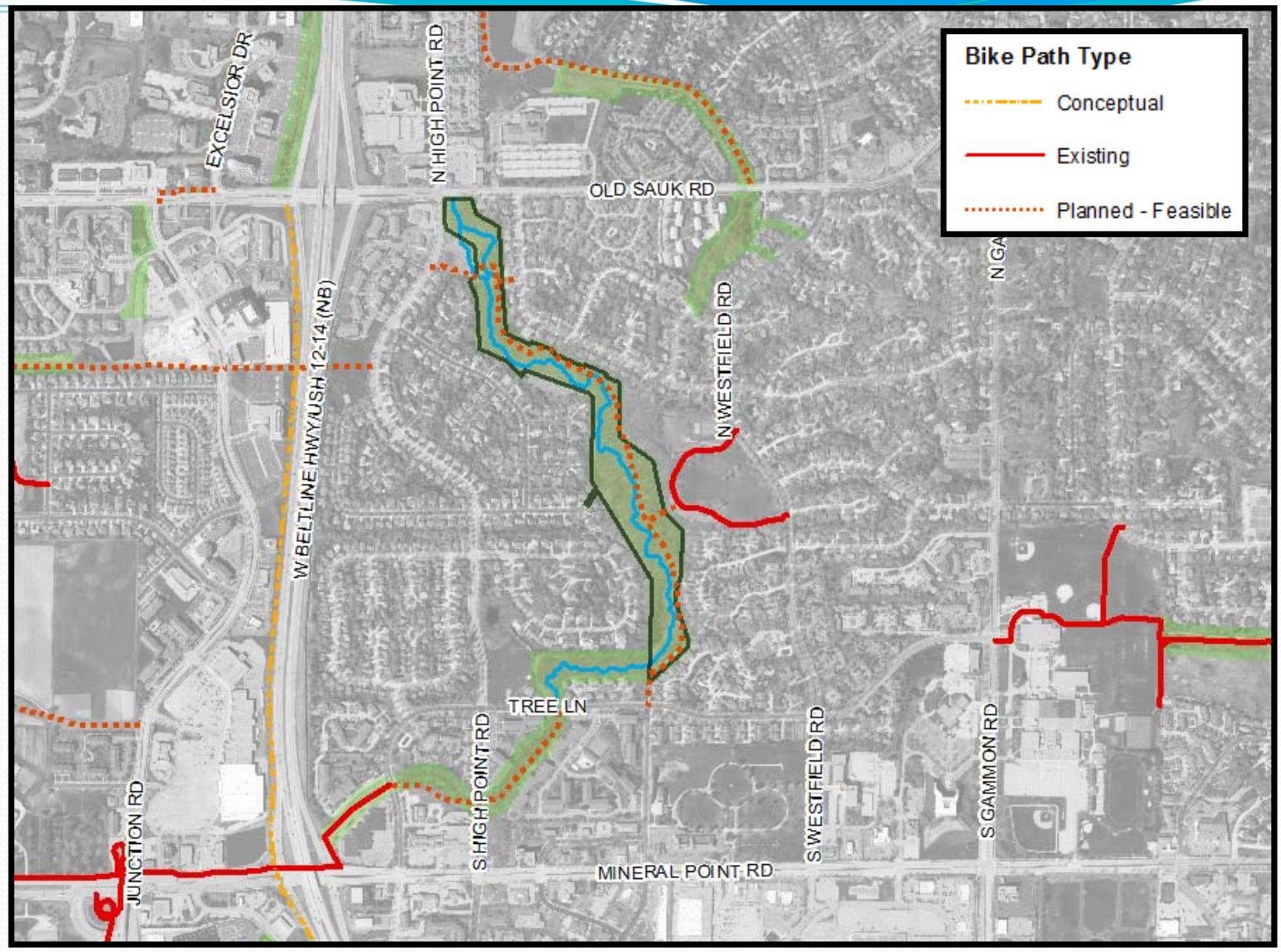
Extra Amenities

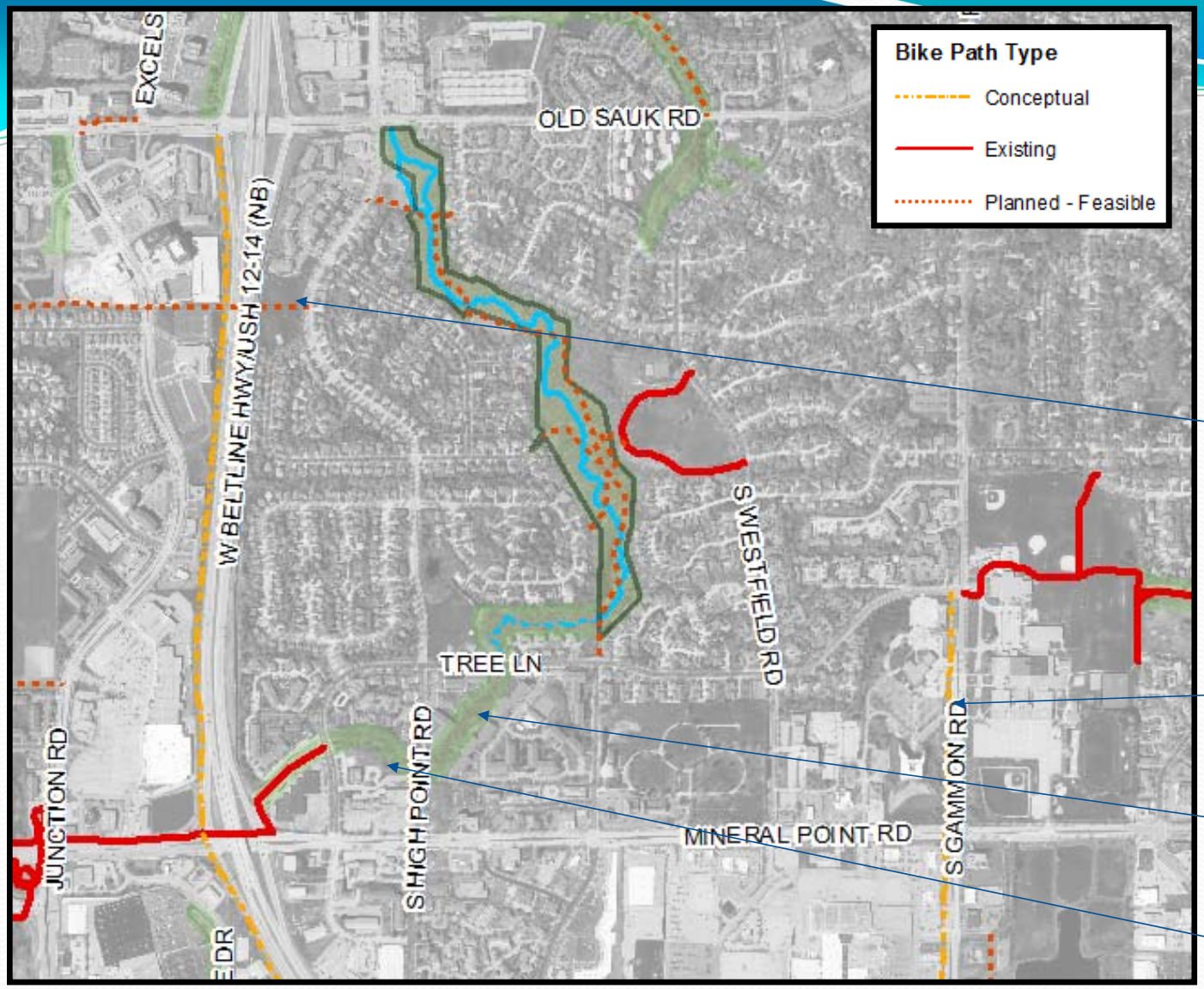
- “Unofficial” trails currently in greenway
  - Not maintained by City if tree falls over path
- Potential to add “official” trails
  - Paved bike path
  - Paved connector paths
  - Unpaved, improved paths
  - Off road bike trails

Bicycle Transportation Plan for Madison Metro and Dane County

Adopted by Common Council and Ped/Bike/Motor Vehicle Commission 7/21/15

Prepared by Staff of the Madison Area Transportation Planning Board, A Metropolitan Planning Organization (MPO)





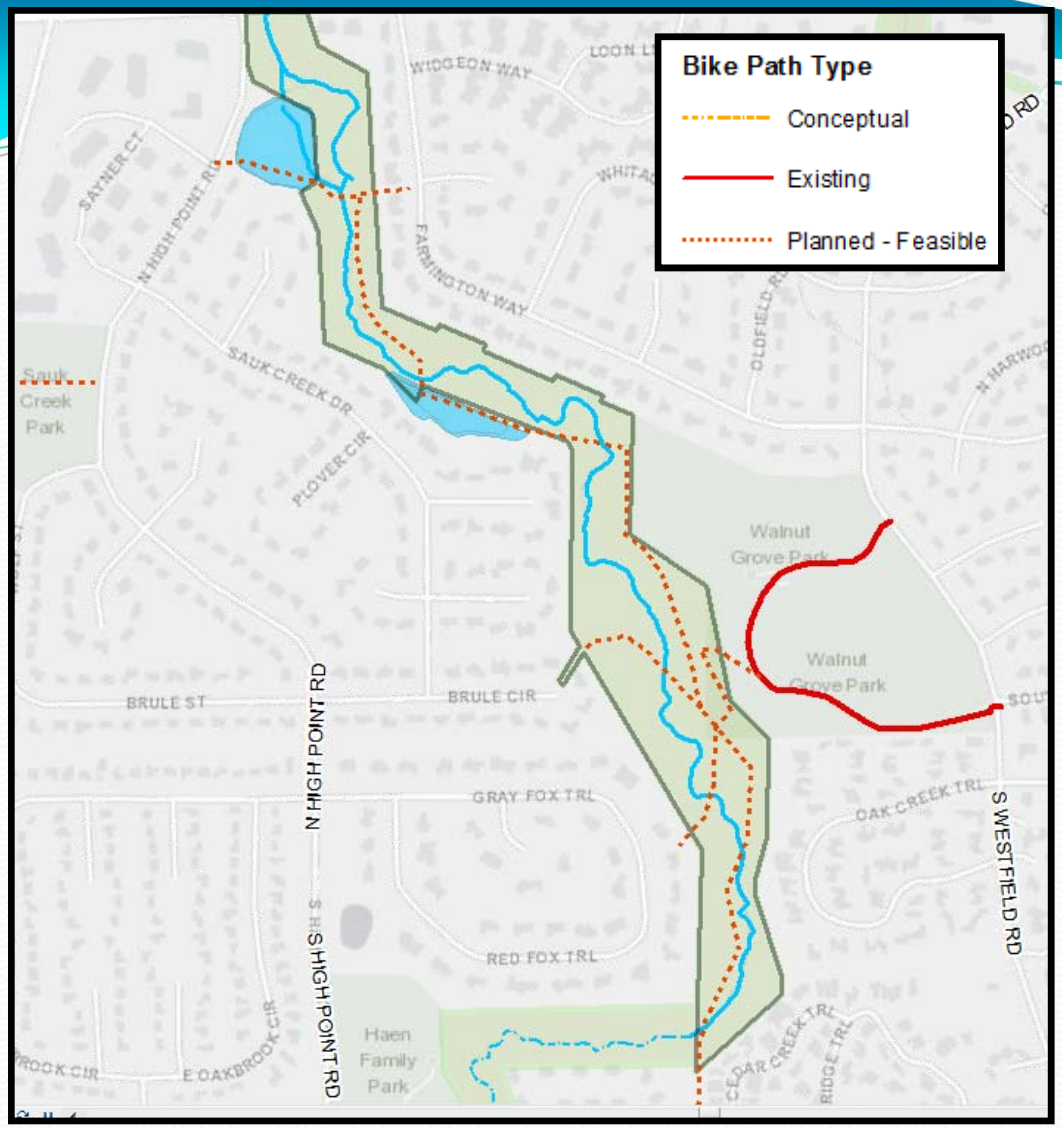
Updates based on current data

Anticipated bike bridge

Anticipated bike path

Not owned by City

Not constructible



Benefits of bike path:

- Connects to bridge over beltline
- Connects to Park
- ADA complaint
  - Inclusive!
  - Allows everyone to access the creek
- Path for “non-commuter” bikers
  - Some bikers feel uncomfortable biking on streets vs off-street paths

Data Collected-Tree Survey

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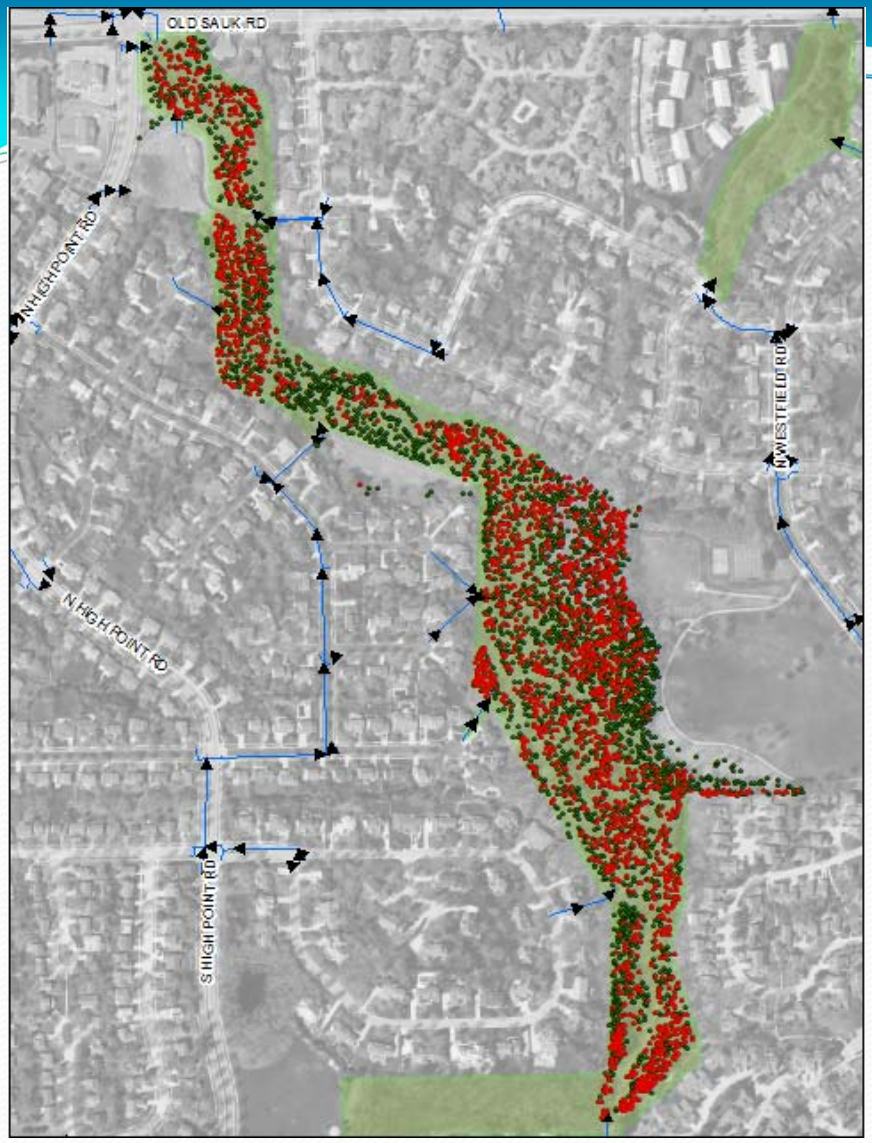
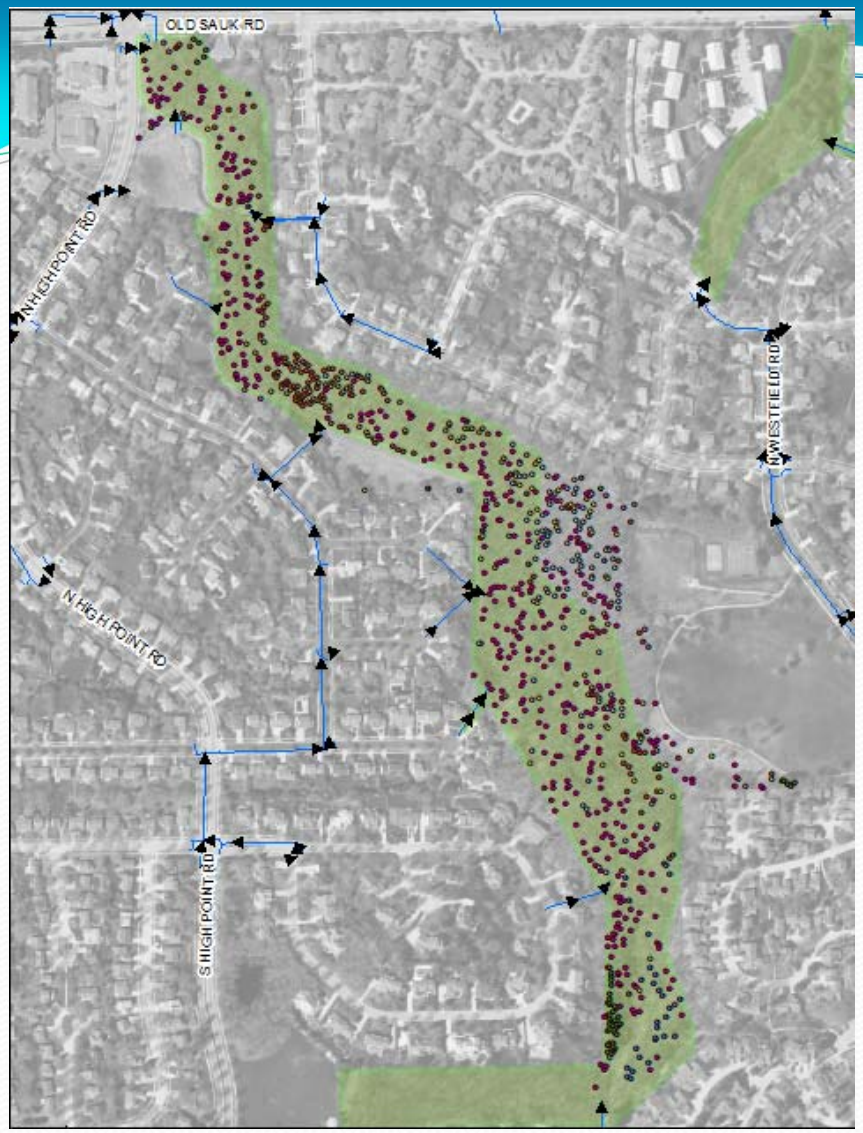


Data Collected-Tree Survey

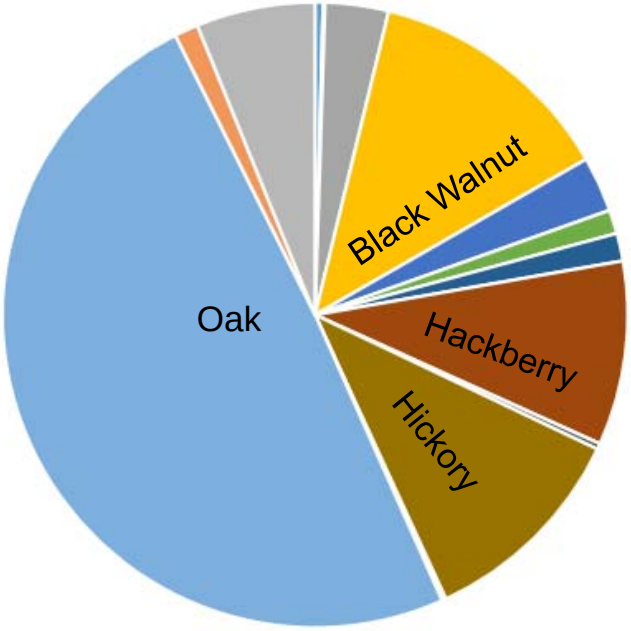
- 2,220 Box Elder or Buckthorn
- 40% of total trees
- Buckthorn
  - Possesses chemicals that suppress native understory
  - Fruit is a diuretic
    - Wildlife cannot retain as food (net loss in calories)
    - Quick distribution of seeds
- Box Elder
  - Easily take over a disturbed man-made landscape and become dominant
  - They don't last as long and aren't as stable

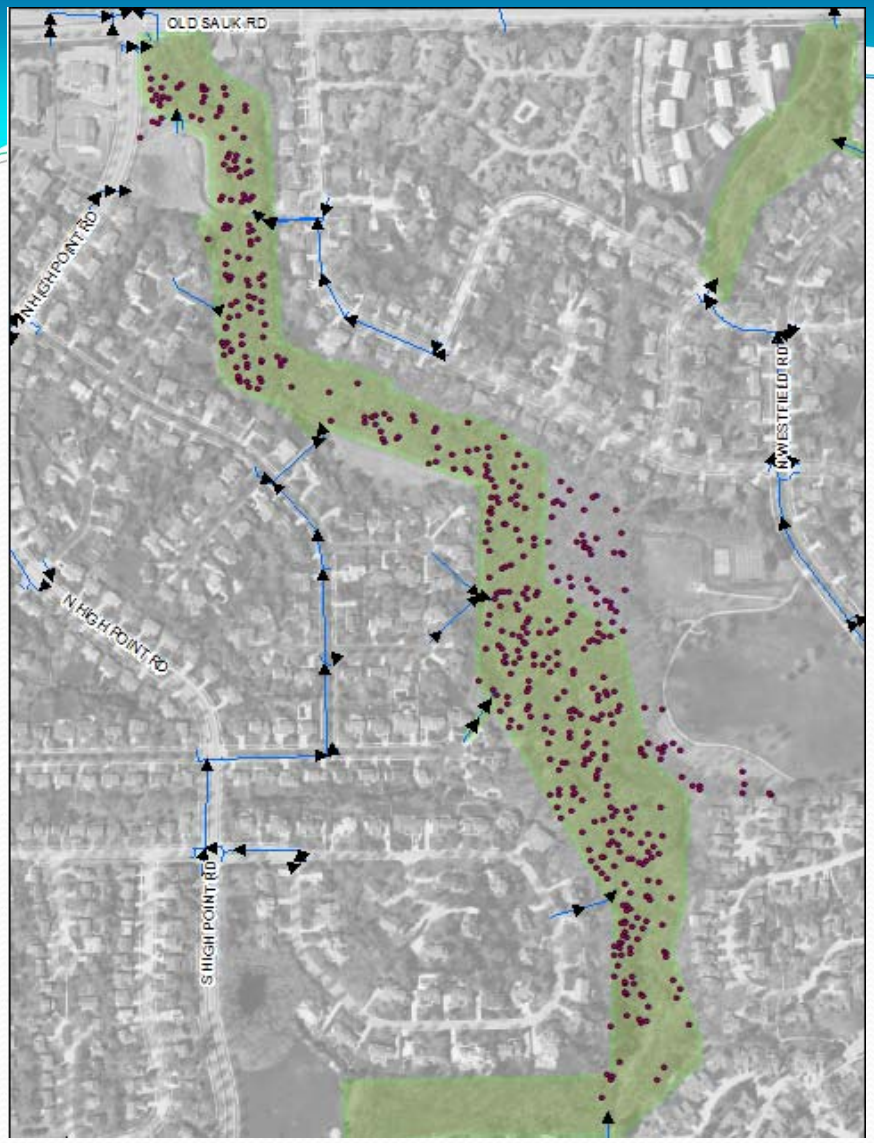


Data Collected-Tree Survey

Quality Trees (>80 ranked, Native, Non-Invasive)
976 Total
17% of Total Trees
Breakdown:

- Aspen: 4
- Basswood: 1
- Black Cherry: 32
- Black Walnut: 126
- Cottonwood: 28
- Crabapple: 12
- Elm: 14
- Hackberry: 93
- Hemlock: 3
- Hickory: 108
- Honey Locus: 1
- Juniper: 1
- Oak: 481
- Other: 12
- Pine: 60

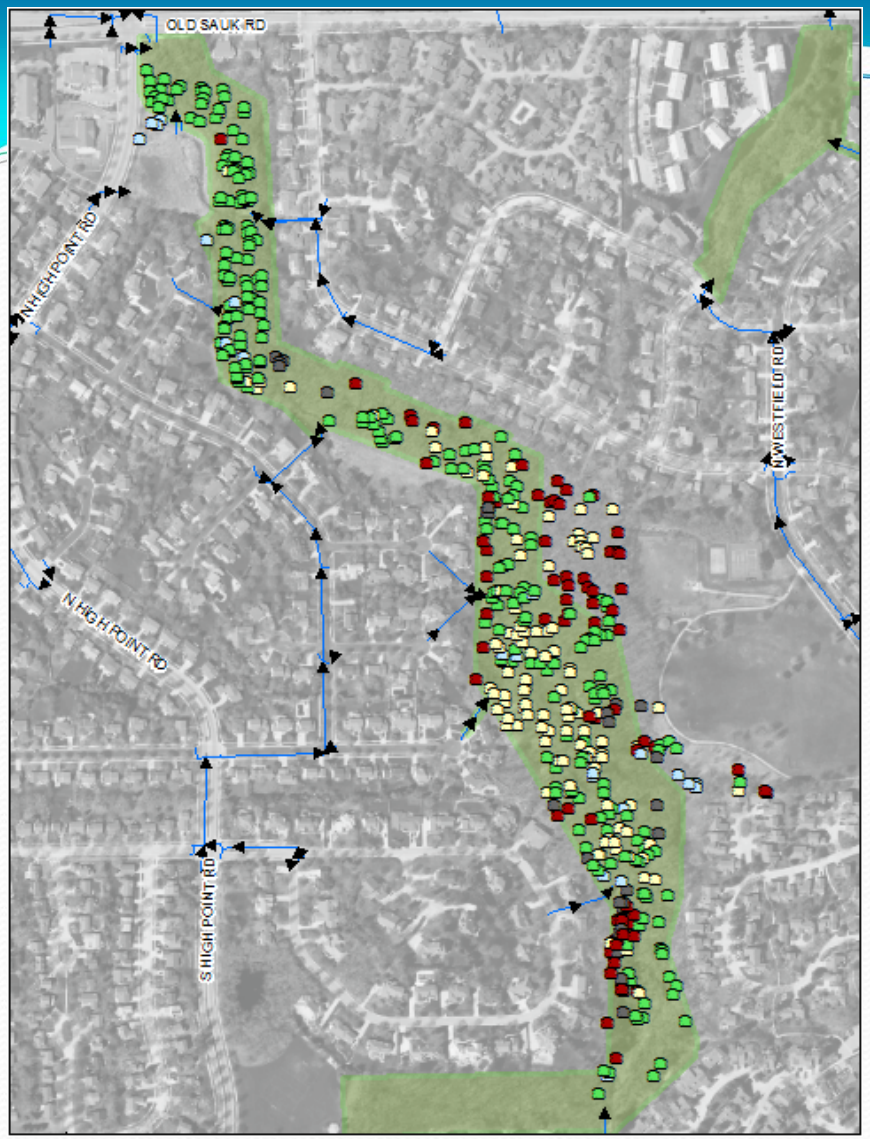




Data Collected-Tree Survey

- Oaks >80 Rating
- 481 Oak Trees
- 8.6% of Total

Data Collected-Tree Survey



SPECIES

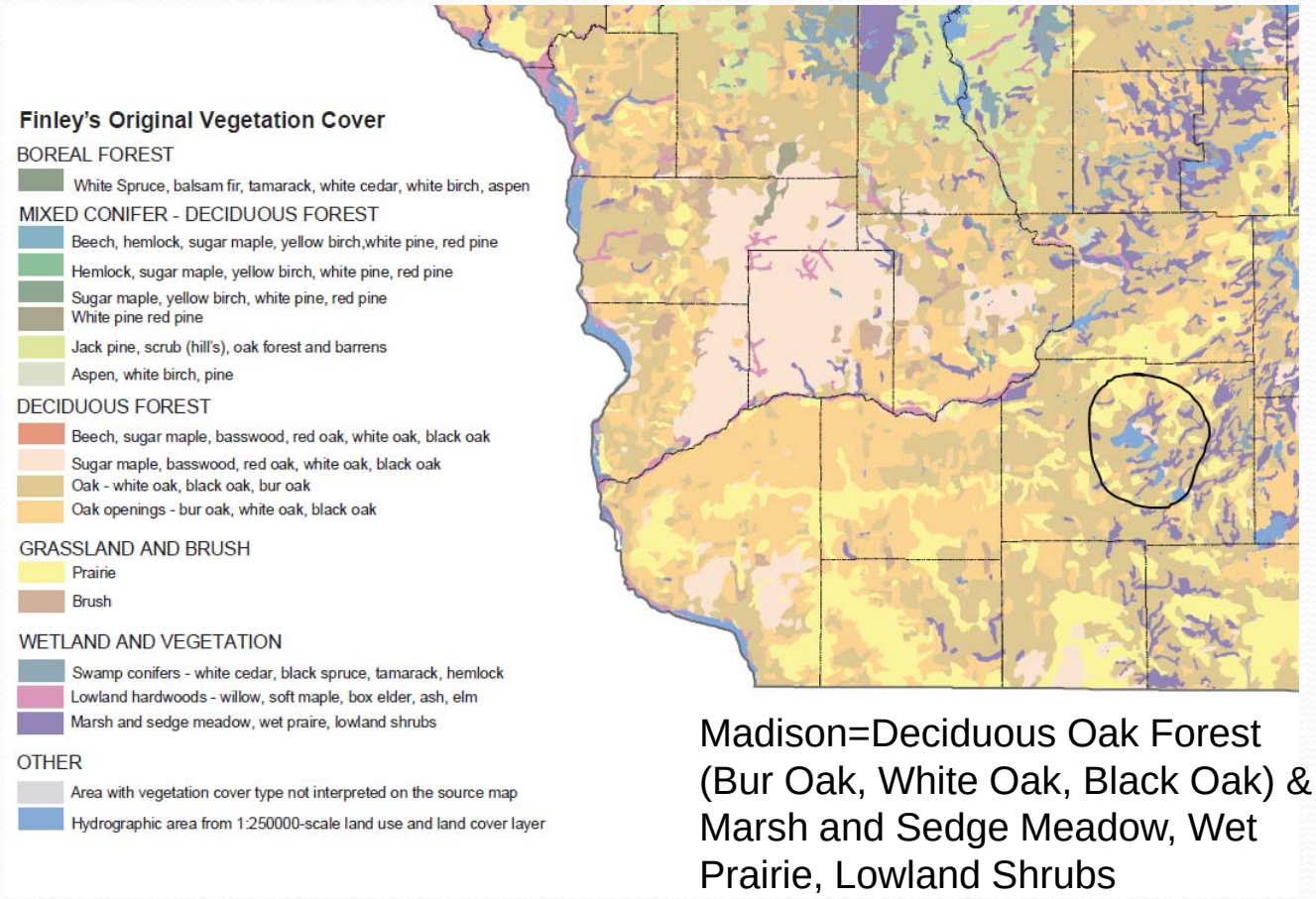
- Black Oak- Quercus velutina (29)
- Bur Oak- Quercus macrocarpa (248)
- Red Oak- Quercus rubra (74)
- Swamp White Oak- Quercus bicolor (22)
- White Oak- Quercus alba (108)

Data Collected-Tree Survey Ecological Summary

- Youngest oaks are 80-100 years old
- Considerable mortality amongst mature oaks in woodlot
  - Root rot, oak wilt, other vascular disease
  - Little oak regeneration
- On current trajectory, mature oaks will die off without being replaced

- Oaks are a light loving species--need it to regenerate and be healthy
- Greenway forest now too overcrowded for general oak health
  - Thinning/girdling less desirable species and creating large opening (200-300’ wide)

Historic Vegetative Cover: Finley's Presettlement Vegetation



Madison=Deciduous Oak Forest (Bur Oak, White Oak, Black Oak) & Marsh and Sedge Meadow, Wet Prairie, Lowland Shrubs

General Reasons City Removes Trees

- Undesirable (fast growing, not long lasting, shading out understory)
- Unhealthy (lead to flooding risk with down branches)
- Will be disturbed when improving channel
- Risk to private property/safety
  - Many residents have reported dead branches/trees and want them removed
  - City cannot trim because
    - No bucket truck/necessary equipment
    - No access on private property
- City Policy is to restore unengineered greenways to grass greenways
  - Easier to maintain 1,500 acres & mitigates future erosion when channels get “shaded out”
  - Here tree survey shows importance of keeping as many quality trees as possible

Large-Scale Problems with Opportunistic Species

- Buckthorn, Box Elder and other opportunistic species easily take over a disturbed man-made landscape and become dominant
  - They don't last as long and aren't as stable
  - They feed/house **very few** insects that birds and wildlife need to survive
- Before human development, WI was primarily oak savannah and prairie
  - The landscape was largely fire-driven
    - Only established oaks survived the fires
- We now prevent fires, so we need to give oaks and other desirable, long-lasting species an opportunity to take hold before the opportunistic species do
  - We don't expect to create an oak savannah, but we need to shift towards a more sustainable ecosystem

Opportunistic Species and Greenways

- In Madison buckthorn and box elders are being removed whenever possible to keep the greenways healthy
  - Female box elders drop a lot of seeds that sprout smaller trees which shade out the greenway, preventing the growth of ground cover
    - The ground cover is necessary because established roots hold the dirt in place and protect the greenway from erosion
- Removing opportunistic species of trees will provide more sunlight to the greenway which will allow native grasses to grow and hold slopes

Existing Paths

- Existing “unofficial” paths in greenway
- City does not maintain paths
  - Down trees/limbs
- Extensive network
  - Can’t cross creek when wet

Off Road Bike Trail “Middleton, WI”

Schedule

- Another PIM
- Pedestrian/Bicycle/Motor Vehicle Commission
- Permitting

- Anticipated construction: 2020

COMMENTS OR QUESTIONS?

Website to be launched next week:
https://www.cityofmadison.com/engineering/projects/sauk-creek-greenway-restoration

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