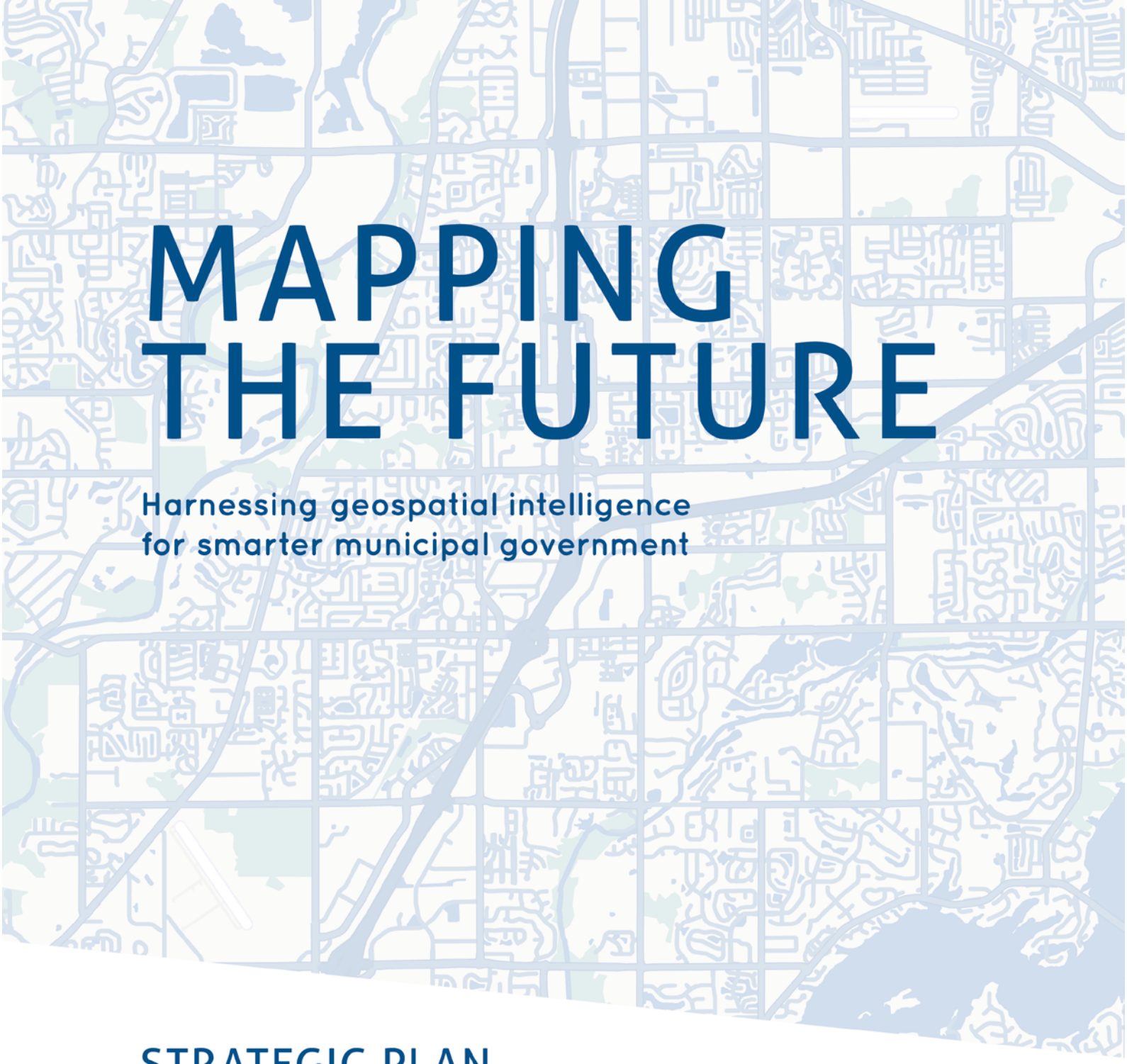


MAPPING THE FUTURE

Harnessing geospatial intelligence
for smarter municipal government

STRATEGIC PLAN FOR THE CITY OF FISHERS GIS 2025-2030

FISHERS INDIANA

cultivate GEOSPATIAL

Table of Contents

Notice

This document and its contents have been prepared and are intended solely for the City of Fishers, Indiana's purpose and use in relation to the mission, vision, strategic goals and objectives and intended management strategies of its enterprise Geographic Information Systems (GIS) Program.

1. Executive Summary

The City of Fishers' Geographic Information Systems (GIS) Program has matured over the years. Today, it is a vital program that supports many city departments and business functions. As such, the City is embarking on a transformative GIS Strategic Plan which includes a 5-year GIS Program roadmap designed to enhance operational efficiency, data governance, data accessibility, and decision-making across City departments. This roadmap (presented in full in section 6) serves as a strategic framework that aligns the City's goals of innovation, transparency, and service delivery with GIS-enabled solutions, ensuring the program remains a robust asset in achieving City-wide objectives.

GIS Program Vision

To establish a dynamic, resilient GIS program that supports data-driven governance, citizen engagement, and cross-departmental collaboration while fostering sustainable community growth.

Findings and Opportunities

Cultivate Geospatial Solutions (CGS) worked closely with the City's Departments to determine the current status of the GIS Program's capabilities, utilization, and desired functionality by conducting a **Discovery Needs Assessment**. The table below highlights the results. In turn, the findings have been utilized to formulate the City's GIS Roadmap for the next five years (2025-2030) and general future activities (**Please see Appendix A for a larger depiction of the graphic below**).

Expressed Need / Partial Alignment / Mature / No Involvement or Unknown	Data Sharing and Collaboration	Mobile Field/Data Collection	Data Integration (Asset Mgmt., ERP, etc.)	Data Accuracy/ Data Management	Real-Time Data Updates	Spatial Analysis and Data Visualization	Web Maps/ Services	BI Analytics and Dashboards	Geocoding, Geofencing, and Address Locating	Data Automation and Validation (ML/AI)	3D BIM/ Facility Indoor Mapping	GIS Training/ Other Training
Information Technology												
Business Solutions Group												
Human Resources												
Public Works												
Fire												
Planning & Zoning												
Fleet												
Engineering												
Water Quality												
AVERAGE ORGANIZATION SCORE												

Recommendations

As part of this strategic plan, the following key recommendations have been identified:

1. Establish a first-generation GIS data governance framework.
2. Continue to maintain best practices in the City's GIS enterprise architecture.
3. Implement a 5-year enterprise GIS roadmap of important initiatives. Following is a summary of the initiatives. The roadmap is presented in full in section 6.

5-year Enterprise GIS Roadmap Summary

Department-wide initiatives:

Department	Initiatives
All	• Address GIS Staffing needs • Address GIS Training needs • Improve data discovery

Department-specific initiatives:

Department	Initiatives
Information Technology	• Indoor facility equipment tracking • Staffing continuity and gaps • Data quality • System Integrations • Documentation
Business Solutions Group	• System Integrations • Data quality • Data compatibility
Human Resources	• System Integrations
Health	• Visualizations for the public • Data quality • Data access and discoverability
Public Works	• Geofencing • Data timeliness • System Integrations • Training and knowledge sharing
Fire	• Enhance Public Safety Preplanning • Staffing for data updates • System Integrations
Planning & Zoning	• Data acquisition (FEMA, easements) • System Integrations • Staffing for data updates
Fleet	• Visualizations for staff • System Integrations • Training and knowledge sharing
Permitting & Inspections	• Data access and discoverability

Department	Initiatives
Engineering	• Data updates • System Integrations • Data acquisition (asset age, repair history, cost)
Water Quality	• Data update workflows • System Integrations

Benefits and Outcomes

By following these recommendations, including the 5-year GIS Program roadmap, The City will:

- Improve operational efficiency: Enable faster, more informed decision-making and reduce redundancies.
- Enhance public engagement: Offer residents and stakeholders access to accurate, interactive data resources.
- Support sustainable growth: Facilitate smart urban planning, infrastructure improvements, and resource allocation.

The Enterprise GIS Roadmap positions the City as a leader in municipal innovation, leveraging GIS to address present challenges and future opportunities. The program's ongoing investments in technology, training, and community engagement will provide lasting value and elevate the quality of services for residents, businesses, and City staff.

2. Background

2.1. City of Fishers, Indiana Government Overview

The City of Fishers is a dynamic and rapidly growing city located in Hamilton County in Central Indiana. Immediately northeast of the City of Indianapolis, Fishers enjoys a prime geographic location within a large metropolitan area, offering easy access to the state capital while maintaining a Smart, Vibrant, and Entrepreneurial identity of its own with a mix of suburban charm and urban innovation. Home to approximately 99,000 people as of the 2020 Census, Fishers is celebrated for its high quality of life, safety, and community-oriented environment. As a result, it regularly appears on lists of the best places to live in the United States and continues to earn widespread recognition. Awards-Recognition

The municipal government leverages new and emerging technologies, data-driven insights, and cross-departmental collaboration to enhance infrastructure and service delivery, improve operational efficiency, and better engage with the community. This has had a significant impact on making Fishers the successful city it is today, enabling it to overcome unique challenges and continue thriving.

Fishers residents, businesses, and visitors benefit from:

- The Nickel Plate District, a vibrant downtown area featuring local shops, restaurants, a farmers' market, and The Amp, a publicly owned outdoor entertainment venue that hosts concerts and more
- Over 20 parks, including Geist Waterfront Park, Richey Woods, and the Fishers AgriPark, one of the largest urban farms in the country
- 130 miles of trails, including the popular Nickel Plate Trail that connects Fishers to neighboring cities of Indianapolis and Noblesville
- Various community events and programming for all ages, including the Spark!Fishers parade and festival, the Geist Half Marathon, and much more
- Maker Playground, public makerspace
- Fishers Art Center, featuring galleries and studio spaces
- Life Sciences and Innovation Park
- An entrepreneur-friendly ecosystem supportive of start-ups and innovators

2.2. City's GIS Program

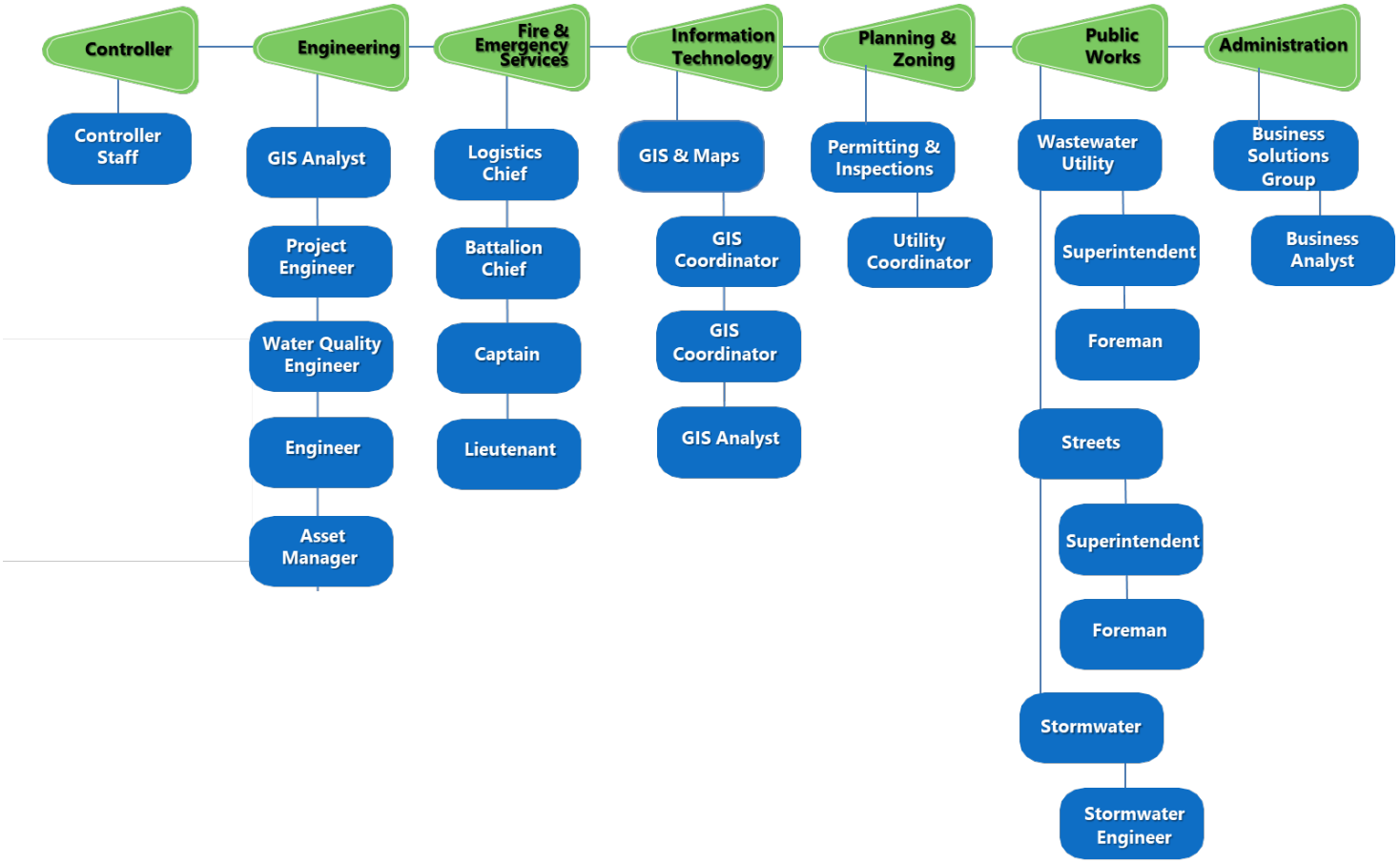
Fishers is well-known for its innovative GIS program. The core GIS team members have achieved high levels of experience, certification, training, and education and are housed in the Information Technology Department. This team maintains the City's GIS Enterprise Architecture and provides GIS services for the public and internally within the organization, as well as produces various maps and web applications to support City planning and operations. The core team has received several awards, including the prestigious Esri Special Achievement in GIS Award, and the Indiana Geographic Information Council (IGIC) Excellence in GIS Award.

In addition to the core team, GIS responsibilities and expertise are also distributed across various departments. Staff in those departments engage in activities such as data creation, data editing, and production of department maps.

The GIS Team collaborates extensively with both Hamilton County and the State of Indiana. All staff are members of the Indiana Geographic Information Council and participate in the Hamilton County Geographic Technical Advisory Group (HagTag), meeting monthly with other geospatial professionals from the County and other municipalities to discuss key issues and topics such as the annual orthophotography program, E911 addressing standards, the Indiana State Data Harvest, and other county- and state-wide coordination.

2.3. GIS Supporting Organizational Chart

The following organization chart identifies the Departments that support or widely use the City's GIS Program (Please see Appendix B for a larger depiction of the Chart). These groups are all important stakeholders of the Program and its sustainability. Their ongoing engagement is critical to ensuring the GIS Program remains responsive to departmental needs, aligned with strategic goals, and capable of delivering accurate, accessible, and actionable geospatial data. Supporting the GIS Program is essential to enhancing decision-making, improving operational efficiency, streamlining interdepartmental collaboration, and enabling data-driven services to the public. **Continued investment in the GIS**



Program ensures that the City of Fishers remains a leader in leveraging technology for smart growth, infrastructure planning, and community development.

2.4. GIS Strategic Plan Purpose and Need

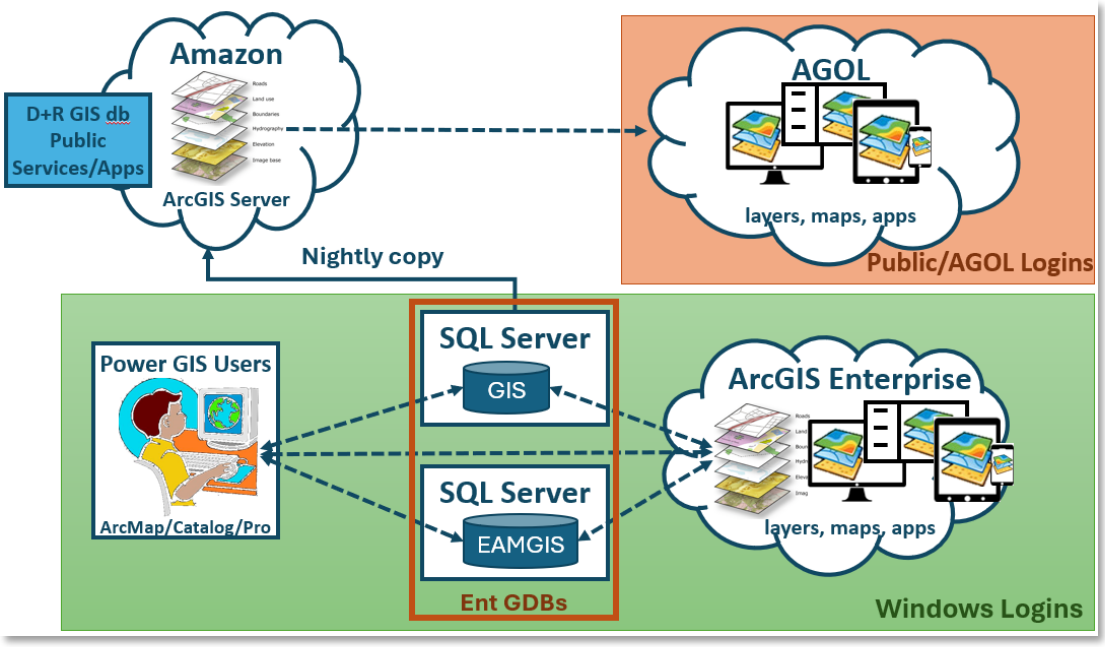
The purpose of the City of Fishers' GIS Strategic Plan is to enhance the City's existing GIS Program, ensuring it remains a sustainable, flexible, and innovative system that effectively supports the diverse business needs of all City departments while improving services for The City' citizens. The plan will identify and prioritize GIS solutions tailored to specific departmental needs, ensuring the strategic implementation of tools that directly benefit residents, such as improved infrastructure management, efficient public services, and enhanced emergency response capabilities. Furthermore, the creation of an enterprise GIS roadmap will provide a clear pathway for the program's growth over the next five years, with opportunities and recommendations. By aligning GIS efforts with the City's goals, the plan will enable the City to better meet the needs of its citizens through more responsive, data-driven governance and improved access to services that enhance quality of life.

3. GIS Program Overview

The City's GIS Program serves multiple departments across the enterprise. It is a mature GIS Program with a robust system architecture that incorporates ArcGIS Online (AGOL), ArcGIS Enterprise, Enterprise Geodatabases (Microsoft SQL Server), Amazon Web Services, public servers, internal servers, a disaster and recovery server, and a large user base including both desktop and web users.

The following **GIS system architecture and business process workflows** are currently in place:

3.1. GIS System Architecture



3.2. Existing GIS Application and Business Application Function

This section provides a list of common GIS activities within the City. The inventory provides a representation of several categories of activities including dataset development, application usage, and report analytics. It focuses on publicly available applications, but the city has a wide variety of secure applications to help drive efficient management of city resources.

Map Fishers GeoHub

The site at https://data-tofgis.opendata.arcgis.com/is the City of Fishers Open Data GeoHub. It serves as a centralized platform for accessing geospatial data, exploring interactive maps, and engaging with city planning and development initiatives.

Focus and Purpose

The GeoHub is designed to promote transparency, support data-driven decision-making, and foster community engagement. It provides residents, developers, planners, and researchers with access to authoritative geographic data and tools that reflect the city's infrastructure, land use, and ongoing projects.

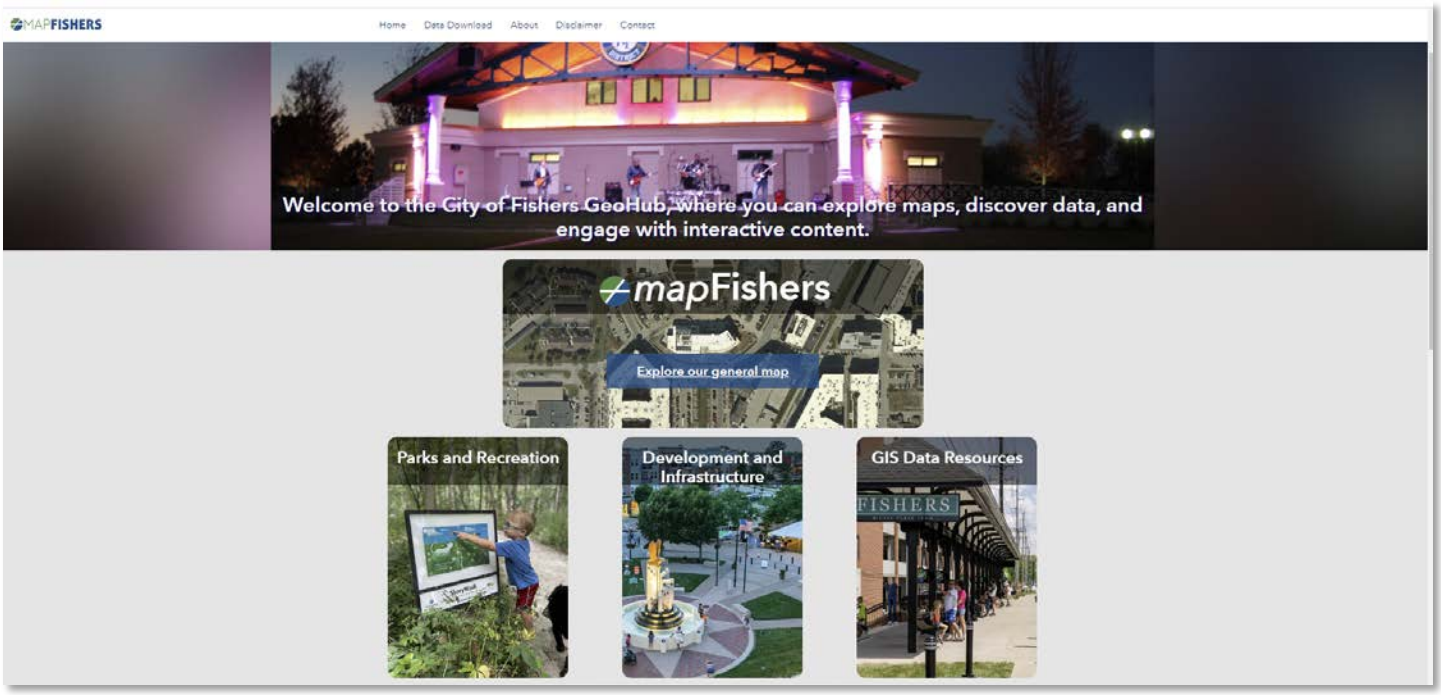
Key Features

- **Interactive Mapping Applications**: The site hosts mapping applications like mapFishers, which is a general viewer allowing interactive access to the city's core GIS layers, dashboards such as the Capital Projects Dashboard, which showcases infrastructure improvements such as decorative streetlight installations and new medians along 96th Street, and the Development Dashboard, which allows users to explore current and upcoming development projects, including details like project names, statuses, and timelines.
- **Open Data Access**: The GeoHub offers downloadable datasets covering various aspects of the city, such as zoning, land use, and township boundaries. These datasets are available in multiple formats to facilitate analysis and integration into other applications.
- **Links to other GIS Data Resources**: The GeoHub connects users to broader geospatial resources like IndianaMap and the Hamilton County GeoHub, enhancing the context and utility of local data.

User Experience

Built on the ArcGIS Hub platform, the site offers an intuitive interface that allows users to search, filter, and visualize data easily. Its design supports both casual exploration and in-depth analysis, catering to a wide range of user needs.

Overall, the City of Fishers' GeoHub is a valuable resource for anyone interested in the spatial dynamics of Fishers, Indiana, providing tools and data to support informed community participation and planning.



mapFishers Application

mapFishers, accessible at https://map.fishers.in.us/mapfishers/, is an important web map application that serves as a comprehensive resource for accessing, visualizing, and analyzing spatial data related to the city's infrastructure, planning, and community services.

Focus and Purpose

mapFishers is designed to support the city's commitment to being smart, vibrant, and entrepreneurial. It provides residents, businesses, and city staff with accurate and up-to-date geographic information to facilitate informed decision-making and community engagement. It is the most commonly used GIS application among both City staff and the public.

Key Features

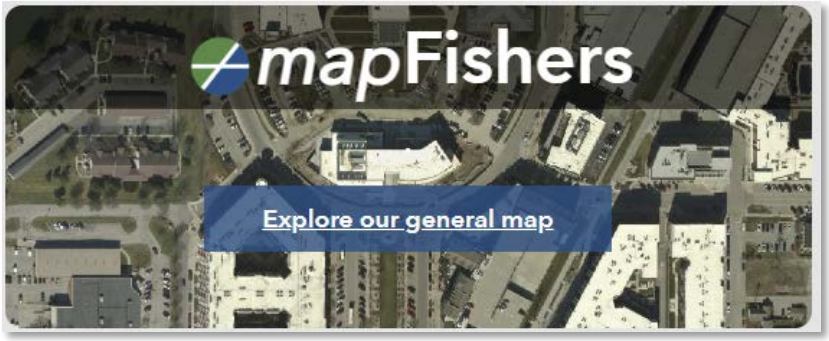
- **Data Visualization**: The platform offers access to a wide range of geospatial data layers, including zoning districts, land use, infrastructure, and environmental features.
- **Custom Map Creation**: Users can create custom maps by selecting specific data layers, adjusting symbology, and adding annotations to suit their needs.

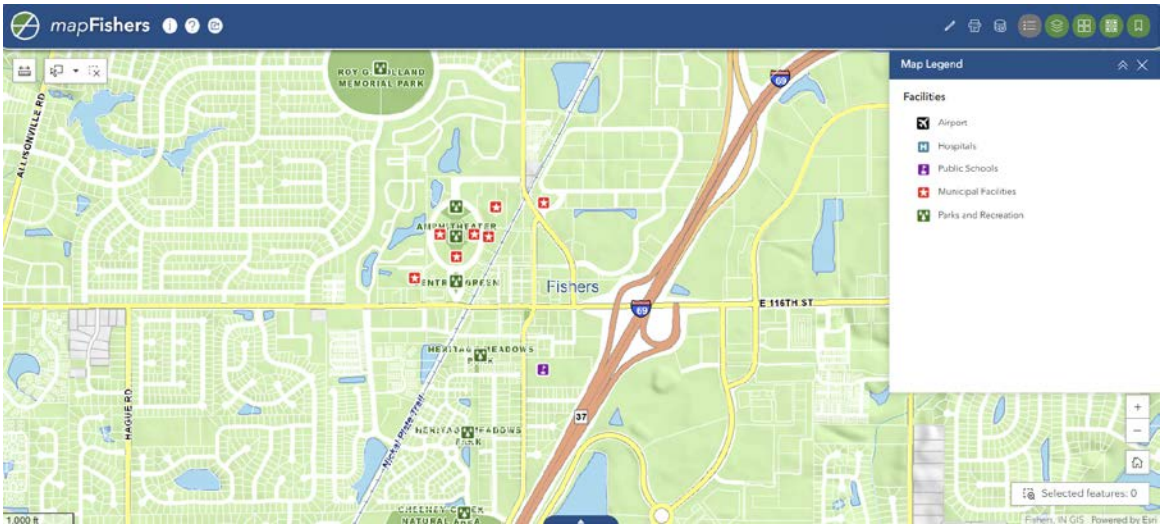
- **Print and Export Tools**: The application includes tools for printing maps in various formats and exporting data for use in other applications.
- **Mobile-Friendly Interface**: mapFishers is optimized for use on various devices, ensuring accessibility for users on desktops, tablets, and smartphones.

User Experience

Built on the ArcGIS Online platform with Experience Builder, mapFishers offers a user-friendly interface that allows for seamless navigation and interaction with the city's geospatial data. Whether a resident is looking for information on local amenities or a developer is seeking zoning details, it provides the tools necessary to easily access and utilize some of the city's most widely requested geographic information.

For more information and to explore the available resources, visit mapFishers at https://map.fishers.in.us/mapfishers/.





Commonly Used Applications

Below are some of the most widely used applications outside of the *map*Fishers Viewer.

Application	Description
Explore Fishers	An ArcGIS StoryMap showcasing attractions, events, and recreational opportunities in Fishers, Indiana. It serves as a guide for residents and visitors to explore City offerings like concerts, sports events, and nature walks.
Fishers Field Status	Interactive map of ball diamonds, and athletic field availability.
Public Trail Routes	Interactive map that displays sidewalks, trails, and trailheads that are open to the public.
Trail Progress Dashboard	Dashboard displays updates on trail construction and gap-filling projects across Fishers. Highlights ongoing and planned projects with timelines, helping residents stay informed about trail infrastructure improvements in the City.
Development Dashboard	Dashboard that displays current status of Development projects across the City including total number of current year submitted permits including commercial buildings, residential buildings, multi-family units, home improvements, and residential pool and spa. The interactive dashboard displays an in-review and under construction status
City of Fishers Public Notices	An interactive map of Public Hearing Notices for the City of Fishers Advisory Plan Commission, Plat Committee, Board of Zoning Appeals (BZA), and Fall Creek BZA.
Road Status and Closures	An interactive map of current road closures status across the City.
Capital Projects Dashboard	Dashboard that displays current status of City Capital Projects. The application offers the ability for the user to filter a specific project or see all projects in a single view. Individual projects selected show project information detail that includes project description, estimated project begin and end dates, current design status, and bid costs.
Snow Districts	An interactive map of snow plow Districts and road priority designation for the City.
Honoring Our Veterans Dashboard	Dashboard that displays City's past and present resident Veterans banner locations and a visual picture of the banner and the contents on each banner.
mapFishers	An interactive City General map viewer that offers the user with the ability to interact with layers such as facilities, trails, trailheads, parcels, Council Districts, utilities, cell towers, subdivisions, City's adopted Comprehensive Plan data, zoning, Planned Unit Developments, and annexations.
Neighborhood Crime Watch Dashboard	Dashboard that displays the number of crime incidents reported in the City based on a filter determined in the application. Current filter is set to current year. Data is displayed as in a heat distribution format and data can be viewed at the subdivision-level.
Restaurant Food Grades Dashboard	Dashboard that displays City restaurant inspection reports. Data can be filtered by food truck permits, permanent food establishment permits, and temporary food establishment permits.
Fishers Wall Map	Printable Wall Map Size of City detail in PDF format
Fishers Event Parking Map	Printable map of City event parking locations in PDF format
Fishers Official Zoning Map	Printable map of City's Official Zoning Designations in PDF format

Application	Description
Fishers Sanitary System Map	Printable map of City's Sanitary System in PDF format
Fishers Fire Stations and Districts	Printable map of City's Fire Station and Fire District boundaries

Public Layers

The City provides GIS layers on the web for the public and staff. These layers are available on the web to be used individually or incorporated in the city's other maps and applications (such as those referenced above). These layers are focused on Fishers' data and layers that are commonly used by the public and staff. The City's GIS currently serves over 200 of these layers, including themes such as addresses, parcels, zoning, and utilities. Layers are continually added as needed.

Secure Layers

The City leverages its GIS to balance secure internal data management with transparent public access. Internally, Fishers maintains secure GIS layers containing sensitive data such as layers with personally identifiable information, emergency response assets, and development review data—accessible only to authorized personnel through a credentialed ArcGIS Enterprise portal These secure layers support operational efficiency, informed decision-making, and interdepartmental coordination.

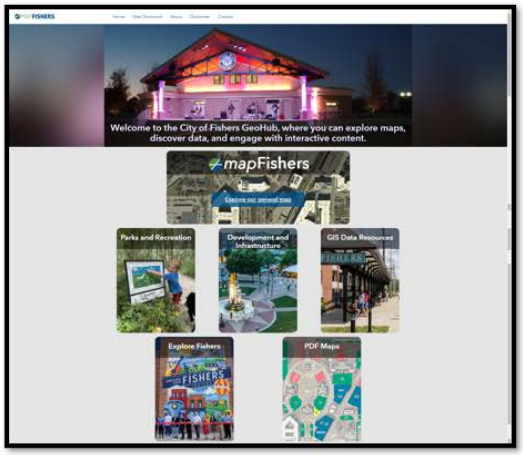
As-Built Requirements Documentation

New developments bring new infrastructure, therefore the City, through Resolution R060820A, requires developers and their engineers to provide digital as-built record drawings of all finished public and private projects to help maintain accuracy of datasets and improve asset management. Following are the resources provided to aid in those submissions, which can be found at https://fishersin.gov/departments/engineering/design-standards-specs/.

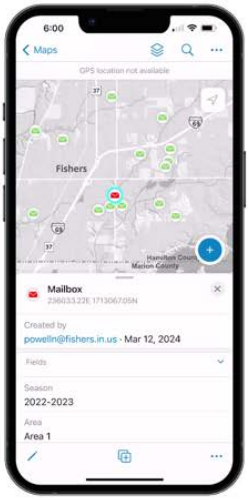
Online Document Name	Format	Purpose
Record Drawing Submittal Standards Resolution R060820A	PDF	Details the official resolution adopted by the City of Fishers, establishing standards for the submission of record drawings for infrastructure projects.
As-Built Attribute Definitions for Object Data Table	PDF	Defines the attributes required for object data tables in as-built drawings, ensuring consistency and accuracy in data representation.
Fishers Digital Record Drawing Submittal Requirements Package	PDF	Outlines the procedures and standards for submitting digital record drawings to the City of Fishers, including formatting guidelines and submission protocols.
Object Data Template	DWG	Provides a template in AutoCAD format for structuring object data, facilitating uniformity in digital drawings submitted to the City.

Visual examples of several Fishers' map products are highlighted below:

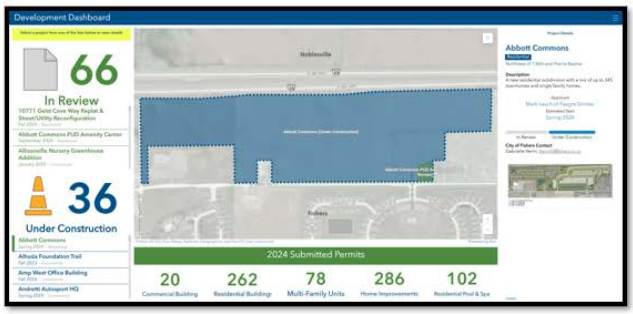
GeoHub



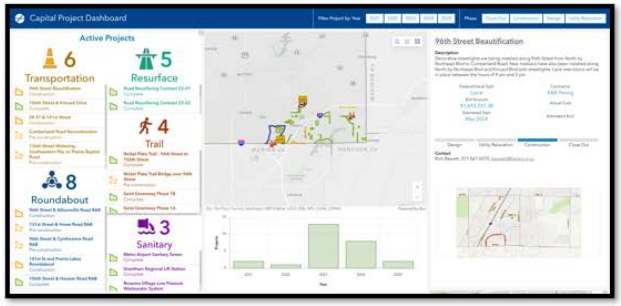
Winter Damage



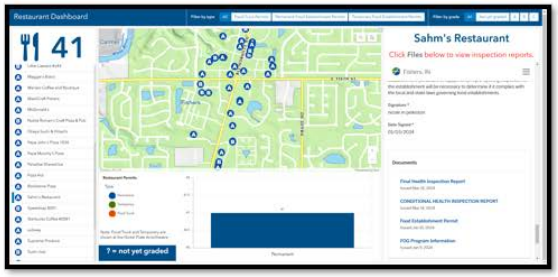
Development Dashboard



Capital Projects



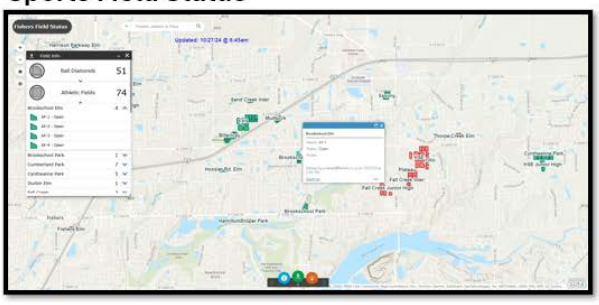
Restaurant Inspections Dashboard



mapFishers

Honoring Fishers Veterans

Sports Field Status



4. Discovery Needs Assessment

The Discovery Needs Assessment Process for the City of Fishers GIS Program was a structured approach designed to evaluate the current GIS environment, identify departmental needs, and establish priorities for GIS enhancements. CGS began this process by deploying an Esri Survey123-based questionnaire to key stakeholders across City departments, ensuring a standardized method for collecting insights on GIS usage, data and training needs, workflow challenges, and desired capabilities. The survey responses were analyzed to identify common themes, technical gaps, and opportunities for improvement. Following the survey, CGS conducted targeted follow-up interviews with department representatives to further refine and validate findings, uncovering additional context behind their GIS needs and operational pain points. This two-phase approach—combining structured data collection with in-depth discussions—allowed CGS to develop a roadmap tailored to the City's unique GIS requirements, ensuring investments align with department-level goals and broader municipal objectives.

4.1. Findings and Opportunities

The Departments and their current/desired usage level based on survey results and interviews, included:

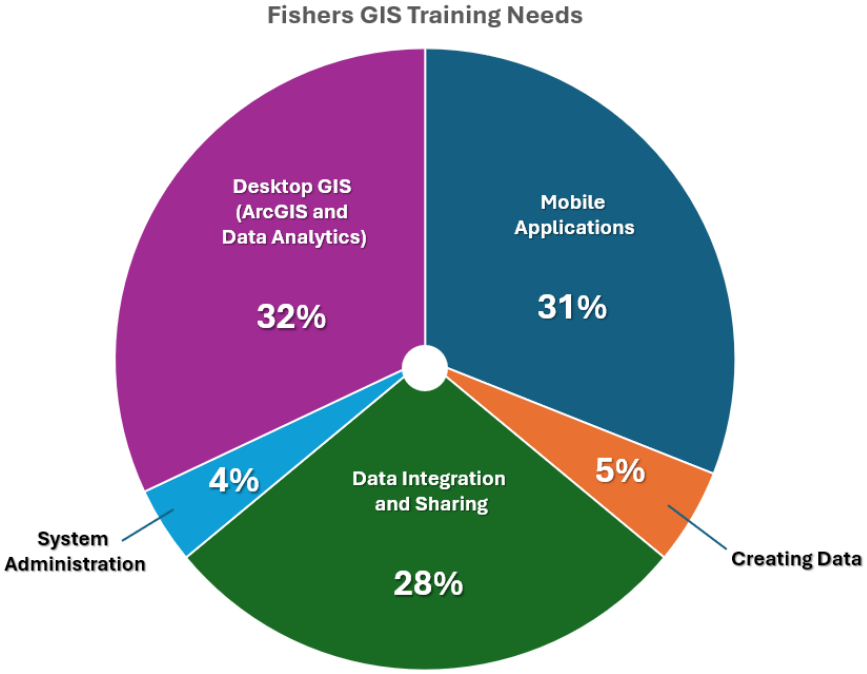
Department	GIS Current Utilization	GIS Desired Utilization
Information Technology	Extensive user	Extensive user
Business Solutions Group	Light user	Extensive user
Human Resources	New to GIS	Light user
Health	Light user	Extensive user
Public Works	Extensive user	Extensive user
Fire Department	Light user	Extensive user
Planning & Zoning	Extensive user	Extensive user
Fleet	Light user	Extensive user
Engineering	Extensive user	Extensive user
Water Quality	Light user	Extensive user

The following summary table describes the high-level GIS Program needs by department. **Please see Appendix A for a larger depiction of the graphic below.**

Expressed Need / Partial Alignment / Mature / No Involvement or Unknown	Data Sharing and Collaboration	Mobile Field/Data Collection	Data Integration (Asset Mgmt., ERP, etc.)	Data Accuracy/ Data Management	Real-Time Data Updates	Spatial Analysis and Data Visualization	Web Maps/ Services	BI Analytics and Dashboards	Geocoding, Geofencing, and Address Locating	Data Automation and Validation (ML/AI)	3D BIM/ Facility Indoor Mapping	GIS Training/ Other Training
Information Technology	Partial	Mature	Partial	Partial	Partial	No Involvement	No Involvement	Partial	Mature	Partial	Expressed Need	Partial
Business Solutions Group	Partial	Mature	Partial	Partial	Partial	Expressed Need	Partial	Partial	Partial	Mature	No Involvement	Expressed Need
Human Resources	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement
Public Works	Mature	Mature	Partial	Mature	Partial	Mature	Mature	No Involvement	Expressed Need	No Involvement	No Involvement	Expressed Need
Fire	Partial	Partial	No Involvement	Mature	Partial	No Involvement	Mature	Expressed Need	No Involvement	No Involvement	Expressed Need	Expressed Need
Planning & Zoning	Mature	Mature	No Involvement	Mature	No Involvement	Expressed Need	Mature	No Involvement	No Involvement	No Involvement	No Involvement	Expressed Need
Fleet	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	Expressed Need	Mature	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement
Engineering	Mature	Mature	Partial	Mature	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	Expressed Need
Water Quality	Mature	Mature	Partial	Mature	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	Expressed Need
AVERAGE ORGANIZATION SCORE	Partial	Mature	Partial	Mature	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	No Involvement	Expressed Need

Survey responses were compiled. Then opportunities and recommendations were identified and used to inform the GIS Roadmap. For opportunities and recommendations identified by department, see Appendix B. For detailed survey responses by department, see Appendix C.

Many of the survey responses mentioned a need for training. The GIS Training Needs are summarized below. For training needs by department, see Appendix D.



4.2. Recommendations

The items above were incorporated into the **5-year Enterprise GIS Roadmap** presented in full in section 6. In addition, our team would like to highlight the following **additional recommendations**:

4.2.1. Establish a First-Generation GIS Data Governance Framework

A well-defined GIS governance structure will ensure that the City GIS Program remains efficient, transparent, and aligned with organizational objectives. It is recommended to develop a first-generation GIS data governance framework that establishes clear policies for data creation, maintenance, sharing, and security that align with the City's operational and regulatory requirements. Key actions include:

- Assigning GIS Data Stewards for each department to oversee data accuracy
- Implementing GIS Governance as a component of City-wide initiatives
- Creating standard operating procedures (SOPs) for data formatting, metadata creation, and version control.
- Establishing routine data quality assurance (QA) processes

The City GIS Program has an immediate need to develop documentation for standard operating procedures. Much of the details of common, annual procedures need to be captured. As part of this Strategic Plan, sample documentation was created describing standard operating procedures for yearly updates of basemap features. It includes a GIS Glossary, major workflows to support yearly updates and suggestions for improvement or other ways the same tasks could be accomplished. See Appendix E. It is recommended that the city develop additional similar standard operating procedure documentation for other key workflows.

4.2.2. Continue Best Practices with the GIS Enterprise Architecture

It is recommended that the City focus on maintaining, expanding, and enhancing its existing ArcGIS Enterprise capabilities to support current operations and future growth. Building on the City's current use of ArcGIS Enterprise, this initiative will optimize the infrastructure to improve performance, scalability, and security. Efforts will include enhancing centralized data management by streamlining multi-user editing workflows and improving data storage to facilitate collaboration across departments. The City will continue to implement advanced analytics tools to enable real-time decision-making and more robust spatial analyses as highlighted in responses of several surveys.

Several standardized workflows have been developed to seamlessly integrate GIS data with other City systems. These integrations will continue to be enhanced as well as new integrations developed. Additionally, the City plans to expand its suite of user-friendly web-based applications by creating dashboards and field data collection tools using ArcGIS Experience Builder, Field Maps, and Survey123 to enhance accessibility for both staff and the public.

4.2.3. Implement a 5-year Enterprise GIS Roadmap

Based on the discovery needs assessment, CGS developed a comprehensive enterprise GIS roadmap to guide the city's geospatial strategy over the next five years. This roadmap addresses critical business

challenges and will lead to improved operational efficiency. The roadmap (presented in full in section 6) will serve as a guide to achieving the City's GIS goals while delivering measurable value to stakeholders.

4.3. Benefits and Outcomes

By following this 5-year roadmap, the City will:

- **Improve operational efficiency:** Enable faster, more informed decision-making and reduce redundancies.
- **Enhance public engagement:** Offer residents and stakeholders access to accurate, interactive data resources.
- **Support sustainable growth:** Facilitate smart urban planning, infrastructure improvements, and resource allocation.

The Enterprise GIS Roadmap positions the City as a leader in municipal innovation, leveraging GIS to address present challenges and future opportunities. The program's ongoing investments in technology, training, and community engagement will provide lasting value and elevate the quality of services for residents, businesses, and City staff.

5. Current and Emerging GIS Technology Trends

The 5-year Enterprise GIS Roadmap was developed based on the Discovery Needs Assessment along with considering emerging GIS technology trends. As the City continues to expand its services, the integration of advanced GIS technology becomes increasingly vital to improving the services offered to its residents. Appendix F includes examples of GIS technology trends that the City can consider for its future GIS Program Roadmap.

6. 2025-2030 Enterprise GIS Program Roadmap

The 2025–2030 Enterprise GIS Roadmap for the City of Fishers represents a strategic vision for realizing the full potential of geospatial technology to support City-wide innovation, service delivery, and data-driven decision-making. As the City continues to grow as a dynamic and forward-thinking community, this roadmap provides a critical framework for leveraging the City's GIS infrastructure, integrating location intelligence across departments, and enhancing operational efficiency. By aligning GIS initiatives with community priorities and emerging technologies, the roadmap ensures that the City of Fishers remains responsive, connected, and resilient, ready to meet the evolving needs of residents, businesses, and City leadership over the next five years and beyond.

6.1. Department-wide Roadmap Initiatives

Following are high-priority opportunities spanning all departments for building upon the success of GIS throughout the city:

- GIS Staffing
    - Identify Gaps in GIS Roles Across the Organization

    - GIS Succession and Continuity Plan
        - Capture key Standard Operating Procedures (SOPs)
- Training
    - Include GIS awareness in staff onboarding
    - Assess targeted training needs throughout all departments
    - Develop and deliver city-specific training
    - Outsource additional training, as appropriate
    - See Appendix F for detailed training needs by Department
- Improve Data Discoverability
    - Develop a staff-focused GeoHub to improve data discovery
    - Establish a GIS Data Dictionary to guide City staff on the proper use of data layers and to identify parties and processes involved in the maintenance of them.

6.2. Department-specific Roadmap Initiatives

The following are Department-level recommendations, including the initiative, implementation approach strategy, and challenges & risks.

6.2.1. Information Technology Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Deploy ArcGIS Indoors	Complete facilities data collection and floorplans, configure ArcGIS Indoors, pilot with one building, then scale to other city buildings, schools, etc.	Data availability, technical setup; floorplans may need conversion or standardization
2	Create a GIS Succession & Continuity Plan	Document roles/responsibilities, identify successors or cross-trained staff, maintain a skills matrix	Unexpected staff changes; incomplete knowledge transfer
3	Identify Gaps in GIS Roles Across the Organization	Assess current staffing, identify overworked GIS users, and recommend new positions or cross-training for departments	Budget constraints; interdepartmental support for new roles
4	Address IT Concerns Around Stagnant/Inaccurate Data	Set up automated scripts for identifying stale data, create a feedback loop for users to report errors, flag outdated records	Misconfigured automation; low engagement from data stewards
5	Integrations: Asset Management, Fiber, ArcGIS Indoors, and Road Rating Data	Develop integration plan for EAM, Fiber management, and ArcGIS Indoors; collaborate with Vialytics for Road Rating data integration; define SOPs for asset lifecycle and data flow	Data transformations; differing data schemas; defining SOPs; interdepartmental coordination
6	Data Needs: Equipment Lifecycle Management and Water Quality System Integration	Evaluate Indoors for equipment tracking, assess and integrate pipe video inspection and SCADA systems with GIS; define data standards and lifecycle stages	Complex system integration; defining lifecycle standards; cross-departmental data coordination

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
7	Develop Enterprise-Wide Standard Operating Procedures (SOPs)	Create and document consistent GIS practices across departments including data creation, editing, publishing, and review	Time-intensive; departmental resistance to standardization

6.2.2. Business Solutions Group Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Integrate GIS with ERP, Utility Billing, Asset Management, and Engagement Systems	Identify integration points and data standards; work with vendors to establish secure, two-way integrations	Siloed data; lack of API support; differing data models
2	Address Data Compatibility and Standardization Issues Across Departments	Implement a governance framework to standardize data formats and improve accuracy across systems	Resistance to change; inconsistent updates; lack of skilled personnel

6.2.3. Human Resources Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Explore Payroll System Integration with GIS	Conduct a feasibility study to determine if GIS can integrate with payroll systems to visualize workforce distribution, labor allocation by location, or enhance reporting on field-based activities	Data privacy concerns; integration complexity; limited spatial relevance of payroll data

6.2.4. Health Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Develop Public-Facing Visualization of Health and Social Determinants	Design a user-accessible web system for visualizing social determinants of health data, inspired by platforms like Healthy Marin	Data sensitivity and aggregation; public accessibility standards
2	Support Visualization of Aggregate Health Status Indicators	Develop map layers and dashboards that depict aggregate-level health metrics for community awareness and public health planning	Ensuring anonymity in public data; interpreting indicators correctly
3	Improve Access to Data, and Technical Support	Establish technical assistance programs, shared data repositories, and self-service portals for health department and public users	Ongoing resource needs; varied technical skill levels

6.2.5. Public Works Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Implement Geofencing for Snow Removal Tracking	Integrate GIS with GeoTab to geofence key properties (schools, parks, etc.) for tracking hours worked on snow removal activities by location	System integration complexity; accuracy of GPS data; coordination across departments; Training
2	Increase timeliness of data availability	Improve timeliness of infrastructure asset updates including type and status. Improve timeliness of contour and orthoimagery.	Latency; system interoperability; data synchronization
3	Enhance Integration Across Operations and Asset Systems	Streamline integrations with EAM, pothole tracking, sidewalks, Vialytics, utility billing, and citizen engagement platforms	Siloed systems; inconsistent data formats; overlapping data sources
4	Reinstate and Support the GIS User Group	Reform a city GIS User Group to promote knowledge sharing, peer learning, and internal support across departments	Participation; sustained engagement

6.2.6. Fire Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Enhance Public Safety Preplan Program with GIS Collaboration	Coordinate across departments to integrate GIS components into the Preplan Program for hydrants, quadrants, and emergency response planning	Coordination across departments; keeping preplans updated
2	Allocate Dedicated GIS Resources for Daily Operational Layers	Assign dedicated personnel or automate tasks for updating high-importance layers such as hydrants and preplans	Personnel availability; sustaining updates long-term
3	Strengthen GIS Integrations with Asset Management and Citizen Engagement Systems	Maintain and enhance integrations with asset and citizen systems to support situational awareness and operational readiness	Data sync reliability; complexity of integrations

6.2.7. Planning & Zoning Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Enhance Mapping of Easements, FEMA Flood Maps, and County Data	Acquire and publish up-to-date FEMA flood maps and easement data; collaborate with the County to access additional GIS datasets	Data access limitations; update frequency of FEMA layers
2	Strengthen GIS Integrations with Citizen Engagement and Code Enforcement	Expand GIS integrations to support code enforcement initiatives while enhancing citizen-facing maps like Trail Gap and Public Notice Map	Integration complexity; varying data standards
3	Allocate Dedicated GIS Resources for Daily Operational Layers	Assign dedicated personnel or automate tasks for updating high-importance layers such as zoning and comprehensive plan	Personnel availability; sustaining updates long-term

6.2.8. Fleet Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Enhance Data Visualization for Infrastructure Assets	Develop intuitive dashboards and map-based visualizations to support better understanding and communication of infrastructure asset data	Inconsistent asset attributes; unclear visualization goals
2	Strengthen Integration with Asset Management Systems	Ensure seamless data flow between GIS and Asset Management systems for real-time access and reporting	Integration challenges; data duplication or sync issues
3	Assess Training Needs and GIS Readiness	Conduct a training and needs assessment to determine GIS familiarity, potential user roles, and onboarding path	Lack of baseline understanding; time to onboard

6.2.9. Permitting & Inspections Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Expand Access to Local, Regional, and Open GIS Data Sources	Create a centralized GIS data access portal for internal users to view and retrieve data from department, county, state, and open access sources	Data standardization; managing permissions and updates

6.2.10. Engineering Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Improve Sewer Data Visualization and Accessibility	Create enhanced sewer mapping layers showing existing, proposed, and abandoned systems; ensure layers are updated and accessible	Inconsistent records; limited historical data; proposed project tracking
2	Integrate CEG Sewer and Water Asset Data in GIS	Coordinate with CEG to securely access sewer and water asset layers relevant to Fishers, subject to security constraints	Data privacy; legal barriers; system compatibility
3	Integrate Sewer Video Data from ClearVision with GIS	Evaluate integration options to link ArcGIS sewer assets with ClearVision video files for comprehensive asset insights	File size; linking spatial locations to video content
4	Advance GIS Integrations with ERP, Billing, and Modeling Systems	Establish integrations with enterprise resource planning, utility billing, and sewer modeling tools to create data synergy	Integration complexity; inter-system dependencies
5	Improve Access to Sewer Asset Management Data	Expand asset management records to include age, repair history, and cost data, and integrate this with GIS	Data completeness; inconsistent formats

6.2.11. Water Quality Department

ID	Initiative	Implementation Approach Strategy	Challenges & Risks
1	Improve Data Entry Processes to Ensure Accuracy	Implement validation rules, drop-downs, and guided workflows in GIS applications to reduce errors and ensure consistency in data entry	User resistance to changes; legacy process reliance
2	Strengthen GIS Integrations with Asset Management, OpenGov, and ArcGIS Tools	Ensure ArcGIS Pro, Field Maps, and GIS platforms are integrated with Asset Management and OpenGov for seamless information exchange	Version conflicts; limited interoperability; departmental coordination

This GIS Roadmap outlines a strategic framework for the development, implementation, and enhancement of Geographic Information System (GIS) capabilities within the City of Fishers within the coming years. It provides numerous tasks to modernize spatial data infrastructure, integrating geospatial technologies, and improving data-driven decision-making. The roadmap identifies key initiatives, timelines, resource requirements, and governance structures to ensure alignment with organizational goals. By establishing a clear path forward, this document supports the effective use of GIS to drive innovation, operational efficiency, and informed planning across departments.

Appendix A: Needs Assessment Department Results

Expressed Need / Partial Alignment / Mature / No Involvement or Unknown	Data Sharing and Collaboration	Mobile Field/Data Collection	Data Integration (Asset Mgmt., ERP, etc.)	Data Accuracy/ Data Management	Real-Time Data Updates	Spatial Analysis and Data Visualization	Web Maps/ Services	BI Analytics and Dashboards	Geocoding, Geofencing, and Address Locating	Data Automation and Validation (ML/AI)	3D BIM/ Facility Indoor Mapping	GIS Training/ Other Training
Information Technology	Partial Alignment	Mature	Partial Alignment	Partial Alignment	Partial Alignment	No Involvement or Unknown	No Involvement or Unknown	Partial Alignment	Mature	Partial Alignment	Expressed Need	Partial Alignment
Business Solutions Group	Partial Alignment	Mature	Partial Alignment	Partial Alignment	Partial Alignment	Expressed Need	Partial Alignment	Partial Alignment	Partial Alignment	Mature	No Involvement or Unknown	Expressed Need
Human Resources	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown
Public Works	Mature	Mature	Partial Alignment	Mature	Partial Alignment	Mature	Mature	No Involvement or Unknown	Expressed Need	No Involvement or Unknown	No Involvement or Unknown	Expressed Need
Fire	Partial Alignment	Partial Alignment	No Involvement or Unknown	Mature	Partial Alignment	No Involvement or Unknown	Mature	Expressed Need	No Involvement or Unknown	No Involvement or Unknown	Expressed Need	Expressed Need
Planning & Zoning	Mature	Mature	No Involvement or Unknown	Mature	No Involvement or Unknown	Expressed Need	Mature	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	Expressed Need
Fleet	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	Expressed Need	Mature	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown
Engineering	Mature	Mature	Partial Alignment	Mature	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	Expressed Need
Water Quality	Mature	Mature	Partial Alignment	Mature	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	Expressed Need
AVERAGE ORGANIZATION SCORE	Partial Alignment	Mature	Partial Alignment	Mature	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	No Involvement or Unknown	Expressed Need

Appendix B: Needs Assessment Opportunities and Recommendations

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	Opportunities	Recommendations
Information Technology	Daily	• Data visualization and mapping • Asset management • Decision support • Operational efficiency • Field data collection • Public engagement • Regulatory compliance	• Expand GIS integration with ArcGIS Indoors for facility support and equipment tracking • Improve data accuracy and documentation • Increase adoption of real-time data collection and automation	• Develop SOPs (standard operating procedures) for data validation and lifecycle management • Invest in training and GIS awareness across departments • Support data transformation partnerships for analytics and automation
Business Solutions Group	Weekly	• Data visualization and mapping • Asset management	• Improve interoperability between ERP, Utility Billing, and GIS	• Improve GIS training and provide more intuitive data visualization tools • Expand integrations to ensure seamless data interoperability
Human Resources	Never	• Not answered	• Potential integration of payroll and workforce data into GIS	• Explore GIS-based workforce analytics and payroll system enhancements
Health	Weekly	• Data visualization and mapping • Decision support	• Develop a public-facing dashboard for health and social determinants • Enable real-time health data visualization	• Invest in statistical and geospatial analysis tools for health data visualization • Develop GIS-integrated health dashboards
Public Works	Daily	• Data visualization and mapping • Asset management • Operational efficiency	• Improve real-time asset tracking • Ground contour data and orthoimagery • Expand GIS automation to improve data quality	• Expand GIS capabilities for real-time infrastructure monitoring • Develop automation for routine maintenance tracking

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	Opportunities	Recommendations
		• Decision support • Field data collection		
Fire Department	Weekly	• Data visualization and mapping • Field data collection • Operational efficiency • Public engagement and transparency	• Leverage mobile applications for hydrant management and emergency planning • Improve GIS training for operational efficiency	• Enhance GIS training for emergency personnel • Implement real-time hydrant and asset tracking with GIS dashboards
Planning & Zoning	Daily	• Data visualization and mapping • Regulatory compliance • Operational efficiency • Public engagement and transparency	• Enable real-time collaboration on zoning and planning maps • Improve access to FEMA flood maps and easements	• Develop GIS workflows for real-time zoning updates • Improve data integration between planning and public works.
Fleet	Rarely	• Data visualization and mapping • Asset management	• Improve asset management tracking and data visualization for fleet operations	• Implement GIS-based tracking for fleet maintenance and asset utilization
Permitting and Inspections	Daily	• Data visualization and mapping • Field data collection	• Enhance GIS support for utility mapping and mobile field inspections	• Expand GIS integration with field survey applications • Improve utility mapping accuracy
Engineering	Daily	• Data visualization and mapping • Operational efficiency • Public engagement and transparency • Asset management	• Improve sewer data visualization and integration with ClearVision • Develop automated sewer modeling capabilities.	• Develop GIS-based sewer infrastructure models • Improve real-time updates for sewer and water assets

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	Opportunities	Recommendations
		• Regulatory compliance		
Water Quality	Daily	• Data visualization and mapping • Operational efficiency • Decision support • Asset management	• Reduce data entry errors with improved GIS workflows • Improve integration with asset management tools	• Implement validation checks in GIS workflows • Improve interoperability with OpenGov and ArcGIS Pro

Appendix C: Survey Responses by Department

The following summarizes the survey responses:

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs
Information Technology (Tracy Gaynor, Melissa Brenneman, Mike Cranfill)	Daily	• Data visualization and mapping • Asset management • Decision Support • Operational Efficiency • Field Data Collection • Public Engagement and Transparency • Regulatory Compliance	• Continuing to design and deploy GIS services that are simple and intuitive that staff can leverage and departments realize value and efficiencies. Support for having a GIS educated, trained, and empowered workforce and community. GIS is currently critical for transparency and planning, but the Department feels it can be leveraged in additional ways. Desire to begin a capstone initiative in place at HSE schools. • Desire to establish ArcGIS Indoors in production, for City departments and ideally for HSE and SRO's. GIS introduction and capstone at HSE. • Establish a succession and continuity plan for eventual GIS position changes (retirements etc). • Documentation of historic procedures, transition away from Web AppBuilder apps, increased data accuracy, and achieve GIS positions in other departments who have subject matter experts. • IT is always concerned with stagnant, inconsistent, inaccurate, missing, or duplicative data. Garbage in leads to garbage out and having perpetually validated and reliable data is critical. • **Integrations:** o **Asset Management**: IT does not leverage EAM (enterprise asset management), Fiber management, ArcGIS Indoors for facility support and equipment tracking. o Possible integration of Road Rating data with Vialytics. This initiative is underway. o **Challenges**: Data transformations - integrations from separate systems. Definition of SOPs for equipment life cycle management. • **Data Needs:** o Desire to have a better equipment lifecycle management system in place. IT hopes that Indoors may assist with this. o Additionally, interested to see systems such as pipe video inspections, and SCADA more directly integrated for the Water Quality division.

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs
			• **Other Support Needs:** o Adoption of additional enterprise applications with open API's. IT currently lacks internal developers and DBA's (database administrators). Desire for data transformation partnerships with vendor(s) who could help extract relevant data from a variety of systems for analytics, dashboards, business intelligence (BI), and automation. o On-going efforts of coordination, cooperation and collaboration with various entities outside of the organization. o Documentation of responsibilities and processes for maintaining various layers of data. o Other departments could benefit by understanding more about what GIS might be able to do for them. Potentially provide some examples in a newsletter that is sent out to key staff. • **Data Maintenance Needs**: System integrations, process automations, and BI. • **Training Needs:** o Mobile applications creation, data integration and sharing, and system administration. o Need more than one IT administrator to be involved with GIS system administration. • **Trends:** o Real time data collection is intriguing. Anything that results in good, valid, actionable, reliable data at minimal to no effort by staff. o ArcGIS Indoors. o Real-time data collection, web applications.
Business Solutions Group (Aaron Williamson)	Weekly	• Data visualization and mapping • Asset management	• Data Collection, Integration, Interoperability and Management. • Spatial Analysis and Visualization. • Web Services. • Geocoding and Validation. • **Data Needs:** o Property boundaries.

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs
			• **Integrations:** o Enterprise Resource Planning. o Utility Billing. o Asset Management. o Citizen's Engagement. o Community Development. o **Issues**: Compatibility, lack of or siloed data, standardized data formats, data accuracy and skill gaps. • **Training Needs:** o Overall training and technical capabilities. Better understanding of system capabilities and limitations would help with recommendations for other departments. o Desktop GIS: ArcGIS data analysis, map creation and visualization. o Mobile Applications. o Data Integration. o Data Sharing. o System Administration. • **Trends:** o AI and Machine Learning. o Interior Mapping and 3D modeling. o Web applications probably stand out the most, followed by data collection. o More IoT investments. o Better data share with neighboring municipalities.
Human Resources (Ethan Lee)	Never	Not Answered	• Interested in Payroll potential integration with GIS.
Health (Josh Robinson)	Weekly	• Data visualization and mapping • Decision support	• Improved data visualization: simple ways to visualize and enable real-time data updates (e.g. tile system for website development), as well as built-in analytics particularly statistical testing. • Creating a health and social determinants of health data visualization system (public facing). • **Data Needs:** o None, currently outside of what is mentioned in other sections here. • **Other Support Needs:** o Health status (aggregate level) visualization. o Access to data, training and technical support.

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs
			• **Integrations:** o Nothing right now except for exploring the visualization capabilities mentioned above. • **Training Needs:** o Desktop GIS. o The effort mentioned above for health and social determinants of health interactive visualization is a nascent idea but would benefit the public. Here is an example of what is envisioned: - https://www.reidcommunities.org/indicators/index/dashboard?alias=alldata • **Trends:** o Support research in GIS to provide innovative ways to visualize health of the community and communicate through a public-facing dashboard. o Consider making public safety data visualizations to allow residents to interrogate police and fire responses. Would have to limit to census track areas likely and presented in aggregate (e.g., violent crime responses per 1,000 residents visualized by heat mapping across census tracts).
Public Works (Kyle Marks, Eric Steiner, James Knowles, Jason Armour, Nick Powell)	Daily	• Data visualization and mapping • Asset management • Operational efficiency • Decision support • Field data collection	• **Data Needs:** o Implementation of Geofencing of Properties to support Snow Removal activities. This is to put a geofence around schools, parks, etc. to track hours of employee work on snow removal. This will require an integration of GIS and GeoTab to support fleet management. o **Real-time updates**: Infrastructure Assets, Type, Information Data. o **Support for:** Property boundaries.. o Real-time ground contour data (concern is that 5-6 data intervals is too long of a data gap). o Real-time orthoimagery.

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs
			• **Integrations**: o Asset Management (EAM). o **Currently have integrations with**: pothole, sidewalks, paser, snow maps, field use. o Utility billing. o Citizen engagement. o Steward Program Maps. o Sewer Utility database update. o Possible integration of Road Rating Paser ratings for roads, paths, and trails data with Vialytics. • **Other Support Needs:** o Analytical tools. o Better understanding of what GIS can do or not do. o Improved data visualization - primarily with the sidewalk collector. o Reinstatement of the GIS User Group. • **Training:** o What is available in GIS from the City to include ArcGIS Pro, Field Maps, Experience Builder, Hub Page, etc. o Access to data. o Detailed ArcGIS Pro training. o Data Analysis. o Mobile Applications. o Data Integration and Sharing. • **Trends:** o Mobile GIS. o Access to multiple data layers in our Department and multiple other sources such as County, State, and open access data. o Analytical and design level tools. o Desire automation to remove human element from the timely updates. o Real-time data collection, web applications.
Fire Department (Adam Lee, Mark Carman I, Kevin Brolsma, Robert Mayfield, Jim Alderman)	Weekly	• Data visualization and mapping • Field data collection • Operational efficiency	• Mobile access and real-time updates. • **Public Safety Preplan Program**: the Department believes there are opportunities to collaborate on various components of the program that can benefit initiatives that each department is working on. • GIS is person-power intensive. Some projects could use dedicated personnel to manage/update on a daily basis (hydrants).

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs
		• Public engagement and transparency	• Already supporting our preplan project. • **Integrations**: o Asset Management. o Citizen Engagement. • **Other Support Needs**: o Training with ArcGIS Pro and PowerBI. o Mobile Applications. o Working with preplans development, hydrants, quadrants, etc. • **Training Needs:** o Desktop GIS. o Mobile Applications. o System Administration. o Using ArcGIS with PowerBI. • **Trends:** o Mobile for hydrants, preplan work as described in previous meetings.
Planning & Zoning (Ross Hilleary)	Daily	• Data visualization and mapping • Regulatory compliance • Operational efficiency • Public engagement and transparency	• The mapping of easements, FEMA flood maps, and any additional information available from the County. • Creating and editing online maps collaboratively across departments. • Some County layers or not accessible on MapFishers (Easements, FEMA, etc.). • **Data Needs:** o **Support for**: Zoning, PUD Layer, Boundaries, Parcel lines, FEMA, Easements. • **Other Support Needs:** o Issues with collaboration of online mapping, FEMA map absence. • **Integrations:** o Citizen Engagement. o Code Enforcement opportunity. o **Currently integrate with**: MapFishers, Development Dashboard, Public Notice Map, Trail Gap. • **Training Needs**: o Training and technical support. o Desktop GIS. o Mobile Applications. o Additional GIS training would allow our team to be more self-sufficient. Access to internal layers created for other departments.

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs

Fleet
(Scott Tritch)
	Rarely	• Data visualization and mapping
		• Asset management
			• Improved data visualization.
			• **Data Needs:**
			  o Currently work with: infrastructure assets.
			• **Integrations:**
			  o Access to Asset Management.
			• **Training:** Not a user, unknown.

Permitting and Inspections (Stephen Connolly)	Daily	• Data visualization and mapping
		• Field data collection
			• Improved data visualization.
			• **Data Needs:**
			  o Utility GIS data. Assist with mapping of new utilities in the field.
			• **Other Needs:**
			  o Access to multiple data layers in our Department and multiple other sources such as County, State, and open access data.
			• **Trends:**
			  o Mobile GIS, real-time data collection.
			  o Trimble R2 is used in the field for implementing SBAS. If the Department switched to a subscription-based plan it would improve accuracy.

Engineering (Jeremy Schmitt and Laura McClure	Daily	• Data visualization and mapping • Operational efficiency • Public engagement and transparency • Asset management • Regulatory compliance	**Data Needs:** • Better data visualization. • Improvement of historical and proposed data: Specifically sewers. • Desire to have layers showing existing sewers, proposed sewers in new developments that are not built or active yet, and abandoned sewers which are still physically in the ground. • Access to CEG's sewer asset data in Fishers. • Access to CEG's water asset data in Fishers (if possible given security parameters). • Better understanding of how to get data updated when information is found in the field. • Access to mobile software to easily utilize the online web map. • Interested in a connection between ArcGIS and ClearVision for sewer videos. • Understanding how we can process data updates. • Timely updated aerials, real-time data updates.

City Department (Staff Surveyed)	GIS Usage Level	Primary Objectives of GIS	GIS Needs
			Integrations: • Enterprise resource planning. • Utility Billing. • Asset Management. • Possibly integrate with sewer modeling. **Trends:** • Access to maps both on desktop and mobile software. **Other Needs:** • More asset management tools such as data for age, repairs, and costs. **Training:** • Training on analytical tools. • Desktop GIS. • Additional training will allow us to use the software's tools. This should either speed up the ability to work through analyses or, in many cases, allow graphics to be created that could be used now and in the future.
WQ (Dan Tucker)	Daily	• Data visualization and mapping • Operational efficiency • Decision support • Asset management	**Data Needs:** • Improved process to avoid entering wrong data. **Integrations:** • Asset management. • OpenGov. • ArcGIS Pro, Field Maps. **Training Needs:** • Desktop GIS.

Appendix D: Training Needs by Department

ID	Department	Training Initiative	Implementation Approach Strategy	Challenges & Risks
1	Information Technology	Training Needs: Mobile Apps, Data Integration, System Administration, and IT Involvement	Develop and deliver targeted training modules on mobile app creation, data sharing/integration, and system administration; identify and mentor additional IT staff for GIS support	Limited staff time; varying skill levels; dependence on external trainers
2	Business Solutions Group	Deliver Comprehensive Training Across GIS Capabilities and Tools	Offer structured training programs in ArcGIS Desktop, mobile app development, data sharing, system administration, and integration practices	Varying skill levels; staff availability; training adoption
3	Health Department	Provide Desktop GIS Training with Focus on Health Visualization	Develop desktop GIS training modules tailored to mapping, analyzing, and visualizing health and social determinant data	Participation variability; health-specific content development
4	Public Works	Provide Targeted GIS Training on City Tools and Applications	Offer training on ArcGIS Pro, Field Maps, Experience Builder, Hub Page, mobile workflows, and data sharing and integration	Staff availability; varying skill levels
5	Fire	Deliver Targeted Training for ArcGIS Pro, PowerBI, and Mobile Workflows	Offer training sessions covering ArcGIS Pro use, system admin, mobile apps, and integration with PowerBI for analytics	Varying proficiency levels; availability of time and trainers
6	Planning & Zoning	Provide Comprehensive GIS Training and Access to Internal Layers	Deliver in-depth GIS training and improve access to internal layers to enable department self-sufficiency in map creation and spatial analysis	Permission levels; staff time constraints; consistency in training
7	Engineering	Deliver Training on GIS Analytics and Desktop Tools	Provide training on desktop GIS and spatial analysis to accelerate workflows and improve visualization outputs	Time constraints; varying skill levels
8	Water Quality	Develop Training Program for Accurate Data Entry and Platform Use	Create a modular training program focused on accurate data entry, ArcGIS Pro, Field Maps, and integration best practices	Staff availability; varied technical proficiency

Appendix E: Sample Standard Operating Procedures Documentation

GIS Glossary Example

Annexations: Annexations are land acquired by a municipality (Fishers) and added to that municipality's corporate limits.

As-Built: An As-Built is an AutoCAD drawing displaying utility locations provided by the engineering firm that developed a certain area.

AutoCAD: AutoCAD is software that is used to create wall maps and process additions/changes to Fishers GIS data.

Boundary and Annexation Survey (BAS): The U.S. Census Bureau conducts the Boundary and Annexation Survey (BAS) annually to collect information about selected legally defined geographic areas. Fishers sends new annexations to the Census Bureau each year as part of this program.

Construction File: A construction file is an AutoCAD drawing displaying utilities and parcels/land ownership locations provided by the engineering firm that developed a certain area.

Corporate Limits: Corporate limits is a polygon layer representing the legal boundary of a municipality. All Fishers annexations merge together to create the Fishers corporate limits.

Edge of Pavement: Edge of Pavement is a polygon layer maintained by the City of Fishers that represents the pavement along a street.

Explode: Explode is an AutoCAD operation used to split a polygon into polylines.

Orthophotography: Orthophotography is aerial imagery that is captured and orthorectified by Hamilton County annually.

Planimetrics: Planimetrics are geographic data collected by Hamilton County every 3-5 years. Layers include building footprints, edge of pavement, hydrography, and topology.

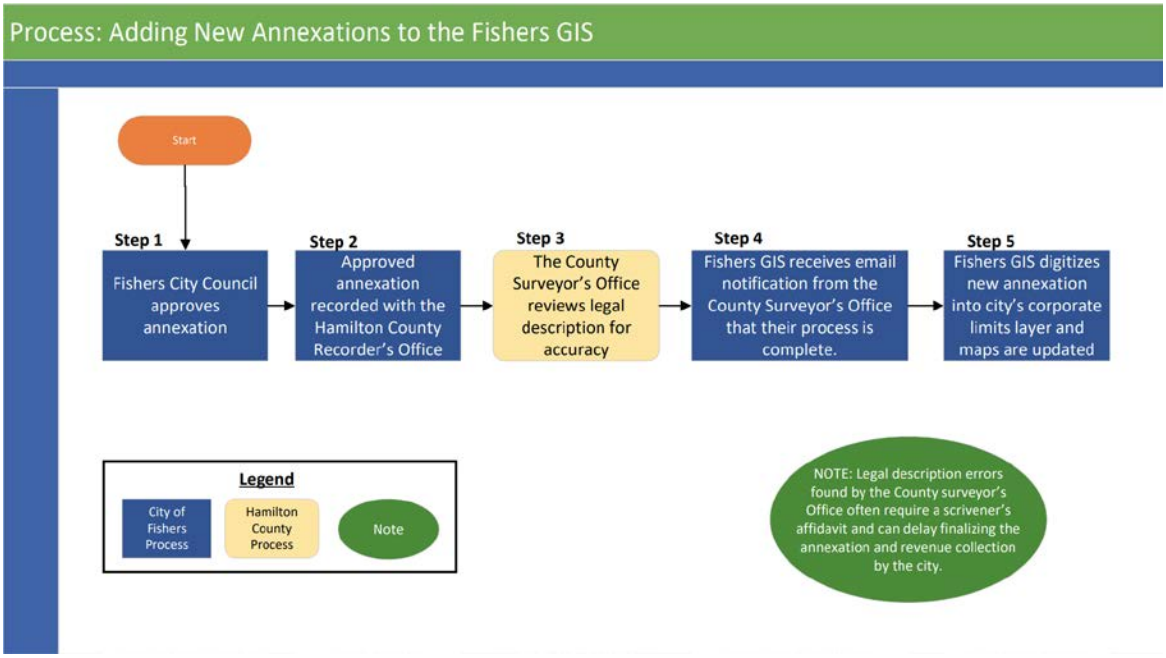
Record Drawing A record drawing is an AutoCAD drawing displaying parcels/land ownership locations provided by the engineering firm that developed a certain area.

Right of Way (ROW): ROW is a polygon layer maintained by the City of Fishers that represents the areas that are accessible for people to pass through. This is similar to the edge of pavement layer, but typically spans a bit wider across the roads.

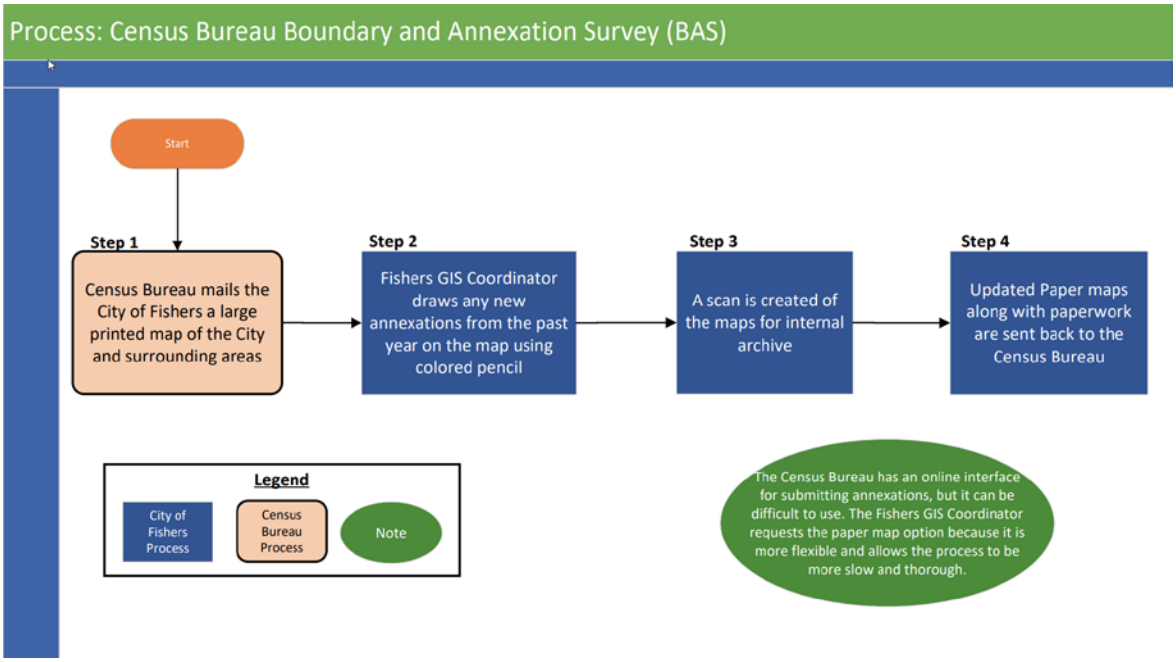
Streets Double: Streets Double is a polyline layer derived from the ROW polygon layer. This is a visual layer only and is typically used for paper wall maps that are authored in AutoCAD.

Yearly Updates to Basemap Features

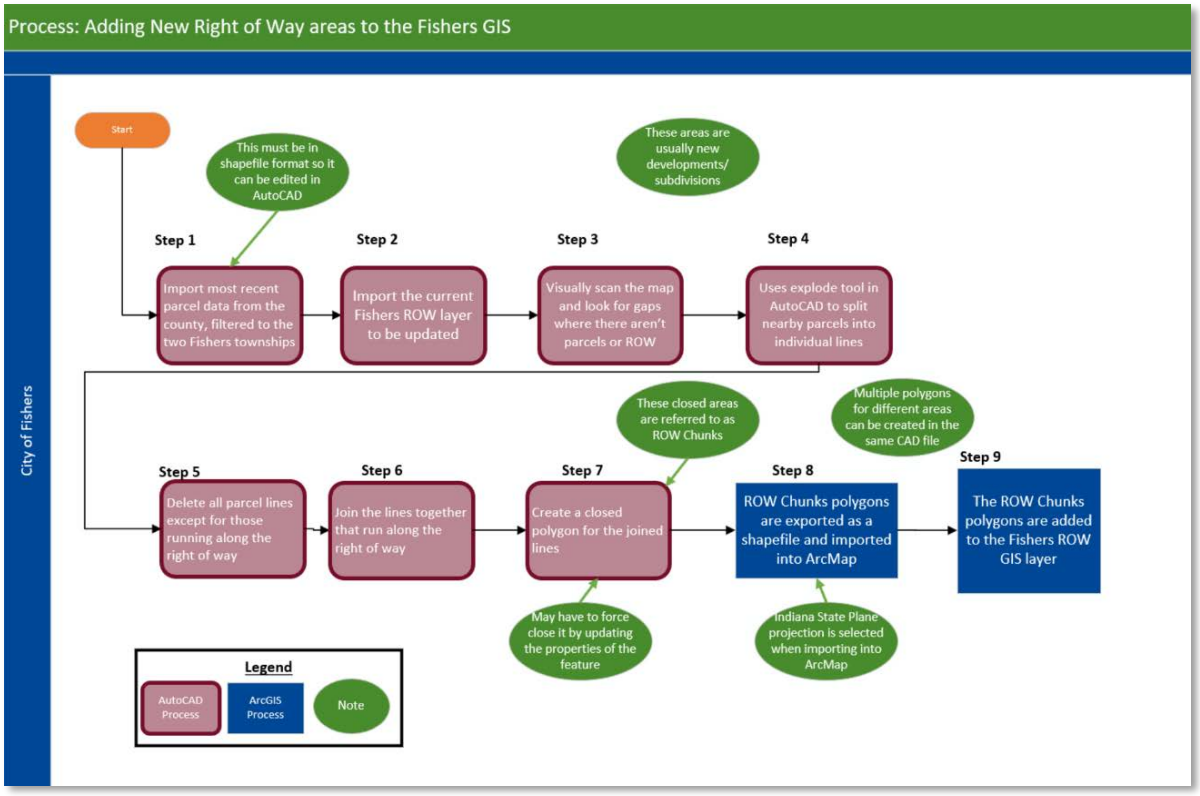
E.1 Annexation Workflow



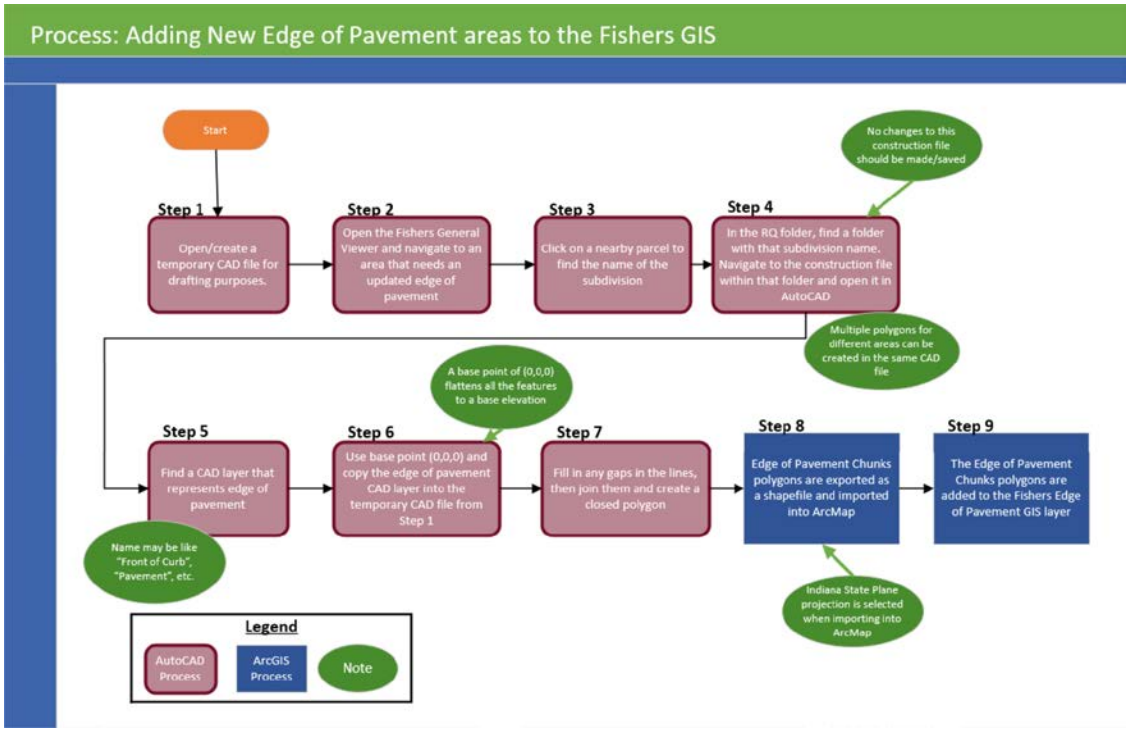
E.2 Boundary and Annexation Survey (BAS) Workflow



E.3 Right of Way (ROW) Workflow



E.4 Edge of Pavement Workflow



E.5 Workflow Observations and Recommendations

E.5.1 Data Sources

The Fishers GIS Department needs to further document all internal and external data sources that feed into paper and web maps used by the City. For each layer maintained by Fishers GIS, the following should be documented:

1. Original source (ex: CAD file or a paper map)
2. Resulting location within the Fishers GIS infrastructure (ex: Enterprise Geodatabase, network folder, etc.)
3. Processing required, additional notes, and/or justification for the process used

E.5.2 Maps

The City of Fishers utilizes a variety of maps including basemaps, web maps, web applications, and printed maps. All maps used by the city should be documented with the following information:

1. The purpose of the map
2. The data sources used in the map
3. How often the map is updated
4. Map format

E.5.3 Digitizing in ArcGIS Pro

Digitizing workflows (for layers such as ROW and Edge of Pavement) that are currently done in AutoCAD can also be done in ArcGIS Pro. The CAD to Geodatabase tool can be used to import the source CAD files as a feature dataset with polygon, polyline, point, and annotation feature classes. Once imported, the trace editing tool can be used to trace along the CAD features. An additional method is to copy features directly out of a CAD file and paste them into a layer, if the CAD file is properly georeferenced to the GIS data.

E.5.4 Helpful Esri Documentation

- CAD to Geodatabase: https://pro.arcgis.com/en/pro-app/latest/tool-reference/conversion/cad-to-geodatabase.htm
- Create segments by tracing other features: https://pro.arcgis.com/en/pro-app/latest/help/editing/create-segments-by-tracing-other-features.htm

E.5.5 Sample Data Sources used in Yearly Updated Maps and Associated Maintenance

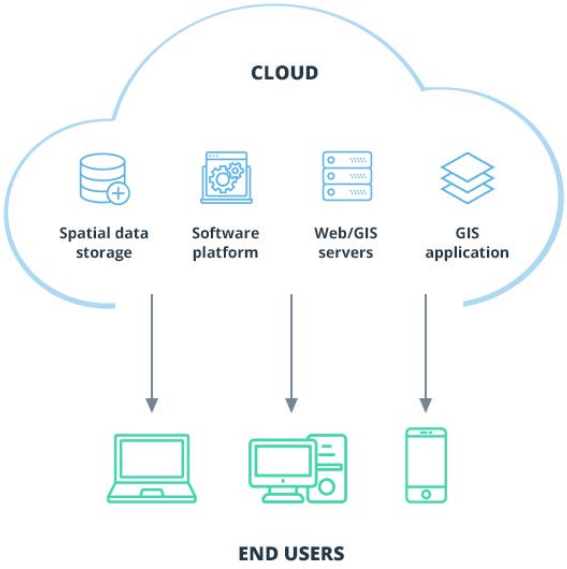
The following table lists the data sources for some of the layers maintained by the Fishers GIS Department.

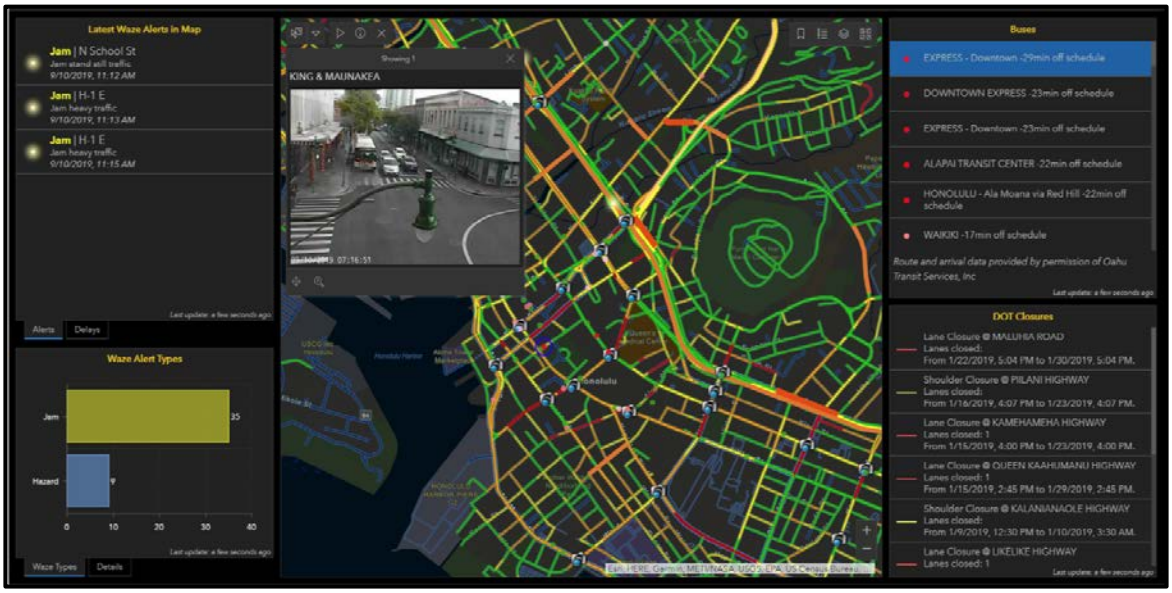
Layer Name	Data Source	Organization
Annexations	Mailed Paper Map	Hamilton County Surveyors Office
Edge of Pavement	Edge of pavement lines in Construction Files (CAD)	Engineering firm developing the area
Right of Way	Parcels	Hamilton County GIS
Streets Double	Right of Way	Fishers GIS

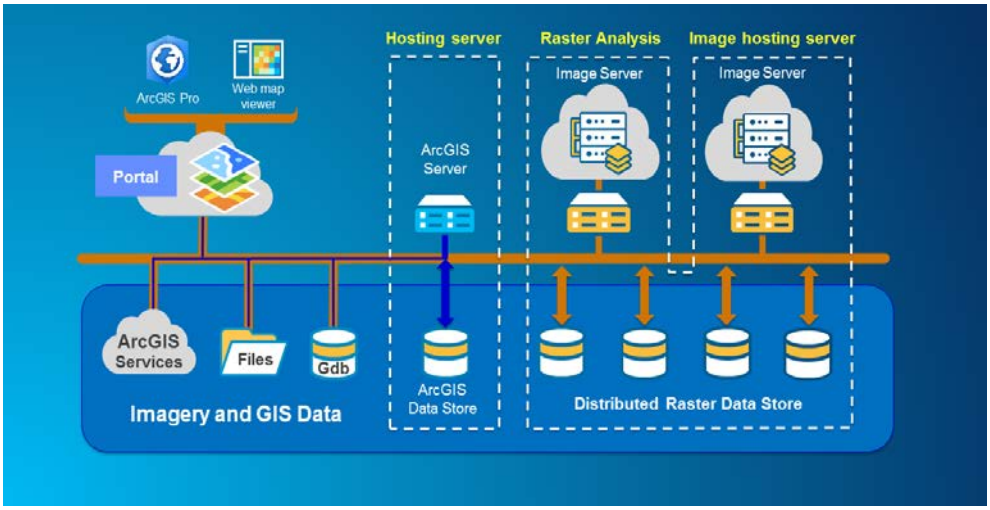
Updating data layers in house such as Right of Way, Edge of Pavement, and Annexations allows the city to have more accurate and up-to-date data than the open data provided by Hamilton County. Examples include:

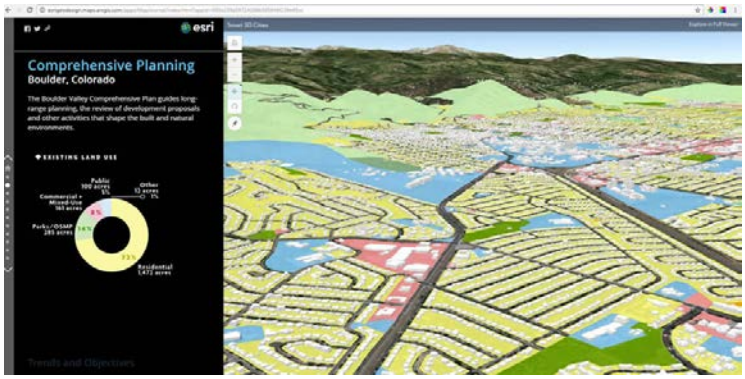
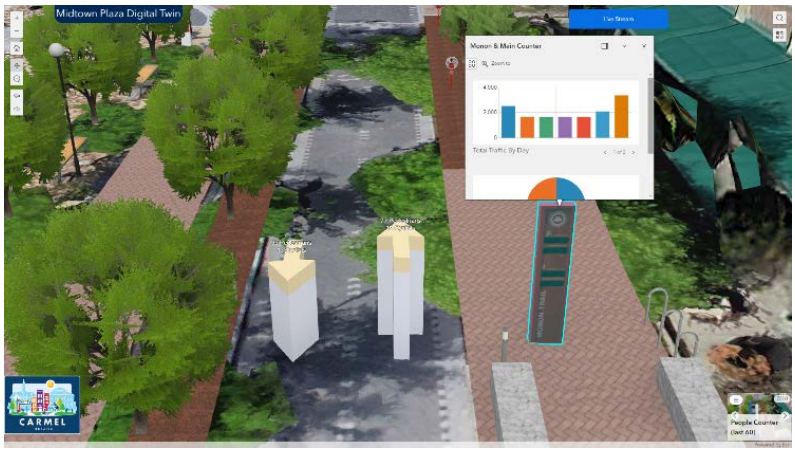
- **Annexations**: The Annexations layer maintained by the City of Fishers has more historic annexations that the Hamilton County layer does not have.
- **Edge of Pavement**: The Hamilton County edge of pavement layer is part of the planimetric data provided every 3-5 years. By updating this data in-house, the City of Fishers can keep its Edge of Pavement layer more current.
- **Right of Way:** The Hamilton County ROW layer only displays the ROW maintained by Hamilton County. The Fishers GIS department maintains a separate ROW layer to represent all roadways in the City.

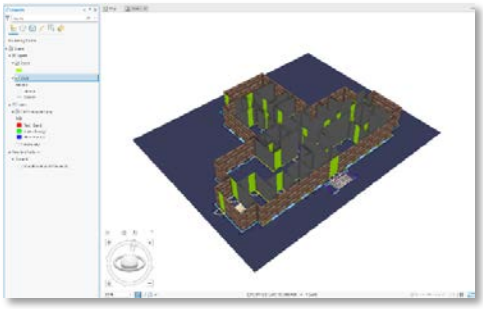
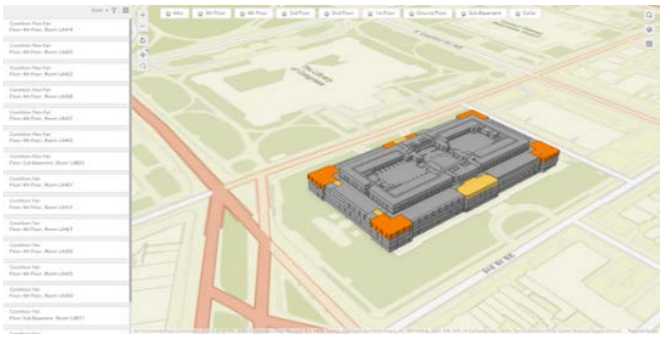
Appendix F: Current and Emerging GIS Technology Trends

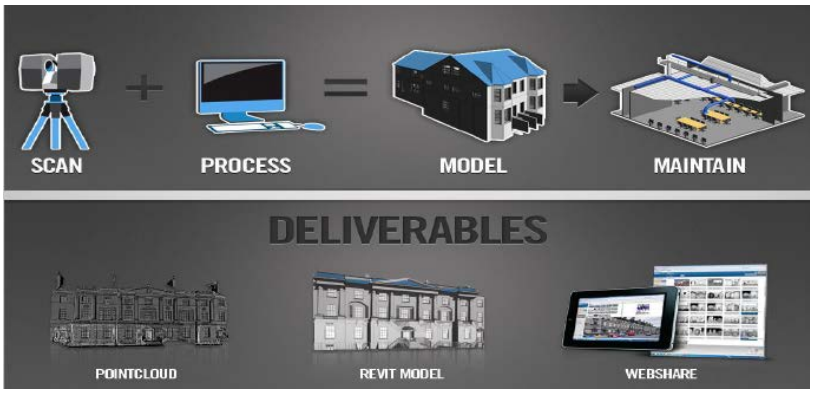
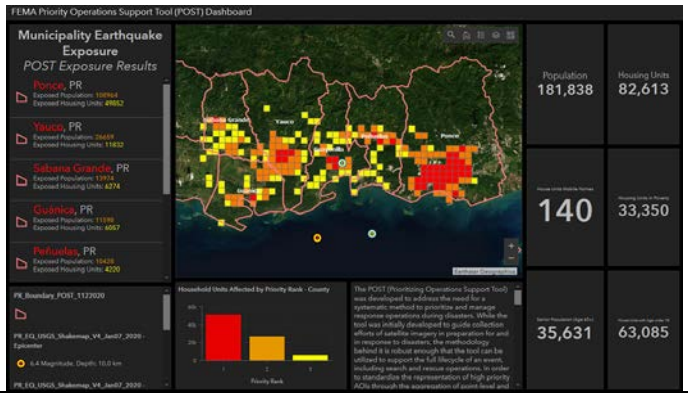
Trend	Description and Applicability
GIS in the Cloud	The trend in general for business data, images, documents, accounts, etc. is moving to the Cloud. GIS in the Cloud provides several advantages for organizations. Data access, capture, and distribution becomes easier in a cloud-based system. Additionally, IT management burden is reduced as it runs through the hosting organization or provider. Real-time data can be displayed directly in the web application provided to access geospatial information. Other important components to consider that are improved through GIS in the Cloud are: • Can utilize large, big data stores • Improve scalability and reliability • Better user experience • Accessibility to end users • Lower costs by paying only for resources used  Important considerations of moving to the Cloud includes ensuring that security and industry specific standards are met through the cloud provider, as well as on-going support of the system. There are several providers to consider in this space including Amazon Web Services (AWS) and Microsoft Azure being the most commonly used. Implementing a common GIS server platform in the Cloud (i.e. Esri, Mapbox, etc.) provides a framework for leveraging and configuring out-of-the-box tools that support geo-enabling of the organization: 
Real-Time GIS	Utilizing real-time GIS technology such as Automatic Vehicle Location (AVL) devices leveraging Global Positioning Systems (GPS) provides awareness of vehicle location, tracking, and on-time performance of transportation assets. These real-time tools are

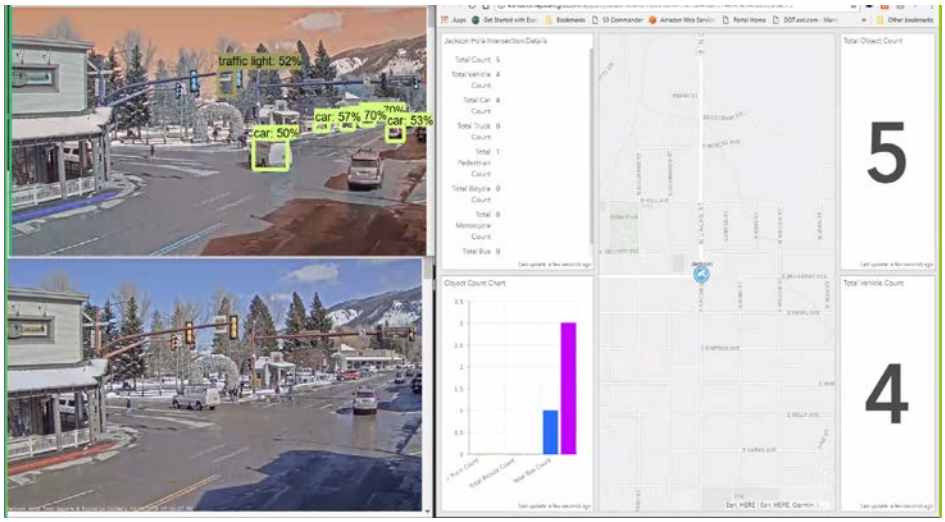
Trend	Description and Applicability
	quickly becoming expected as standard for transportation and fleet management in order to provide the foundation for improved customer service, safety/incident management, and schedule adherence. In addition, real-time information can be integrated with camera feeds such as closed-circuit television (CCTV) to supplement awareness at specific locations.  *Asset Data Management and Links to Camera Feeds (CCTV)*
Image Analytics	Imagery from remote sensing, drones, aircraft, and even satellites is becoming increasingly available, and GIS is providing the framework to manage all this information. Hence, our challenges of gathering new data are becoming less, providing ready access to various image types, such as video, classified raster images, and still pictures. All have a use in GIS applications from **monitoring of construction and mapping of right-of-way assets**, to classifying **pervious and impervious surfaces for stormwater runoff and MS4 permitting analytics**. 

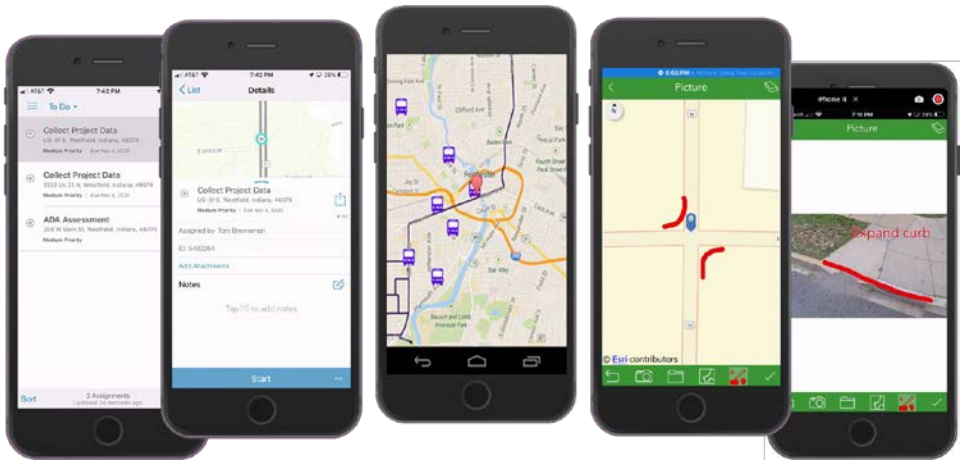
Trend	Description and Applicability
	These data capture platforms are making it easier to collect important asset data in mass, and incorporating them in GIS databases in order to look at conditions, risks, and overall maintenance and operational needs. Depending on the resolution requirement for particular parts of a transportation network, for instance; any number of these data collection methods (i.e. satellite, airplane, helicopter, drone) may be utilized to capture precise locational information. The diagram below highlights how an image analytics framework could be established as part of an overall **enterprise GIS platform**.  

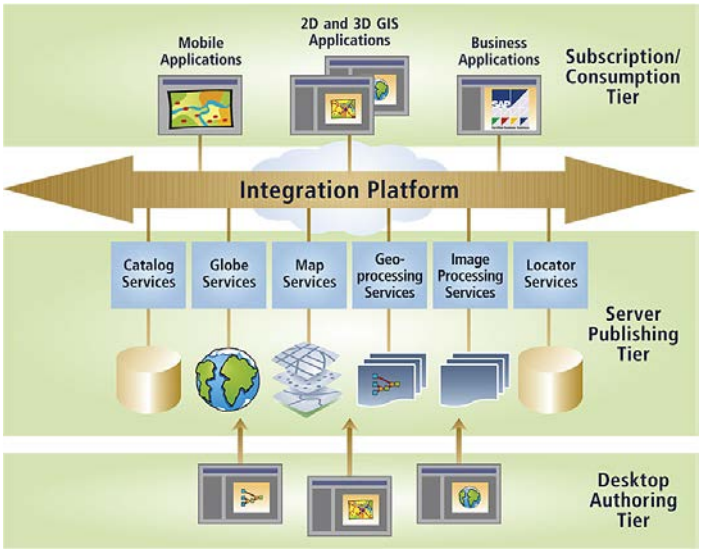
Trend	Description and Applicability
	Image Analytics Setup for Enterprise GIS The City can leverage image analytics in various ways to enhance municipal operations and services. For instance, aerial imagery from drones or satellites can be analyzed to monitor urban growth, assess land use changes, and plan for future developments. High-resolution images can support infrastructure inspections, such as identifying road surface conditions or detecting cracks in bridges, reducing the need for manual inspections and enhancing safety. Image analytics can also aid in environmental monitoring, such as detecting changes in green spaces, tracking water quality in local bodies, or identifying areas prone to flooding. In public safety, analyzing real-time video feeds from cameras can help detect traffic congestion, improve emergency response times, and enhance pedestrian safety. Additionally, integrating image analytics into GIS can create dynamic visual dashboards, enabling City leaders to make data-driven decisions while engaging residents with transparent and visually intuitive tools. By embracing image analytics, The City can ensure a more connected, efficient, and sustainable city. Further, image analytics are now incorporating artificial intelligence (AI) algorithms to identify right-of-way (ROW) missing elements such as signage or markings that are important to providing real-time safety emphasis of traffic safety features. AI and machine learning is further discussed in the GEOAI section later in this document.  

Trend	Description and Applicability
3D/BIM	The City can greatly benefit from integrating 3D BIM (Building Information Modeling) with GIS technologies to improve urban planning and infrastructure management. By combining the detailed, design-level data of BIM with the spatial context of GIS, the City can create comprehensive 3D models of its infrastructure, enabling more accurate analysis and planning. For example, 3D BIM-GIS integration can be used to visualize proposed developments within the existing cityscape, helping planners assess the impact on traffic flow, utilities, and surrounding neighborhoods. It can also support asset management by providing detailed models of city facilities, such as a water treatment plants or public buildings, to monitor their condition, plan maintenance, and streamline operations. Furthermore, 3D BIM-GIS can enhance emergency response planning by modeling evacuation routes or identifying vulnerabilities in critical infrastructure. These technologies also allow the City to engage the community through interactive 3D visualizations of projects, fostering transparency and public trust. By embracing this integration, The City can drive smarter, more sustainable growth while improving service delivery and operational efficiency.    The key benefits of applying BIM models and incorporating GIS data includes: • Provides a model for sharing information throughout a project and assets lifecycle • Provides cost and time savings through visualization of a project through-out planning, design, and construction • Provides a mechanism to highlight directly within a model on each asset/item specific information such as condition, date of installation, etc.

Trend	Description and Applicability
	The diagram below highlights representative steps in the process to implement BIM within a municipal organization. Please note, as discussed earlier in this section, the actual scan to start the data acquisition process can be achieved in several ways with multiple device types (drone with LIDAR, terrestrial scanner, etc.). 
Spatial Analysis & Data Science	The City can leverage spatial analysis and data science to enhance urban development planning, public safety, and stormwater management, fostering a more sustainable and resilient urban environment. By utilizing advanced GIS tools, the City can analyze zoning regulations, population density, and utility networks to strategically identify suitable locations for new residential, commercial, and recreational developments, ensuring growth aligns with infrastructure capacity and community needs. In the realm of public safety, spatial analysis of crime patterns and emergency response times can inform the strategic allocation of police and fire resources, improving response efficiency and overall safety outcomes. Additionally, stormwater management efforts can be elevated through the use of spatial models to identify flood-prone areas, evaluate drainage system efficacy, and prioritize infrastructure upgrades to mitigate flooding risks. Implementation of these initiatives will require investments in cutting-edge GIS software, capacity building for staff in spatial analysis techniques, and collaborative engagement between City departments and external experts. 

Trend	Description and Applicability
GEOAI	GIS software has become integrated or interfaced with a whole library of open-source Artificial Intelligence (AI) and machine learning tools. This software is enabling agencies to use the power of relationship building and statistics to be able to make predictions or create new understanding between elements, assets, etc. These GEOAI engines are utilizing live video, LIDAR, and imagery for detecting all kinds of phenomena including, for example, condition and safety information. Additionally, these tools are being applied to camera feeds for counting and typing vehicles as well as identifying other right-of-way assets.  **GEOAI to Identify Entities in Camera Feeds**

Trend	Description and Applicability
Mobile GIS	Mobile GIS allows field staff to access, collect, and update geospatial data in real-time, directly from smartphones or tablets, bridging the gap between the office and field. For example, public works teams can use Mobile GIS to inspect infrastructure such as roads, water lines, and storm drains, instantly updating conditions and repair needs into the City's GIS database. Similarly, mobile applications can assist code enforcement officers in documenting violations with precise geotagging and photographic evidence, expediting case resolution. Emergency response teams can leverage mobile GIS to access critical information, such as building layouts or hydrant locations, on-site during incidents, improving efficiency and safety. To implement this technology, The City should invest in mobile-friendly GIS platforms like Esri Field Maps and Survey123, train staff on their use, and ensure robust integration with existing GIS systems. 

Business System Integration	GIS is an excellent platform to support integration across multiple business systems. The GIS environment is capable of cataloguing and bringing multiple data and systems together in a single, map-based interface. Through a GIS Portal application, access can be gained to other business systems, mobile applications, web applications, etc. That said, it is not necessary to be able to leverage GIS for it to be the system of record for interaction with other business systems. It simply can be a foundational spatial layer that gives location to data inside other business systems. Integration can be accomplished through several methods such as Extract, Transform and Load (ETL processes), direct access to transactional data, data warehouses, and Application Programming Interfaces (APIs). The integration capabilities using location are especially unique as many data sets do not contain the data linkages (primary foreign keys, common identifier, etc.) to link data from different systems or sources. Linking a real-time accident location with the nearest access point, associating an incident with a maintenance activity with a planned project to the video from a nearby camera are possible through spatial and temporal integration provided by GIS, for example.  The need for integration is large, as there are several potential business systems being utilized in municipal organizations, such as: • **AVL System**: AVL, engine telemetry, onboard configuration, fleet management, reporting/analytics • **HR System**: personnel data warehouse, payroll • **Enterprise Asset Management System**: enterprise asset management system, materials management, field maintenance, warehouse/stockroom management, work order management, warranty management • **Enterprise Resource Planning Systems**: payroll, general ledger, capital budgeting • **External Data and Systems**: tolling, permits, easements, utilities • **Other Internal Data & Systems**: Excel, Machine Learning/AI, Data Warehouse, BI Tools