



## GIS Enhancements to Support Park District Initiatives

Cleveland Metroparks Board Meeting

November 17, 2022



# GIS Program Summary

## Priorities

- ❖ Provide relevant GIS and drone services to:
  - Support / enhance work across the Park District
  - Facilitate access to information (spatial data)
  - Augment communication through engaging visualizations
- ❖ Leverage resources through an open-source platform
- ❖ Support internal and external conservation and research
- ❖ Partner with external agencies to promote best practices
- ❖ Promote STEAM education



Cleveland-Cliffs Bike Park, Ohio and Erie Canal Reservation  
Photo credit: India Johnson

# Our Services

## GIS Team

- Applications for spatial data access
- Visualizations and rendering
- Drone program
- GIS development and database administration

## GIS Users within CM

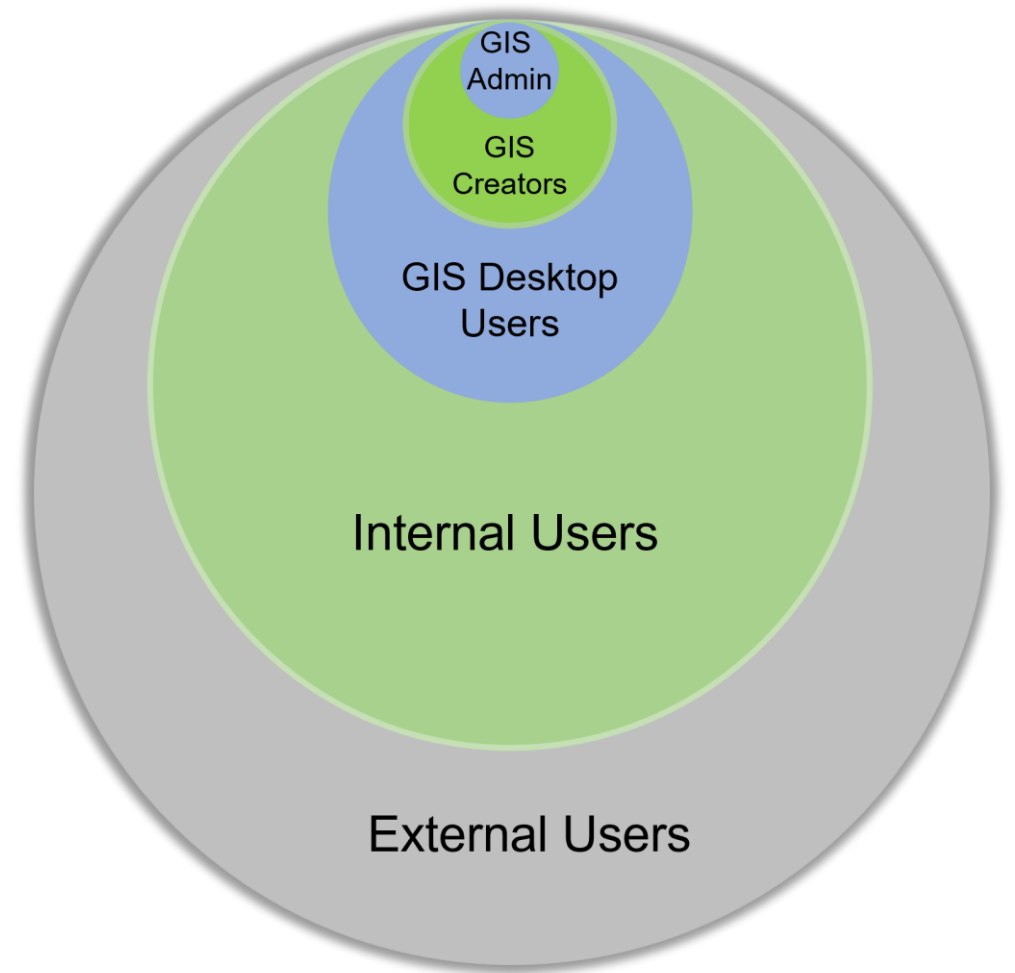
- Maintain park-wide data layers
- Support desktop users
- Promote best practices

## CM Staff

- Make spatial/tabular data available to all staff
- Provide applications that support job functions
- Answer spatially-based and data driven questions

## External users

- Share data with stakeholders
- Facilitate collaboration
- Support publicly available applications





# Staff

## GIS Admin

- ❖ GIS Team (Planning & Design)

Cartographer – Brandon Garman

Geospatial Developer – India Johnson

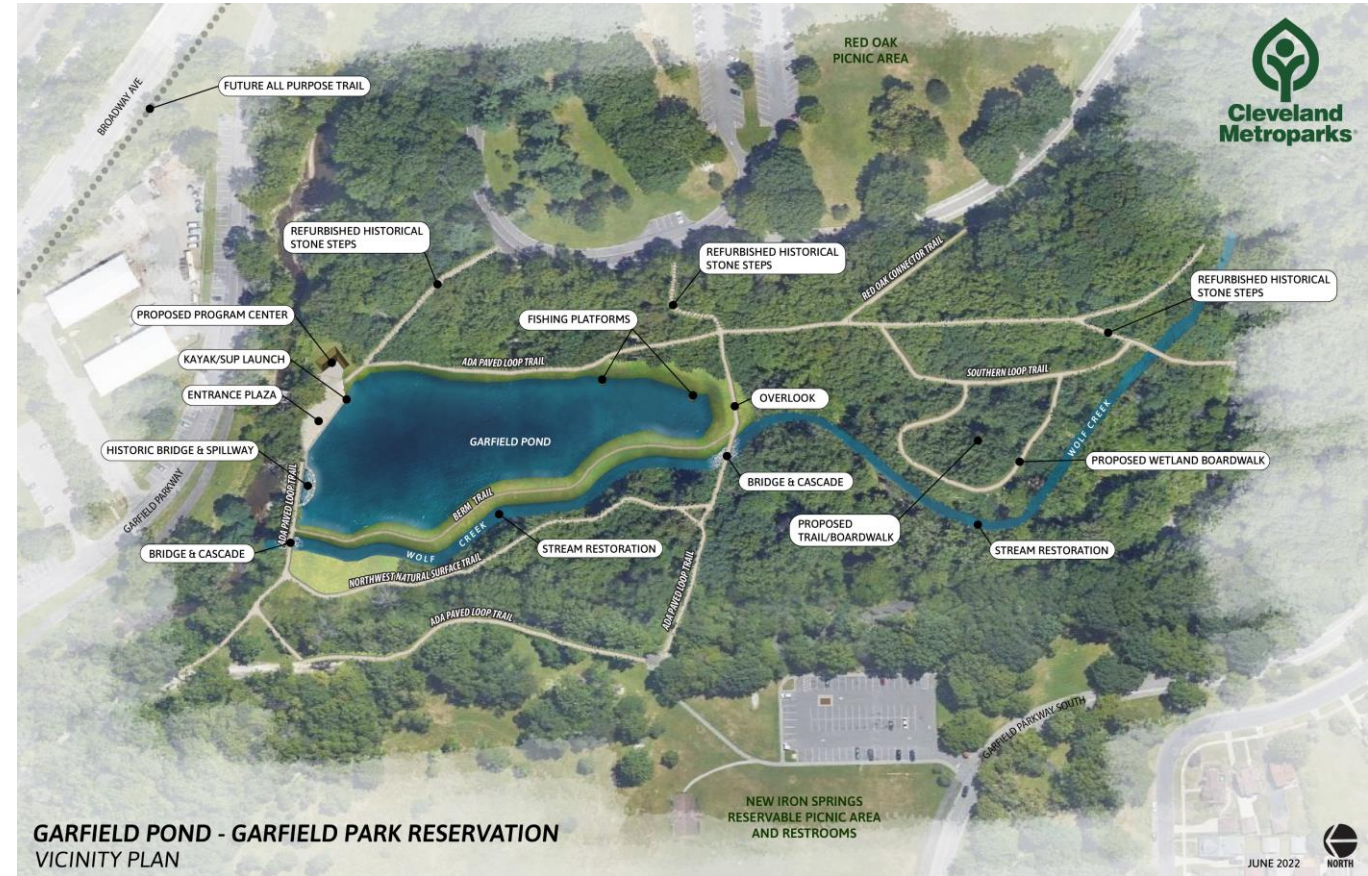
GIS Administrator – Tom Kraft

GIS Manager – Laura Schuch, PhD

- ❖ IT Services

- ❖ Natural Resources

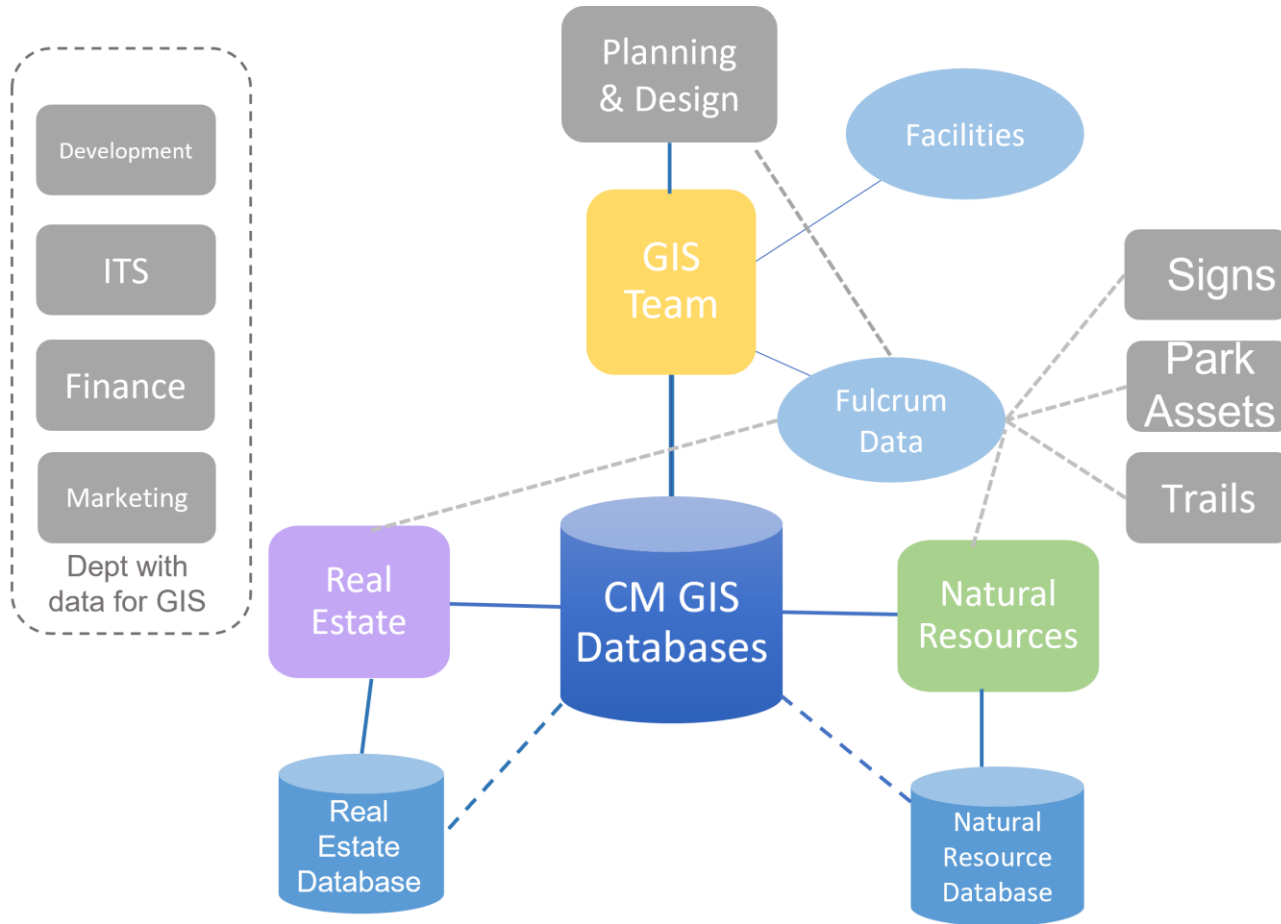
- ❖ Real Estate



Credit: Brandon Garman

# Organization

## Hybrid Structure – Data, Staff and Applications



Benefits	Challenges
Collaboration	Documentation
Team approach	Technological – server admin
Empowerment of staff	Knowledge management
Greater spatial understanding	Adequate communication
Intentional communication	



# GIS Supported End-User Applications and Digital Resources

QGIS

Fulcrum

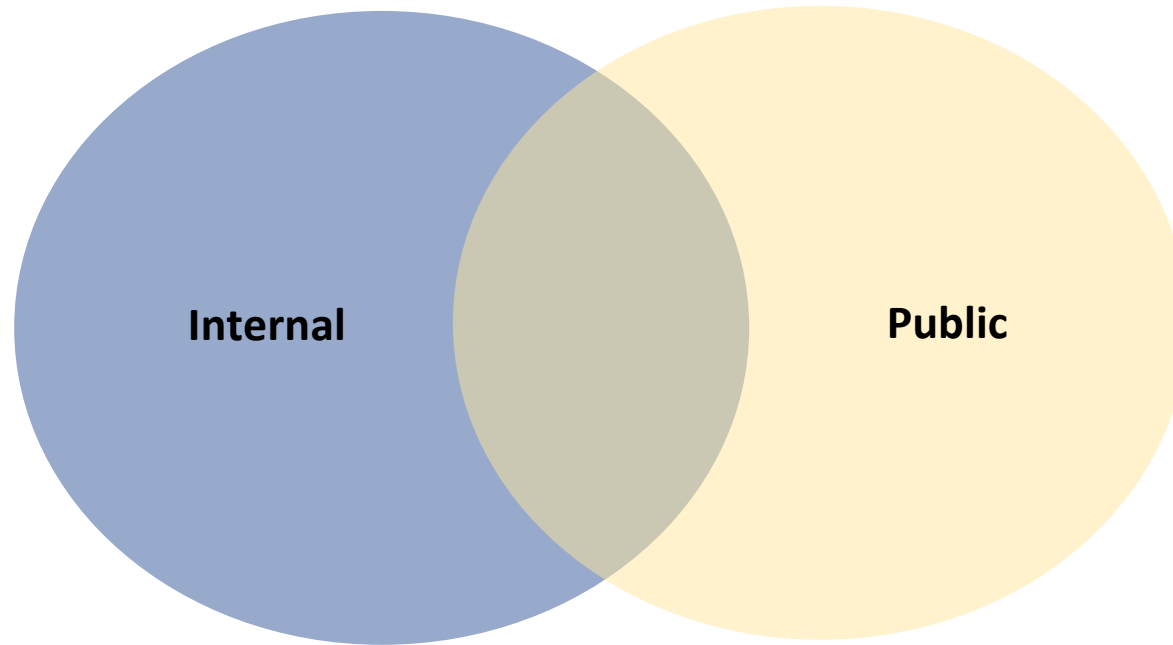
WebODM



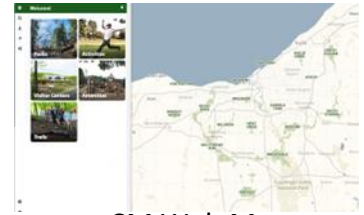
\*MapStore



\*Printserver



\*PrintServer functionality will be slowly phased out beginning 11/2022



CM Web Map



Mobile App



Print / Digital media



Trail maps

Trail Maps

# Internal Service Requests / GIS Footprint

## Planning & Design

- Planners – data analysis, trails, visualizations for meetings / projects
- Surveyors – boundary updates, data sharing
- Architects – facilities database
- Engineers – infrastructure visualization, GIS data
- Construction – site plans, drone imagery, renderings



East 55<sup>th</sup> Marina Panorama, Lakefront Reservation, Photo Credit: India Johnson

## Other Departments

- Marketing
- Real Estate
- Park Operations
  - Natural Resources
  - Outdoor Experiences
  - Reservation Managers
  - Trails
- Development
- Golf
- IT Services
- Legal
- Police
- Zoo



# Drones / Unmanned Aerial Systems (UAS)

- Project planning
  - Site assessment
  - Project development
  - Visualization
- Research
  - Natural Resources
  - Conservation
  - Erosion
- Marketing
  - Special events
  - Golf Courses
- Infrastructure
  - Mapping
  - Asset Management
- Virtual Reality
  - 360 camera
  - Hard to reach areas



Garfield Pond Restoration, Garfield Park Reservation, Photo Credit: India Johnson



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Hawthorn Bridge Infrastructure, South Chagrin Reservation, Photo Credit: India Johnson



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Seneca Golf Course, Photo Credit: India Johnson



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Wild Winter Lights, 2021, Cleveland Metroparks Zoo; Photo Credits: India Johnson

The screenshot shows the Cleveland Metroparks GIS Portal interface. At the top left, the logo for Cleveland Metroparks is displayed next to the text "Cleveland Metroparks". To the right of the logo are the navigation links "Featured" and "Contents". In the top right corner, there is a small American flag icon and a user profile icon. The main heading in the center is "Cleveland Metroparks GIS Portal" in a large, dark green font. Below the heading is a search bar with the placeholder text "search..." and a magnifying glass icon. Underneath the search bar, the section "Featured" is displayed, containing three map thumbnails. The first thumbnail is titled "CM Public BaseMap" and shows a map of a park area with roads like Shurner Rd, Drake Rd, and W Edgerton. The second thumbnail is titled "CM Public Toner BaseMap" and shows a map of an urban area with roads like Detroit Ave, Washington Blvd, and Brookside Zoo. The third thumbnail is titled "CM Transparent Aerial BaseMap" and shows a map of a park area with roads like Snow Rd, Ridge Rd, and W Pleasant Valley Rd. Below the featured maps, the text "Results 3 of 3" is displayed. At the bottom of the interface, the "Contents" section is shown with four tabs: "Maps (9)", "Dashboards (2)", "GeoStories (3)", and "Contexts (0)".



# MapStore – Web Map

The screenshot displays a web map interface with a central map area and several control panels. The map shows a residential area with streets like Fulton Rd, Park Dr, and Wildlife Way, and a park area with the Cleveland Metroparks Zoo. A purple star labeled "You Are Here" is positioned in the park area. A purple line represents a trail network, including a "Brookside Overlook" and a "Wildlife Way" trail. The interface includes a search bar at the top right with the text "Search by location name". On the left, there is a "Filter layers" panel with a "CM Public BaseMap" layer selected. Below this, there are several layer categories: "Default", "CM Building/Facilit...", "Annotations", "CM Points of Interest", and "CM Regional Trails". The "CM Regional Trails" category is expanded, showing a legend with various trail types: Towpath Trail, CM All Purpose Trail, Other APT, Bridle, Hiking, Buckeye Trail, and Mountain Bike Trails. At the bottom right, there is a vertical toolbar with navigation icons (home, search, zoom in, zoom out, pan, 3D) and a scale bar showing "100 m" and "Scale: 1:3600".



# MapStore – Web Map

Search by location name

CM Public BaseMap

Filter layers

Default

CM Building/Facilit...

Annotations

CM Points of Interest

CM Regional Trails

- Towpath Trail
- CM All Purpose Trail
- Other APT
- Bridle
- Hiking
- Buckeye Trail
- Mountain Bike Trails

2021 7-County Aeri...

Cleveland Metropa...

City/Township Bou...

© OpenStreetMap contributors.

100 m Scale: 1:3600

3D



# MapStore – Web Map

The screenshot displays the MapStore web map interface. The main map area shows an aerial view of a park with various trails and buildings. A purple line highlights a specific trail route, and a purple pin labeled "You Are Here" is placed on the map. The interface includes a search bar at the top right with the text "Search by location name". On the left side, there is a layer control panel with the following layers and their visibility percentages:

- CM Public BaseMap
- Filter layers
- Default
- CM Building/Facilit... (100%)
- Annotations (100%)
- CM Points of Interest (100%)
- CM Regional Trails (100%)
  - Towpath Trail
  - CM All Purpose Trail
  - Other APT
  - Bridle
  - Hiking
  - Buckeye Trail
  - Mountain Bike Trails
- 2021 7-County Aeri... (90%)
- Cleveland Metropa...
- City/Township Bou...

At the bottom right, there is a scale bar showing 100 m and a scale of 1:3600. The interface also includes a home button, a user profile icon, and a menu icon.



# MapStore – GeoStory – Capital Projects for Coordinated Infrastructure

**Infrastructure Projects**

## CHEERS

The Cleveland Harbor Eastern Embayment Resilience Study (CHEERS) outlines a plan for additional parkland and habitat along Cleveland's Lake Erie shoreline in proximity to the St. Clair-Superior and Glenville neighborhoods. The partners are wrapping up the initial concept plan and hope to move towards final design as grants and other funding become available. CHEERS illustrates the importance of investing in coastal resilience measures in an urban area to provide the greatest impact for human community resilience. The project will demonstrate beneficial use of dredge material to build habitat and expand parks, protect the critical infrastructure of Interstate 90 along the shore, ameliorate previous industrial uses and unjust development practices, and stabilize the unpredictable wave action adjacent to key recreation and transportation facilities.

**Map Labels:** Lakefront, Lakefront, Brookside Zoo, Washington, Ohio & Erie Canal, Garfield Park, Euclid C...

**Navigation Bar:** CHEERS, RAISE Planning, Euclid Creek ..., Eastern Ledg..., Solon to Chag..., Mastick Road ..., Brecksville Rd..., Heritage/Rive..., Garfield Boul...



# MapStore – Dashboard – Trail Statistics

## Cleveland Metroparks Trail Mileage Dashboard

Total Mileage, System-Wide

328.3 miles

APT, System-Wide

123.96 miles

Bridle, System-Wide

86.966 miles

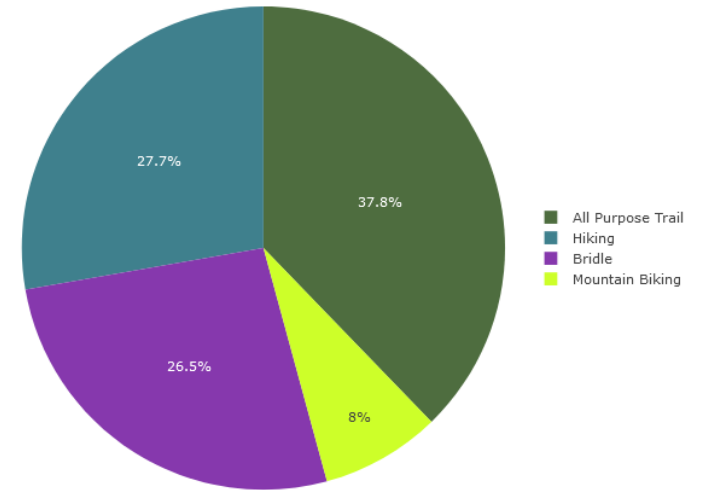
Hiking/Walking, System-Wide

91.1 miles

Mountain Biking, System-Wide

26.275 miles

Trail Use Breakdown, System-Wide



# MapStore – Dashboard – Summary Table

## Reservation Summaries

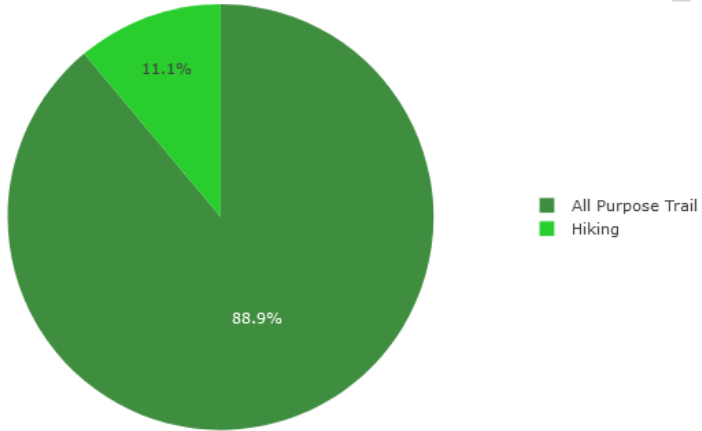
Trail Mileage by Reservation Summary Table

Reservation	TotalMiles	APTMiles	BridleMiles	HikingMiles	MtnBikeMiles	MilesPer100Acres
Acacia Reservation	4.2	3.7		0.5		2.7
Bedford Reservation	39.7	8	13.3	8.7	9.8	1.5
Big Creek Reservation	14.8	11.6		3.2		1.9
Bradley Woods Reservation	4.3	1		3.3		0.5
Brecksville Reservation	43	12.1	17.9	13		1
Brookside Reservation	5.7	4.7		1		4.3
Euclid Creek Reservation	8.1	4.4		3.7		1.5
Garfield Park Reservation	7.4	4.2		3.2		3.3
Hinckley Reservation	20.8	3.4	9	8.5		0.7
Huntington Reservation	3	0.8		2.2		3
Lakefront Reservation	8.3	7.9		0.4		1.9
Mill Stream Run Reservation	33.5	11.3	8.7	4.1	9.4	1
North Chagrin Reservation	27.9	5.3	9.8	12.9		1.3
Ohio & Erie Canal Reservation	23.2	18.7		0.5	4.1	5.9
Rocky River Reservation	35.5	16.1	11.7	7.7		1.4
South Chagrin Reservation	37.5	7.1	16.6	13.8		2.2
Washington Reservation	2	2				3.4
West Creek Reservation	9.2	1.8		4.5	3	1.9

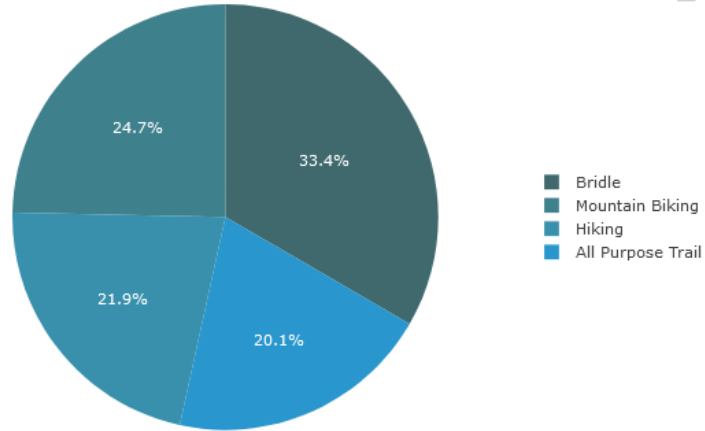


# MapStore – Dashboard – Charts

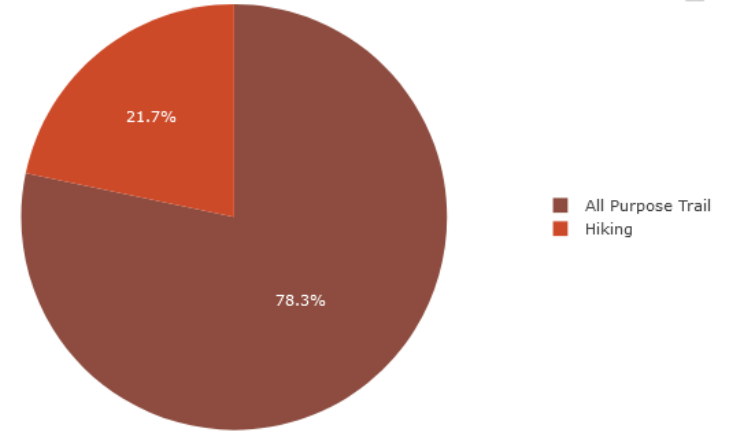
Acacia Reservation



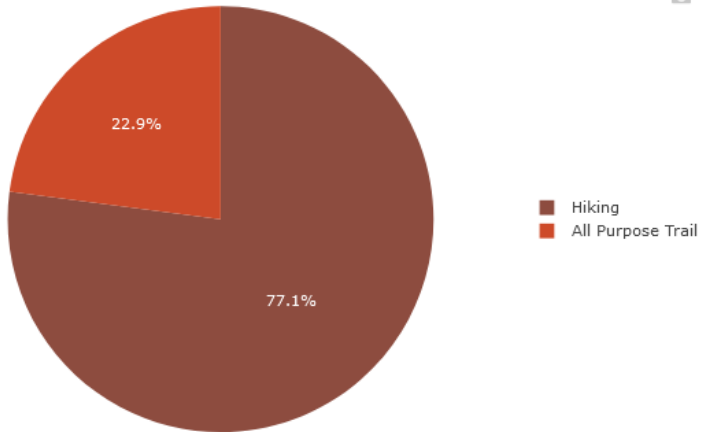
Bedford Reservation



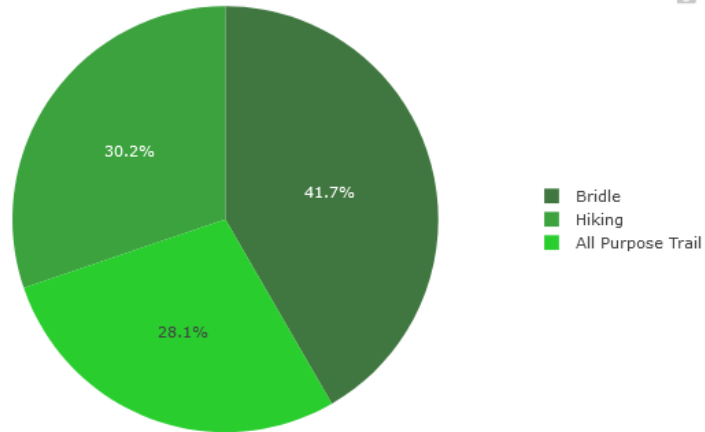
Big Creek Reservation



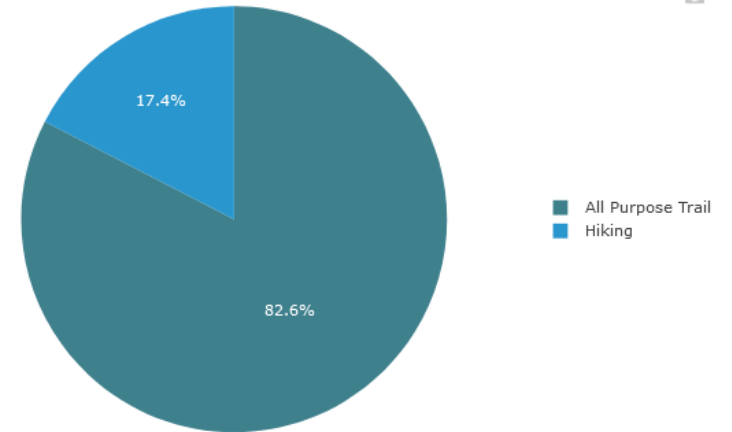
Bradley Woods Reservation



Brecksville Reservation



Brookside Reservation



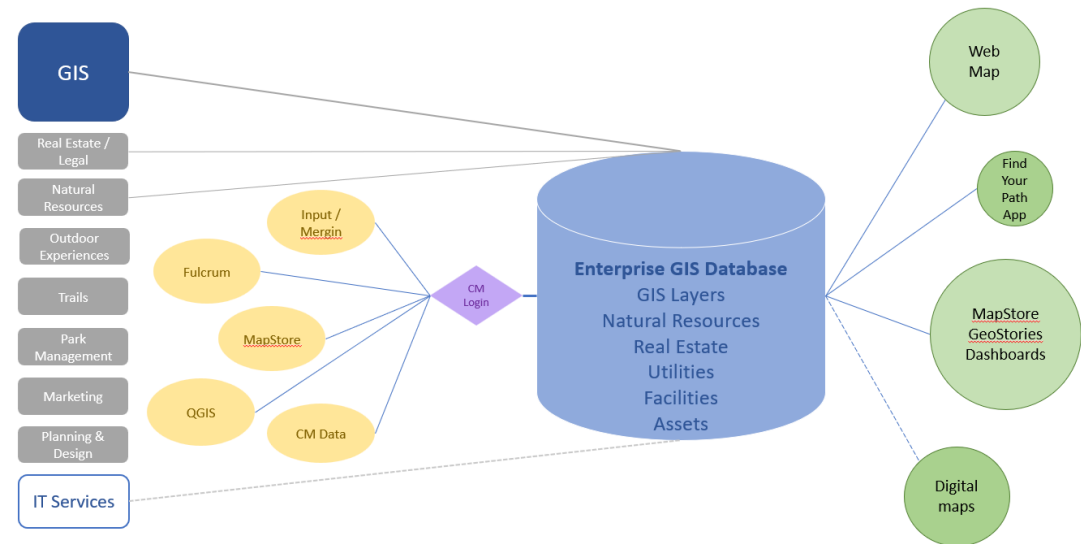
# Initiatives

## 2022 / 2023

- ❖ GIS Day
- ❖ MapStore roll-out beginning November 2022
- ❖ Enterprise Infrastructure mapping / needs assessment
  - Facilities
  - Assets
  - Utilities
  - Integration of other GIS databases
- ❖ Support internal and external GIS users
  - Within Cleveland Metroparks
  - With other park districts

## 5-year goals

- ❖ Established Enterprise GIS
- ❖ Utility mapping completed and workflow established







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