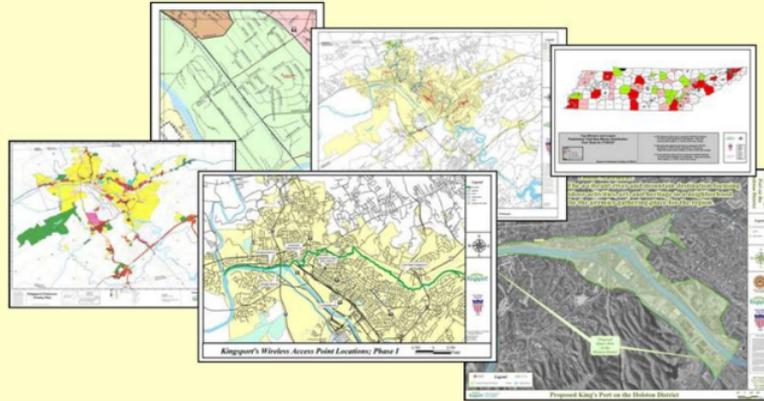


Geographic Information Systems in the City of Kingsport



Christopher Campbell
GIS Analyst

August 4, 2005

GEOGRAPHIC INFORMATION SYSTEMS IN THE CITY OF KINGSPORT

BY:

CHRISTOPHER CAMPBELL
GIS ANALYST

PREFACE

During the summer session of 2005 I was enrolled in a consultantship course at East Tennessee State University, which is part of the course requirements in the Master's of Public Administration program. I was tasked with developing a project that related to my position as a GIS Analyst with the City of Kingsport. The project also required that I go above and beyond the normal scope of my job description and responsibilities. My goal was not only to successfully complete the requirements of the consultantship course, but also provide a product that the City of Kingsport could use to move closer to its vision of being a planned regional center for people and business—the community of choice for the Northeast Tennessee Valley. After much debate, I decided to use the City of Kingsport's Organizational Chart to show how each Department or Division uses geography and GIS to collectively work towards the City's goals and objectives.

Since the concepts of geography and spatial information are easier to understand through the use of pictures, I chose to use a visually medium to explain the uses of GIS in a manner that would be both educational and entertaining. I interviewed every Department head in the City, as well as each Division Manager in the Development Services Department, to inquire about their department's/division's role and responsibilities and also how each incorporate the use of GIS. From their responses and my own research, I developed a 30x40 poster for each City Department and the Divisions of the Development Services Department. Each 30x40 poster was then adhered to a piece of foam board and mounted on the walls of the GIS office. What follows are reduced scale copies of the original 30x40 posters. Although the reduced size diminishes the resolution and quality of the original posters, I believe the overall feel and message still rings true for each. I would like to thank everyone that participated in the interview process for his or her insight and helpfulness.

City of Kingsport Organizational Chart

*Titles and outlines in maroon represent Kingsport City operations.



Citizens & Voters



Board of Mayor and Alderman



Board of Education



Superintendent of Schools



City Judge

25 Boards, Commissions, & Committees

City Manager

City Attorney

City Recorder/
Finance Officer

Development Services

Fire Department

Human Resources

Leisure Services

Office of the City Manager

Police Department

Public Works

Code Enforcement

Legal



Finance

Information Services

Records

Building & Codes

Geographic Information System

Planning

Transportation Planning



Operations (Suppression)

Prevention

Training



Benefits

Compensation

Human Resources

Risk Management

Liability

Property

Safety

Workers Compensation

Training

Bays Mountain Park

Library

Parks and Recreation

Senior Citizens



Assistant City Manager Development

Budget Office

Community Relations

Fleet Maintenance

Grants Specialist

Procurement



Administrative

Operations



Engineering

Facilities Maintenance

Streets & Sanitation

Traffic

Wastewater Services

Water Services



GIS in the Office of the City Manager



"GIS is a tremendous planning tool for this office. The ability to integrate mapping with forms and reports helps to provide a turnkey job." Ray Griffin, City Manager

Office of the City Manager

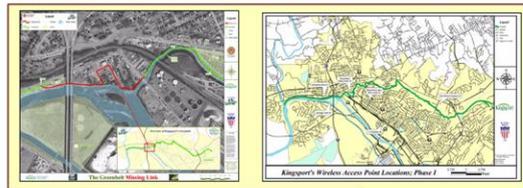
- Assistant City Manager for Development
- Budget Office
- Community Relations
- Fleet Maintenance
- Grants Specialist
- Procurement

The council-manager government is one of two main variations of representative municipal government. The city-manager system of city government was created and designed to bring expertise and efficiency to city government. Kingsport was the first city in the State of Tennessee to adopt the Council-Manager form of government. In this form of government the Board of Mayor and Aldermen, elected by the public, is the governing body of the City and a City Manager is hired by the BMA to carry out the policies it establishes and the overall operations of the municipality. The City Manager serves as the BMA's chief advisor. The mission of the City Manager is to help create a healthy economy as characterized by an expanding and diversifying economic base by providing effective and visionary leadership to the administrative

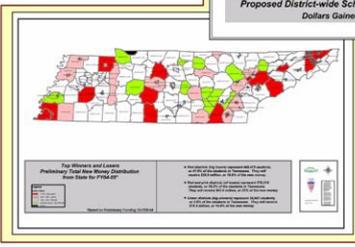
section of city government, advises the Board of Mayor and Alderman on policy matter and to implement Board policy in an effective manner. In Kingsport, some of the major functions of the Office of the City Manager include development of the Board's agendas, development of recommendations in coordination with appropriate staff for BMA consideration, representation of the Board and City on numerous boards, commissions, and agencies at the State, regional, and local levels, preparation and management of the annual budget, management of the day-to-day procurement policies, community and media relations including dealing with citizen complaints and concerns, and management and maintenance of the fleet equipment and rolling stock. The Office of the City Manager is comprised of several divisions including: Assistant City Manager for Development, Budget Office, Community Relations, Fleet Maintenance, Grants, and Procurement. The role of the Assistant City Manager for Development is to help expand and diversify Kingsport's economic base by providing support and coordinating City activities relating to economic development and community partners. The Budget Office conducts the annual budget cycle and provides resourceful analysis and forecasting to support decision-making and planning processes. The budget is arguably the most important policy document that the City deliberates on and adopts each year. Kingsport's total recommended budget, less inter-fund transfers, for fiscal year 2005-2006 is \$129,300,250. The Community Relations Division issues news releases and provides background information on City services, programs, and projects. Fleet Maintenance provides centralized maintenance and purchasing of all city and school vehicles. Grants are a source of revenue that are increasingly important to all municipalities. The Grant Specialist researches, develops, and provides guidance in grant applications and researches other grant programs for funding opportunities. Procurement consists of all the processes involved in requesting, ordering, auditing, and paying for goods and services. The Procurement Division is responsible for purchasing with an emphasis on quality, timeliness of delivery, and cost savings. All items over \$5,000 are secured by competitive bid.



Shown above are examples of location maps.

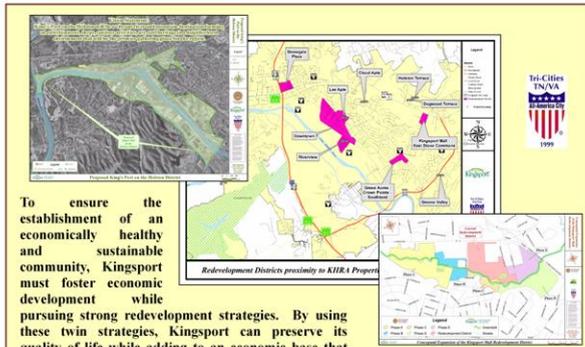


Kingsport City Manager Eric Coffey reviews a GIS map.

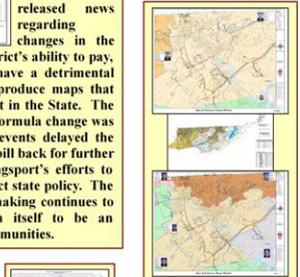


School funding is one of the largest budget expenditures in Kingsport. When the State of Tennessee released news regarding changes in the school funding formula that included a district's ability to pay, it was quickly discovered that it would have a detrimental impact on Kingsport. GIS was used to produce maps that visually showed the impact to every district in the State. The maps helped prove unequivocally that the formula change was not fair and equitable statewide. These events delayed the implementation of the change and sent the bill back for further review. The GIS maps assisted with Kingsport's efforts to communicate with state legislators and effect state policy. The role of GIS in local government decision-making continues to expand exponentially. GIS has proven itself to be an invaluable tool for managing change in communities.

Maps can be custom made to meet the needs of any given project. The two maps above were used to help leverage grant opportunities.

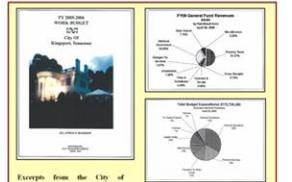


To ensure the establishment of an economically healthy and sustainable community, Kingsport must foster economic development while pursuing strong redevelopment strategies. By using these twin strategies, Kingsport can preserve its quality of life while adding to an economic base that includes attracting new businesses and retaining existing ones. GIS can augment traditional economic development tools with analysis and graphics that make a compelling argument for the City. The maps seen here are but a few examples of how GIS is being used in projects concerning economic development and redevelopment throughout the City of Kingsport.



The maps above depict the State of Tennessee State Districts, Sullivan County Commission Districts and Voting Precincts, and State of Tennessee House Districts.

The U.S. Census Bureau collects demographic information that can help target community and market potential. A variety of maps can be produced to help analyze the data spatially.



Excerpts from the City of Kingsport's Fiscal Year 2005-2006 Work Budget. This document is produced annually by the City Manager's Office.

The City Recorder's Office has been identified as one of the oldest public service professions, along with the tax assessor, in existence. Over the years municipal clerks have become the hub of government, the direct link between the inhabitants of their community and their government. The City Recorder's office is a citywide information and document resource, and is the official records management office for the City. Because the core component of a GIS is the database, its ability to store and organize data has naturally been incorporated into the daily functions of the City Recorder's Department.

GIS in the City Recorder's Department



"The GIS services are vital to our utility billing operations."
Jim Demming,
Chief Financial Officer



Establishing landownership makes the orderly transfer of real estate possible and is the basis for a fair, equitable, and open land tax system. Property assessment, ownership, and other land management attributes are stored on the city's AS/400 and the geography is stored in the geographic information system. In the not so distant past this type of data was virtually inaccessible to departments other than those that were maintaining it. Today, with the use of GIS, it is readily available in formats such as a tabular database, a hard copy map, digital map, and through reporting software.



Governments at all levels require accurate and current land records for mapping the location and extent of landholdings, establishing the ownership of rights in real property, and determining the value of those rights. This information provides the foundation for income generation, land use planning, environmental management, public safety, public works, and a myriad of other applications essential to governments. Valid land records also underpin all types of business activities.



Recordkeeping for a municipality is critical. The City Recorder's office is the keeper of all official records relating to city government, including the minutes of the Board of Mayor and Aldermen, ordinances, resolutions, contracts, and deeds. The City Recorder's Department is comprised of Finance, Records, and Information Services. The City

Recorder is the Chief Financial Officer and also serves as City Clerk. The mission of the City Recorder's Department is to help create a healthy economy as characterized by an expanding and diversifying economic base by providing general sound stewardship of the city's fiscal affairs and general accounting supervision over the city's property assets and disposition thereof. The department administers property taxes and business licenses throughout the city. There are over 24,100 real property accounts in the City of Kingsport equaling an assessed value of 1.2 billion dollars. Other responsibilities of this department include payroll, internal auditing, financial reporting, accounts payable/receivable for both the City of Kingsport and city schools, and water/sewer utility billing. There are currently over 36,000 water accounts and over 21,000 sewer accounts. These figures include accounts that are outside of Kingsport's municipal boundaries. The Information Services Division maintains computerized records and provides hardware and software support to all city government departments. Their mission statement is to help create a healthy economy as characterized by an expanding and diversifying economic base by providing information technology through the development of computer networks, workstation, maintenance of mainframe systems, intranet, and internet access via networked servers, and maintenance of the city's website.

When the Information Services Division was tasked with determining the costs associated with extending fiber optic to city owned properties on West Industry Drive GIS was used in order to calculate the length and cost associated with the extension.

Examples of how the Geodatabase stores attributes pertaining to the Parcel and City Owned data layers.

This map displaying city owned property is one example of how GIS and its output capabilities are used in the City Recorder's Department.

Thematic Layers of the Parcel Data Model

This graphic illustrates the numerous geographic layers that are incorporated into the parcel data model. The use of GIS provides for a comprehensive solution for efficient and accurate mapping, fair and accurate assessment of all real property, and timely access to ownership, assessment, and map data. By using GIS, the City of Kingsport has a comprehensive and highly integrated platform for data creation, integration, maintenance, and dissemination of land records data.

GIS in the City Attorney's Department

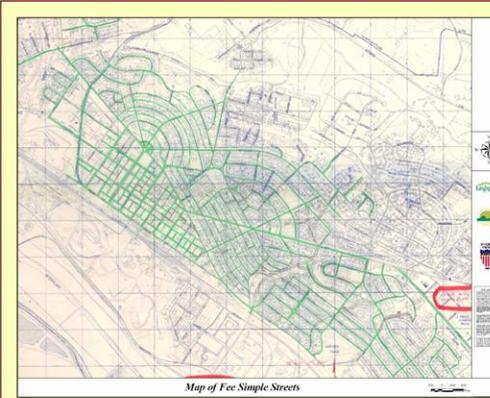


City Attorney

Code Enforcement

The Office of the City Attorney is responsible for all of the City's legal business. As such, the City Attorney serves as the legal advisor and representative for the City of Kingsport. The mission of the City Attorney's Department is set out and established in Kingsport's City Charter. The position exists to represent and/or advise the City Council, Boards and Commissions, the City Manager, and City Staff with respect to all legal matters pertaining to the City. One of the most important functions of the City Attorney is to render advice to the City Council to ensure that Council members' actions fall within the framework of the law. In this role the City Attorney advises the City Council on procedural and substantive legal issues, the possible legal ramifications of proposed courses of action, and on matters directly affecting the conduct of City Council business, such as public meeting and conflict of interest laws. The City Attorney is charged with the responsibility of drafting or reviewing a host of legal documents necessary for the daily operation of the City. These include contracts, leases, deeds, resolutions, ordinances, bonds, insurance, and many others. As the chief legal officer of the City, the City Attorney has primary responsibility for the enforcement of the City municipal codes. The City of Kingsport operates in compliance with hundreds of written codes that are designed to maintain a healthy, safe and clean environment, carry out land use policy, and preserve the quality-of-life standards that residents and businesses enjoy in the community. The City Attorney's Department provides highly complex and responsible support, legal advice, research, and interpretation of laws, statutes and ordinances to the City while assuring compliance with statutory and other legal requirements. The department represents the City in actions charged by the City, and in all legal actions and/or claims alleged against the City. As government becomes increasingly legalistic, there is increased demand for daily legal services such as advice, drafting, and compliance review.

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Fee simple is a term used to describe the absolute title to land, free of any other claims against the title, which one can sell or pass to another by will or inheritance. This is a redundant form of fee, but is used to show the fee, or absolute title, is not a conditional fee or determinable fee. Kingsport is unique in that the City actually owns the streets within its downtown area. This map depicts which streets in Kingsport are fee simple. The remainder of the streets in Kingsport only exist by right of way, that is the right of way is a specific grant of land or an easement which is the right to pass across another's land.

A disclaimer is a legal statement that generally states that the person/group authoring the disclaimer is not responsible for any mishap in the event of using whatever object or information the disclaimer is attached to. This is generally done as a measure of legal protection. In this era of frivolous lawsuits, it has become imperative to place a disclaimer on everything including the products produced by the GIS Division. The services of the City Attorney were used to create a disclaimer appropriate for GIS products.

This map product was prepared from a Geographic Information System established by the City of Kingsport for its internal purposes only, and was not intended for use for general use, agents, and persons, made no representation or warranty as to the accuracy and in particular, as to accuracy as to location, dimensions, contours, property boundaries, or placement or location of any map features. The City of Kingsport, its employees, agents and employees, agents and persons, heretofore and hereafter, shall not be held liable for any and all damages, loss or liability, whether direct, indirect or consequential which arises or may arise from the use of this product or the use thereof for any purpose or entity.

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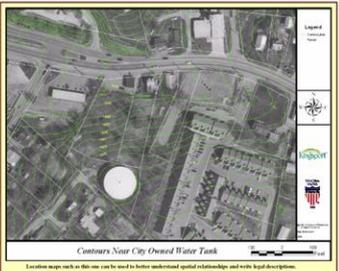
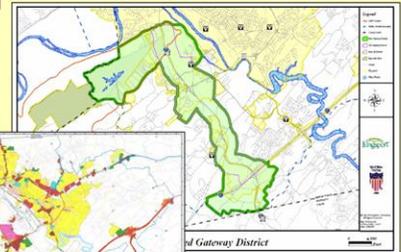
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A legal description is a method of geographically identifying a parcel of land that is acceptable in a court of law. The description of land is based on government surveys, spelling out the exact boundaries of the entire piece of land. It should so thoroughly identify a parcel of land that it cannot be confused with any other. The City Attorney provides assistance in preparing legal descriptions relating to activities such as annexations and the creation of special districts like the Gateway District, which is shown in this map.



Kingsport City Attorney Mike Hillhouse is shown at a map depicting the South portion of the City of Kingsport, TN.

Zoning is the public regulation of land and building use to control the character of a place. The City Attorney uses the Kingsport Zoning Map to assist in his code enforcement responsibilities. Effective code enforcement preserves community aesthetics and enhances property values. GIS tools enable those responsible for code enforcement to respond proactively and prevent neighborhood deterioration.



The City Attorney developed the GIS Division's Usage Agreement. It establishes an agreement between parties in dealing with one another such as may be applied in procurement to define terms and performance.

This agreement is intended to define the terms and conditions of the use of the City of Kingsport's Geographic Information System (GIS) by any person or entity. The City of Kingsport, its employees, agents and persons, heretofore and hereafter, shall not be held liable for any and all damages, loss or liability, whether direct, indirect or consequential which arises or may arise from the use of this product or the use thereof for any purpose or entity.

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"GIS is utilized in order to bring to life legal descriptions and agreements concerning property and law. A picture is worth a thousand words. It can potentially take a thousand hours to read a legal document but it only takes a few moments to interpret a map."

Mike Billingsley, City Attorney

GIS in the Leisure Services Department

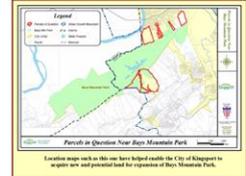
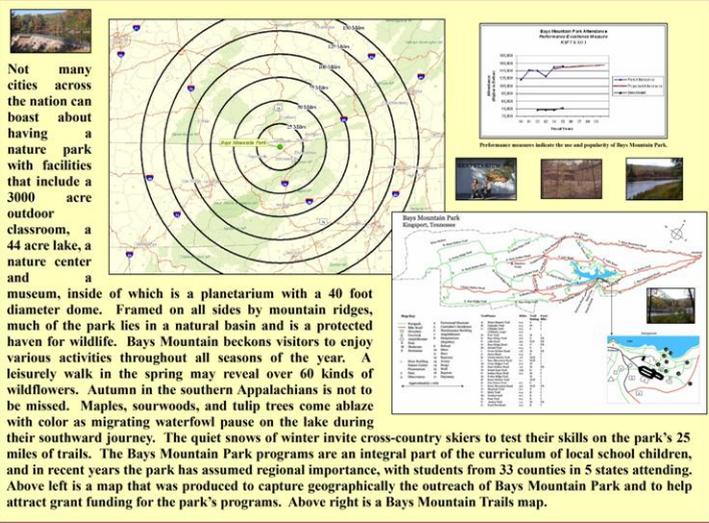


Leisure Services

- Bays Mountain Park
- Library
- Parks and Recreation
- Senior Citizens

Whether you want to take a nature walk, see historic sites, read a book, learn more about the environment, search the internet, participate in a sporting event, or experience cultural opportunities, the City of Kingsport has it all. The Leisure Services Department is dedicated to improving the quality of life for all citizens and visitors by providing the best possible recreational activities, special events, facilities, and services that encourage lifelong learning, fitness, and fun. The full health benefits of Leisure Services are not always immediately recognizable. Access to arts, culture, parks, and recreation is connected to health and well being in many ways. Examples include: improved physical health from exercise and participation in activities, an increased knowledge base provided through libraries and mental stimulation, raised self-esteem, and reduced social isolation through participation in the arts and physical activities resulting in mental health benefits. The Leisure Services Department provides residents and visitors a variety of recreational programs, activities, and events for all interests and lifestyles. The Leisure Services Department is comprised of four divisions: Bays Mountain Park, Library, Parks and Recreation, and Senior Citizens. These respective divisions are responsible for the administrative and operational functions that provide for the diverse programs, opportunities, and facilities that are available in Kingsport. These divisions work collectively to ensure that a broad range of sport, culture, parks and recreation, and leisure opportunities are available and affordable to the City's residents and visitors.

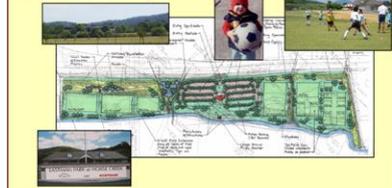
"One of the greatest uses of GIS has been identifying existing and potential properties for park expansion. GIS puts information in your fingertips and allows you to visually display property boundaries and owner information." Tom Bowman, Leisure Services Director



The Kingsport Greenbelt is a linear park that connects residential neighborhoods, traditional parks, downtown, commercial districts, schools, and activity centers. A special feature of this unique park is a pathway for pedestrian and bicycle use. The pathway meanders through marshlands, glides across open meadows, and passes by sites of historical and aesthetic value. A citizen advisory committee and the Kingsport Parks and Recreation Department guide development and operation of the Greenbelt. The popularity and geography of the Greenbelt makes it one of the most requested customized map products. Above is an instance where the GIS Division used GPS to pinpoint the Greenbelt's path and distance markers. Park users, public safety personnel, and other city employees use this map extensively. To the right is a map that was used in a presentation to Tennessee's Governor Phil Bredesen to show the Greenbelt's missing link. The map represents how GIS is used to attract grant money and show the needs of the community visually.



Pictured above is Weyerhaeuser Park and below is Eastman Park. They are Kingsport's two newest parks. Kingsport has the sports facilities to accommodate a wide variety of uses. Many of these facilities have been used to host national and international competitions.



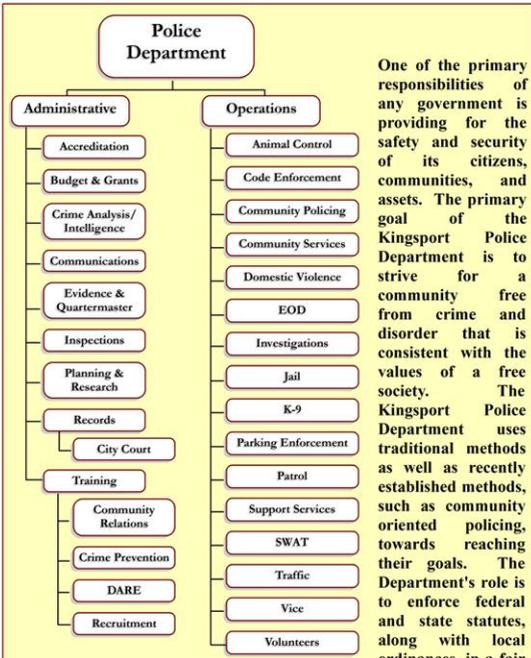


Law enforcement agencies face a multitude of challenges protecting life and property and keeping the peace in their communities. These tasks require both strategic and tactical planning in rapidly changing social, economic, and political environments. Virtually every task has a geographic component. While law enforcement agencies collect vast amounts of data, only a portion of this information can be absorbed from spreadsheets and database files. GIS provides an integrated method to display and analyze all types of data, allowing law enforcement agencies to better leverage information for crime prevention.

GIS in the Police Department

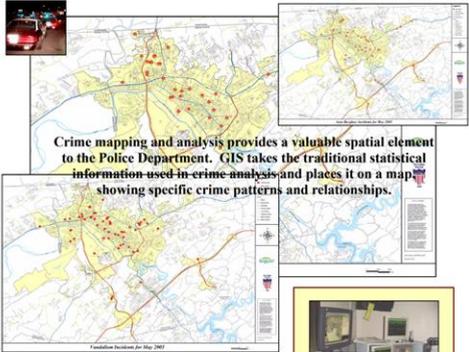


The Kingsport Police Department employed 91 officers in 1928.

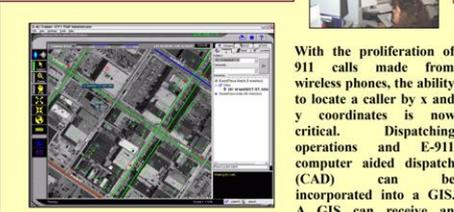


One of the primary responsibilities of any government is providing for the safety and security of its citizens, communities, and assets. The primary goal of the Kingsport Police Department is to strive for a community free from crime and disorder that is consistent with the values of a free society. The Kingsport Police Department uses traditional methods as well as recently established methods, such as community oriented policing, towards reaching their goals. The Department's role is to enforce federal and state statutes, along with local ordinances, in a fair

and impartial manner. The Kingsport Police Department recognizes and abides by judicial and statutory limitations placed upon police authority. The men and women of the Kingsport Police Department are dedicated to the department's mission of preservation of the peace, protection of life and property, prevention of crime, apprehension of criminals, recovery of lost and stolen property, and enforcement of the law both fairly and impartially. The Police Department maintains certification as an Accredited Law Enforcement Agency. The Kingsport Police Department is an internationally accredited law enforcement agency through CALEA, the Commission on Accreditation for Law Enforcement Agencies. The accreditation concept makes a statement to law enforcement colleagues and other professionals that the KPD meets the very highest standards. The KPD was only the third accredited department in Tennessee and the first in upper east Tennessee.



Police departments collect huge amounts of geographic data in the ordinary course of business. Computer-aided dispatch systems and police records management systems are filled with records of crimes, incidents, dispatches, suspects, arrests, and intelligence information all of which contain places and addresses. GIS brings this data alive in a way that cannot be matched by reports, lists, or tables alone. GIS provides an intuitive visual interface that makes obvious the patterns that would otherwise be lost in the sheer volume of events and dispatches.



With the proliferation of 911 calls made from wireless phones, the ability to locate a caller by x and y coordinates is now critical. Dispatching operations and E-911 computer aided dispatch (CAD) can be incorporated into a GIS. A GIS can receive an

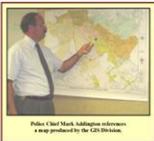
address from an incoming 911 call and locate the call on a map display. This allows dispatchers to visually assign the available equipment, determine the shortest route, and activate a dispatch. Wireless E-911 calls can be placed on the map by using cell tower triangulation and other location technology. In some instances, callers do not know their location, and automated location determination technology becomes critical for efficient response.



E-911 Mapping has been proven to reduce response times for wireless and wireline communications. Kingsport's Emergency Communications District uses GIS mapping software produced by microData, Inc. The application and the data is maintained and updated by the GIS Division.



GIS plays an important role in law enforcement and criminal justice. The ability to access and process information quickly while displaying it in a spatial and visual medium allows the Police Department to allocate resources quickly and more effectively. In the mission-critical nature of law enforcement, information about the location of a crime, incident, suspect, or victim is often critical in determining the manner and size of the response.



Police Chief Mark Addington addresses a group produced by the GIS Division.



GIS is instrumental in assisting with many different strategic and tactical problems such as warrant services, SWAT incidents, domestic violence, terrorism, search and rescue operations, and court presentations.



GIS is a valuable medium for quickly sharing information and improving the decision making process. GIS is used not only to respond to an emergency event but in planning, mitigation, preparedness, and recovery.



"GIS is used to visualize crime patterns and intelligence analysis data." Mark Addington, Police Chief



Photo: Information Systems and Technology Services
Public Works, utilizes the output of GIS to help manage and complete the daily tasks.

GIS is emerging as a principal tool to enhance local government services delivery. It can be used to manage spatial and environmental information about municipal facilities and services including their relationship to citizens and other customers.

GIS in the Public Works Department



Public Works

Engineering

Facilities Maintenance

Streets and Sanitation

Traffic

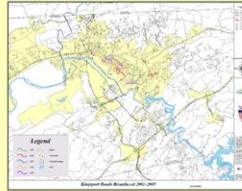
Wastewater Services

Water Services

The Kingsport Public Works Department is one of the largest departments in the city. The work and day-to-day operations of this department are essential to the health and livability of Kingsport. The city's infrastructure is analogous to one's skeleton. It is the support system that the rest of the city and its many auxiliary operations rely on. Some of the key responsibilities and maintenance issues of this department include: streets, sidewalks, storm and sanitary sewers, water mains, facilities and grounds, landscaping, traffic flow, streets lights, garbage

pickup, trash pickup, recycling, demolition landfill, civil engineering, and environmental services. The mission of the Public Works Department is to maintain the basic infrastructure of the City of Kingsport and to improve services to meet the needs and expectations of our customers in a safe and cost efficient manner. Many of the services and infrastructure responsibilities of this department are achieved without recognition or are hidden out of sight underground, but that in no way undermines how critical they are to the present and future condition of Kingsport.

The complex and crucial tasks asked of the Public Works Department require powerful and sophisticated tools such as water testing apparatuses, chemical filtering equipment, environmental measuring tests, bulldozers, dump trucks, and garbage trucks. GIS is also utilized as a tool to help personnel map, plan, and analyze infrastructure and other data. This map is an example of how the city's annual paving and resurfacing program is tracked throughout time.



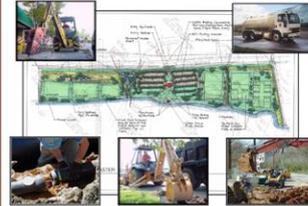
Designing and maintaining street networks is a complex and serious responsibility. Plans must be reviewed and analyzed, data needs to be collected, and reports must be prepared. Traffic counts are set out in strategic locations throughout the city on a yearly basis in order to collect and document traffic patterns. This data is then used by officials to plan infrastructure needs and by economic developers to analyze and forecast future opportunities based on location decisions.



Location	Count	Notes
101st St	1200	
102nd St	1150	
103rd St	1100	
104th St	1050	
105th St	1000	
106th St	950	
107th St	900	
108th St	850	
109th St	800	
110th St	750	
111th St	700	
112th St	650	
113th St	600	
114th St	550	
115th St	500	
116th St	450	
117th St	400	
118th St	350	
119th St	300	
120th St	250	
121st St	200	
122nd St	150	
123rd St	100	
124th St	50	

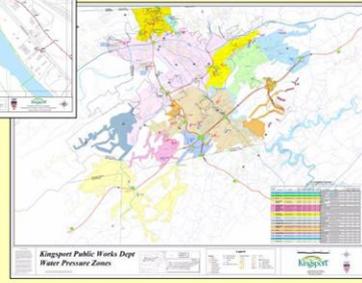


GIS can be used to schedule and route crews for tasks such as grounds maintenance, road repairs, garbage/trash routes, and snow removal. It can help track the status of infrastructure components, prioritize jobs, and create efficient work plans for crews.



GIS must be able to organize, manage, and distribute geographic information while maintaining data integrity and focusing on project direction. The database and the information stored within it is what makes GIS such a powerful tool. Below is a sample report regarding street statistics and bottom left is an excerpt of Kingsport's Geodatabase.

Street Name	Length (ft)	Width (ft)	Area (sq ft)
101st St	1000	40	40000
102nd St	1000	40	40000
103rd St	1000	40	40000
104th St	1000	40	40000
105th St	1000	40	40000
106th St	1000	40	40000
107th St	1000	40	40000
108th St	1000	40	40000
109th St	1000	40	40000
110th St	1000	40	40000
111th St	1000	40	40000
112th St	1000	40	40000
113th St	1000	40	40000
114th St	1000	40	40000
115th St	1000	40	40000
116th St	1000	40	40000
117th St	1000	40	40000
118th St	1000	40	40000
119th St	1000	40	40000
120th St	1000	40	40000
121st St	1000	40	40000
122nd St	1000	40	40000
123rd St	1000	40	40000
124th St	1000	40	40000



The Public Works Department needs the ability to manage many different types and formats of spatial information in order to carry out its operations management and planning functions. Water mains, valves, hydrants, meters, storage facilities, sewer mains, manholes, TV inspection data, and condition ratings are among the themes that could be included when maintaining distribution and collection systems. The GIS Division works with the Public Works Department to provide them with a series of map books and indexes that field crews and project managers use on a daily basis to maintain and improve the city's infrastructure.

Surveyors and engineers understand the importance of geographic data. Surveyors use precise instruments, procedures, and computations to accurately locate and define geographic features while conducting field surveys. Engineers design and build structures and infrastructures on geography measured by surveyors.

KINGSPORT GEODETIC REFERENCE NETWORK					
MON#	LATITUDE	LONGITUDE	NORTHING	EASTING	ELEVATION
1	36 35 20.864392	82 37 43.43036	839520.39	25698220.48	1322.47
2	36 35 20.816202	82 35 25.9292	839430.98	2564440.89	1209.29
3	36 35 20.444382	84 15 25.973	839441.66	2574742.96	1209.45
4	36 35 46.781892	29 13 27.968	839533.70	2569770.39	1412.39
5	36 35 30.925082	28 04 02.959	839445.98	3005344.19	1434.37
6	36 35 49.829682	27 10 08.058	839500.13	3003760.86	1468.54
7	36 34 38.812482	21 30 38.232	839766.96	3037969.23	1588.04
8	36 34 49.829682	27 10 08.058	834500.98	3003760.86	1468.54
9	36 34 26.464382	24 04 28.154	834975.57	3025103.91	1377.81
10	36 34 49.829682	27 10 08.058	835394.51	2963778.61	1346.26
11	36 34 49.829682	27 10 08.058	835494.51	2963778.67	1474.03

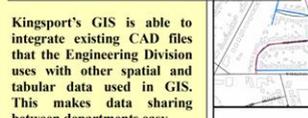
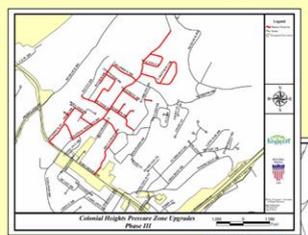


Category	Item	Value
Construction	Asphalt	100
Construction	Concrete	200
Construction	Gravel	300
Construction	Earth	400
Construction	Water	500
Construction	Electric	600
Construction	Gas	700
Construction	Sanitary Sewer	800
Construction	Storm Sewer	900
Construction	Water Main	1000
Construction	Sanitary Sewer Main	1100
Construction	Storm Sewer Main	1200
Construction	Water Main	1300
Construction	Sanitary Sewer Main	1400
Construction	Storm Sewer Main	1500
Construction	Water Main	1600
Construction	Sanitary Sewer Main	1700
Construction	Storm Sewer Main	1800
Construction	Water Main	1900
Construction	Sanitary Sewer Main	2000
Construction	Storm Sewer Main	2100
Construction	Water Main	2200
Construction	Sanitary Sewer Main	2300
Construction	Storm Sewer Main	2400
Construction	Water Main	2500
Construction	Sanitary Sewer Main	2600
Construction	Storm Sewer Main	2700
Construction	Water Main	2800
Construction	Sanitary Sewer Main	2900
Construction	Storm Sewer Main	3000

Category	Item	Value
Construction	Asphalt	100
Construction	Concrete	200
Construction	Gravel	300
Construction	Earth	400
Construction	Water	500
Construction	Electric	600
Construction	Gas	700
Construction	Sanitary Sewer	800
Construction	Storm Sewer	900
Construction	Water Main	1000
Construction	Sanitary Sewer Main	1100
Construction	Storm Sewer Main	1200
Construction	Water Main	1300
Construction	Sanitary Sewer Main	1400
Construction	Storm Sewer Main	1500
Construction	Water Main	1600
Construction	Sanitary Sewer Main	1700
Construction	Storm Sewer Main	1800
Construction	Water Main	1900
Construction	Sanitary Sewer Main	2000
Construction	Storm Sewer Main	2100
Construction	Water Main	2200
Construction	Sanitary Sewer Main	2300
Construction	Storm Sewer Main	2400
Construction	Water Main	2500
Construction	Sanitary Sewer Main	2600
Construction	Storm Sewer Main	2700
Construction	Water Main	2800
Construction	Sanitary Sewer Main	2900
Construction	Storm Sewer Main	3000



Diagram of how the sewer system works.



"GIS bridges the infrastructure management divide between the 20th and 21st century."
Ryan McReynolds, Assistant City Manager for Public Works



GIS in the Human Resources Department



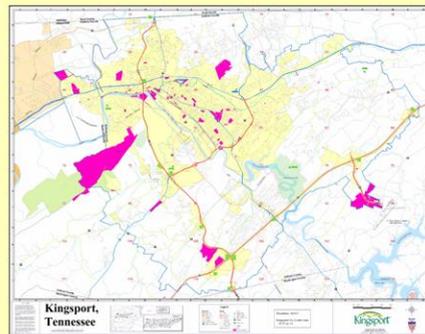
Human Resources

- Benefits
- Compensation
- Human Resources
- Risk Management
 - Liability
 - Property
 - Safety
 - Workers Compensation
- Training

The Human Resources Department provides a critical role within the City of Kingsport. This Department is responsible for designing and implementing the personnel system for the City. Their main goal is achieving this within a prescribed budget, with a limited number of positions, which is politically acceptable and complies with all laws and sanctions regarding personnel issues. Excluding schools, there are approximately 745 city employees. Of those, 76% are male and 24% are female. The median age for a city employee is 42. Human resource management consists of four fundamental functions needed to manage personnel in public organizations. These functions are planning, acquisition, development, and sanction. The planning function consists of budget preparation and human resource planning activities such as job analysis, classification, and evaluation techniques. Pay and benefits

"With the ability to visually display the City, GIS helps us support our mission."
 Belva Hale, Human Resources Director

Risk management is the decision-making process involving considerations of political, social, economic, and engineering factors with relevant risk assessments relating to potential hazards. GIS is incorporated to help locate and track City owned property and facilities. These assets must be insured and managed much in the same way private citizens insure and protect their private property. This map produced by the GIS Division displays all City owned property and is used by a number of different departments and divisions.



Employees from the Human Resources Department use GIS maps to complete a variety of different tasks.



are also included in this function. Acquisition involves recruitment and selection of employees. The development function is made up of orientation, training, motivating, and evaluating employees to increase their competencies. Employee assistance programs are also included in this function. These types of programs are designed to diagnose, treat, and rehabilitate employees' personal problems before they have an irreparable effect on job status. The sanction function establishes and maintains expectations and obligations that employees and the City have toward one another. This can include health and safety concerns, discipline, grievances, and employee rights. Risk Management is another component of the Human Resources Department. Risk management encompasses the traditional elements of insurance and benefits, and handles safety matters as well as the City's liability exposures. Risk management is the combination of three steps: risk evaluation, emission and exposure control, and risk monitoring.

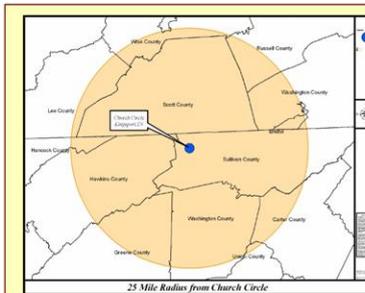
It is imperative that Risk Management knows of all city owned property. GIS stores the location and tax attributes relating to properties that the city owns. The graphics shown here are excerpts of Kingsport's Geodatabase.



One of the most requested products from the GIS Division is a basic location map such as this one. With GIS, the map can be customized to the customer's satisfaction.



Orientation includes activities and programs designed to help new employees become acquainted with the City of Kingsport. The standard general map of Kingsport, as seen to the left, is a very practical tool produced by the GIS Division that can be utilized in an orientation or training program. It can be used to help route an employee or citizen to a particular location, measure distances, or locate landmarks throughout the city.



Some Departments and Divisions require employees that may be called in for emergency response situations to live within a certain distance from Kingsport. This map is an example of a 25 mile radius from Church Circle.

Age	Gender	Race	Education
20-29	Male	White	High School
30-39	Female	Black	College
40-49	Male	White	High School
50-59	Female	Black	College
60-69	Male	White	High School
70-79	Female	Black	College
80-89	Male	White	High School
90-99	Female	Black	College



Example of a Map of Kingsport Application for Employee



HAVE YOU EVER WONDERED WHAT OTHERS SAY ABOUT YOU WHEN YOU ARE NOT LISTENING?



If you work in the Improvement Building then you should know firsthand how fast word of mouth and untrue rumors travel. To combat and counteract the spread of this uncontrollable kudzu, a reverse physiology experiment has been developed that includes real quotes. How fast will positive news travel? It is up to you to decide.

When asked to provide insight on how GIS is used in their respective department or division, members of both the Leadership and Management teams had positive things to say. Below are their quotes listed alphabetically according to their first name.



Alan Webb, Planning Director, *"A planner needs the ability to visualize the landscape like a map. You have to be able to read and interpret spatial data as if you were reading a book."*

Belva Hale, Human Resources Director, *"With the ability to visually display the City, GIS helps us support our mission."*

Bill Albright, Transportation Manager, *"Transportation professionals increasingly rely on geographic information systems to manage infrastructure, grants, and administrative policies."*

Craig Dye, Fire Chief, *"GIS, we would be lost without you."*



Jim Demming, Chief Financial Officer, *"The GIS services are vital to our utility billing operations."*

Mark Addington, Police Chief, *"GIS is used to visualize crime patterns and intelligence analysis data."*

Mike Billingsley, City Attorney, *"GIS is utilized in order to bring to life legal descriptions and agreements concerning property and law. A picture is worth a thousand words. It can potentially take a thousand hours to read a legal document but it only takes a few moments to interpret a map."*

Mike Freeman, Building Official, *"GIS is a tool we use to get our jobs done."*

Ray Griffin, City Manager, *"GIS is a tremendous planning tool for this office. The ability to integrate mapping with forms and reports helps to provide a turnkey job."*

Ryan McReynolds, Interim Assistant City Manager for Public Works, *"GIS bridges the infrastructure management divide between the 20th and 21st century."*

Tom Bowman, Leisure Services Director, *"One of the greatest uses of GIS has been identifying existing and potential properties for park expansion. GIS puts information in your fingertips and allows you to visually display property boundaries and owner information."*



GIS Office Before Posters



The posters that were developed over the course of the project were adhered to 30x40 foam board and then mounted throughout the GIS Office. These pictures show what the office looked like before and after the posters were hung. The posters have become a focal point of the office. They animate the work and scope of the GIS Division in a manner that is both easily understood and entertaining.



Produced By
Chris Campbell
GIS Analyst

GIS Office After Posters

