MapForsyth| City-County Geographic Information Office
FY 16-17 Annual Report

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Mission Statement

"To effectively use innovative technologies to serve the citizens and municipalities of Forsyth County by providing comprehensive, reliable GIS and addressing products, data and services."

Vision Statement

"The MapForsyth| City-County Geographic Information Office Geospatial initiative is envisioned to coordinate and facilitate an integrated system-wide Geographic Information System (GIS) to support the effective, practical and innovative use of GIS. At the core of this vision is the development and management of a centralized GIS Data Repository and a Master Address Repository serving all local governmental agencies within Forsyth County."

Roles and Responsibilities[1]

a. **GIS Addressing and Street Naming**
   i. Implement and maintain the Master Address Repository (MAR).
   ii. Identify and implement best practices for a MAR.
   iii. Assign and maintain Addresses and Street Names.
   iv. Facilitate integration with compatible City and County applications where applicable.
   v. Oversee the Local Update of Census Addresses Program (LUCA).

b. **Make Geospatial Data Accessible Externally (Public) and Internally (Local Government Organizations Located in Forsyth County)**
   i. Establish a centrally managed geographic database repository.
   ii. Maintain a list of geographic data produced and maintained by each department and establish update agreements based on the metadata.
   iii. Facilitate and monitor the consumption of GIS data by public and internal users via the creation of freely available GIS services, database connections, and a GIS "Open Data" site using data located on the centralized repository.

c. **Geospatial Reports**
   i. Master Address Repository (MAR) Integration Yearly Report.
   ii. Monthly GIS System Monitor Status Reports.
   iii. Centralized GIS Data Repository Participation & Integration Yearly Report.
   iv. State of GIS in Forsyth County/ City of Winston-Salem Yearly Report.

d. **Promote and/or Provide Training Opportunities**
   i. Establish and meet regularly with a GIS user group network within Forsyth County to share information and help facilitate growth and use of the geospatial technologies.
   ii. Lead and/or participate in community events with goal of promoting GIS technology and applications. An example of this is the annual GIS Day.
   iii. Inform Forsyth County and other municipal GIS professionals of GIS training opportunities through, but not limited to: ESRI, GIS/IT Conferences, Symposiums, and other GIS resources.

e. **Geospatial Analysis**
   i. GIS data creation
      i. Facilitate and assist in the creation of new GIS data layers when requested for departments or agencies lacking the technical expertise or software to do so themselves. Where possible, the goal is to

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[1]The GIS Steering Committee approved MapForsyth's Roles and Responsibilities on February 03, 2017.

transfer knowledge and provide the proper training so the requesting department or agency takes ownership of the data moving forward.

ii. Perform Geostatistics, Network Analysis, Community Analysis and deliver results (not interpretation) to the requesting department or agency. Facilitate the distribution of the analysis to a wider audience via web maps or other methods for the requesting party.

f. Other GIS Services

i. GIS Workflow review and GIS Business Analysis.
ii. ArcGIS Online Map and application initial creation.
iii. Act as a liaison, coordinator, and adviser to GIS users within the various departments within the County and other local government jurisdictions within Forsyth County.
iv. Research and test new ESRI/GIS technologies.
v. Create maps for internal departments or the public (digital and hard-copy).
vi. Provide support to the Emergency Operations Center (EOC).
vii. Provide consultation on the selection of GIS software, software versions, workflows, and solutions for all departments.
viii. Provide all user departments Read-Only access to GIS data in accordance with the associated metadata access/use constraints on the GIS Data Repository to allow departments the capability of creating their own maps.

Message from the Geographic Information Officer

I am pleased to present MapForsyth| City-County Geographic Information Office's annual report for fiscal year 2017. This report provides a summary of program, management, and performance information and describes MapForsyth's activities over the past year to facilitate sustainable development and dissemination of geospatial data and technology.

Overview: FY 16-17 Workload Indicators

MapForsyth is comprised of two teams: 1) GIS Team and 2) Addressing Team. Both teams have very specific tasks and duties assigned to them; however, there is crossover between the two teams on some projects.

MapForsyth tracks all of its projects in a manner that allows all employees to maintain, edit and keep records of all projects and requests of the department. Table 1 shows the fiscal year 2017 summary of all projects by each team.

MapForsyth Team Projects Overall Summary		
	Total Projects	*Percentage*
GIS Team	2,465	82%
Addressing Team	555	18%
Total Department Projects	3,020	100%

Table 1: Overall Projects & Percentage by MapForsyth's Addressing and GIS Teams

Table 2 shows the workload indicators for FY 2017. Support includes, but is not limited to, support for web applications, servers, technical support, GeoData, and GIS software and comprises 43.7% of the workload. Data (21.7%) includes tasks related to data creation, maintenance and requests along with documentation (metadata and inventorying) and any automation processes for creation and maintenance of geospatial data. The Addressing items within Table 2 are all under the general topic of Addressing. A breakdown of their work items is found later in this report.

Key Workload Indicators FY 2017

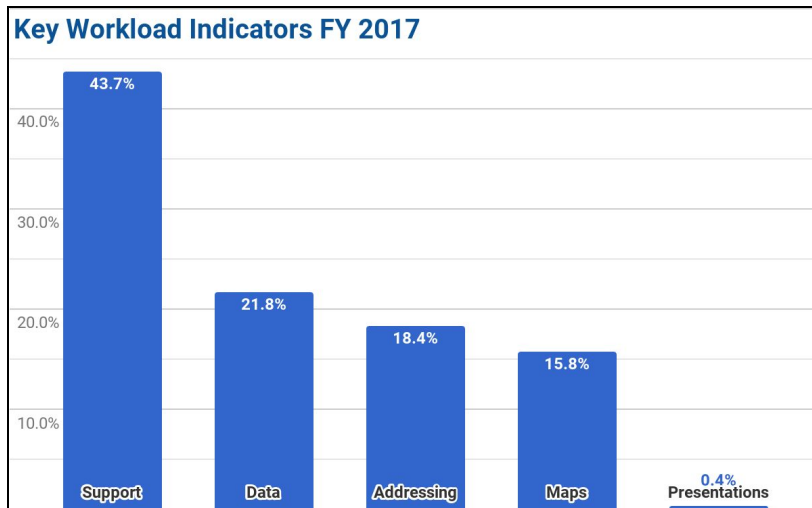| Category	Percentage
Support	43.7%
Data	21.8%
Addressing	18.4%
Maps	15.8%
Presentations	0.4%

Table 2: Key Workload Indicators FY 2017

G. Herbert Stout Award

Since 1993, the NC GIS Conference has awarded the "Herb Stout Award", created to honor exemplary use of Geographic Information Systems (GIS) by a local government that has demonstrated the effective use and benefits of GIS technology. The applications submitted illustrate the variety of issues that can be addressed through the use of GIS technology.

In 2017, MapForsyth, Forsyth County Board of Elections, and Forsyth MIS Department won this award for the development and use of the Forsyth County Early Voting Wait Time Application.

Figure 1: NCGIS Conference 2017 Herb Stout Award Ceremony

Highlights for Fiscal Year 2017

GIS Steering Committee

The GIS Steering Committee members include the Forsyth County Tax Assessor/Collector, City-County Planning & Development Services Director, City of Winston-Salem CIO, Forsyth County CTO, City-County GIO, City of Winston-Salem Assistant Manager, and Forsyth County Assistant Manager.

The purpose of the GIS Steering Committee is to guide GIS implementation development. The focus of the committee is to focus on the high level GIS direction of the organizations and make decisions on priorities based on the overall needs of organizations based on needs identified in the GIS Strategic Plan. The committee also helps formulate policies regarding the utilization and dissemination of geographic information, geographic information systems (GIS), and other related geospatial technologies. The value of the GIS Steering Committee is realized through organized collaboration of geographic information producers and public access to geographic resources that support a wide range of business processes in public and private organizations.

The GIS Steering Committee meets monthly to discuss geospatial technologies, roles and responsibilities of MapForsyth, open-source GIS, GIS license, and other related items.

Forsyth County GIS User Group Meet-ups

The Forsyth County GIS Users Group is an initiative of the GIS Steering Committee and comprised of Local Government GIS users located in Forsyth County, North Carolina. The group consists of GIS users of all levels and from a wide range of specialties (management, analyst, programmer or someone just interested in the technology). Bi-monthly meetings are convened to share ideas, methodologies, and latest projects.

The user group meetings are held in different locations. The City of Winston-Salem, Forsyth County, and the Village of Clemmons have all held the meet-ups. The average attendance for these meetings is 24 attendees. GIS professionals who sit on different GIS boards/committees provide updates from the NCGICC, APWA, CURISA, NCAUG and CURISA Addressing Committees. Discussion topics include Augmented Reality (i.e. Pokemon Go) and GIS, the City of Winston-Salem's Online Information Center, Future of GIS technologies, and so on.

Centralized GIS Data Repository

The Centralized GIS Data Repository (CGDR) is a major goal of MapForsyth. During the FY 2016-2017 MapForsyth established the CGDR. The goal of the CGDR is to provide a centralized location where authoritative GIS datasets reside. The CGDR allows multiple users to access the data freely without the conundrum of emailing and calling different departments for GIS Data. The CGDR requires that metadata be part of the GIS dataset. The metadata contains information such as who created the data, when it was created, how often it is updated, contact information, etc. The metadata policy piggybacks off of the State of North Carolina's metadata policy.

To date, there are 118 feature classes[2] on the CGDR. There are 27 current connections. These connections include the following departments: Tax, City-County Planning, City of Winston-Salem Stormwater, and MapForsyth. MapForsyth will add more connections and feature classes during FY 2017-2018 as we meet with individual departments and confirm the authoritative datasets.

An initiative to meet with all City of Winston-Salem and Forsyth County departments to document all GIS data and who is creating and maintaining this data began during FY 2016-2017. MapForsyth will complete the full documentation process by the end of the 2018. For duplicative datasets, the documentation process will include meeting with City and County management to determine who should maintain the authoritative dataset so that anyone pulling data will access the validated data. The intent is to eliminate duplicative, and sometimes contradictory, data.

From there, updates and follow-ups with data creators will be conducted via email and telephone to ensure the continued updating of data on the Centralized GIS Data Repository to make sure valid information is received by consumers. Each year a report will be given to the City of Winston-Salem and County Managers. This report will contain an comprehensive list of data available on the Centralized GIS Data Repository along with the departments who maintain the data.

OpenData Portal

The OpenData Portal is a website where departments, citizens, and others access authoritative GIS datasets anytime they need data (Figure 2). Datasets are presented in different formats such as Shapefiles, KMLs, and webmap map services (WMS). These datasets have been approved by the departments who create the data , are ready for public consumption, and contain the appropriate metadata.

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[2] A collection of geographic features with the same geometry type (point, line or polygon), the same attributes, and the same spatial reference.

This OpenData Portal is based on Esri technology. Esri has rolled out a new version of the OpenData Portal which will allow quick summaries of each dataset to be displayed in a variety of ways including graphs. MapForsyth will be upgrading to this new version during FY 17-18.
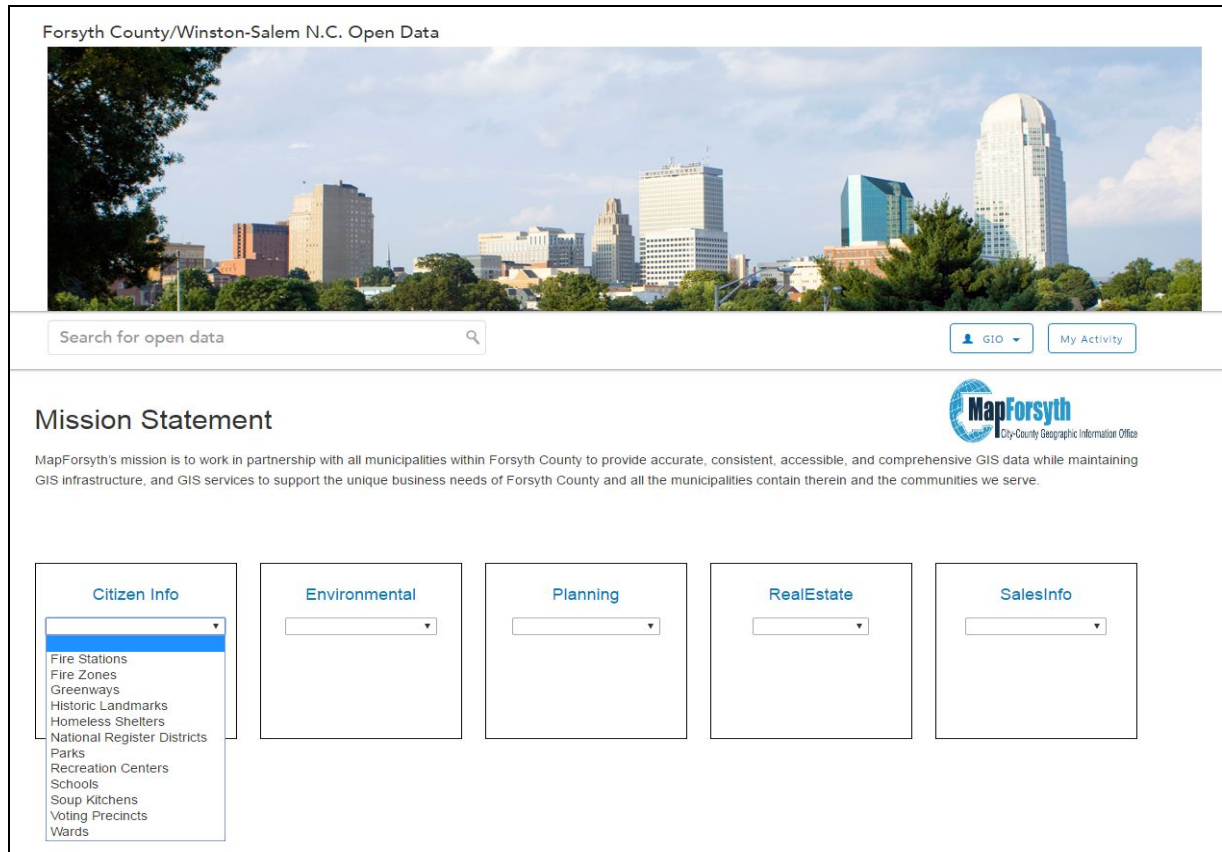

Figure 2: Screenshot of Forsyth County/ Winston-Salem, NC OpenData Portal

Master Address Repository (MAR)

The Master Address Repository (MAR) contains the official addresses within Forsyth County and is a tabular or flat database and not a spatial database so that all systems can use the data contained therein. If a system requires or prefers spatial data, then the Address Points and Street Centerlines are used for integration. The Addressing Coordinator presented an Addressing Project Report to both the City of Winston-Salem and Forsyth County governing boards during FY 2017. This report (Figure 3) contained information on the number of anomalies (incorrect addresses based on Addressing Policy Manual) and the location of these anomalies. Figure 4 is included within the Addressing Project Report. This figure shows the connections between ArcGIS SDE and the MAR and how they are updated simultaneously by MapForsyth's Addressing staff.
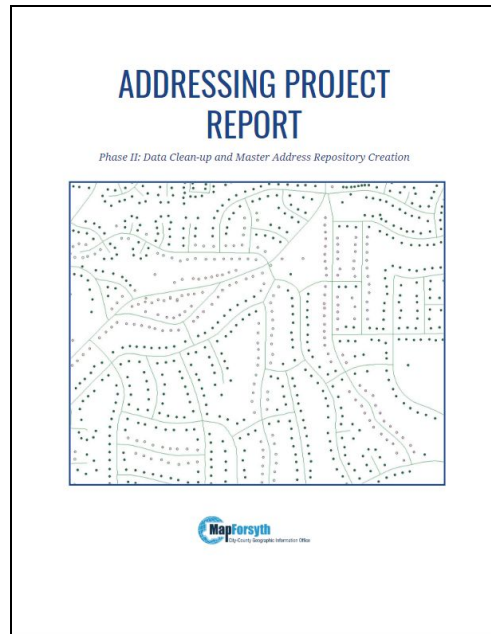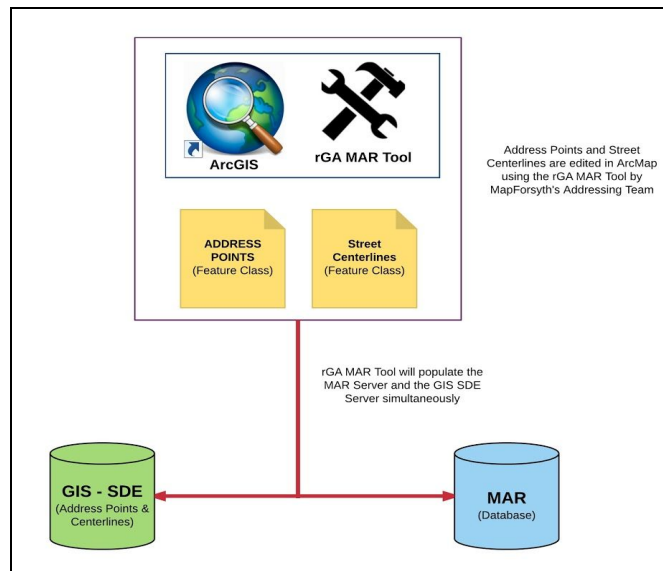
Figure 3: Addressing Project Report Cover

Figure 4: Diagram of How the MAR Tool Works

GIS Datasets

MapForsyth is responsible for maintaining 68 GIS datasets. These datasets are used within numerous departments and web applications. Table 3 provides a list of datasets currently maintained; however, with the growth and increase usage of GIS, the need for more GIS datasets will continue to increase over the next few fiscal years.

Table 4 shows the update schedule for the GIS datasets listed in table 3. Almost half of the datasets (46.0%) are updated annually with datasets updated "as needed" making up 28%. These "as

needed" datasets include many of the CAD GIS datasets, whose updates are driven by Fire and EMS as needs arise.

GIS Datasets Maintained by MapForsyth (Fiscal Year 2016-2017)		
Public Schools - points	Libraries	CAD - Fire Agency
School Districts - poly	Major Points of Interest/Large Assembly Facilities	CAD - Fire District
School Zones - poly	YMCAs	CAD - Fire Station
Private Schools	Fire Insurance Districts - Annual Snapshot	CAD - Fire GeoProximity
WSFCS Admin Facilities	Centerlines	CAD - Fire Response Plan
Colleges/Universities	Address Points	CAD - Fire Reporting Area
Food Retailers	Zip Codes	CAD - EMS Agency
Grocery Stores	US House/Congressional Districts	CAD - EMS District
HOPE Feeding Sites	State Senate Districts	CAD - EMS Station
Registered Underground Storage Tanks	State House Districts	CAD - EMS GeoProximity
Food Assistance Programs	County Commissioner Districts	CAD - EMS Response Plan
Food Deserts (low access tracts)	Municipal Districts	CAD - EMS Reporting Area
Community Gardens	School Board Districts	CAD - Law Districts (FCSO)
Registered Sex Offenders	Superior Court Judge Districts	CAD - Law Beats (FCSO)
Day Cares	Soil & Water Conservation Districts	CAD - Law GeoProximity (FCSO)
Foreclosures	Precincts	CAD - Law Agency (FCSO)
Fire Insurance Districts	Polling Places	CAD - Nature Spawn Override (FCSO)
Fire Station Locations	Adult Care Facilities	CAD - Law Response (FCSO)
EMS Bases & Outposts	Lumber Yards	CAD - Law Reporting Area (FCSO)
Garbage (Refuse) Provider	Permitted Landfills	
Address Points (FCSO Custom)	PODs_Forsyth (Commodities POD)	
Playgrounds	Temporary Disaster Debris Staging Areas	
Red Cross Shelters	SNS_PODs_Health	
Hospitals	Brownfields	
AnimalClinicsVetOffices		

Table 3: MapForsyth Maintained GIS Datasets (FY 16-17)
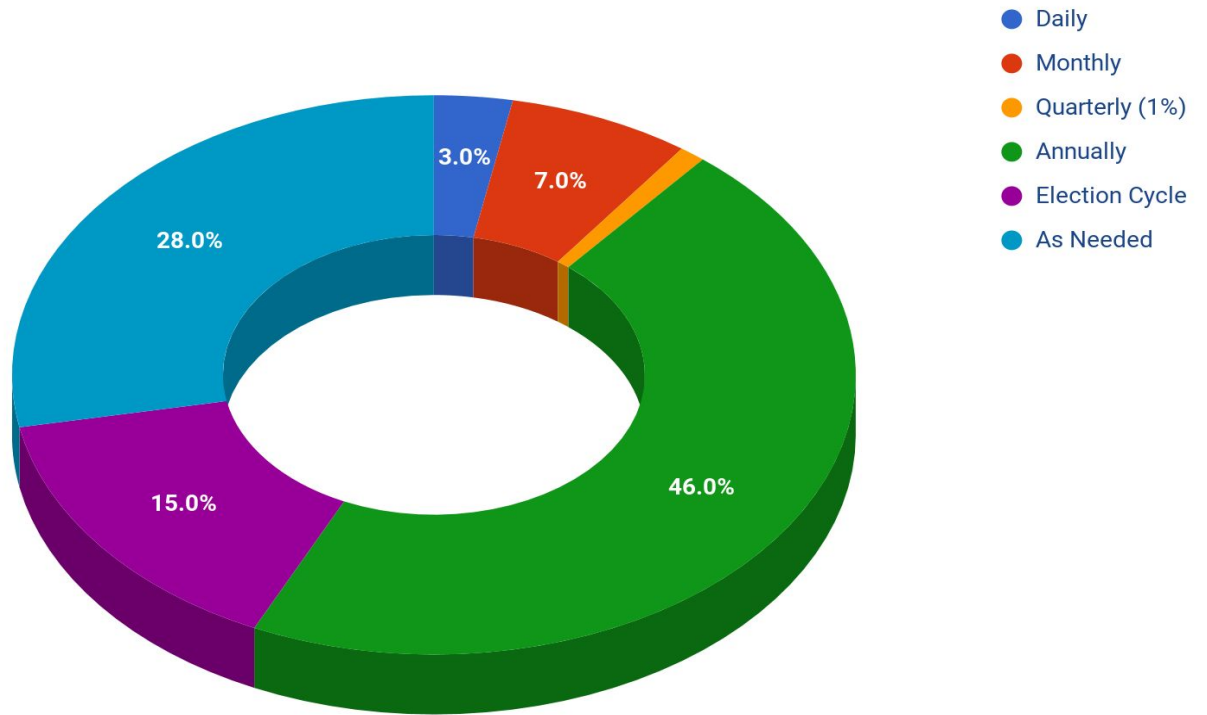
GIS Dataset Update Schedule

FIscal Year 2016 -2017

- Daily
- Monthly
- Quarterly (1%)
- Annually
- Election Cycle
- As Needed

3.0%

7.0%

28.0%

46.0%

15.0%

Table 4: GIS Dataset Update Schedule FY 16-17

GIS Statistics 2017
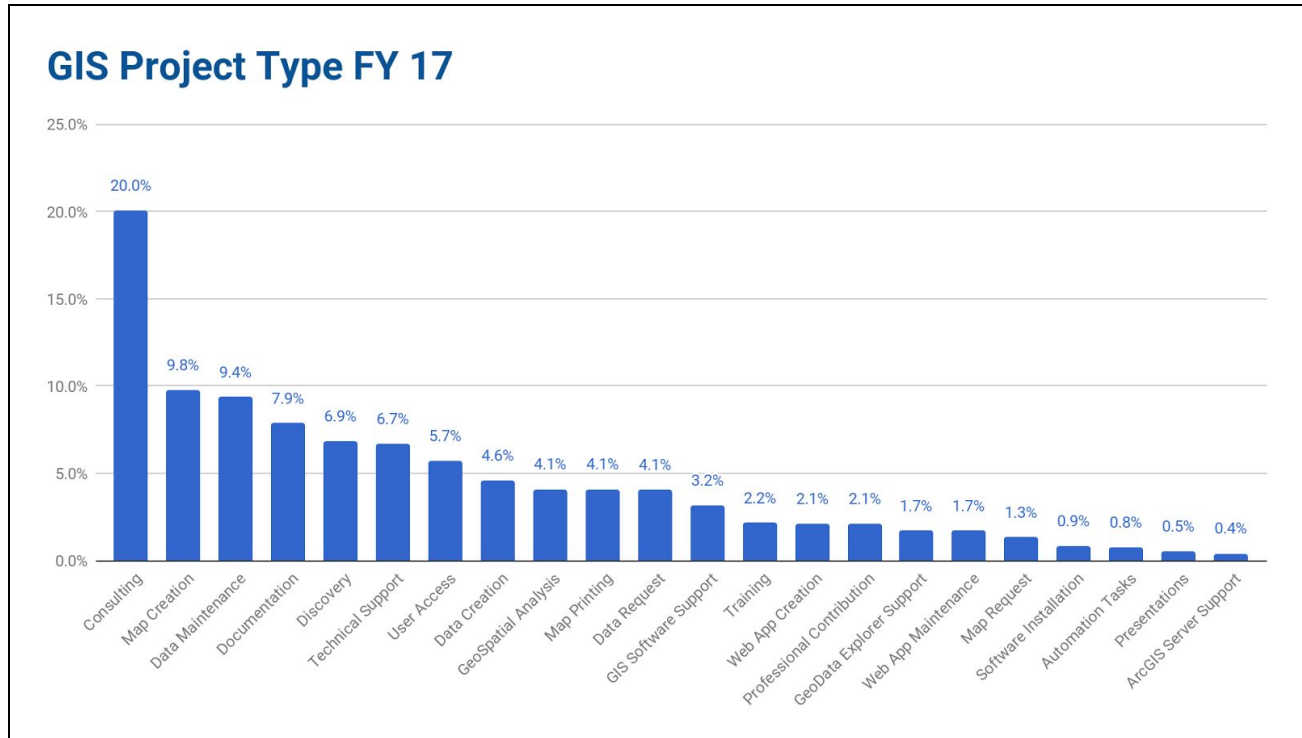

GIS Project Type FY 17

Table 5: Breakdown of GIS Projects by Type

- The top three GIS Projects for FY 2016-2017 are Consulting, Map Creation, and Data Maintenance
  - Consulting (20%) consists of meeting with clients and stakeholders for project creation, project updates, geospatial/ GIS advice, and project closeouts.
  - Map Creation (9.8%) includes hard copy maps, web maps, and geospatial analysis.
  - Data Maintenance (9.4%) is the creation, deletion, and updates of geospatial datasets.

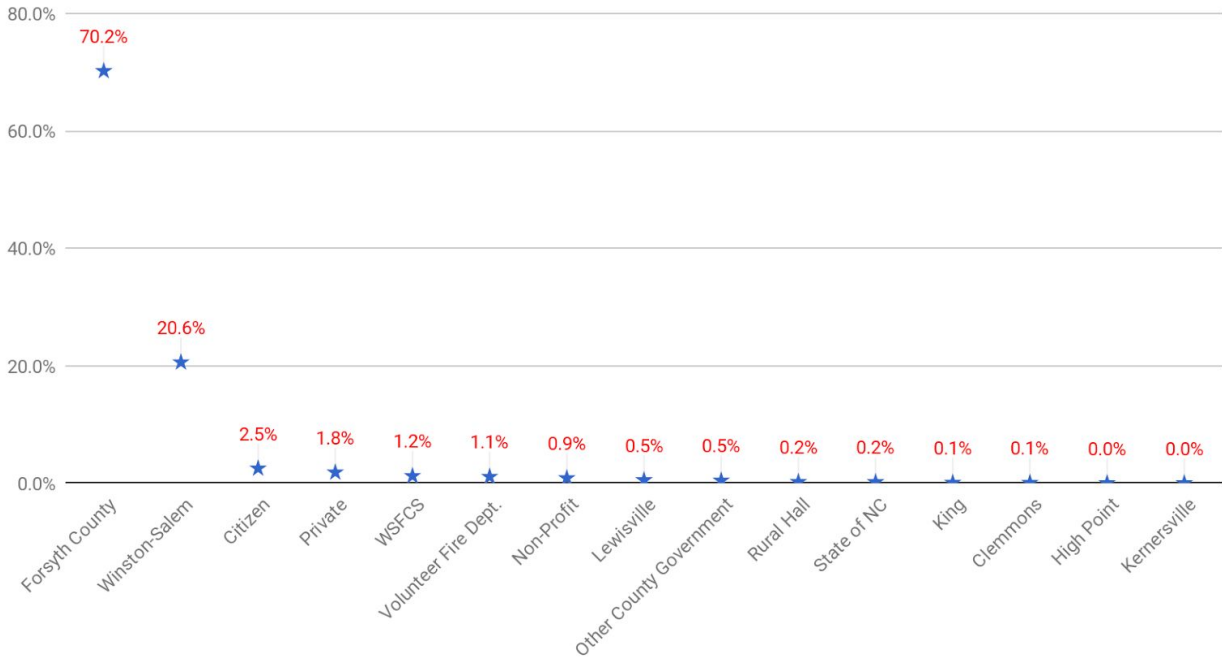**GIS Projects by Organization Based on Percent of Time FY 16-17**

Table 6: GIS Projects by Organization Based on Percent of Time FY 16-17

- The top three users of MapForsyth services for FY 2016-2017 based on percent of time by MapForsyth are, Forsyth County (70%), City of Winston-Salem (21%), and Citizens (3%)
    - The top three project types for Forsyth County include: GeoData, Map Printing, and Map Request.
    - City of Winston-Salem's top three project areas are: technical support, user access, and ArcGIS server support.
    - For citizens it was data request, map creation, and map printing.

Addressing Statistics 2017

MapForsyth's Addressing Team is responsible for address assignment and road centerline updates for the following entities via interlocal agreements (Table 7):

Interlocal Agreements Completed During FY 16-17		
Forsyth County	City of Winston-Salem	Town of Lewisville
Village of Clemmons	Village of Tobaccoville	Town of Rural Hall
Town of Walkertown	Town of Bethania	

Table 7: Interlocal agreements entered into during FY 17
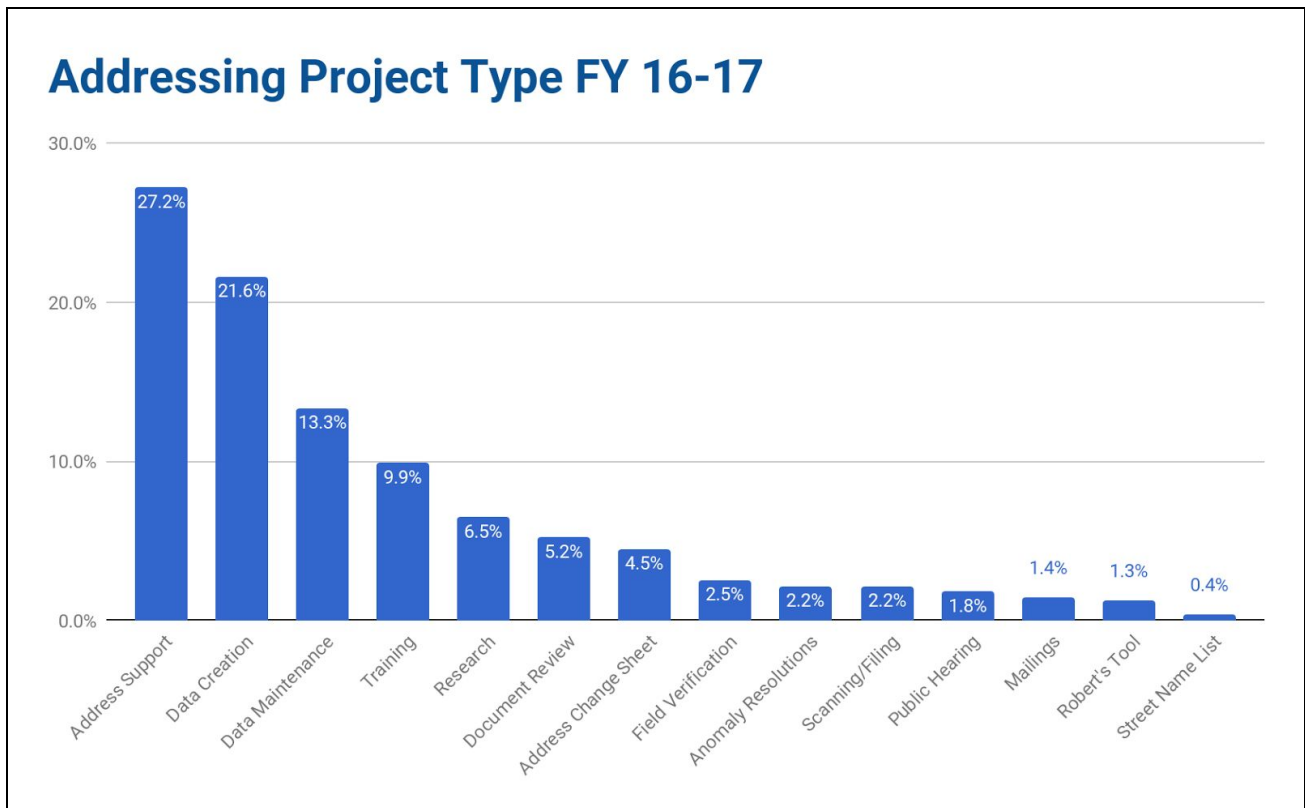

Table 8: Addressing Project Type FY 16-17

- ● The top three Projects for MapForsyth's Addressing Team for FY 2016-2017 are Addressing Support, Data Creation, and Data Maintenance
  - ○ Address Support (27.2%) includes verifying addresses for the public, internal departments, and the US Post Office. It also includes contacting the US Post Office

and Here.com to pass along correct address information. Citylink request and verification letters for banks and homeowners also fall under this category.
- ○ Data Creation (21.6%) includes address point and centerline creation, editing, retiring addresses, etc. These data creations happen on the ArcGIS SDE and the Master Address Repository (MAR) at the sametime.
  - ■ Data creation is important to permitting and emergency dispatch as they need regular and frequent updates.

Table 9 shows the Addressing projects by organizations served based on amount of time per organization.
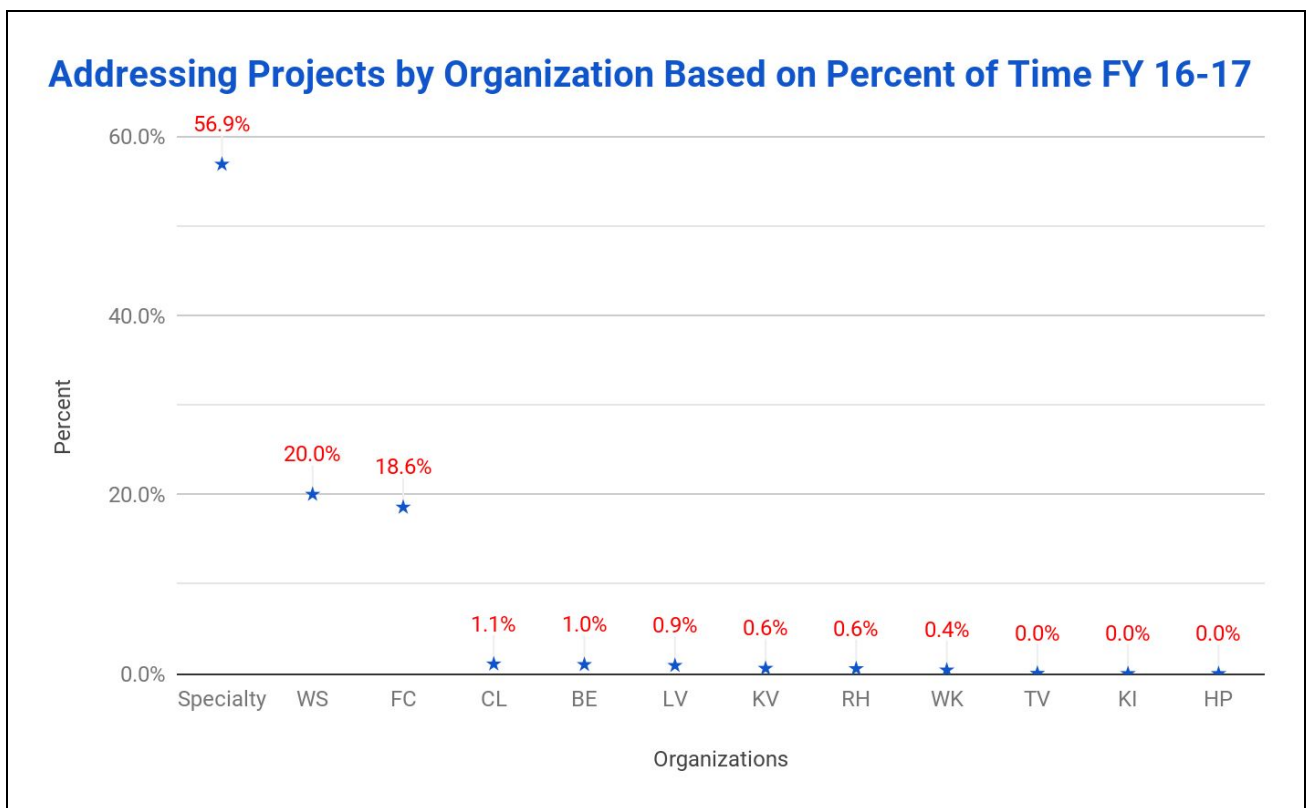

Table 9: Addressing Projects by Organization based on time

- ● 56.9% falls under the category of Specialty projects which includes tasks not generated by or provide benefit to one particular organization, such as Phase II of the Addressing Project. Tasks can include weekly plan review meetings that may have projects inside various corporate limits. Updates provided to other governmental agencies. Meetings that review projects that provide benefit to the whole county.
- ● Out of municipalities served, the City of Winston-Salem makes up 20% of MapForsyth's Addressing time.

      ○ City of Winston-Salem work items included, but are not limited to: Public Hearings, Address Support, and Document Review.

      ○ Forsyth County's projects included Field Verification, Data Maintenance, and Research.

Goals 2017

- Improve all City and County departments by developing and maintaining a centralized GIS data repository.
  - Completed with the Centralized GIS Data Repository and Master Address Repository both in place.
- Help City and County departments use geographic data in decision-making and to help the community understand strengths, weaknesses, opportunities, and challenges.
  - Completed. The accomplishment of this goal is seen through Addressing by their highest percent of projects (Table 8) was "Address Support". The GIS team's high percent project (Table 5) was "Consulting." Both these items focus on helping the community and departments make data driven decisions.

Current Initiatives

- Create efficiency across City and County departments through the accuracy and completeness of geographical reference data
- Serve as custodian of GIS and Addressing datasets
- Bring data alive through the use of maps
- Tell the story behind the data using story maps
- Implement procedures to work with departments to create a product of the data

These initiatives are manifested through the creation of the Centralized GIS Data Repository, the Master Address Repository (MAR), web apps (see www.http://mapforsyth.org/projects.aspx), and projects like the ongoing Distressed Areas, uses 26 different variables to identifiy areas in need of support (http://mapforsyth.org/Documents/2016_Update_Distressed_Areas_lr.pdf). Data tell a story, and MapForsyth works with numerous stakeholders and data creators to help facilitate these stories with the use of GIS and spatial analysis.

Major Work Items for Fiscal Year 2018

Departmental Goals

1. Generate a Customer Satisfaction Survey
2. Finalize SM3 Monitoring
3. Seek approval of an Interlocal Agreement with Kernersville
4. Seek approval of an Interlocal Agreement with King
5. Create a Decision Tree for New GIS Data and Applications best practices
6. Facilitate and host GIS Day 2017

GIS Team Goals

1. Establish the OpenData Portal 2.0 and Open Data Policy
2. Test and Pilot GIS Software
   a. ArcGIS Pro
   b. QGIS / GRASS
3. Monitor and Manager the GIS Environment (AGOL & Portal)
4. Populate the Information for the Centralized GIS Data Repository

Addressing Team Goals

1. Continue Editing Centerline History Layer
2. Conduct Analysis for the US Census Local Update of Census Addresses (LUCA) Program
3. Create and Maintain the Master Address Repository (MAR)
   a. Views
   b. Integration
4. Topology on Centerlines for improved accuracy
5. Create Address Verifying Website

MapForsyth Staff

Joseph Sloop, PhD, GISP, CGCIO
Geographic Information Officer

Matthew Hamby
Addressing Coordinator

David Toren
GIS Programmer

Anthony 'Skip' Daniels
GIS Programmer

Stacy Tolbert
Addressing Analyst

Jason Clodfelter, GISP, CGCIO, CMS
GIS Analyst

Appendix A: MapForsyth's Fee Schedule

This fee schedule is designed to be in compliance with G.S. 132-1(b) which states, "*People may obtain copies of their public record and public information free or a minimal cost...'minimal cost' shall mean the actual cost of reproducing the public record or public information.*"

PRINTED MAPS (Color or Black and White)	COST
8.5" x 11"	$0.10
11" x 17"	$0.25
18" x 24"	$10.00
24" x 36"	$20.00
34" x 44"	$30.00
DIGITAL MAPS (Web or pdf)	
8.5" x 11"	$0.00
11" x 17"	$0.00
18" x 24"	$0.00
24" x 36"	$0.00
34" x 44"	$0.00
REPORTS	
Buffer Reports	$1.00 (per page)
Address Mailing Labels	$1.00 (per page)
Community Analyst Report	$1.00 (per page)
GIS DATA REQUEST	
Raster (already created)	Free Download
Vector (already created)	Free Download
Raster Creation	Based on hourly rate and project time
Vector Creation	Based on hourly rate and project time
MISCELLANEOUS ITEMS	
Special Projects	Based on hourly rate and project time
Return Check Fee	$25.00
Shipping and Handling	Actual Charges