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EXECUTIVE SUMMARY

The City of Suffolk, Virginia initiated a City-wide Geographic Information System (GIS) implementation in July of 1997, with the issuance of an RFP for a GIS consultant. Baker – GeoResearch, the GIS consulting unit of the Michael Baker Corporation, was ultimately selected to work with the City to ensure the successful, multi-phased GIS implementation. Upon its successful implementation, Suffolk intends to utilize its GIS to improve the operating efficiencies, data exchange, and planning and analysis capabilities of over fifteen City departments.

Phase I of the implementation procedure includes the development of a comprehensive GIS Needs Assessment, Data Survey, Management Plan, and System Implementation Plan, intended to provide the basis for the design of the City's planned GIS. Cumulatively, Phase I is referred to as the System Planning Phase. Phase I is logically followed by System Design (Phase II), Implementation (Phase III), and System Production/Maintenance (Phase IV). The accompanying GIS Needs Assessment report is intended to present the results of the Needs Analysis, which was conducted to determine the City's overall desire, and need for the planned GIS.

Based upon information gathered through user questionnaires and personal interviews, it was determined that City personnel are anxious to embrace GIS technology, and look forward to maximizing the benefits offered by a City-wide GIS. Together with the City's potential GIS users, Baker personnel evaluated over 100 potential municipal GIS applications, with fifty-four being selected as potential Focus Applications. A Focus Application is defined as an intended use of the planned system that will 1) improve existing work flows and efficiencies, 2) provide the best return on the City's initial investment in the GIS, and 3) present the best chances for an early success. Ultimately, twenty-six individual applications, falling within ten distinct categories, were selected as Focus Applications.

Based upon the results of the Needs Assessment, which defines the system's required functionality, a Data Survey will be conducted to determine the data required to support the desired applications. Following the Data Survey, a System Implementation Plan will be developed to guide the system design, procurement, and installation. A Management Plan will also be produced to identify management and staffing issues, which must be addressed during system implementation, production, and maintenance.

As a result of implementing GIS technology, the City of Suffolk can expect to realize a number of tangible and intangible benefits. Several of the potential benefits include:

- Rapid access to current, accurate digital information, enabling more efficient performance of daily job functions
- Reduction or elimination of data redundancy among departments, resulting in decreased operating costs and increased operating efficiencies
- Improved accuracy of existing information
- Increased data query, reporting, and map production capabilities
- Increased decision support capabilities
- Better informed employees and citizens
- Increased organization and integration of spatially related/oriented information
- Improved employee morale, through the reduction or elimination of certain redundant manual functions
- Potential revenue source through the distribution of data
- More efficient management of limited City resources
- Improved customer service

CHAPTER 1 – NEEDS ANALYSIS METHODOLOGY AND PROCEDURE

The development of a Comprehensive Needs Analysis report is the first critical step toward a successful Geographic Information System (GIS) implementation. A GIS Needs Analysis, such as the one performed for the City of Suffolk, is intended to achieve the following primary objectives:

1. Extract detailed information about the City's existing work flows, data, procedures, and hardware/software platforms
2. Determine how to most effectively implement the City's GIS
3. Prepare a Comprehensive Needs Assessment report detailing the findings of the Needs Analysis

For the City of Suffolk, these objectives were achieved through the performance of the following sub-tasks:

1. Staff Orientation
2. Develop, Distribute, and Analyze User Questionnaires
3. Conduct User Interviews
4. Develop Preliminary Application Designs and Definitions
5. Define Landbase Requirements
6. Perform Work Flow Analysis
7. Prepare a Comprehensive Needs Assessment report

A brief description of each sub-task, along with the results achieved, is presented in the following sections:

STAFF ORIENTATION

Baker staff presented a GIS orientation program to City employees on May 14, 1998, in the City Council Chambers. The purpose of the orientation was to

1. Introduce GIS technology to the City's potential users
2. Prepare the attendees for participation in personal interviews
3. Distribute and explain the user questionnaires

The orientation program consisted of the following presentations:

1. Introduction to GIS
2. The GIS Implementation Process
3. GIS Applications in Municipal Government
4. Data Conversion and Migration
5. Handout and Explain User Questionnaire

DEVELOP, DISTRIBUTE, AND ANALYZE USER QUESTIONNAIRE

Prior to presenting the Staff Orientation program, Baker staff prepared a series of questionnaires for the purpose of soliciting pertinent information from each of the City's selected Needs Assessment participants. Copies of these questionnaires are included in the appendix. These questionnaires were distributed to approximately seventy-five City employees during the staff orientation. A total of fifty-four City employees, representing a variety of departments, completed the questionnaires.

Baker researchers analyzed the completed questionnaires to identify existing work flows, desired GIS applications, trends, inconsistencies, redundancies, deficiencies, and discrepancies. This information was used in preparation for the personnel interviews, as well as for the preparation of this Needs Assessment report.

CONDUCT USER INTERVIEWS

Baker researchers conducted a series of personal interviews, with selected City employees, over a two week period. A total of fifty-eight City employees, representing a variety of City departments, were interviewed. There is no correlation between the number of employees who completed the questionnaires, and those whom were interviewed. Several employees who completed the questionnaire were not interviewed, and vice versa. A complete list of City employees who participated in the Needs Analysis, through completion of the questionnaire, participation in the interviews, or both, is included in the Chapter 2.

The personal interviews were used to clarify issues identified through the analyses of the questionnaires. Baker researchers focused on data used throughout the City, movement of this data, and potential GIS applications.

Detailed interview notes from the personnel interviews were compiled into a stand-alone document, and provided to the City's GIS Committee as a "working" document.

DEVELOP PRELIMINARY APPLICATION DESIGNS AND DEFINTIONS

Based on the results of the questionnaire analysis, supplemented with the information gathered during the personal interviews, Baker researchers identified all of the potential GIS applications desired by the various City departments. Of these 144 potential GIS applications, Baker researchers identified a total of twenty-six individual focus applications, falling within ten distinctive groups. As used in this report, a focus application is defined as an application which will 1) improve existing work flows and efficiencies, 2) provide the best return on the City's initial investment in the proposed GIS and 3) present the best chances for an early success. These are the applications that will be developed as part of the City's base GIS. Additional applications, which are deemed to be of value to the City, may be developed and included in the GIS as additional funding becomes available, and/or the demand arises.

DEFINE LANDBASE REQUIREMENTS

Utilizing the results of the preliminary application designs and definitions, Baker researchers and designers investigated and determined the following:

1. Landbase utilization by each participating department
2. Probable additional applications (not focus applications)
3. Features and components to be included in the landbase to support both the focus and probable applications
4. Landbase accuracy requirements
5. Required map scales

A departmental landbase feature matrix, that lists the required landbase features and components by participating department, was developed, and is included in Chapter 6.

PERFORM WORKFLOW ANALYSIS

Based upon the determination of the ten Focus Application categories, Baker staff worked with City personnel to compile a series of detailed work flow diagrams. These diagrams illustrate the current data utilization and movement required for the performance of the work processes. The following current work processes were diagramed and analyzed:

1. Parcel Map Maintenance
2. Address Assignment
3. Permitting
4. Inspections
5. E-911 Dispatching

These diagrams were analyzed to determine:

1. How decisions are currently made
2. How services are currently delivered
3. Existing data used to make decisions and provide services
4. Techniques currently used to make decisions and provide services
5. Information flows between departments and agencies
6. Current mapping functions, processes, and operation techniques and methodologies

Upon the completed analyses of the current work flows, a series of automated work flow diagrams were developed to illustrate the automation and/or re-engineering that will occur as a result of the GIS implementation. The completed work flow analysis diagrams are included in Appendix C.

PREPARE COMPREHENSIVE NEEDS ASSESSMENT REPORT

The final product of the City of Suffolk's Needs Analysis is the comprehensive GIS Needs Assessment report presented in the following chapters. Baker researchers and designers formatted the data, which was gathered, compiled, and analyzed during the needs analysis, into this report.

CHAPTER 2 – SUMMARY OF FINDINGS

STUDY PARTICIPANTS

A total of seventy-two City employees participated in the Needs Assessment through the completion of user questionnaires, participation in personal interviews, or both. These various employees represent a total of twenty-six different City departments, or offices, as listed below:

Participating Departments, Offices, or Agencies

5th District Court Service Unit	Assistant City Manager – Development
Assistant City Manager – Operations	Circuit Court Clerk's Office
City Assessor	City Manager's Office
Commissioner of the Revenue	Department of Public Utilities
Department of Public Works	Economic Development
Finance	Fire Department
Fleet Management	Information Technology
Library	Neighborhood Development Services
Parks and Recreation	Personnel
Planning	Police Department
Public Schools	Registrar
Social Services	Suffolk Health Department
Treasurer	Virginia Cooperative Extension

A complete list of participating employees is included on the following pages.

Last Name	First Name	Department	Office	Division	Questionnaire	Interview
Andrews	Larry	Public Utilities				4
Biberdorf	Mark	City Managers Office	Management Services		4	
Blakeney	John	Police			4	4
Byrum	Stanley	Public Utilities	Maintenance		4	4
Carruth	Fredia	Finance			4	
Cunningham	MaryAnn	Parks and Recreation				4
Daughtrey	Sid	Real Estate Assessor's Office				4
Davis	Tim	Neighborhood Development Services	Zoning			4
Dodson	Marie	Personnel			4	
Drew	Elliot	Library			4	4
Echipare	Effren	Finance			4	4
Finch	Deborah	Finance			4	
Fisher	Paul	Planning			4	4
Freeman	William	Police				4
George	Debbie	Police				4
Grady	Kathy	City Managers Office			4	
Grant	Columbus	Public Utilities				4
Harlow	David	Neighborhood Development Services	Administration		4	4
Harrell	William	5th District Court Service Unit	State Department of Juvenile Justice	Suffolk Office	4	4
Hawkins	Cecil	Fleet Management			4	4
Hazelwood	Thomas	Commissioner of the Revenue			4	4
Hipski	Yolanda	Neighborhood Development Services	Zoning			4

Last Name	First Name	Department	Office	Division	Questionnaire	Interview
Holland	Janice	Public Schools			4	4
Horton	Leonard	Social Services			4	4
Hurd	Richard	Police	Support Division		4	4
Johanningsmeier	Carol	Finance			4	
Jones	Calvin	Health	Environmental Health		4	
Kattman	Maria	Real Estate Assessor's Office			4	4
Kiemer	Susan	Finance			4	4
King	Wesley	Public Works	Administration		4	4
Kitterman	Sid	Public Utilities	Engineering		4	4
Layton	Chris	City Managers Office	Management Services		4	
Ledford	Christine	Finance				4
Lewis	Robert	Public Works	Traffic Engineering		4	4
Littlefield	John	Public Schools				4
Liverman	Milton	Public Schools			4	
Long	Donald	Public Works	Administration		4	4
McCoury	L. Elizabeth	Assistant City Manager - Development	Downtown Development Coordinator		4	4
Messinger	Jeff	Fire	Administration	Emergency Operations Center	4	4
Mills	Scott	Planning				4
Moor	Albert	Public Utilities	Administration		4	4
Murden	Henry	Circuit Court	Clerks Office		4	

Last Name	First Name	Department	Office	Division	Questionnaire	Interview
Nielsen	Eric	Public Works	Administration		4	
Nurney	Polly	Information Technology				4
O'Grady	Thomas	Economic Development			4	4
Outlaw	Mark	Fire	Adminstration		4	4
Parker	Beverly	Planning			4	4
Parker	Patsy	Registrar			4	4
Patrick	Tom	Information Technology			4	4
Pearson	Katherine	Finance	Purchasing		4	4
Phillips	Jeryl	Planning			4	4
Pierce	Bruce	Public Utilities	Water Production		4	
Ralph	Bobby	Social Services				4
Ritter	Marion	Finance			4	
Rockwell	William	Public Utilities	Line Maintenance		4	4
Russel	Jackie	Health				4
Shaw	Lynda	Public Utilities	Water Production		4	4
Slade	Clifton	Virginia Cooperative Extension			4	4
Smith	Randy	Parks and Recreation				4
Speares	Barry	Information Technology			4	4
Sperling	Paul	Information Technology			4	4
Spinella	Carol	Public Utilities	Customer Service		4	4
Taylor	Cynthia	Planning			4	4
Tiwari	Dinesh	Parks and Recreation			4	4

Last Name	First Name	Department	Office	Division	Questionnaire	Interview
Vacalis	James	Assistant City Manager - Operations				4
Van Hosen	Jeffery	Neighborhood Development Services	Housing Inspections			4
Werner	Tom	Public Utilities	Water Production		4	4
Whitehurst	Wayne	Neighborhood Development Services	Buildings Inspections		4	
Williams	Ron	Treasurer				4
Wilson	Jimmy	Police	Administration		4	4
Winslow	Allen	Public Utilities	Administration		4	4
Winter	Patricia	Health			4	4

The results of the Needs Analysis indicate a substantial desire, as well as a need, for GIS technology throughout the City of Suffolk's participating departments. Of the fifty-four questionnaire respondents, fifty-two, or 96 percent, indicated, to varying degrees, the need for GIS applications that fall within a variety of general categories. A summary of the respondents' needs for the particular GIS application types is presented in the table on page 2 - 8.

A detailed description of each GIS application category, and the specific applications included in each general category, is provided in Chapter 3.

In addition to the twenty-six departments that participated in the Needs Analysis, three other City departments, that regularly utilize geographic based data, have been identified as being able to benefit from the implementation of the City's proposed GIS. These additional departments include:

- City Attorney
- Commonwealth's Attorney
- Sheriff

While these departments' GIS needs were not analyzed, the following discussions include an overview of each department's responsibilities, along with a discussion of how GIS technology may benefit them in their daily operations. For the departments that participated in the Needs Analysis, the following paragraphs describe each City department's responsibilities; the data utilized to satisfy these responsibilities; the types of general GIS functionality desired by each department; and the GIS benefits that can be realized within the department. A department specific listing of the desired GIS applications is included in Appendix B.

The data required to support each desired application either exists in some form (hard copy or digital), or will require development or acquisition during the data conversion phases of the implementation process. These issues are addressed, in detail, in the Data Survey report.

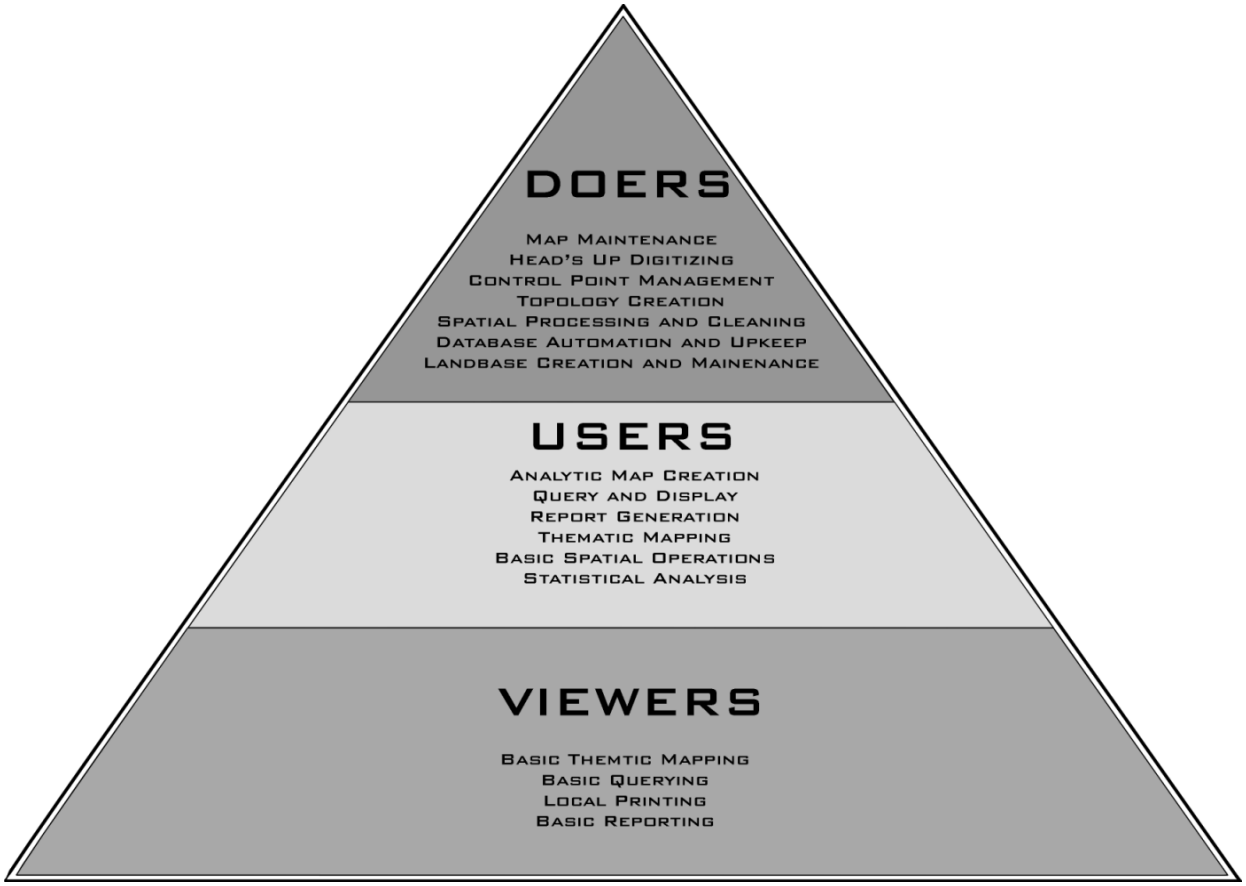
As presented in this report, the term data is used to represent features, attributes, and themes. Features are those elements that can be represented graphically on a map, as either a point, line, or polygon. Attributes

are the various characteristics used to further describe each of the features. Attributes are stored in a relational database, and may be displayed graphically along with the features. Themes are a collection of like features and/or attributes that are used to describe specific occurrences. Examples of various themes maintained in a GIS include: parcels, fire hydrants, manholes, environmentally sensitive areas, tree stands, zoning, etc. Examples of typical features and their attributes are included in the following table:

Features	**Attributes**
Water Mains	size, material, installation date, from/to coordinates, installed depth, etc.
Fire Hydrants	size, manufacturer, flow, test date, coordinates, etc.
Manholes	size, rim elevation, material, depth, inverts, test date, coordinates, etc.
Rights-of-Way	type, width, etc.
Parcel Centroids	parcel address, ownership, assessed value, zoning type, etc.
Property Lines	from/to coordinates, bearing, length, etc.
Building Foot Prints	building type, number of stories, material of construction, permit status, etc.
School Districts	name, number of students, schools, etc.
Street Centerlines	type of street, speed limit, ownership, name, impedances, etc.
Intersections	census block, accident data, coordinates, etc.

USER GROUPS

Three distinct types of user groups (Doers, Users, and Viewers) will utilize the City of Suffolk's proposed GIS. The 'doers" are those who develop, maintain, and manage the GIS. The "users" require the GIS for analytical purposes, and the "viewers" only require simplified viewing, querying, and reporting capabilities. In a typical GIS user organization, there are approximately ten times more "users" than "doers", and ten times more "viewers" than "users". The following graphic illustrates the typical distribution of user groups, along with their respective GIS requirements:



The "doers" are the people who create and maintain the GIS data (draftsmen, designers, mappers, and sketchers). These people are responsible for: placing graphic features; populating attribute fields; creating and cleaning topology; managing the GIS hardware and software; etc.

The "users" (engineers, analysts, planners, assessors, etc.) within the organization require access to the majority of the data maintained in the GIS. Through the use of traditional and customized query tools, these users create a variety of complex thematic displays; create buffers and intersections; and perform such operations as overlay analyses. "Users" require the ability to create sophisticated queries to define specific selection sets; display and contrast these sets of information; and create summary statistics that may include functions such as charting and table creation.

The "viewers" (engineers, planners, managers, Council members, field personnel, etc.) require view only access to certain GIS features and attributes for the purpose of creating reproducible thematic displays. "Viewers" require the ability to turn layers on and off; generate simple attribute queries; print maps to local printers; etc.

The majority of the City's participating user departments will fall within two or more of the previously defined user group types.

POTENTIAL CITY-WIDE GIS BENEFITS

The City of Suffolk can expect to realize a number of tangible and intangible benefits, as a result of implementing GIS technology. Several of potential benefits include:

- Rapid access to current, accurate digital information, enabling more efficient performance of daily job functions
- Reduction or elimination of data redundancy among departments, resulting in decreased operating costs and increased operating efficiencies
- Improved accuracy of existing information
- Increased data query, reporting, and map production capabilities
- Increased decision support capabilities
- Better informed employees and citizens
- Increased organization and integration of spatially related/oriented information
- Improved employee morale, through the reduction or elimination of certain redundant manual functions
- Potential revenue source through the distribution of data

- More efficient management of limited City resources
- Improved customer service

CITY DEPARTMENTS

The following sections detail each of the City's potential user departments' responsibilities, data usage and maintenance requirements, and identified GIS application requirements and benefits. The discussion of potential benefits is intended to identify specific applications, improved operating efficiencies, and increased service capabilities that will justify the City's investment in the proposed GIS. This discussion is intended to supplement the previously identified potential system benefits, and is, by no means, intended to serve as an exhaustive list.

5th DISTRICT COURT SERVICE UNIT

The 5th District Court Service Unit, operating within the City's Juvenile and Domestic Relations District Court, is responsible for processing cases involving:

- Child custody and visitation
- Abuse/neglect
- Juvenile delinquency
- Domestic violence
- Child and spouse support
- Criminal cases involving a juvenile or family member
- Juvenile mental commitments

The department handles the intake process for the City's Juvenile and Domestic Relations Court; performs background investigations; and provides case supervision, and treatment and service management.

The unit handles around-the-clock intake of juvenile criminal offenders, and administers detention and out-of-home placements. The unit produces reports on transfers, dispositions, paroles, service funding,

and case status. The 5th District Court Services Unit handles all civil and domestic intakes with regard to custody, and administers visitations, support, paternity, juvenile emancipation proceedings, and family abuse matters; especially with regard to preliminary hearings, support guidelines, status hearings, referrals, etc. The unit also appropriates and secures the required services for supervised cases, and implements court orders in regards to treatment, restitution, community service, alternative education, placement, etc. The unit serves as an intermediary between the courts and the juvenile correctional system, alternative placement centers (treatment regimen), after care parole planning, etc.

The 5th District Court Services Unit receives a variety of information from, and distributes a variety of information to, defense and victim attorneys, the Commonwealth's Attorney, citizens, the Clerk of Court, the school system, the Sheriffs Office, the Police Department, and juvenile correction facilities.

This department indicated the need for an "up-to-date" city map to be used for locating client's homes, which must be visited on a regular basis. This map, along with the School System's attendance records and grades, and the Juvenile and Domestic Relations Court computer records were identified as the most important needs for the department. The Police Department's FBI offense reports were identified as being a very important data set.

Standardized parcel addressing can be implemented to link the School System's and Police Department's digital records to a base map, containing street network, parcel, subdivision, and school district features, to meet the 5th District Court Services Unit's most basic geographic information needs.

Current Database Usage

The 5th District Court Services Unit utilizes the Department of Justice's Intake database to track petitions and offense records. The database is updated daily, and has been identified as most important to the performance of the Unit's duties. This database could be linked to the GIS through the appropriate address field to provide a variety of mapping and analyses capabilities.

Current Non-Computerized Data Usage

The following non-computerized data sources are utilized by the 5th District Court Services Unit:

1. **Juvenile and Domestic Relations Court Clerk's files** – maintained by the Court Clerk's office, the unit has read only access to these files and has indicated them as most important to the performance of the unit's duties.
2. **Public Schools attendance, conduct, and grade information files** – the unit utilizes these to support its case supervision activities, and has indicated them as most important in the performance of the unit's duties. This data is ranked as most important.
3. **Detention home population sheets** – the unit utilizes these files to locate clients and verify service changes, and has indicated them to be very important in the performance of the unit's duties. The Court Service Unit ranks this data as very important.

GIS Applications and Benefits

The 5th District Court Service Unit will benefit from various GIS applications that fall within the general category of ***Facility Location and Allocation of Services***.

The unit will benefit from the City's GIS implementation in a number of distinct ways, primarily as a viewer/user of other department's geographic data sets. The proposed system has the potential of supporting an automated document management/retrieval operation, which should increase the Unit's overall operating efficiencies. The GIS will also provide the Unit with a variety of tools that support crime and juvenile/domestic analyses. The unit will also have the ability to use the GIS to automatically generate displays of various court/incident related statistical data.

ASSISTANT CITY MANAGER - DEVELOPMENT

The Assistant City Manager – Development directs the day-to-day operation of City departments in order to meet the needs of citizens in accordance with policies established by City Council. The department acts as a liaison between citizens, employees, and the City Manager for development activities. This involves the coordination of the development departments of the City; specifically, Public Utilities, Planning, Economic Development, and Neighborhood Development Services. The department is responsible for attracting and retaining businesses in the City's Central Business District.

Current Database Usage

The Assistant City Manager – Development maintains and/or uses the following databases:

1. **Real Estate database** – this database is a computerized version of the City's land book and is updated daily by the City Assessor's Office. The Assistant City Manager – Development department utilizes this database to obtain a variety of parcel/property information. The Assistant City Manager ranks this database as most important.
2. **Property Inventory** - the department is currently in the process of developing an address-based computerized inventory of business and office/retail properties located within the City. The Assistant City Manager has ranked this database as most important.

Current Map Usage

The department is supplied with a variety of maps detailing zoning, land use, utility locations, etc. These are various scaled, paper maps, maintained by such departments as Planning, City Assessor, Public Works, Public Utilities, and Neighborhood Development Services.

GIS Applications and Benefits

The Assistant City Manager – Development Department will benefit from numerous GIS applications that fall within the general application categories of ***Compliance Auditing***, ***Facility Location and Allocation of Services***, and ***Land Recordation***.

The department will primarily be a viewer/user of other department's geographic data. The proposed system implementation will provide the department with rapid access to a variety of digital data sets (graphic and tabular), enabling more efficient performance of daily job functions. Improved access to critical information will increase the department's decision support capabilities, enabling the City to proactively attract and retain businesses and address citizens' concerns. The inherent analysis capabilities of the GIS will enable the department to insure all development activity meets the City's stated goals and objectives.

ASSISTANT CITY MANAGER - OPERATIONS

The Assistant City Manager – Operations directs the day-to-day operation of the City departments in order to meet the needs of citizens in accordance with policies established by City Council. The department acts as a liaison between citizens, employees and the City Manager for administration and operations. This involves the coordination of the operational departments for the City; specifically, Parks and Recreation, Public Works, Social Services, Fleet Management and Library.

GIS Applications and Benefits

The Assistant City Manager – Operations will benefit from a variety of GIS applications falling within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***

- ***Facility Location and Allocation of Service***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The department will primarily be a viewer/user of other department's geographic data. The proposed system will provide the department with rapid access to the various data sets maintained by these departments. This will improve the Assistant City Manager – Operations' decision making abilities, and promote effective communication across departments. The system will provide the department with a variety of analysis, reporting, and map production tools.

CIRCUIT COURT CLERK'S OFFICE

The Office of Clerk of Circuit Court is required under Section 15.2-1634 of the Code of Virginia and the Rules of the Supreme Court of Virginia. The duties of the Clerk's Office include:

- Management of court records
- Collection of fees and taxes
- Administration of general civil and criminal case procedures
- Extraordinary actions (attachments, injunctions, etc.)
- Recordation of real estate transactions, corporations and limited partnerships, and marriages
- Administration of game, fish, and marine laws
- Fiduciaries, receivers and estates
- Administration of oaths of office, elections, and referenda

The Circuit Court Clerk's Office serves as the court administrator, and recorder of all public records identified by statute. The office interacts with the Assessors office through the reporting of the City's various property conveyances. The Clerk's office maintains the hard copy parcel plats in a manual (ink on mylar) format.

Current Database Usage

The Circuit Court Clerk's Office maintains Criminal and Civil Record databases on line with the State Supreme Court. The office anticipates implementing an on-line document scanning and imaging system by January 1999.

Current Non-Computerized Data Usage

All of the land records maintained by the Clerk's office are indexed in a manual indexing system. Electronic maintenance of these records was initiated on July 1, 1998. Through this system, a user can obtain parcel descriptions and determine the considerations given for the parcel. The index cross-references grantors and grantees, and lists all aliases in a single document. The parcel information maintained in the Clerk's office does not include a parcel ID number. This parcel ID number is assigned by the Assessors office, and is not reported back to the Circuit Court Clerk's Office.

GIS Applications and Benefits

The primary use of GIS technology, as applied to the Circuit Court Clerk's Office, would be for the preparation of courtroom exhibits, which require cartographic and spatial depiction of assets, or events. These exhibits would benefit the Commonwealth's and City Attorneys by providing the court with a visual description/understanding of the cases being presented. Additional analyses might include historical records of traffic accidents or other spatially relevant data.

The GIS may provide the Clerk's Office with increased access to digital information, improved flows of information between various agencies, increased querying, reporting, and map production capabilities. The office's planned electronic document management system can be interfaced with the GIS to offer users the ability to browse plat information on-line with a mapping component.

CITY ASSESSOR

The City Assessor is appointed by Council and is responsible for the assessment, for tax purposes, of real estate within the City. Real estate tax rates are based on one hundred percent of fair market value, and are determined using the Cost Approach, Market Approach, and Income Approach assessment methods.

In addition, the City Assessor is responsible for the annual preparation of the Land Book used for the development of all real estate tax levies, which are effective July 1 of each calendar year. All records concerning ownership, mapping, and assessments are monitored and updated by this office. The City Assessor also ensures the fair and equitable administration of the State Land Use Programs and the Rehabilitated Structure Program.

The City Assessor's Office maintains the City's base maps, relative to subdivisions and plats. The office records and maintains all real property transfers filed in the Circuit Court Clerk's Office. The Assessor's Office also assists in implementing the City's tax relief program for the elderly and handicapped. The office reviews all building permits for changes, and updates the Real Estate database accordingly. Additional duties performed by the Assessor's Office include:

- Reporting of statistics to the State Tax Department
- Assisting the Board of Equalization in all local appeals
- Assisting the public in all inquiries concerning real estate in the City
- Listing and assessing all real property within the City of Suffolk.

The department receives information from, and distributes information to various City departments and agencies, including: Assistant City Manager's Office, Circuit Court Clerk's Office, Finance, Neighborhood Development Services – Zoning and Building Inspections, Planning, Social Services, Suffolk Health Department, Public Works, Public Utilities, City Treasurer, and staff appraisers.

Current Database Usage

The City Assessor's Office maintains and/or uses the following databases:

1. **Building Permits database** – this database, updated daily by the City's Inspection Department is used to maintain all permit and inspection data records. The Assessor's Office has read only access to this database, which is 100 percent complete. The City Assessor ranks this database as being very important.
2. **Delinquent Tax database** – this database, updated daily by the Treasurer, is used to maintain a list of all delinquent taxes on real property within the City. The Assessor's Office has read only access to this database.
3. **Real Estate database** – this database is a computerized version of the City's land book and is updated daily by the City Assessor's Office. It is used to maintain all real property data for all parcels within the City, supports a variety of queries, and maintains data on delinquent taxes, taxes due, and building permits. This data set is 100 percent complete and has been ranked as being most important by the City Assessor's Office.
4. **APLUS CAMA database** – this database, maintained by the City Assessor on a Novell file server, and regularly uploaded to the AS400, contains information on building and land characteristics. The system tracks parcels based on: tax map number, account number, owner name, and property address. Data is uploaded from this system to the Real Estate database. Zoning information, maintained in this database, is approximately ninety percent accurate. The address information is supplied from the Neighborhood Development Services Inspection division. This database has been ranked as being most important by the City Assessor's Office.

Current Non-Computerized Data Usage

The City Assessor's Office maintains and/or uses the following non-computerized data sources:

1. **Building Site Plans** - this data, supplied by the Neighborhood Development Services Inspection division, is utilized to verify information affecting assessments of parcels that have

undergone improvements. The City Assessor's Office ranks this data set as being most important and is 100 percent complete.

2. **Septic Tank and Perk Test Site Plans** - this data, supplied by the Suffolk Health Department, is also utilized to adjust assessments of parcels. This data set has been ranked as most important by the City Assessor's Office and is 100 percent complete.

Current Map Usage

The City Assessor's Office maintains and/or uses the following maps:

1. **USGS 1:24,000 quadrangles** - the Assessor's Office utilizes these maps to determine ground elevations. These maps are 100 percent complete with the City Assessor's Office ranking this data set as being very important.
2. **Tax Maps** – these maps are maintained by the Assessor's office, and are used to determine the size and location of the City's real property parcels. This data set is 100 percent complete. These 277 maps, maintained at a variety of scales, are manually updated on a daily basis. A variety of City Departments and Agencies, as well as the general public utilize these maps and has been ranked as very important by the City Assessor's Office.
3. **Zoning Maps** - the Assessor's office utilizes these maps to determine the zoning of the City's real property parcels. The maps, maintained by Neighborhood Development Services, are an overlay of the City's Tax Maps and are 100 percent complete. The City Assessor's office ranks this data as being most important.

GIS Applications and Benefits

The City Assessor's Office will benefit from a variety of applications falling within the general categories of:

- ***Environmental Analysis***
- ***Infrastructure Management***
- ***Land Recordation***

- ***Routing, Scheduling, and Coordination of Services and Inspections***

The Assessor will serve as a "doer" within Suffolk's GIS community. Much of the data required to support the various intended applications is maintained within the Assessor's Real Estate and CAMA databases, as well as on the Tax Maps. Implementation of the proposed GIS will result in a comprehensive digital parcel mapping product. The GIS will support a variety of thematic outputs based on specific assessment queries. The GIS will also enable the Assessor to more efficiently distribute the most current property information to all interested parties. Interfacing the City's GIS with the various assessment, permitting, and inspection databases will improve coordination efforts among the various departments.

CITY ATTORNEY

The Department of Law is the chief legal advisor of the Council, the City Manager and all department heads, commissions, and agencies of the City in all matters affecting the interest of the City. The Department of Law institutes and defends all legal proceedings, which it deems necessary and proper to protect the interests of the City, and performs other functions as required by Council and requested by the City Manager.

GIS Applications and Benefits

The City Attorney's Office will have limited use for the GIS, primarily as a viewer of other department's data. The City Attorney will be able to utilize the GIS for investigative purposes in preparing for litigation and for the development of displays to assist in presenting evidence during litigation. The GIS data, and applications required by the City Attorney's Office will be developed and maintained within other City departments.

The proposed GIS will enable the City Attorney to quickly and efficiently integrate and organize a variety of spatially oriented information. The system will also provide the department with access to digital information that supports their overall decision making processes.

CITY MANAGER'S OFFICE

The City Manager directs the general operation of the City government in order to meet the needs of the citizens in accordance with policies established by City Council. These operations are governed by City ordinances, State statutes and Federal regulations.

The City Manager also interacts with various elements of the community, such as legislative delegation, the business community, civic organizations and other governments.

The City Manager's office advises the City Council, recommends policies, and establishes service priorities in order to meet the needs of citizens. This office oversees the management of the City and provides administrative support for the Mayor and City Council. The City Manager's Office is also responsible for maintaining the City's web page.

Operating within the City Manager's Office is the City's Management Services Department. The Management Services Department provides direct support to the City Manager and City Council for the purpose of facilitating and coordinating Council/Manager functions, such as City Council Meetings. These efforts include the development of various reports which are used to update, advise, and support administrative policy decisions. The department coordinates research efforts that cross departmental lines, and provides inter-governmental liaison with federal and state legislative bodies, as well as various local boards and commissions. The department also applies for, acquires, and administers federal and state grants, including CDBG and HOME. Management Services oversees a variety of special projects undertaken by the City.

The Public Information function of the Management Services Department provides for the distribution of City related information to the public via publications, cable programs (on the City's Municipal Access Channel), and public meetings.

Current Database Usage

The City Manager's Office utilizes the following databases:

1. **Legislative Information database** – the City Manager's office uses this database, maintained by the Virginia Department of Information Technology, to track State General Assembly information. The database is 100 percent complete and updated on a daily basis. The City Manager's Office ranks this database as most important.
2. **Thomas database** – this database, maintained by the Library of Congress, is used to track Federal legislative information, and is updated on a daily basis and ranked as being most important.
3. **Community 20/20 database** – this database is maintained by HUD, and is used to produce maps and tables for Community Development grants (CDBG and HOME). This database is 90 percent complete and is updated annually. This database ranks as most important by the City Manager's Office.
4. **Home Consortium database** – this database is maintained by the Management Services Department, and is used to track expenditures and ongoing project activities. It is updated on a monthly basis and is 25 percent complete. The City Manager's Office ranks this database as being most important.

Current Non-Computerized Data Usage

The City Manager's Office utilizes the following non-computerized data:

1. **Project set-up form** – the City is currently setting up this form for the purpose of tracking the HOME grant funds. This database is 95 percent complete and ranks as most important by the City Manager's Office.
2. **Payment draw-down** - the City is currently setting up this form for the purpose of making payments for the HOME grant. The City Manager's Office ranks this data as being most important and is 95 percent complete.

3. **Legislative Agenda** – the City currently updates the City of Suffolk Legislative Agenda. This data set is 100 percent complete and ranks as being most important by the City Manager's Office.

Current Map Usage

The City Manager's Office utilizes the following maps:

1. **Legislative maps** - these maps, provided by the Virginia Department of Legislative Information Services, are used for determining legislative districts and are 100 percent complete. The City Manager's Office ranks these maps as being most important.
2. **Community map** – this map, provided by HUD, is used to identify neighborhoods throughout the City where grant funds are used. These maps are 90 percent complete. This map is updated annually, using Maptitude GIS software. This is part of HUD's Community 20/20 software and ranks as most important by the City Manager's Office.

GIS Applications and Benefits

The City Manager's Office will benefit from numerous GIS applications falling within the general categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The City Manager's Office will primarily be a viewer/user of other department's geographic data. The GIS will offer the department the capability of viewing and compiling a wide variety of spatially related data. The system will offer the department increased decision support and analysis capabilities, and will also improve communication and data flow between departments. The system should enable the department to link a variety of external data sources (HUD, Census, etc.) to the City's internally maintained data for increased analysis capabilities. Implementation of the proposed GIS should also enable the City Manager's Office to more efficiently respond to citizens', and other departments', requests for information.

COMMISSIONER OF THE REVENUE

The Commissioner of the Revenue is an elected official whose responsibilities are to assess individual and business personal property and machinery and tools for taxation, issue City business and professional licenses and administer special taxes on meals, lodging, and cigarettes.

The Commissioner of Revenue's Office also performs the following:

- Processes state income and estimated tax returns
- Assesses Public Service Corporations
- Maintains the City's personal property record and assessment books
- Enforces City business license codes
- Assists individuals and businesses with tax and license inquiries, as well as income and estimated tax inquiries
- Addresses citizen concerns and complaints

Current Database Usage

The Commissioner of the Revenue's Office utilizes the following databases:

1. **Business License database** – this database is used to track the issuance of business licenses throughout the City. It is maintained by the Commissioner of the Revenue's Office, and is updated on a daily basis. This database ranks as being very important by the Commissioner of the Revenue's Office.
2. **Meal Tax database** – this database is used to track the payment of meal taxes throughout the City's restaurants. It is maintained by the Commissioner of the Revenue's Office, and is updated on a monthly basis. The Commissioner of the Revenue's Office ranks this database as being very important.
3. **Personal Property database** – this database, maintained by the Department of Motor Vehicles, is used to track prorated personal property assessments. It is updated on a daily basis. The Commission ranked this database as most important.

GIS Applications and Benefits

The Commissioner of the Revenue did not indicate a need for the proposed City-wide GIS implementation. However, a typical municipal revenue commissioner may benefit from a variety of GIS applications that assist with the projection and collection of revenues and taxes.

By linking the department's various databases to the geographic data maintained in the proposed GIS, the Commissioner of the Revenue can utilize the system to more efficiently and effectively collect revenues. The system will also provide a variety of reporting and analysis tools that may enable the department to qualify for additional revenues through outside sources/agencies.

COMMONWEALTH'S ATTORNEY

The Commonwealth's Attorney's Office is required by Section 15.1-40.1 of the Code of Virginia to prosecute criminal offenses in the City of Suffolk, including DWI cases. The office prosecutes cases in the Juvenile and Domestic Relations District Court, the General District Court and the Circuit Court. It also prepares briefs for the Virginia Court of Appeals and the Virginia Supreme Court. In addition, the Commonwealth's Attorney's Office advises other City law enforcement personnel during investigations as to the substance and procedure of the criminal law. The office also issues opinions on conflicts of interest matters.

GIS Applications and Benefits

The Commonwealth's Attorney's Office will have limited use for the GIS, primarily as a viewer of other department's data. The Commonwealth's Attorney will be able to utilize the GIS for investigative purposes in preparing for litigation, and for the development of displays to assist in presenting evidence during litigation.

The proposed GIS will enable the Commonwealth's Attorney to quickly and efficiently integrate and organize a variety of spatially oriented information. The system will provide the department with access to digital information that supports their overall decision making processes.

ECONOMIC DEVELOPMENT

Economic Development's stated mission is to:

- Promote enhanced job opportunities and broaden the tax base through the recruitment and retention of business and industry
- Maintain and encourage the continuation of a favorable business environment for businesses to locate and expand within the City, and
- Attract and encourage new national and international businesses to locate and invest in Suffolk

In addition, the department provides staff support to the Suffolk Industrial Development Authority.

Current Database Usage

The Department of Economic Development utilizes the following databases:

1. **ProCure** – this database, maintained by the Department of Economic Development and updated weekly, is used to maintain property owner and agent information to track the real estate data available on various buildings and property sites. This database is 40 percent complete. The Department of Economic Development ranks this database as being most important.
2. **Permits database** – this database, maintained by the Neighborhood Development Services Inspection division, is used as a read only reference by the Department of Economic Development to monitor and track the status of building permits.
3. **Real Estate database** - this database is a computerized version of the City's land book and is updated daily by the City Assessor's Office. It is used to maintain all real property data for all parcels within the City, supports a variety of queries, and maintains data on delinquent taxes, taxes due, and building permits.
4. **Utilities Department** – this database, maintained by VDOT and the Department of Public Works, is used as a read only reference by the Department of Economic Development to track and monitor all traffic counts within the city.
5. **Employment** – this database, maintained by the Virginia Employment Commission, is used as a read only reference by the Department of Economic Development to gain access to employment statistics and wage information.

Current Non-Computerized Data Usage

Economic Development currently utilizes the hard copy only Zoning Permit database maintained by Neighborhood Development Services – Zoning. Economic Development uses this data set to track

the progress and status of zoning permits issued by the City. This paper database ranks as being most important by the Department of Economic Development.

GIS Applications and Benefits

The Department of Economic Development will benefit from numerous GIS applications that fall within the general application categories of:

- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Economic Development will benefit greatly from the various digital data sets, which will be maintained in the City's GIS. A variety of parcel and infrastructure information, required to support the department's mission of promoting and attracting business within the City, will be readily available through the proposed GIS. The department will have the ability to perform analyses, and generate various thematic map displays in support of its mission. The GIS will provide the tools necessary to better coordinate services between other city departments and outside agencies.

FINANCE

The various functions of the Finance Department include:

- Accounting
- Accounts payable/receivable
- Operating and Capital budget development and administration
- Payroll
- Timely and accurate financial reporting
- Issuance of bonds

- Debt issuance and administration
- Monitoring of financial activity

These services are provided to City Council, the City Manager, other departments, and additional users as needed. The department provides financial reporting services internally to City management, and externally to federal and state agencies.

The Finance Department's Purchasing Division provides a centralized system for the management of public funds expended for procurement of materials, supplies, equipment, professional, consulting, and other services, and construction via competitive pricing of the appropriate product quality for timely delivery. Purchasing also provides for transfer or disposal of surplus property.

The division administers the competitive procurement process for goods, equipment, and services, including professional (A&E) and construction contracts. The division evaluates responses, prepares, and awards contracts, and assists with contract administration.

Current Database Usage

The Department of Finance currently utilizes the following databases:

1. **AP Vendor Master**– this database, maintained by the Department of Finance, is used to monitor and assess vendor financial information and activity throughout the city. This database is 100 percent complete and is updated weekly. The Department of Finance ranks this database as being most important in their daily operations.
2. **AP District** – this database, maintained and updated daily by the Finance Department, is used to track the status of and pertinent information regarding city vouchers and checks. This database is 100 percent complete and ranks as being most important by the Department of Finance.
3. **General Ledger Master** – this database, maintained by the Department of Finance, is used to track the financial status of all general ledger accounts. This database is 100 percent complete and is updated daily. The Department of Finance ranks this database as being most important.

4. **Spreadsheets** – this database, maintained and updated daily by the Department of Finance, is used for the purpose of performing financial data analysis and reporting. This database is 100 percent complete and ranks as being most important by the Department of Finance.
5. **Miscellaneous Charges** – this database, maintained by the Department of Finance, is used to monitor the status of all miscellaneous billings by throughout the city. This database is updated daily and is ranked as being most important by the Finance Department.
6. **Accounts Payable Master** – this database is used as a read only reference by the Department of Finance to monitor the A/P history of all city accounts, including manual checks and petty cash. It is updated daily. This database is 100 percent complete and ranks as being most important by the Finance Department.
7. **Vendor Master File** – this database, maintained by the Department of Finance, is used to track the activity of all vendors throughout the city, including accounts payable. This database is updated daily and is 100 percent complete. The Finance Department ranks this database as being most important for the performance of their duties.
8. **Account History File** – this database is used as a read only reference by the Finance Department to record and monitor the ancillary information history of all city accounts. This database is updated weekly and is 100 percent complete. The Finance department ranks this database as being most important.
9. **Payroll Master** – this database, maintained and updated weekly by the Department of Finance, is used to track the payroll accounts of all city employees. This database is 100 percent complete and ranks as being most important by the Finance Department.
10. **Fixed Assets** – this database, maintained by the Finance Department, is used to keep track of all City owned property information. This database is updated monthly and is 100 percent complete. The Finance Department ranks this database as being most important for the performance of their duties.
11. **AR Customer Master** – this database, maintained by the Finance Department, is used to record and track all information regarding city customers. This database is 100 percent complete and updated weekly. The Department of Finance ranks this database as being most important for their operations.
12. **Bidder List** – this database, maintained by the Purchasing Department, is used by Finance to keep track of and register potential bidders by commodity. This database is 10 percent

complete and is updated daily. The Finance Department ranks this database as being most important for performing their daily operations.

Current Non-Computerized Data Usage

The Department of Finance currently utilizes the following non-computerized databases:

1. **Vendor Cash Requests** – the Department of Finance creates these hard copy requests in order to process and issue checks to vendors for services rendered. This database is 100 percent complete and ranks as being most important by the Finance Department.
2. **AP Edits** – the Department of Finance creates and uses these paper files to note and enter all information needed for vouchers. This data is 100 percent complete and ranks as being most important by the Finance Department.
3. **AP Void Checks** - the Finance Department creates these paper documents to issue and track all voided checks throughout the city. This database is 100 percent complete and the Finance Department ranks this data as being most important.
4. **Vendor Check Register** – this register is maintained and updated by the Finance Department to keep track of all checks issued to vendors for services rendered. The Department of Finance ranks this data as being most important for their daily operations.
5. **Revenue Reports** – these reports are generated and maintained by the Department of Finance in order to keep track of all year to date revenues. These reports are 100 percent complete and are ranked as being most important for the performance of their duties.
6. **Expenditure Reports** - these reports are generated and maintained by the Finance Department for tracking all year to date expenditures throughout the city. These reports are 100 percent complete and are deemed as most important.
7. **Balance Sheets** – these sheets, generated by the Finance Department, are used as read only references for monitoring the status of all current asset and liability records. This database is 100 percent complete and ranks as being most important by the Department of Finance.
8. **Payroll Register**– this register generated by the Department of Finance as a read only reference is used to keep track of all issued payroll checks. This register ranks as being most important to the Finance Department.

9. **Vendor Catalogs** - these catalogs are received by various vendors and used by the Finance Department as a reference aid for the purpose of hiring and selecting vendors for various commodities. The Finance Department ranks these catalogs as being most important.
10. **Fixed Assets Reports** – these reports, generated and maintained by the Department of Finance, are used to track and record information regarding City-owned property. These fixed asset reports rank as being most important.
11. **Hospital Insurance Billing** – these hardcopy records are used by the Department of Finance as read only references containing all pertinent information regarding city employee health coverage and billing requirements. These records are 100 percent complete and rank as being most important by the Finance Department.
12. **Support Insurance Billing** – the Finance Department uses these read only hardcopy records to track employee health coverage and insurance billing requirements. The Finance Department ranks these billing records as being most important.

Current Map Usage

The Purchasing Division of the Finance Department utilizes a set of maps that delineate existing building footprints, along with associated utility easements. These maps are used infrequently, and are provided by the City Assessor's Office and the Planning Department.

GIS Applications and Benefits

The Finance Department will benefit from various GIS applications that fall within the general application categories of:

- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The Finance Department will realize various benefits from the proposed GIS, primarily as a viewer/user of other department's data. The system will provide Finance with quick access to various data sets. It will also provide various analysis, querying, and reporting tools that will enable the department to operate more efficiently. Perhaps the greatest benefit Finance will realize from the GIS will be the ability to implement an automated asset valuation application. This application can be implemented on top of the base GIS to provide Finance with the ability to track the installation of various City assets, such as street lights, signs, etc., to help determine the amount of taxes/fees to levy against developers. The system's ability to provide clear and accurate reports will enhance the department's budgetary reporting capabilities.

FIRE DEPARTMENT

The Fire Department is responsible for providing protection and rapid response to fires, explosions, natural and man-made disasters, hazardous materials, and other related emergencies. In an effort to reduce life and property loss, the department is also responsible for the implementation of fire prevention programs, code inspection/enforcement, fire cause determination/investigation, and public fire and life safety education programs in the community. The department also assists with the coordination of emergency responses provided by City and Volunteer organizations involved in fire protection and emergency medical services including vehicle rescue and extrication procedures, and inland search and rescue operations.

The Fire Department maintains complete hazard analyses of potential disasters, including the most appropriate mitigation and preparedness actions. The department also develops and maintains operational capabilities for the office of Emergency Management and the Emergency Operations Center, as provided for in the City's Emergency Operations Plan. The department is responsible for the reporting and management of all fire and hazardous material incident documents as well as all fire incident analysis and mapping services.

The Fire Department's Emergency Services unit is responsible for ensuring the City can provide an overall effective and efficient response to natural and unnatural disasters of all types and magnitudes. The unit coordinates the daily activities of the Emergency Management Program, and oversees the

development and maintenance of the City's Emergency Operations Plan. Emergency Services is responsible for ensuring the City's Emergency Operations Center is maintained in a constant state of readiness. The unit coordinates with each emergency response organization, and assures the development and maintenance of appropriate emergency response capabilities. The unit assures compatibility between the City's Emergency Operations Plan, and the plans and procedures of other key facilities and organizations operating within the City.

Current Database Usage

The Fire Department currently uses the following databases:

1. **CRIS-FIRE 3.0 database** - this database, generated by the MEGG Association, is updated by the Fire Department and used to keep track of all pubic safety fire information. This database is updated daily and is 100 percent complete. The Fire Department ranks this database as being very important to performing their daily operations.
2. **Fire Vision 2.5 bFD database** - this database, generated by Firehouse Software, is used by the Fire Department as a software management tool. This database is updated daily and ranks as being somewhat important to the Fire Department staff.
3. **NFIRS 4.1 database** - this database, generated by the National Fire Information Course 1, is used by the Fire Department to keep track of and report all fire incidents. This database is 100 percent complete. The Fire Department did not rank this database.

The Emergency Services Unit currently uses the following databases:

1. **Aloha database** – this database, generated by the US Environmental Protection Agency (US EPA) and the National Ocean and Atmospheric Association (NOAA), is used by Emergency Services to determine the area locations of H/M atmospheres. This database is updated daily and is 10 percent complete. The Department of Emergency Services ranks this database as being most important to performing their daily operations.
2. **Cameo 1.1 database** – this database, generated by the US Environmental Protection Agency (U EPA) and the National Ocean and Atmospheric Association (NOAA), is used by

Emergency Services as a chemical database management system. This database is updated yearly and is 10 percent complete. The Department of Emergency Services ranks this database as being most important to performing their daily operations.

3. **Marplot 3.0 database** – this database, generated yearly by the US EPA and NOAA, is used by the Department of Emergency Services to map all emergency response plans. This database is 10 percent complete and ranks as being most important to Emergency Services.
4. **Hurrevac 6.0 database** - this database, generated by the National Hurricane center, is used by the Department of Emergency Services to monitor and evaluate approaching hurricane tracks. This database is 100 percent complete. Emergency Services ranks this database as being most important to performing their daily operations.
5. **EIS/WIN Inforbook 8.0 database** - this database, generated yearly by Essential Technology, is used by Department of Emergency Services to evaluate all emergency management plans and procedures. This database is updated yearly and ranks as being most important.

Current Non-Computerized Data Usage

The Fire Department currently uses the following non-computerized databases in performing their operations:

1. **Standard Operations Procedures** – this hardcopy procedures manual, generated and maintained by the Fire Department, outlines all of the standard operating policies and procedures regarding the daily operations of the Fire Department staff. This manual is 100 percent complete and ranks as very important by the Fire Department.
2. **Fire Incident Reports** – these reports, generated by the National Fire Information Board and maintained on 3.5 inch diskettes by the Fire Department, are used to record all fire incident information. This report is 100 percent complete and is ranked by the Fire department as being most important.
3. **Medical Incident Reports** – these reports, generated by the Virginia Department of Fire Programs, are used by the Fire Department to record all medical response incident information. These reports are updated by the Fire Department and maintained on 3.5 inch

diskettes. This data set is 100 percent complete and ranks as being most important by the Fire Department.

4. **Hazardous Materials Incident Reports** - these reports, generated by the Virginia Department of Fire Programs and updated on 3.5 inch diskettes by the Fire Department, are used to keep track of and record all hazardous materials incident information. This data set is 100 percent complete and ranks as being most important by the Fire Department.
5. **Inspection Reports** – these hardcopy reports, maintained by the Fire Department, are used to record the results of all fire prevention inspections. These reports are 100 percent complete and rank as being very important by the Fire Department.

Emergency Services currently uses the following non-computerized databases:

1. **Emergency Operation Plans** – this document, generated by the Virginia Department of Emergency Services and updated by the Fire Department, is used by Emergency Services as a reference guide to emergency operation plans. This document is 100 percent complete and ranks as being most important by the Fire Department.
2. **Hurricane Response Plan** – this document, generated and maintained by the Fire Department, is used as a reference guide outlining the procedures of hurricane response plans. This guide is 100 percent complete and ranks as being very important by the Fire Department.
3. **Hazardous Material Report** – this report, generated by the Virginia Department of Emergency Services, is used to keep track and record all hazardous material reports. This report, updated by the Fire Department, is 100 percent complete and ranks as being most important.
4. **Local Site Reports** – these reports, generated by the Virginia Department of Emergency Services, are used to keep track of all fire and safety regulations information regarding notification changes in the land use of local sites. This report, maintained by the Fire Department, is 100 percent complete and ranks as being most important.
5. **EOC Message Form** – these forms, generated by the Virginia Department of Emergency Services and maintained by the Fire Department, are used for the purpose of hardcopy message documentation. These records are 100 percent complete and rank as being most important by the Fire Department.

6. **EOC Message Log** – this log, generated by the Virginia Department of Emergency Services and maintained by the Fire Department, is used for logging all hardcopy message documentation. These records are 100 percent complete and rank as being most important by the Fire Department.

Current Map Usage

The Fire Department currently utilizes the following map products:

1. **Street Maps** - a variety of different road map products, produced and maintained in house by the Fire Department, are used by the Fire Department staff for the purpose of locating different areas and facilities. The data set of hand-drawn maps is 75 percent complete and are considered most important.
2. **Street / Highway Maps** – these maps, generated yearly by ADC Inc., are used by the Fire Department as an additional reference for identifying streets, highways, and roads. This data set, consisting of 1"=200' scale maps, is 95 percent complete and ranks as being most important by the Fire Department.
3. **Cameo 3.0** – these maps of various scales, generated yearly by the US Environmental Protection Agency (US EPA), are used by the Fire Department to track all hazardous materials release plotting chemical storage sites and air dispersal patterns. This data set, available in paper or digital format, is 100 percent complete and ranks as being most important by the Fire Department.
4. **Marplot 3.0** - these maps of various scales, generated yearly by the US EPA, are used by the Fire Department to track all hazardous materials release and air dispersal plotting sites. This data set, available in paper or digital format, is 100 percent complete and ranks as being most important by the Fire Department.
5. **Tax Plat Maps** - these CADD maps, generated yearly by the Assessor's office, are used to determine the size and location of the City's real property parcels. These maps, maintained at a scale of 1"=200', are used as a reference by the Fire Department to identify and confirm parcel data, including parcel number and zoning. The tax maps have been identified by the Fire Department staff as being very important.

6. **Hurricane Surge Maps** – these CADD maps, generated yearly by the Virginia Mapping Bureau, are used as a reference only guide to storm surge planning. This 1"=4500' scale map set is 100 percent complete and ranks as being very important by the Fire Department.
7. **Radiation Zone Exposure Map** – these CADD maps, generated yearly by the Virginia Department of Emergency Services, are used as a read only reference by the Fire Department to track and locate radiation exposure injection pathways throughout the city. This 1"=63360' scale map set is 100 percent complete and ranks as being most important by the Fire Department.
8. **Grid Tracks -** these charts, generated by WSA Charts, are used by the Fire Department as a means of tracking hurricane storm progression. The Fire Department uses these 1'=90nm scale charts to record the time, position, speed, and direction of hurricanes approaching this area. This data set is 100 percent complete and rank as being most important.
9. **DTN Weather Satellite Images** – these images, generated by the (DTN) in a CADD format, are used by the Fire Department to track severe weather. This data set is 100 percent complete and are ranked by the Fire department staff as being most important.
10. **Emergency Information System (EIS) - Tiger Raster Line Files –** these digital files, maintained and updated yearly by the EIS, are used by the Fire Department to enhance their emergency information mapping and plotting capabilities to coordinate address locations. This 1"=100' scale digital map set is 100 percent complete and ranks as being most important by the Fire Department.
11. **Street Atlas USA 5.0** – these CADD maps, generated yearly by Delorme and distributed on CD, are used by the Fire Department to enhance their detailed mapping capabilities to include the location, address and phone number of parcels located throughout the city. This data set is 100 percent complete and is ranked as being most important by the Fire department staff.

GIS Applications and Benefits

The Fire Department will benefit from various GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***

- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The City's Emergency Dispatch system can be interfaced with the GIS to accurately locate incidents, and provide the department with the quickest route, thereby improving response times. Critical response information such as: locations and operating conditions of fire hydrants; the presence and location of stored hazardous materials; and whether or not children or others with special needs reside at the location can be rapidly accessed through an interface with the proposed GIS.

Department maintained, as well as externally obtained data sets, may be interfaced with the GIS, thereby enabling the Fire Department to analyze various "what if" scenarios, and develop the most efficient response plans. The system's reporting, querying, analysis, and map production capabilities will support many department specific functions, and improve overall operating efficiencies.

The future implementation of Automated Vehicle Location (AVL) technology will greatly benefit the Fire Department. AVL technology provides real time global positioning system (GPS) locational capabilities, which will allow the Fire Department to dispatch the appropriate nearest available unit to all emergencies.

FLEET MANAGEMENT

The Department of Fleet Management is operated as an internal service fund for the purpose of providing equipment and vehicles, their repairs, and management to all city departments. The Department also provides service to the City's transit system (TRT), Western Tidewater Regional Jail, Social Services, Redevelopment and Housing, and the Western Tidewater Community Services Board, and fueling

assistance to the Nansemond-Suffolk Rescue Squad. The department houses a portion of the school transportation personnel and provides controlled inventory and computerized maintenance records.

Fleet Management maintains a comprehensive computerized record keeping system to track all costs associated with maintained vehicles, their equipment, and communications equipment. This system has been updated to include all radios and school transportation vehicles and equipment. The computer system is also used to determine lease rates to utilizing departments, agencies, and the school in recovering all direct and indirect costs associated with maintaining the City's fleet of vehicles and equipment.

Current Database Usage

Fleet Management currently utilizes the following databases:

1. **Faster database** – this database, maintained by Fleet management, is used to keep track of all equipment reports and records. This database is updated daily and is 100 percent complete. Fleet Management ranks this database as being most important.
2. **Lotus database** – this database, maintained by Fleet Management, is used as a primary means of record management for various fleet files. This database is updated weekly and is 100 percent complete. This database ranks as being most important by Fleet Management.

Current Non-Computerized Data Usage

Fleet Management currently utilizes and maintains a non-computerized work order management system, generated by CCG Systems, to track the status of all work orders. This database is 100 percent complete and ranks as being most important by the Fleet Management staff.

GIS Applications and Benefits

Fleet Management may benefit from various GIS applications that falls within the general application category of ***Infrastructure Management***.

While Fleet Management currently has a limited use for GIS technology, the proposed system will enable the department to view a variety of data sets maintained by other departments. This access to information should improve the department's overall operating efficiencies.

INFORMATION TECHNOLOGY

Information Technology provides computer related services to City departments, Constitutional Officers and other governmental agencies, in support of the goals and objective of the City of Suffolk. Information Technology provides consultation, analysis, office automation, computer operation, software development, equipment maintenance, networking, Internet, and information management services to improve the productivity and effectiveness of the City's user departments and agencies.

Information Technology manages the City's local and wide area networks (LAN and WAN), and provides a variety of computer related services. The department provides the following specific services:

- Recommends systems
- Selects equipment for purchase
- Repairs, maintains, and installs systems, networks, and equipment
- Supports the City's computer users
- Develops application software for the City's IBM AS/400
- Maintains software
- Recommends and selects commercial application systems

With the advent of personal computer (PC) technology, Information Technology has assumed an increasingly important role in the coordination and management of networked PCs, and the development and maintenance of mainframe technology applications accessed via commonly available PCs.

With regard to GIS technology, very few applications exist that Information Technology can reasonably apply to its own needs. However, the department is positioned to assume a significant role in the City's planned implementation of this technology.

The planned GIS hardware, software, applications, and data must be designed and implemented to fit within the City's existing computing environment, which is managed by Information Technology. The implementation of the planned GIS will require the integration with, and migration of, various existing legacy systems and platforms, such as the AS400 platform/applications. Information Technology is well suited to assist the City, and its implementation consultant, with the evaluation, selection, design, and implementation of the various hardware, software and peripherals needed to support the GIS.

Information Technology is also well suited to provide the necessary staff support required for the installation and maintenance of the City's proposed GIS hardware and software.

Current Non-Computerized Data Usage

Information Technology currently utilizes the following non-computerized databases:

1. **Inventory database** – this document, maintained by Information Technology, is used to record and track all IT supplies.
2. **Fixed Assets database** – this document, maintained by Information Technology, is used to record and track all fixed assets of the IT agency such as all computer equipment.

GIS Applications and Benefits

The Information Technology Department will benefit from various GIS applications that fall within the general application categories of ***Infrastructure Management***, and ***Routing, Scheduling, and Coordination of Services and Inspections***.

A significant benefit of the City's proposed GIS, as it relates to Information Technology, will be the standardization of departmental databases. Many of the existing digital data sets maintained by the City's various departments will be migrated to the proposed GIS relational database. This will eliminate Information Technology's need to administer a number of legacy applications, which currently exist throughout the City. On the other hand, several existing legacy systems (APLUS CAMA, AS400, etc.) will not be migrated into the base GIS database. These systems will need to be interfaced with the proposed GIS, to provide the desired functionality. In these instances, Information Technology will be called upon to assist with the development of the required interface programs.

Various infrastructure management and routing applications may be implemented to significantly improve Information Technology's operating efficiencies. The proposed GIS will offer Information Technology with the ability to map the City's existing computer network infrastructure (PC's, servers, cabling, peripherals, etc.) and proactively schedule preventative maintenance and system upgrades.

LIBRARY

The role of the library is to assist the citizens of Suffolk in fulfilling their recreational, informational and cultural needs by:

- Promoting, encouraging and supporting a lifelong interest in reading
- Providing sources of information in all fields of knowledge
- Providing materials that support the continuing formal and informal educational needs of its citizens.

As the City's provider of information services to Suffolk's general population, the Library is well suited to serve as the conduit for providing public access to the City's geographic data sets.

GIS Applications and Benefits

The Library did not indicate any desire, or need for a City-wide GIS implementation. However, a typical municipal library system may find the following general GIS applications useful:

- ***Facility Location and Allocation of Services***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Although the Library did not indicate any desire for a GIS, it may benefit from a variety of common GIS applications. A variety of political, parcel, and demographic data sets may be analyzed within the GIS to assist with site selection of a new library. The GIS may also be used to help coordinate the route and schedule of the Library's book mobile.

By providing kiosks (desk top access) for citizens to retrieve, view, and publish various GIS maps and data sets, the Library will serve as a conduit for access to public information. By placing the proposed GIS in the library branches for the public to access, the City will increase public participation in the planning and review process of various City-wide initiatives.

NEIGHBORHOOD DEVELOPMENT SERVICES

Neighborhood Development Services (NDS) strives to continue to improve the quality of life of Suffolk citizens by combining the functions of Housing and Building Inspections and Zoning Administration, and by providing coordinated activities with neighborhood and business leaders for a comprehensive building and housing inspections program. A primary responsibility of NDS is the coordination and management of permit distributions, property code inspections and enforcement of all new and existing structures, and property zoning.

The mission of NDS's Building division is to enforce the Uniform Statewide Building code and the City ordinances pertaining to new construction. In support of this mission, Buildings investigates various complaints, and follows-up through either complaint abatement, or court action.

The mission of NDS's Housing division is to enforce the Uniform Statewide Building Code and City ordinances pertaining to existing construction. This division enforces regulations involving the housing code including grass and weeds, trash and debris, inoperable vehicles and unsafe structures. Investigations are performed on a systematic, as well as a complaint, basis with follow-up through either complaint abatement, or court action. This division also enforces the City's Rental Occupancy Programs.

Current Database Usage

NDS currently utilizes the following databases:

1. **Permits Database** – this database, maintained by NDS, is used to keep track of all permits throughout the City. NDS updates this database daily and ranks it as being most important.
2. **Code Enforcement** – this database, maintained by NDS, is used to keep track of all inspection requirements. NDS updates this database daily and ranks it as being most important.
3. **Real Estate Assessor** – this database, maintained and updated daily by the City Assessor's office, is used by NDS as a read only reference for keeping track of all parcels and buildings throughout the City. This database ranks as being most important by NDS staff.
4. **Finances** – this database, generated and maintained daily by the Finance Department, is used by NDS as a read only reference for tracking all year to date expenditures. This database ranks as being very/somewhat important by NDS.

Current Non-Computerized Data Usage

NDS currently utilizes the following non-computerized databases:

1. **Plats and Maps** – these paper maps, updated by NDS, are used for reviewing and processing parcel information. These maps rank as being most important by NDS staff.
2. **Building Plans** – these plans, updated by NDS, are used for keeping track of and processing building plan information. These plans rank as being most important by NDS.
3. **Permit Applications** – these applications, maintained by NDS, are used to process all permits applications throughout the City. NDS ranks these applications as being most important.
4. **Building Reports** - these paper documents, maintained by NDS, are used to keep track of building trends throughout the city. These reports rank as being most important by NDS staff.
5. **Rental database** – this hardcopy database, maintained by NDS, is used to track rental occupancy information. NDS ranks this database as being most important.

Current Map Usage

NDS currently utilizes the following map products:

1. **Zoning Maps** – these maps, manually maintained by NDS, are used to determine zoning boundaries within the City limits. Zoning maps are maintained on both paper and mylar. These maps rank as being most important by NDS.
2. **City Routing Maps** – these paper maps are used by NDS to keep track of all routing tracks for permit inspections. These maps are updated monthly and ranks as being most important by NDS.
3. **Approved Site Plans** – these plans are used and maintained by NDS to keep track of record site addresses for approved plans. These maps are updated weekly. NDS ranks these maps as being most important.
4. **Subdivision Maps** – these hand drawn maps are used by NDS to keep track of all major subdivisions and boroughs located throughout the City. NDS has not ranked these maps.

GIS Applications and Benefits

Neighborhood Development Services will benefit from numerous GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Neighborhood Development Services will be a viewer/user of other department's data. NDS will also be a "doer" in the City's GIS user community. The majority of the data that NDS collects and maintains is related to lots or structures throughout the City, and can be tied to a specific parcel address. The digital parcel map product that will be available through the proposed GIS will greatly benefit NDS by ensuring rapid access to the most up-to-date parcel information. Many of NDS's existing work flows will be automated by the proposed GIS implementation, thereby improving the department's overall operating efficiencies. Information, which is shared between NDS, Planning, the City Assessor, Public Utilities, Public Works, etc. will be readily accessible and more easily shared through the proposed GIS.

The proposed GIS will support an automated address assignment application, benefiting many city departments. Such an application will enable new addresses to be automatically reported back to the Assessor's Real Estate database for use by all other interested departments or agencies. This will eliminate the delay (sometimes up to twelve months), which currently exists between the time the address is assigned, to when it is posted in the Real Estate database. This issue is very important to the efficient operation of the desired Emergency Dispatching application required by Police and Fire.

The GIS will also support the automatic generation of various thematic maps, such as the City's Zoning Map, based on parcel attributes. When a parcel, or group of parcels, is re-zoned or issued a variance, NDS will be able to automatically recreate the Zoning Map based on the subject changes. This application will eliminate the departments need to manually updated the existing hard copy zoning map every several years.

The proposed system will provide NDS with numerous reporting, querying, and analyses tools that will assist the department with planning and presenting cases to the City's various planning, zoning, etc. boards.

PARKS AND RECREATION

The Department of Parks and Recreation is responsible for providing the appropriate resources and opportunities for leisure activities for the citizens of Suffolk. The department is organized into three individual divisions: Administration, Recreation and Maintenance.

Parks and Recreation is responsible for the maintenance, rental, and use of the City's parks, sports fields, buildings and waterfront areas. The department administers ticket sales, collects the appropriate user fees, and issues use waivers when appropriate. Parks and Recreation oversees the City's green-space and recreation planning for all new housing development areas and subdivisions.

Current Database Usage

The Department of Parks and Recreation indicated the current use of the following databases:

1. **AS400 database** - this database, maintained by the Finance Department, is used by the Parks and Recreation Department to request purchase orders and review accounts and line items. This database is updated daily and is 100 percent complete. The Parks and Recreation Department did not rank this database.

2. **Rec-Ware – Activity Registration database** – this database, maintained by the Parks and Recreation Department, is used to record all activity registration information such as class, activity and league registrations. This database is updated daily and is 90 percent complete. The Parks and Recreation Department did not rank this database.
3. **Rec-Ware – League Schedules database -** this database, maintained by the Parks and Recreation Department, is used to keep track of all team and league scheduling information. This database is updated weekly and is 80 percent complete. The Parks and Recreation Department did not rank this database.
4. **Rec-Ware – Facility Rental database -** this database, maintained by the Parks and Recreation Department, is used to track all facility rental and facility maintenance scheduling information. This database is updated daily and is 40 percent complete. The Parks and Recreation Department did not rank this database.
5. **Rec-Ware – Market Almanac database -** this database, maintained by the Parks and Recreation Department, is used to monitor market demographic information. This database is updated monthly and is 90 percent complete. The Parks and Recreation Department did not rank this database.
6. **Rec-Ware – Phone Registration -** this database, maintained by the Parks and Recreation Department, is used to record all activity registration and accept credit card registration payments by phone. This database is 5 percent complete. The Parks and Recreation Department did not rank this database.

Current Non-Computerized Data Usage

The Department of Parks and Recreation indicated the current use of the following non-computerized databases:

1. **US Census (1990) database** – this hardcopy database, generated by the US Government, is used by the Parks and Recreation Department as a read only reference aid in qualifying for USDA finding. This database is 100 percent complete and ranks as being very important by the Parks and Recreation Department.

2. **School Board Facilities database** – this hardcopy database, generated by the Suffolk School Board, is updated by the Parks and Recreation Department and used to schedule reservations for use of school facilities. This database is 100 percent complete and ranks as being very important by the Parks and Recreation Department.
3. **Parks and Recreation Facilities database** - this hardcopy database, maintained by the Parks and Recreation Department, is used to track all facility rental information. This database is updated daily and is 100 percent complete and ranks as being most important.
4. **ABC applications** - these applications, generated by the ABC Board, are used as a read only reference by the Parks and Recreation Department to monitor alcohol licenses at city rental facilities. This database is 100 percent complete and ranks as being very important by the Parks and Recreation Department.
5. **Police Department database** – this hardcopy database, maintained by the Suffolk Police Department, is used as a read only reference by the Parks and Recreation Department to monitor all permits including those required for gun shows, the Health Department and entertainment licenses. This database is 100 percent complete and ranks as being very important by the Parks and Recreation Department.
6. **Treasurer's Office database** – this hardcopy database, maintained by the City of Suffolk Finance Office, is used as a read only reference by the Parks and Recreation Department to keep track of all payment receipts and deposits. This database is 100 percent complete and ranks as being most important by the Parks and Recreation Department staff.
7. **Criminal database** – this database, maintained by the Virginia State Police Personnel Department, is used as a read only reference by the Parks and Recreation Department to conduct criminal background record checks. This database is 100 percent complete and ranks as being most important by the Parks and Recreation Department staff.

Current Map Usage

The Department of Parks and Recreation indicated the current use of the following map products:

1. **Park maps** – these hand drawn maps, produced by the Parks and Recreation Department, are used to determine the general locations and layouts of all city parks and amenities. This map

set is 80 percent complete and ranks as being most important by the Parks and Recreation Department staff.

2. **City maps** – these hand drawn maps, produced by the Parks and Recreation Department, are used to determine program delivery areas throughout the city. These maps are 100 percent complete and are ranked as being most important.

GIS Applications and Benefits

Parks and Recreation will benefit from various GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Implementation of the proposed GIS will provide Parks and Recreation with a base map and data set, upon which department specific applications can be developed. For example digital asset inventory, asset valuation, and work order systems can be implemented to improve the department's overall operating efficiencies. The implementation of routing and scheduling applications will enable the department to make more efficient use employees' time and resources.

Decisions can be made with the support of the most accurate and up to date information available. Implementation of the GIS will greatly reduce or eliminate data redundancies, which currently exist between divisions, and other City departments. Implementation of the proposed GIS will also greatly improve the accuracy of the data sets Parks and Recreation relies upon for the performance of its daily tasks.

As a result of the GIS implementation, Parks and Recreation will have its facility data available, on-line, in a centralized database. This data will include park boundaries, topographic data, hydrography, utilities, roads, building footprints, and existing facilities. This will enable the department to respond quickly and efficiently to various requests for information, and to more efficiently plan and administer its various programs.

PERSONNEL

The general mission of the Personnel Department is to assist other City departments in planning for the future and projecting needs, as well as the recruitment, selection, retention and overall management of their employees. The Personnel Department maintains employee records, offers a variety of training programs, reviews new legislative initiatives and developments, and advises on federal and state requirements related to Personnel issues. The department also oversees programs relating to employee recognition, employee satisfaction and employee relations with internal and external customers.

GIS Applications and Benefits

The Personnel Department may benefit from various GIS applications that fall within the general application categories of ***Case Management in Health and Social Services***, and ***Facility Location and Allocation of Services***.

Personnel will realize limited benefits from the initial implementation of the City's proposed GIS, primarily as a viewer of other departments' data. Applications may be implemented to support the recruitment of potential municipal employees.

PLANNING

Planning strives to preserve and enhance the quality of life of Suffolk Citizens by providing sound and efficient management and administration of the City's overall land use planning program, and by implementing various mechanisms for Council to utilize in managing and guiding the growth and development of the City.

In order to effectively respond to the needs of many different authorities and constituents within the City, Planning routinely performs the following tasks:

- Updates original tax and zoning maps
- Prepares agenda maps for City Council, the Planning Commission and BZA
- Makes presentations to the Land Use committee, Planning Commission, and Historic Landmarks Commission

Planning is responsible for the management of the City's current and long range planning. The department reviews all applications. Although the Neighborhood Development Services Department is responsible for code compliance, the Planning Department performs a significant amount of plan inspections and enforcement. Planning is also responsible for special projects, such as policy/report writing, ordinance revisions, and citizen interaction to determine the needs and opinions of the public.

The Planning Department is central to many of the City's operations. In carrying out its daily tasks, the department works closely with numerous City departments and outside agencies. The department relies upon, and/or provides information to:

- the City Assessor
- Public Utilities
- the Clerk of Court
- the Virginia Department of Transportation
- Public Works
- Neighborhood Development Services
- Finance
- the Federal Emergency Management Agency

- the Department of Conservation
- various developers, contractors and property owners
- the United States Department of Agriculture

Current Database Usage

1. **Minor Subdivisions database** – this database, maintained by Planning, is used for tracking the owners' name, map and parcel number, and date of subdivision for each minor subdivision (less than five lots) created within the city. This database is 100 percent complete, and is updated weekly. Planning staff ranks this database as being most important.
2. **Street List database** – this database, maintained by Planning, is used to identify and keep track of all streets, route numbers, locations, types, associated map numbers, and status, for all streets located within the city. This database is 100 percent complete, and is updated weekly. Planning ranks this database as being most important for the performance of their duties.
3. **Subdivision List database** – this database, maintained by Planning, is used to keep track of all major subdivisions and boroughs located throughout the city. It is 100 percent complete, and is updated on a weekly basis. Planning ranks this database as being most important for the performance of their duties.
4. **Building and Zoning Permit database** – this database, maintained by Neighborhood Development Services, is used by Planning for various purposes. This database is ranked as most important by the Planning staff.
5. **Zoning Map database** – this map maintenance is performed by the Planning Department. This database is considered most important by the Planning staff.
6. **Real Estate database** - this database is a computerized version of the City's land book and is updated daily by the City Assessor's Office. It is used to maintain all real property data for all parcels within the City, supports a variety of queries, and maintains data on delinquent taxes, taxes due, and building permits. Planning has read only access to this database, and receives weekly updates from the Assessor's Office. Planning ranks this database as most important.

7. **Taxes database** – this database, maintained by the Treasurer's Office, is used by numerous City departments for the purpose of tracking payments. Planning has read only access to this database, and is provided weekly updates from the Treasurer. Planning ranks this database as very important.
8. **Tower database** - this database, maintained by Planning, is used to track the location and features of the various municipally owned and private communications towers located throughout the city. This database is updated on an as-needed basis.
9. **Plan Tracking database** – this database, maintained by Planning, is used to track the status of a variety of outstanding plans throughout the city. This database is updated on a weekly basis, and is most important to the Planning department.
10. **Conditional Use Permits database** – this database, maintained by the Planning Department, is used to track CUP numbers, tax map and lot numbers, conditional use descriptions, and date of issuance.
11. **Subdivision Variances database** – this database, maintained by the Planning Department, is used to track approved variances.

Current Non-Computerized Data Usage

1. **Planning files** – the Planning staff creates these files, and uses them as a reference aid for the performance of their duties. This data set is ranked as most important.
2. **Deeds and Plats** – the Planning Department uses these files, maintained by the Clerk of Court, to note property transfers throughout the city.
3. **Municipal Property files** – the Planning Department generates these printouts from the Assessor's database for the purpose of identifying and tracking city owned property.
4. **Chesapeake Bay Preservation Area (CBPA) Waiver Requests** – requests for waivers from the CBPA requirements are submitted to the Planning Department from various developers, contractors, and citizens. The Planning Department maintains these paper files, and ranks them as most important.
5. **Application Files for Wetlands Permits, HLC, and DBAR** – these paper files are used to capture and maintain information relating to wetland applications, Historic Landmark Commission decisions, and Downtown Business Association activities. Planning ranks the

wetland permit application files as very important, while they rank the HLC and DBAR application files as most important.

Current Map Usage

1. **Tax Maps** – these maps, maintained by the Assessor's office, are used to determine the size and location of the City's real property parcels. These 277 maps, maintained at a variety of scales, are manually updated on a daily basis. The Planning Department uses these maps to identify and confirm parcel data, including parcel number and zoning. The tax maps have been identified by Planning staff as being most important.
2. **Telecommunications Tower maps** – the Planning Department maintains a series of telecommunications tower maps for the purpose of identifying tower locations throughout the city. These hand-drafted maps are considered very important to the Planning staff.
3. **Historic Preservation maps** – these hand drawn maps, maintained by the Planning Department are used for keeping track of all historical landmark properties within the city. They have been ranked as very important.
4. **Flood Zone maps** – the Planning Department utilizes the published FEMA flood zone maps that depict the areas of the city that fall within the 100-year flood plain. These maps have been identified as a very important resource.
5. **Chesapeake Bay Preservation Area maps** – these hand-drafted maps are maintained by the Planning Department to delineate those areas that fall within the Chesapeake Bay Resource Protection and Resource Management Areas. Planning staff ranks these maps as most important.
6. **USDA Soil Survey maps** – the USGS Soil Survey contains hard copy maps, and attribute tables, of the various soil types within the area. Planning staff ranks this source as very important.
7. **Water and Sewer Utility Planimetrics** – these maps are maintained by the Public Utilities Department. The Planning staff uses them to reference a variety of utility features. The planimetrics are considered very important.
8. **Road and Street maps** – a variety of different road map products, produced and maintained by VDOT, the City's Public Works Department, and other local and regional agencies, are

used by the Planning staff for the purpose of locating different areas and facilities. These are considered most important.

9. **USGS Quadrangles** – the Planning Department utilizes the published USGS Quadrangles to interpret topographic features. This map product has been ranked as most important.
10. **National Wetlands Inventory maps** – Planning uses these maps, produced by the Fish and Wildlife Department, to identify the various wetlands located throughout the city. They have been identified as a very important data source.
11. **Plan Tracking maps** – these maps are maintained by the Planning staff for the purpose of tracking the status of various plans, in progress, throughout the city. They have been identified as most important.
12. **Zoning maps** – these maps, maintained by the Planning staff, are used to track and verify current parcel zoning. They have been identified as most important.
13. **Land Use and other Physical Feature maps** – these maps are periodically updated by the Planning Department and are considered very important.

GIS Applications and Benefits

The Planning Department will benefit from numerous GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Planning will be a classified as a viewer/user/doer within the City's GIS user community. All of the data that Planning collects and maintains carries a spatial component, and most is related to specific

lots or structures located throughout the City, and can be tied to a specific parcel address. The digital parcel map product that will be available through the proposed GIS will greatly benefit Planning by ensuring rapid access to the most up-to-date parcel information. Many of Planning's existing data sets may be integrated into, or linked with, the proposed GIS, thereby improving the department's overall operating efficiencies. Information, which is shared between Planning and various other departments and outside agencies will be readily accessible and more easily shared through the proposed GIS.

A parcel maintenance application, effectively implemented within the City Assessor's Office, will eliminate the Planning department's need to manually update the City's tax maps. The changes to the parcel geometry (subdivides and combines) could be entered directly into the GIS as they are processed by the Assessor's Office, thereby making the parcel updates immediately available to the rest of the City's users. This will eliminate the need for the redundant parcel maintenance work currently being performed between the Assessor's and Planning offices.

The proposed GIS will support an automated address assignment application, benefiting many city departments. Such an application will enable new addresses to be automatically reported back to the Assessor's Real Estate database for use by all other interested departments or agencies. This will eliminate the delay (sometimes up to twelve months), which currently exists between the time the address is assigned, to when it is posted in the Real Estate database. While this issue is important to a variety of permitting, inspection, and review applications, it is most important to the efficient operation of the desired Emergency Dispatching application required by Police and Fire.

The GIS will also support the automatic generation of various thematic maps, such as the City's Zoning Map, Telecommunications Tower maps, Historic Preservation maps, Flood Zone maps, CBPA maps, Soils maps, wetlands maps, etc., based specific attributes maintained within the GIS's relational database. This application will eliminate the departments' need to manually update the existing hard copy maps.

The proposed GIS will provide Planning with numerous reporting, querying, and analyses tools that will assist the department with each of its designated responsibilities.

POLICE DEPARTMENT

The primary functions and responsibilities of the Police Department include: the preservation of public peace and order, the prevention and deterrence of crime, the apprehension of offenders, the assistance in the prosecution of offenders, and the protection of life and property. In addition, the Police Department strives to enforce vehicular and other traffic regulations, enhance the recovery and return of lost or stolen property, and otherwise enforce all applicable laws and ordinances.

In order to carry out these functions, the Department is organized into three major divisions, including the Support Division, the Operations Division and the Animal Control Division. The Support Division oversees Training and Inspection, Records and Identification, Property and Supply, Communications, Public Information and Crime Line. The Operations Division is responsible for Uniform Patrol, Criminal Investigations, Special Investigations, DARE, Traffic Enforcement, Community Police Service Unit, Auxiliary Police, School Crossing Guards, Police Explorer Scouts, and Police Chaplains. The Animal Control Division is responsible for investigation of incidents and enforcement of State and City laws regarding domestic animals.

Current Database Usage

The Police Department currently utilizes the following databases:

1. **Crime Analysis database** - this database, maintained by the Police Department, is used for crime statistics analyses. This database has been ranked as most important by the Police Department staff.
2. **Internal Communications database** - this database, maintained by the Police Department, is used for directing all internal communications. This database is 100 percent complete and has been ranked as most important by the Police Department staff.
3. **NCIC database -** this database, generated by the Virginia State Police Department and the Virginia State Government, is used by the Police Department for keeping track of all criminal and traffic violation records including state arrest records. This database is updated daily and ranks as being most important by the Police Department.

4. **Vision CAD database** - this database, maintained by the Police Department, is used for tracking and dispatching all police, fire and rescue operations. This database is 100 percent complete and updated daily. The Police Department has ranked this database as most important.
5. **Vision RMS database** - this 100 percent complete database, generated by the Police Department, is used for recording all incident reports of all criminal and traffic violations. This database is updated daily and ranks as being most important by the Police Department.
6. **VCIN database** - this database, generated by Police Department, is used by the Police Department for keeping track of all criminal and traffic violation records including state wanted/arrest records. This database is updated daily and ranks as being most important by the Police Department.
7. **AS400** – this database, maintained by the Finance Department, is used by the Police Department to retrieve archived records and review accounts and budget line items. This database is updated daily and is 100 percent complete. The Police Department has ranked this database as most important.
8. **State AFIS database** - this database, maintained by the Police Department, is used as an automated fingerprint information system. This database is updated daily and ranks as being most important by the Police Department.

Current Non-Computerized Data Usage

The Police Department currently utilizes the following non-computerized databases:

1. **Police Reports** – these paper reports, maintained by the Police Department, are used to record and document all criminal offense cases. This data set is 100 percent complete and rank as being most important by the Police Department.
2. **Warrants** – these paper documents, generated by the City Magistrate and other city agencies, are used by all law enforcement agencies to document arrest warrants. These records are 95 percent complete and rank as being most important by the Police Department staff.

3. **Finger Print Cards** – these paper documents, maintained by the Police department, are used to record and track the fingerprints of all criminal offenders. This data set is 100 percent complete and rank as being most important by the Police Department.
4. **Police Pictures** – these pictures, maintained by the Police department, are used to document and keep track of all criminal offenders for the purpose of recognition. Police Department staff did not rank these picture files.
5. **Central Records** – this hardcopy database, maintained by all law enforcement agencies, is used by the Police Department to keep track of and manage all criminal arrest histories. This data set is 95 percent complete and rank as being most important by the Police Department.
6. **Investigations** – this hardcopy database, generated internally by the Police Department, documents and tracks all criminal case reports and investigations. This data set is 95 percent complete and rank as being most important by the Police Department.

Current Map Usage

The Police Department currently utilizes the following map products:

1. **Street Maps** - a variety of different road map products are used by the Police Department staff for the purpose of locating different areas and facilities when investigating complaints. The data set of hand-drawn maps is 100 percent complete and are considered most important.
2. **General Real Estate Maps** - a variety of real estate map products are used by the Police Department staff for the purpose of associating parcel or lot locations with street addresses. This database ranks as being most important by the Police Department.
3. **Crime Analysis Maps** – these mylar maps, generated by the Planning Department, are used by the Police Department as a means of tracking crime trends and thus budgeting manpower allocations. The Police Department updates these maps daily with the data set being 75 percent complete. The maps are ranked as being most important.

GIS Applications and Benefits

The Police Department will benefit from numerous GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The City's Emergency Dispatch (Vision CAD) system may be interfaced with the GIS to greatly enhance the City's dispatching and routing capabilities. Incident locations can be accurately mapped through the GIS. Inclusion of various street impedances within the GIS database will also support automated routing applications, thereby improving response times by providing officers with the quickest route. Critical response information such as known offenders residing at the location, can be rapidly accessed through an interface with the proposed GIS.

The future implementation of Automated Vehicle Location (AVL) technology will greatly benefit the Police Department. AVL technology provides real time global positioning system (GPS) locational capabilities, which will allow the Police Department to dispatch the appropriate nearest available unit to all reported incidents.

The department's recently acquired crime analysis software can be interfaced with the GIS, thereby providing Police with increased crime analysis capabilities. The Police Department can utilize the GIS to help define/modify patrol areas, ensuring the most efficient use of the department's limited resources

The GIS's inherent reporting, querying, analysis, and map production capabilities will support many department specific functions, and improve overall operating efficiencies.

PUBLIC SCHOOLS

The Suffolk City School Board is responsible for managing the instruction, curriculum and personnel, as well as technology of the public school system. In order to efficiently manage the public school system, the Suffolk School Board must track all rezoning analysis, maintain school transportation schedules, and optimize school bus routes.

The School Board also oversees programs relating to pupil issues such as guidance, food services, alternative education, Title I, health services, safe and drug free schools, health and personal exercise programs, drivers education, print services, discipline issues, VNSL, gifted/talented programs, Title IX, 504's, and attendance.

Current Database Usage

Public Schools currently utilizes the following databases:

1. **EDULOG database** – this 100 percent complete database, maintained by the Public Schools Transportation Department, is used to monitor and keep track of all bus routes and school attendance zones. This database is updated weekly and ranks as being most important by the Public Schools Department.
2. **VASISMS database** - this database, maintained by the Public Schools Department, is used to keep track of all student attendance and school scheduling. This database is 100 percent complete and ranks as being most important by the Public Schools Department.

Current Map Usage

Public Schools currently utilizes the following map products:

1. **Attendance Zoning Maps** – these maps, manually maintained and updated as needed by the Public Schools Department, are used to monitor and adjust attendance zones for each school as necessary. This data set is 100 percent complete and ranks as being most important by the Public Schools Department.
2. **Bus Route Maps** - these maps, manually maintained and updated as needed by the Public Schools Department, are used to monitor and adjust school bus transportation zones for each school as necessary. The Public Schools Department did not give these maps a rank of importance.

GIS Applications and Benefits

Public Schools will benefit from various GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Interfacing School's existing EDULOG system with the proposed GIS will offer increased functionality in the areas of school bus routing and school rezoning. The attendance zone and school bus route maps, which are currently manually maintained by Public Schools, can be automatically generated through the proposed GIS.

The various reporting, querying, analysis, and map production capabilities offered by the GIS will support many additional department specific functions, such as school siting, and improve overall operating efficiencies.

PUBLIC UTILITIES

The Department of Public Utilities is comprised of the following six divisions:

- Administration
- Engineering
- Customer Service
- Water Production
- Facility Maintenance
- Line Maintenance

The Administration Division provides executive management and general direction to all divisions of the Department of Public Utilities. In addition, Administration is responsible for the comprehensive planning function of the Department, thereby ensuring the orderly expansion of water and sewer systems in accordance with Federal, State and City regulations. The City's Comprehensive Land Use Plan 2018 identifies the service areas for water and sanitary sewer expansion. In addition, the division administers the financial management of the City's Utility Fund, which operates as an enterprise.

The Engineering Division's primary mission is to provide technical assistance to the department. This division manages the Utility Fund Capital Improvement Program and proposed water development projects**.** As part of their effort, the division administers engineering agreements, construction contracts, development agreements, and reviews all design and construction activities.

In addition, the division maintains the department's water model and water/sewer database; provides utility feasibility studies/cost estimates; manages the development of water and sewer master plans; reviews subdivision and commercial development plans; and manages the design and construction of utility and neighborhood improvement projects.

The primary mission of the Customer Services Division is to handle all utility service account activities including meter reading, bill processing, service requests, new water and sewer connections, contracts for

service, and other related functions. The division manages the accounts receivable and billing of approximately 17,000 accounts.

The Water Production Division functions to ensure that there is an adequate supply of potable water that meets or exceeds the qualitative guidelines established by Federal and State regulatory agencies. This is achieved through the day-to-day operation and maintenance of the water treatment plant, the desalination plant, water storage tanks, water transmission and distribution lines, and many other municipally owned facilities.

The division monitors the City's water quality throughout the treatment process and into the distribution system. Water Production ensures compliance with State and Federal requirements in all aspects of water production. The division also manages the City's cross-connection program, and watershed protection efforts.

The Facility Maintenance Division maintains all of the department's structural facilities, including 90 sewer pumping stations, six community well systems, two emergency deep wells, the conventional water treatment plant and EDR plant.

The Line Maintenance Division is responsible for the maintenance of approximately 220 miles of water transmission/distribution mains and services, and approximately 150 miles of sanitary sewer mains, which includes gravity lines, vacuum lines and force mains. Their function includes the installation of new mains, repair of main failures, meter testing, meter repairs/replacement, maintenance of fire hydrants, valves, and manholes, and other various activities in response to customer inquiries. In addition, this division implements the Virginia Underground Utility Damage Prevention Act (Miss Utility) for the department.

Current Database Usage

The various divisions within the Department of Public Utilities use the following lists of databases. The descriptions of the databases are followed by the list of divisions that use the product.

1. **Customer Account database** – this database is maintained by Public Utilities, and is used to track customer billing, consumption data, and maintenance activities. It is updated on a daily basis, and is considered to be most important. (Administration)
2. **Cybernet Water Model database** – the City's skelatal water model (8" and larger mains) is maintained in this database/network analysis model. Public Utilities updates this data on a monthly basis. The model is used to analyze water flows within the City's distribution system. The Cybernet graphics file was developed from 1:24,000 USGS quadrangles. The department would like the ability to track the water/sewer main installation dates, material, etc. using this software. The data maintained in this database is considered most important in the performance of the department's functions. (Administration, Engineering)
3. **Node File database** – this database is maintained on the City's AS400, and is used to track water consumption data at the traffic zone (HRPDC) level. (Engineering)
4. **Engineering Inspection/Billings database** - this database is used to develop inspection invoices. It is updated on a weekly basis, and is considered most important. (Administration)
5. **General Ledger database** - this database, maintained by the Finance Department, is used by Public Utilities to view department expenditures. Utilities staff considers this database to be very important. (Administration, Customer Service)
6. **Real Estate database** - this database is a computerized version of the City's land book and is updated daily by the City Assessor's Office. It is used to maintain all real property data for all parcels within the City, supports a variety of queries, and maintains data on delinquent taxes, taxes due, and building permits. Public Utilities utilizes it to view a variety of parcel information, and considers it to be a very important data set. (Administration, Customer Service)
7. **Utility Fund Accounts database** - this database, maintained by the Finance Department, is used by Public Utilities to view Operations and Capital Budget account information. Utilities staff considers this to be a most important database. (Administration)

8. **Water Production database** – this database is updated by Public Utilities on a daily basis. It is utilized to track critical water production information, and is considered most important. (Administration)
9. **Billing/Stars database** – this database is updated by Public Utilities on a daily basis. It is used to track meter reading and billing account information. The division is currently in the process of upgrading this software. (Customer Service)
10. **Project List database** – Public Utilities utilizes this database to track information on all capital and private projects under design, review, or construction. It is updated on a weekly basis, and is considered to be a most important data set. (Engineering)
11. **Work Order Database** – this database is used for tracking all line maintenance activities and assigning jobs. It is updated on a daily basis by Public Utilities. Approximately 200 to 300 requests for maintenance or new service are entered into this Access database per month. There are plans to interface this system with the City's AS400 via an ISDN connection. The data maintained in this system is considered most important. (Line Maintenance)
12. **Wonder Ware database** – this is the City's Supervisory Control and Data Acquisition (SCADA) system. The system captures and stores the flow information and tank level data from the plants and storage facilities. The data maintained by this system typically fills the division's one-gigabyte hard drive every thirty days. The division would like the ability to access historical SCADA data through the GIS. This database is considered most important to the staff. (Water Production)
13. **Various databases** – a variety of Access, dBase, Excel, and Lotus databases are used to store and track operational and water quality data. These are updated on a daily basis, and are considered most important. (Water Production)

Current Non-Computerized Data Usage

The various divisions within the Department of Public Utilities use the following non-computerized data sources. The descriptions of the data sources are followed by the list of divisions that use the product.

1. **Administrative Policies** – this data source is used as a reference for reviewing the department's administrative policies. It is considered to be most important. (Administration)
2. **Connection Fee Receipts** – this data initiates new service numbers which identifies specific accounts and subsequent service history.
3. **Fire Hydrant Data** – this data is used to assist Utilities personnel with scheduling maintenance and repairs to the City's fire hydrants. This data is considered most important. (Administration)
4. **Plan/Project Files** – this as-built information is used to track piping networks, sewer service areas, drainage basins, etc. Utilities staff considers this data to be most important. They would like to get this information into a digital database. (Administration, Engineering)
5. **Utility Service Files and Account data** – Public Utilities uses these files to review account activities. They are considered a most important data source. (Administration, Customer Service)
6. **Work Orders** – these files are used to schedule and track maintenance activities. They are considered most important. (Administration)
7. **Housing data** – these files are used to verify certificate of occupancy permits. These files are considered very important. (Customer Service)
8. **Zoning data** – this data, maintained by Neighborhood Development Services, is used to verify zoning permits. It is considered a very important data source. (Customer Service)
9. **Leak Notices** – are used to notify Utilities personnel of leak complaints. Complaints are recorded by location and date. This data is considered most important. (Line Maintenance)
10. **Meter Tickets** – are used to track the service and repair history of the City's water meters. They are considered a very important data source. (Line Maintenance)

11. **Street Permits** – are used to report street openings. The Department of Public Utilities uses these to assist in scheduling inspections, repairs, and upgrades. They are considered most important data sources. (Line Maintenance)
12. **Utility Contract** – is used to document tap and fee records. This data is considered very important. (Line Maintenance)
13. **Laboratory data** – tracks a variety of monitored water quality variables. This data is considered most important in the operation of the treatment facility. (Water Production)
14. **Operations data** – tracks a variety of operational data. This data is considered most important in the operation of the treatment facility. (Water Production)

Current Map Usage

The various divisions within the Department of Public Utilities use the following lists of map products. The descriptions of the map products are followed by the list of divisions that use the product.

1. **Tax Maps** – these maps are maintained by the Assessor's office, and are used to determine the size and location of the City's real property parcels. These 277 maps, maintained at a variety of scales, are manually updated on a daily basis. Public Utilities receives monthly updates of these maps, and uses them to identify parcel sizes and locations, and plan for property acquisitions. Department personnel rank the Tax Maps as most important. (Administration, Engineering)
2. **Subdivision Project plans and As-builts** – project plans are used by Administration to view detailed plans of the various utilities. These files exist in paper and mylar format. As-builts are utilized by Line Maintenance to identify the final constructed location and configuration of the utilities. Department personnel consider project plans to be most important, and as-builts to be very important. (Administration, Line Maintenance)
3. **Sewer Master Plan** – a sewer master plan map product is currently under development. This map will provide GPS locations and various attributes for all sewer manholes located within the City. (Administration)

4. **Water Model map** – the Cybernet water model graphics files is used to identify major transmission main flows rates, direction, and pressures. This product is considered to be most important. (Administration)
5. **Water and Sewer Utility Planimetrics** – the City's planimetric maps were developed in 1978, and have not been updated in the last three years. These 1"=400' scale maps are used to identify the general location of utility features and appurtenances. Public Utilities personnel feel that collectively, these files are between 20 to 90 percent complete, and are most important to the performance of the department's functions. (Administration, Engineering, Customer Service, Line Maintenance, Maintenance, Water Production)
6. **Inspection maps** – these hand drawn maps, which are used by Neighborhood Development Services to assign parcel/structure addresses to new developments, are also used by Customer Service to set up new customer accounts. They are considered to be most important. (Customer Service)
7. **Land Use/Comprehensive Plan maps** – these hard copy maps, maintained by the Planning Department, are used by Engineering for a variety of purposes including coordination of proposed land use with the utility development plans. These maps are considered to be very important data sources. (Engineering)
8. **Green Book maps** – these maps provide an historical account of water main locations, dating back to the 1920's. These maps, which are hand drawn at various scales, are considered to be very important to the department's personnel. (Line Maintenance)
9. **ADC Road Map** – this map book product, purchased from the ADC company, is used to orient the Water Production staff throughout the city's service areas. It is widely used, and considered a very important data source. (Water Production)
10. **Plant Piping Schematics** – these hand drafted maps are used by the Water Production staff to locate plant appurtenances. The staff considers them to be most important. (Water Production)
11. **Topographic maps** – these USGS produced topographic maps are used by the Wate Production staff to identify and evaluate topographic characteristics throughout the service areas. These maps are considered to be very important. (Water Production)

GIS Applications and Benefits

The Department of Public Utilities will benefit from numerous GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The Department of Public Utilities' numerous responsibilities are focused on various City assets. Each of these assets carries a spatial component that is particularly suited for representation in a GIS.

Implementation of the City's proposed GIS would provide Public Utilities with the base information necessary to further develop numerous department specific applications. For example digital asset inventory, asset valuation, work order systems, engineering model and SCADA interfaces can be implemented on top of the City's base GIS. The implementation of routing applications will enable the department to make more efficient use of field crews' time and resources. Facility maintenance and inspection programs will benefit from the accurate, detailed asset information to be maintained in the proposed GIS. An interface with the department's Customer Service database will increase service call and meter reading efficiencies, particularly when combined with the planned routing application.

The Department of Public Utilities currently suffers from a lack of accurate information regarding the location and condition of the City's various utility (water and sewer) assets. The department is utilizing inaccurate and outdated utility planimetric maps to support its required engineering functions. The implementation of the currently planned GIS will provide Utilities with accurate, up-to-date utility information, thereby increasing the department's ability to provide efficient engineering

services to the citizens of Suffolk. The department will be able to utilize this data to support complex infrastructure management decisions.

Implementation of the GIS will greatly reduce or eliminate data redundancies, which currently exist between divisions, and other City departments. The GIS will provide Public Utilities with the tools necessary to better coordinate services between other city departments and outside agencies. For example, paving programs may be better coordinated with utility upgrades/installations, thereby saving valuable funding resources.

Interfacing the department's engineering models with the planned GIS will permit accurate modeling of the City's water and sewer systems under varied operating conditions. This functionality will support the department's Comprehensive Land Use planning, management of the Utility Fund, and various other planning and economic development functions required of City departments.

As a result of the GIS implementation, the department will have most of its infrastructure data available, on-line, in a centralized database. This will enable Public Utilities to respond quickly and efficiently to various requests for information from internal and external customers alike.

PUBLIC WORKS

The mission of the Department of Public Works is to provide safe and efficient essential services to the citizens, including:

- Street and storm water facility maintenance
- Refuse collection
- Transit operations
- Traffic engineering
- Maintenance services for City operated facilities
- Other special services

The department is organized into the following eight divisions:

- Administration
- Traffic Engineering
- Streets/Storm Sewer
- Sanitation
- Buildings/Grounds
- Transit (TRT)
- Aviation
- Public Service

Public Works' Administration Division is responsible for ensuring that all of the department's operational services and management strategies are effectively and efficiently maintained. The division oversees and/or coordinates the following activities:

- Trash collection and recycling/litter coordination
- TRT bus service
- Cemetery upkeep, files, grave opening and bills
- City building maintenance - including HVAC
- City building janitorial service
- Municipal airport operation
- Traffic control in 2 square mile downtown area
- Street/storm drainage/sidewalk repair, paving and upkeep in 2 sq. mile downtown area and parking lots in downtown area
- Street sign fabrication for City, street light requests and authorization
- City telephone responsibility for billing
- Maintenance changes or additions or moves for all departments,
- Mosquito control

The Administration Division is also responsible for managing all Public Works records as well as formulating reports and documents for presentation and reporting activities.

The Traffic Engineering Division's primary responsibilities include signage, signalization, pavement markings, plan review, parking management, project management, accident data analysis, and traffic

management analysis. The division also provides traffic engineering services for construction activities within the public right-of-way for Old Suffolk.

The Division of Aviation serves to provide efficient and essential administrative and operational services and facilities to the general aviation community. The division is responsible for the daily maintenance and operation of the Suffolk Municipal Airport, including operating runways, taxiways, hangar facilities, apron and tie down facilities, fueling facilities, and the required navigational equipment.

The Street/Storm Sewer Division serves to manage the street and sewer systems within the Suffolk Taxing District, thereby ensuring their effective operation. The division is responsible for providing field maintenance and construction of the street system, effective street and storm sewer design, sidewalk design and repair, and upkeep of City-owned parking lots.

The Sanitation Division of the Department of Public Works manages all sanitation and recycling operations within the City including the collection of refuse and recyclables and the coordination of all recycling/litter programs.

The Division of Buildings and Grounds' primary responsibilities include the maintenance of all City owned buildings, City building janitorial services, review of construction plans for new subdivisions, and management, operation, and upkeep of the City's two cemeteries.

The Transit Division manages all operations involving the City transit system.

The Public Service Division manages the customer service and public awareness programs for all Public Works divisions. The division is responsible for public relations, public awareness programs, customer service/satisfaction, and overall communication between City customers and all Public Works divisions.

Current Database Usage

The Department of Public Works currently utilizes the following databases:

1. **Refuse Collection** – this database, maintained by Public Works, is used for tracking all special refuse collection routes. This database is updated daily. The Department of Public Works has ranked this database as being most important.
2. **Salary Recap** – this database, maintained by Public Works and updated weekly, is used to identify and track all weekly salary expenditures of the department. This database ranks as being most important by the Department of Public Works.
3. **Cemetery Records** – this database, maintained by Public Works, is used to accurately maintain cemetery files and records including cemetery lot ownership and location as well as maintaining burial logs. This database is updated daily and is ranked as being most important by the Department of Public Works.
4. **Microcall** – this database, maintained by Microtel and updated monthly, is used by the Department of Public Works to accurately track all internal long distance phone calls and maintain responsibility for billing City departments. This database ranks as most important by the Department of Public Works.
5. **Special Trash Collection –** this database, maintained by Public Works, is used to develop special trash collection pick-up zones and maintain all special trash collection request records. This database is updated daily and ranks as being most important by the Department of Public Works.
6. **Storm Drainage and Street –** this database, maintained by Public Works, is used to track storm drainage and street cleaning routes and maintenance requests for the Department of Public Works.

Current Non-Computerized Data Usage

The Department of Public Works currently utilizes the following non-computerized databases:

1. **Work Orders** – the Department of Public Works staff create paper copy work order requests in order to assign project tasks to City employees. This data set ranks as being most important by the Department of Public Works.
2. **Street Operating Permits** - the Department of Public Works maintains all street operating permits in order to maintain accurate hard copy work records. The Department of Public Works ranks this data set as being most important.
3. **Subdivision Plans** - hard copy plans, maintained by the Planning Department, are used as read only records by the Department of Public Works to keep track of subdivision and borough site development throughout the City. These plans are ranked as being most important by Public Works.
4. **Street Permits** – these records, maintained and updated by the Department of Public Works, are used to monitor the status of all private street related work. The Department of Public Works ranks this data as being most important.
5. **Street Lights** – these records, maintained and updated by the Department of Public Works, are used to track all paper records pertaining to the upgrade or installation of new street lights. This data ranks as being very important by the Department of Public Works.

Current Map Usage

The Department of Public Works currently utilizes the following maps:

1. **Tax Maps** – these maps, maintained by the City Assessor's Office, are used to determine the size and location of the City's real property parcels. These 277 maps, maintained at a variety of scales, are manually updated on a daily basis. The Department of Public Works uses these maps to define and identify property information. These maps rank as being very important by the Department of Public Works.

2. **Street Maps** – a variety of different road and street map products, produced and maintained by VDOT, the City's Department of Public works, and other local and regional agencies are used by the Department of Public Works for the purpose of tracking public transportation routes and sanitary/recycling routes.
3. **City Streets** – these maps are produced for the Department of Public Works for tracking the location and responsibility areas of City work crews. These maps are updated daily.
4. **Cemetery Maps** – these CADD mylar maps, maintained by the Department of Public Works, are used as reference to track lot and burial locations. These maps are updated monthly.
5. **Building Maps** - these hard copy building maps are created as needed for the purpose of tracking the locations of all electrical, HVAC, and plumbing operations in progress throughout the City.

GIS Applications and Benefits

The Department of Public Works' numerous responsibilities are focused on various City assets. Each of these assets carries a spatial component that is suited for representation in a GIS. Public Works will benefit from numerous GIS applications that fall within the general application categories of:

- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Implementation of the proposed GIS will provide Public Works with the base information necessary to further develop numerous department specific applications. For example digital asset inventory, asset valuation, and work order systems can be implemented on top of the City's base GIS. The implementation of routing applications will enable the department to make more efficient use of field crews' time and resources.

Decisions can be made with the support of the most accurate and up to date information available. Implementation of the GIS will greatly reduce or eliminate data redundancies, which currently exist between divisions, and other City departments. The GIS will provide Public Works with the tools necessary to better coordinate services between other city departments and outside agencies. For example, paving programs may be better coordinated with utility upgrades/installations, thereby saving valuable funding resources.

As a result of the GIS implementation, the department will have most of its infrastructure data available, on-line, in a centralized database. This will enable Public Works to respond quickly and efficiently to various requests for information from internal and external customers alike.

REGISTRAR

The Registrar is appointed by the Suffolk City Electoral Board, whose three members are appointed by the Circuit Court Judges. The Registrar is responsible for carrying out directives from the State Board of Elections and the local Electoral Board to ensure all eligible citizens the right to vote. The duties of the office include: arranging and supervising primary, general, and special elections at local, state and federal levels; registering voters; and maintaining voter registration records that reflect up-to-date information.

In addition, the Registrar is responsible for precinct analysis and map production in order to maintain and improve voter precinct boundaries. The Registrar is also responsible for, verifying signatures on petitions, and maintaining all electronic results to certify electoral candidates.

Current Database Usage

The Registrar currently utilizes the following databases:

1. **Registration Applications** – this database, generated by the State Board of Elections, is updated by the Registrar for use in processing and keeping track of new voter registration.

This database is 100 percent complete and updated daily. The Registrar ranks this database as being most important.

2. **Voter Record Changes database** - this database, generated by the State Board of Elections, is updated by the Registrar for use in processing and keeping track of all voter record changes. This database is 100 percent complete and updated daily. The Registrar ranks this database as being most important.
3. **Voter Delete database** – this database, generated by the State Board of Elections, is updated by the Registrar for use in deleting registered voters form the roster. This database is updated daily and ranks as being most important by the Registrar.
4. **Reinstate Voter database** - this database, generated by the State Board of Elections, is updated by the Registrar for use in processing and reinstating voter privileges. This database is 100 percent complete and updated yearly. The Registrar ranks this database as being very important.
5. **Inquire Registrant database** - this database, generated by the State Board of Elections, is updated by the Registrar for use in tracking the current status of all voters. This database is 100 percent complete and updated daily. The Registrar ranks this database as being most important.
6. **Name Browse database** - this database, generated by the State Board of Elections, is updated by the Registrar for use in searching the database by name to determine the current status of a particular voter. This database is 100 percent complete and updated daily. The Registrar ranks this database as being most important.
7. **Absentee Processing** - this database, generated by the State Board of Elections, is updated by the Registrar for processing the applications of those voters requesting absentee ballots. This database is 100 percent complete and the Registrar ranks this database as being most important.
8. **Petition Tracking** – this database, generated by the State Board of Elections, is updated by the Registrar for processing and verifying the signatures on petitions. This database is 100 percent complete and the Registrar ranks this database as being most important.

GIS Applications and Benefits

The Registrar's Office will benefit from various GIS applications that fall within the general application category of ***Land Recordation***.

The primary benefit the Registrar will realize through the proposed GIS is the ability to electronically develop and maintain precinct boundary maps. Incorporation of certain Census and demographic information with the GIS will provide the Registrar with the tools necessary to perform precinct and redistricting analyses.

The proposed GIS will offer the Registrar quick and efficient access to other departments' data, thereby increasing overall operating efficiencies.

SHERIFF

The Sheriff's Office is required by 15.2 of the Code of Virginia. The Sheriff's Office performs what is required for any civil process ordered by the courts, provides security while court is in session, and transports all prisoners in a humane and timely manner.

While the department would have a limited use for the proposed GIS, the system may provide access to other departments' (Police, Clerk of Court, Social Services, etc.) data, thereby improving the Sheriff's overall efficiencies.

SOCIAL SERVICES

The Department of Social Service's mission is to promote self-reliance and protection through community based services. The Department is responsible for administering and effective social service and benefit programs safety net, which meets the basic needs of citizens and provides community-based services within an environment that promotes family stability and self-reliance.

The department's services are categorized into the following four broad programs:

- Financial Assistance
- Foster Care
- Employment Services
- Protective Services

The Financial Assistance Program is the source of public assistance payments to, or on behalf of, eligible citizens. The Employment Services Program encompasses all activities associated with the goal of promoting self-reliance. The Foster Care Program includes all services regarding the care and maintenance of children whose custody has been awarded to the Agency. The Protective Services Program emphasis is to provide services that afford protection to adults and children, and rehabilitation of dysfunctional families.

The Department of Social Service's goal is the promotion of self-reliance and protection for the citizens of Suffolk through Community Based Services. The department reaches this goal by administering effective social service and benefit programs that meets the basic needs of citizens, and provides community based services within an environment that promotes family stability and self-reliance.

Current Database Usage

The Department of Social Services currently utilizes the following databases:

1. **Q & A database** – this database, maintained by the Department of Social Services, is used to track and review all social work cases and report on their status. This database is updated daily and ranks as being most important to Social Services.
2. **IRIS database** - this database, maintained by the Department of Social Services, is used primarily as a resource management tool. This database is updated daily and ranks as being most important to Social Services.
3. **Clipper database** - this database, maintained by the Department of Social Services, is used to keep track of all case benefits. The Department of Social Services staff ranks this database as being most important and is updated daily.

4. **VACIS database** - this database, maintained by the Department of Social Services, is part of an integrated state system responsible for service program case management. This database is updated daily and ranks as being most important to Social Services.
5. **Mapper database** - this database, maintained by Social Services, is also part of an integrated state system responsible for tracking Social Services related cases throughout the State. This database is updated daily and ranks as being most important to Social Services.
6. **ADAPT database** - this database, maintained by the Department of Social Services, is also part of an integrated state system responsible for tracking food stamps and Temporary Assistance for Needy Families (TANF) throughout the State. This database is updated daily and ranks as being most important to Social Services staff.
7. **APECS database** - this database, generated by the Department of Social Services, is part of an integrated state system and is used as a read only reference allowing a link with State Child Supportive Enforcement. The Department of Social Services ranks this database as being most important and is updated daily.
8. **ALEX database** - this database, generated by Social Services, is part of an integrated state system and is used as a read only reference allowing access to employment opportunities throughout the State. The Department of Social Services staff ranks this database as being very important and is updated daily.
9. **DMV database** - this database, maintained and updated daily by the Department of Motor Vehicles, is used by Social Services as a read only reference in conducting criminal and background check searches. This database ranks as being very important to Social Services staff.
10. **IEVS database**- this database, generated by the Department of Social Services, is used by the department as a read only reference allowing employees to conduct multi inquiry searches through this system. This database is updated daily and ranks as being very important to Social Services staff.
11. **OASIS database** - this database, maintained by Social Services, is used by the department to integrate and link all state database systems. The Department of Social Services staff updates this system daily and ranks this database as being very important.
12. **CANIS database** - this database, maintained by the Department of Social Services, , is part of an integrated state system and used to track Child Protective Services complaints

throughout the State. This database is updated daily and ranks as being most important to Social Services.

13. **Criminal Records database** - this database, maintained by the State Police Department, is used by the Department of Social Services as a read only reference allowing employees to conduct criminal records investigations relating to social work cases. This database is updated daily and ranks as being most important to Social Services.

Current Non-Computerized Data Usage

The Department of Social Services currently utilizes the following non-computerized databases:

1. **Vital Records** – these hardcopy records, maintained by the Virginia Department of Motor Vehicles Vital Statistics, are used as a read only reference by Social Services to keep track of and monitor birth, marriage and death records. These records rank as being very important by the Department of Social Services.
2. **Real Estate Assessments** - this database is a hardcopy document of the City's land book and is updated daily by the City Assessor's Office. It is used to maintain all real property data for all parcels within the City, supports a variety of queries, and maintains data on delinquent taxes, taxes due, and building permits. Social Services has read only access to this database and ranks this database as most important.
3. **Personal Property / Blue Book** - these hardcopy records, generated by NADA, are used as a read only references by Social Services to keep track of and monitor personal property valuations. These records rank as being very important by the Department of Social Services.
4. **Case Records** - these hardcopy records, maintained by the Social Services Department, are used as documentation of benefits and services provided. The Department of Social Services ranks this information as being most important.

GIS Applications and Benefits

The Department of Social Services will benefit from a variety of GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Social Services will be able to utilize the proposed GIS to coordinate the allocation of services throughout the community. The department will be able to query and analyze demographic and client specific data to ensure the adequate and equitable administration of services. Implementation of the GIS will provide Social Services with a variety of tools that will increase the departments general operating efficiencies.

SUFFOLK HEALTH DEPARTMENT

The Department of Public Health promotes health for all citizens of the City of Suffolk and assumes the primary objective of providing for the prevention of disease and the protection of the citizens' health, safety, and environment. The department strives to improve the health conditions of all Suffolk residents by enhancing program development and clerical heath care program operations through quality assurance. The department provides several programs to Suffolk residents including Environmental Health, Family Planning, Personal Care/Respite Care, Health Support Services, Epidemiology Services, Home Health Care, and Maternal and Child Health Care.

In addition, the Department of Public Health provides leadership and management of environmental health programs. These programs include: evaluations of future building sites using on-site sewage disposal systems; issuing permits and inspecting system installation; permitting and approving private water supplies; permitting and inspecting food service establishments; and investigating and tracking animal bite incidents, including rabies cases. Finally, the department enforces all general environmental programs including citizen complaints, campground evaluations and inspections, and motel and child care facilities permitting and inspections.

Current Database Usage

The Health Department currently utilizes the following databases:

1. **Sewage and Well Log** – this database, maintained by the Health Department, is used to track the status of all sewage and well applications throughout the city. This database is updated daily and ranks as being most important to the Health Department.
2. **Complaint Log –** this database, maintained as needed by the Health Department, is used for tracking the status of all health complaints and concerns. The Health Department staff ranks this database as being most important.
3. **Restaurant Database** – this database, maintained as needed by the Health Department, is used for tracking the status of all restaurant permits. This database ranks as being most important by the Health Department.
4. **Rabies Log** - this database, maintained as needed by the Health Department, is used for tracking the status of all animal bite incidents. The Health Department staff ranks this database as being most important.
5. **Department of Health PCMS System database** – this database, generated by the Virginia Department of Health, is used as a read only reference by the Health Department. This database is 100 percent complete and updated daily.

Current Non-Computerized Data Usage

The Health Department currently utilizes the following non-computerized databases:

1. **Land Applications** – this hardcopy database, generated by the Planning Department, is used by the Health Department to add additional information regarding health issues of land applications. This database ranks as being very important by the Health Department.
2. **Special Events Permits** – this hardcopy database, generated by Neighborhood Development Services, is maintained by the Health Department to track and record permit requirements of special events. The Health Department staff ranks this database as being most important.
3. **Heath Department Evaluation Form** – this hardcopy database, generated by Neighborhood Services, is maintained by the Health Department record all Health Department site evaluations. This database ranks as being most important by the Health Department.
4. **Site Improvement Application** – this hardcopy database, maintained by the Suffolk Health Department, is used to track the status of all site improvement applications throughout the city. The Health Department staff ranks this database as being most important.
5. **Animal Bite database** – this hardcopy database, generated by the Animal Control Division, is maintained by the Health Department to track all animal bite investigations. This database ranks as being most important by the Health Department.

Current Map Usage

The Health Department currently utilizes the use of the following map products:

1. **City Tax Maps** - these maps, received from the Planning office, are used to determine the size and location of the City's real property parcels including map and lot numbers. These 600' scale maps are manually updated by the Health Department and have been identified by the Health Department staff as being very important.
2. **Soil Conservation Maps** – these maps, generated by the Soil Conservation office, are used by the Health Department to determine the general soil condition of sites throughout the city.

These 600' scale maps are updated as needed and ranks as being somewhat important by the Health Department.

GIS Applications and Benefits

The Suffolk Health Department may benefit from various GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The Health Department will be able to utilize the proposed GIS to coordinate the allocation of services throughout the community. The department will be able to query and analyze demographic, client specific, and site specific data to ensure the adequate and equitable administration of services. Incorporation of the department's various databases will permit rapid access to critical information, thereby allowing the department to more efficiently perform its stated functions.

The department may benefit from scheduling and routing applications, which will improve the departments' facility inspection efficiencies. Implementation of the GIS will provide the Health Department with a variety of tools that will increase the departments general operating efficiencies.

TREASURER

The City Treasurer's Office is required under 15.2 of the Code of Virginia. The Treasurer collects, accounts for, and maintains custody of all monies paid to the City.

In addition, the Treasurer is responsible for the accurate and timely billing and collection of current and delinquent real estate and personal property taxes. The office also sells vehicle, dog and bicycle licenses, and invests all idle funds of the City.

Current Database Usage

The Treasurer's Office currently utilizes the **Taxes Database**. This database, maintained by the Treasurer's Office, is used by numerous City departments for the purpose of tracking payments.

GIS Applications and Benefits

The Treasurer's Office may benefit from various GIS applications that fall within the general application categories of:

- ***Case Management in Health and Social Services***
- ***Compliance Auditing***
- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Notification and Approval of Changes in Land Use***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

The Treasurer's Office will benefit from the proposed GIS, primarily as a viewer/user of other departments' data. Incorporation of the Assessors' various databases will provide the Treasurer with

the tools necessary to ensure timely and efficient collection of real Estate and personal property taxes. Rapid, on-line access to various digital data sets will improve the overall operating efficiencies of the Treasurer's Office.

VIRGINIA COOPERATIVE EXTENSION

The Extension Service is responsible for providing technical information, educational programs and problem solving consultation in the area of agriculture, 4-H and youth, home economics, natural resources, and community resource development for all citizens.

The Virginia Cooperative Extension serves as the liaison between Virginia Institute of Technology and Virginia State University. The department's primary mission is to disseminate research based information to all of Suffolk's citizens as it relates to agriculture, 4-H (youth) and family and consumer sciences.

Current Database Usage

The Virginia Cooperative Extension utilizes a variety of databases, accessed via Virginia Institute of Technology's and Virginia State's web sites. These read only web sites are updated daily and ranked as being most important to the Virginia Cooperative Extension.

Current Non-Computerized Data Usage

The Virginia Cooperative Extension currently utilizes the following non-computerized databases:

1. **Farmer Records** – these hard copy records, maintained by the Virginia Cooperative Extension, are used as a mailing reference for farmers' addresses to contact farmers and report the results of any investigative findings.

2. **Various Field Guides** – these hard copy records, maintained by the Virginia Cooperative Extension and others, are used as references to support investigations, identifications, and research.

Current Map Usage

The Virginia Cooperative Extension currently utilizes a series of **Farm maps**. These maps, maintained by the Farm Service Agency, are used primarily to track all farm land usage throughout the City. The maps, which are developed from aerial photography, are updated every one to two years. They are of varied size and scale. A complete cropping history of the City, dating back to the 1930's, is available from these maps. The Virginia Cooperative Extension ranks these maps as being very important.

GIS Applications

The Virginia Cooperative Extension will benefit from several GIS applications that fall within the general application categories of:

- ***Environmental Analysis***
- ***Facility Location and Allocation of Services***
- ***Infrastructure Management***
- ***Land Recordation***
- ***Routing, Scheduling, and Coordination of Services and Inspections***

Incorporation of various thematic data sets (soils, flood plains, farm land, timber stands, etc.) within the GIS will offer the Extension Service the ability to query, analyze, and map a variety of spatially related data sets significant to its daily operations. The GIS will offer the Extension Service the tools required to support the planning, implementation, and management of various farming and environmental initiatives.

CHAPTER 3 – COMPREHENSIVE LIST OF APPLICATIONS

Case Management in Health and Social Services - Assist public and private caseworkers of all health and social services in locating and coordinating services to families and individuals.	
Childcare Facilities	Map locations of childcare facilities by services provided - latch-key program, infants, toddler, etc.
Childcare Facility Complaints	Track and analyze complaints against childcare facilities
Food Stamps and WIC Analysis	Geo-code the residential location of food stamp recipients and Women and Infant Children (WIC) recipients
Healthcare Facilities	Identify/map hospitals, clinics, etc.
Homeless Shelters	Map, locate and track usage of homeless shelters
Medicare/Medicaid Patient	Map patient residence
Medicare/Medicaid Type	Identify patients by type (disabled, age groups, etc.)
Public Assistance	Map residential location of Public Assistance by type (WIC, AFDC, etc.)
Subsidized Housing	Map location and availability status of subsidized housing units
Unemployment Analysis	Link tax information (income tax, property tax, etc.) by address to GIS allowing statistical analysis
Vector Control Analysis	Track vector control efforts and hot spots.
Welfare to Work	Link to Unemployment Agencies "available jobs" for cross reference with Welfare Recipients and others.
Compliance Auditing - Use address matching between different files to ensure that people are complying with all the tax and licensing requirements that apply to them.	
Alcoholic Beverage Control	Track ABC activities to include permitting and licensing by type, inspections, violations, etc.
Business Licensing	Track and monitor business licenses by type, location, violations, etc.
Malpractice Lawsuits	Track/analyze malpractice lawsuits
Permit Tracking	Track permit location, type, duration, and conditions.
Professional Licensing	Track professional licenses for analysis
Sanitation Enforcement	Map and analyze litter control, nuisance citations, fines assessed and collected, recurring violations, etc.
Zoning Inspections	Map and track zoning inspections by type and violation

Environmental Analysis – Determine environmental conditions; locate various types of polluters; evaluate pollution control programs, etc.	
Endangered Species Mapping	Map the location and concentration of endangered species.
Hazardous Spills Analysis	Perform plume analysis based on weather conditions
Hazardous Spills Warning	Immediately locate neighborhoods adjacent to hazardous spills
Hazardous Waste Responses	Track, map and analyze responses to hazardous waste calls
Hazardous Waste Storage	Track the storage location of hazardous waste materials.
Soils Analysis	Map and analyze soil types for construction/environmental conditions
Wetland Mapping	Map the location and type of wetlands.
Facility Location and Allocation of Services - Determine locations of incidents such as crimes, fires, and diseases; or of service receivers such as students, patients, and clients, to help locate new facilities and close existing ones; and to allocate resources between them. Provide information on the location of residents and businesses and the status of real property in the City to help the private sector in making business decisions. Combine various measures to get composite neighborhood measures of poverty, deterioration, etc. to target programs.	
Animal Control	Map and track/analyze animal control efforts, violations, actions, etc.
Business Districts	Map and analyze business districts.
Consumer Affairs Complaints	Track/analyze complaints against health care providers, lawyers, etc.
Crime Analysis	Map and analyze crime statistics, trends, response time, type (UCRS Part I and Part II), etc.
Crime Potential Analysis	Map/identify locations of half-way houses (CBRF's), previously convicted child molesters, violent criminals
Emergency - Incident Analysis	Locate and display emergency incidents on street map - response time, etc.
Fire and Ambulance Station 1	Track the location, geographic coverage, and other attributes of all stations
Fire and Ambulance Station 2	Track the number and type of incidents over a period of time for each station.

Facility Location and Allocation of Services (continued)	
Fire Department Response	Track and map fire incidents by type and other related statistics
Healthcare Analysis	Track illness by type -age-related, chronic, crime related, immunizations, etc.
Healthcare Facility Analysis	Identify facilities by type of service -trauma, ER, outpatient physical therapy, mental health, etc.
Healthcare Quality Analysis	Analyze quality of healthcare providers
Juvenile/Domestic Analysis.	Track the location of youth violence throughout the municipality.
Medicare/Medicaid	Track and analyze usage at healthcare facilities (type and frequency)
Municipal Employees	Cross reference personnel records (address) with GIS for recruiting new personnel
Municipal Service Centers	Track the location and attributes of Service Centers.
Municipal Service Coverage	Track the geographic coverage of Service Centers.
Rabies Tracking	Track the incidents of rabid animals throughout the municipality.
School Quality Analysis	Correlate school quality with teacher education/other factors
School Quality Assessment	Evaluate schools, both public and private
Unemployment Services	Map locations of unemployment offices in surrounding area
Infrastructure Management - Help plan, coordinate, route and schedule construction, repair, and maintenance of such facilities as water, sewers, storm sewers, roads, bridges, and traffic control devices; and route and schedule repair and maintenance services. Maintain information on the status of different types of infrastructure in an easily accessible manner. Enhance the information service on underground utilities for construction contractors.	
Bridge Maintenance	Map bridge inventory and display features
Capital Budget Mapping	Map the location and attributes of capital budget items throughout the municipality.
Cemeteries – Location	Map the location and size of all cemeteries within a municipality
Contour Mapping	Watershed and Flood analysis with existing and proposed contours
Demolitions	Track the location structures torn down due to dilapidation.
Drainage Analysis	Map drainage features and aid in drainage analysis.

Infrastructure Management (continued)	
Information Systems	Track the inventory of computer systems and network components.
Link to Customer Service	Provide link to billing history (consumption, etc.)
Long Range Transportation Plan	Map the short and long range transportation plans.
Parking Inventory	Map the location, size and other attributes of all public parking lots, garages and loading zones.
Parking Management	Map and analyze parking violations, actions taken (ticket, fine, tow, boots, etc.) locations and owner information
Parking Meter Inventory	Analyze the location and use of parking meters.
Public Facilities - Work Order	Tie maintenance records and schedules to the GIS system
Road Construction	Map location of existing construction projects.
Road Maintenance	Monitor roadway maintenance and condition (resurfacing, potholes, etc.) for streamlined maintenance efforts
Roadway Corridor Analysis	Map and analyze potential roadway corridors for social and environmental impacts
Roadway Performance	Map measures of roadway effectiveness such as VPD, VMT, LOS
Stormwater Infrastructure	Map stormwater structures and aid in analysis
Street Maintenance Mapping	Maintain street maintenance database
Street Trees (ROW)	Identify trees in ROW. Identify those dead or dangerous for removal.
Traffic Accident Analysis	Map accident locations to determine accident rates and dangerous intersections.
Traffic Feature Mapping	Map and maintain traffic signs, lights and pavement markings
Utility Engineering	Map utility engineering projects throughout the city
Utility Maintenance	Track maintenance schedules on utility features
Utility Mapping	Map location of utility features
Utility Network Analysis/Modeling	Analyze utility networks for emergency and maintenance
Vehicle Maintenance	Identify municipal vehicle servicing centers (towing, mechanical, fuel)

Infrastructure Management (continued)	
Water Emergency Ordinance	Map locations under WEO (hospitals, kidney dialysis, etc.)
Water Usage	Track/identify above average water usage for single and multi-family residential units
Land Recordation, Permitting, Licensing, and Planning - Maintain, access, and coordinate databases on assessments, deeds, land use, zoning, building permits, licenses, etc. Ascertain the restrictions on construction and use of private facilities. Provide information from all these databases on one map, facilitating land use decision making.	
Address assignment	Address placement and maintenance
Cemeteries – Capacity	Provide updates on the remaining capacity of all cemeteries
Census Analysis	Analyze the municipality by tract, block group, etc. through Census available information.
Community Development	Map and analyze specific community development locations
Computer Assisted Mass Appraisal	Provide link to GIS
Cultural Facilities	Identify/map theaters, museums, stadiums, concert halls, historical preservation sites, etc.
Drug Free Zones	Map the limits of Drug Free Zones and "Red Zones"
Easement Map	Map the location and type of easements throughout the city
Existing Land Use Map	Map and analyze the existing land use.
Floodplain Mapping	Map the location and type of floodplains.
General Plan Map	Map and update general/comprehensive plan categories.
Geodetic Survey Map	Map control point network to aid in survey process
Housing Development	Track and map housing development trends and permitting by type
Housing Inventory	Analyze age and condition of housing by census tract or neighborhood.
Library Service Areas	Track the location of library branches and their services areas.
Mosquito Districts	Track the coverage of mosquito spraying districts.
Municipal Land Map	Map the location of municipal land in relation to other important features.

Land Recordation, Permitting, Licensing, and Planning (continued)	
Municipal Land Track	Track the location and attributes of municipal land for development.
Neighborhoods	Map and analyze neighborhoods targeted for revitalization
Park Lands Map	Map the location of park lands throughout the city by facilities provided
Permits – Bingo	Track the location of bingo permits, and status.
Permits - Construction 1	Track the location of construction permits.
Permits - Construction 2	Analyze the geographic coverage, duration, and total value of all construction permits.
Permits – Dumpster	Track the location of dumpster permits.
Permits – Electrical	Track the location of electrical permits, and status.
Permits - Occupancy Permits	Track the location of Occupancy Permits, and status.
Permits – Plumbing	Track the location of plumbing permits, and status.
Permits – Wetlands	Track the location of wetland permits.
Permits – Zoning	Track the location of Zoning permits, and status.
Property Assessment Maps	Maintain current tax map database
Public Facilities Mapping	Map the location and attributes of all public buildings throughout the municipality.
Real Property Analysis	Map and track real property statistics by class (owner-occupied, renter-occupied, etc.)
School Districting Map	Map the limits of School Zones
School Locations	Map location of public/private schools, by type
Shopping	Map locations of malls, "super" stores, etc.
Strategic Building Mapping	Show key commercial and industrial buildings, and their availability, in the municipality.
Strategic Parcel Mapping	Show important industrial and commercial parcels and their relationship to interstates.
Strategic Parcel Search	Search for parcels that meet certain development criteria such as zoning.

Land Recordation, Permitting, Licensing, and Planning (continued)	
Strategic Parcels	Map and describe parcels targeted for specific development.
Subdivision boundary Map	Map subdivision boundaries and their existing attributes
Taxation Links	Link tax information (income tax, property tax, etc.) by address to GIS allowing statistical analysis
Topographic Map	Map topographic features
Voting - District Query	Determine the voting district for any address.
Voting - Map Production	Prepare maps showing all voting districts and precinct boundaries.
Voting - Polling Sites	Track the location, geographic coverage, and other attributes of all polling sites
Voting - Re-districting	Analyze voting districts and precinct boundaries for annual re-districting.
Zoning Category Analysis	Analyze zoning districts by size, location, and category.
Zoning Map	Map all zoning districts.
Notification and Approval of Changes in Land Use - Notify residents in a given area, as required, of proposed government actions affecting the construction on, or use of private property. Also, determine if all proximity rules are satisfied, i.e., certain facilities must be specified distances from other facilities, and provide other relevant information on properties at issue and surrounding properties.	
Airport Crash Zones	Map the airport crash zones, track incidents, reevaluate zones when indicated
Halfway Houses (CBRF's)	Analyze legal restrictions to identify potential sites for halfway houses (Community-Based Residential Facilities)
Routing, Scheduling, and Coordination of Services and Inspections – Determine the shortest routes for police, fire emergency, trash/recycling trucks; building, housing, fire, health, and food inspections; and health/social services, etc.	
Childcare Facility Inspections	Track and schedule inspections of childcare facilities
Collection of Fines	Map fines/delinquent accounts by facility (residential or commercial) for routing and collection

Routing, Scheduling, and Coordination of Services and Inspections (continued)	
Disaster Planning	Provide traffic, flood, and public service analysis during disaster situation
Emergency Dispatch	Automatically locates address and surrounding area. Locate nearest response vehicle
Emergency Response Modeling	Incorporate modeling parameters into GIS for emergency response analysis, alternatives
Emergency Routing	Provide the quickest route to emergency scenes.
Handicapped and Elderly Transportation	Map, route and track calls for special transportation
Hazardous Waste Inspection	Monitor the regular inspections of hazardous waste sites.
Health Dept. Inspections	Analyze, schedule and track results of restaurant/facility health inspections
Inspections Tracking	Track inspection scheduling, status, and type.
Library Book Mobile	Route the coverage of the book mobile.
Mosquito Spray Truck Routes	Route the coverage of mosquito spraying trucks.
Parking Meter-reader Routing	Route the most efficient coverage for meter readers.
Public Transportation	Map public transportation routes to include bus, rail, and any others
Sanitation Truck Routing	Route trash, recycling, and street sweeping vehicles
School Bus Routing	Route school buses for pick and drop-offs
Snow Removal	Route and track snow removal vehicles
Traffic Flow Analysis	Analyze traffic flow and patterns to determine "choke points", travel time, etc.

CHAPTER 4 – PRIORITIZED LIST OF FOCUS APPLICATIONS

The results of the Needs Analysis were compiled and studied. The results yielded the following fifty-four potential Focus Applications:

Address Assignment	Business Districts	Business Licensing
Capital Budget Mapping	Census Analysis	Childcare Facilities
Community Development	Contour Mapping	Cultural Facilities
Demolitions	Disaster Planning	Drainage Analysis
Easement Mapping	Emergency Dispatch	Emergency Routing
Existing Land Use Map	Floodplain Mapping	General Plan Map
Geodetic Survey Map	Hazardous Spills Analysis	Hazardous Spills Warning
Hazardous Waste Storage	Housing Development	Housing Inventory
Inspections Tracking	Long Range Transportation Plan	Municipal Land Map
Municipal Land Track	Neighborhoods	Park Lands Map
Parking Inventory	Permit Tracking	Permits - Construction 1
Permits - Construction 2	Permits - Occupancy Permits	Permits - Wetlands
Permits – Zoning	Property Assessment Maps	Public Facilities Mapping
Public Transportation	Real Property Analysis	Road Construction
Soils Analysis	Strategic Building Mapping	Strategic Parcel Mapping
Strategic Parcel Search	Strategic Parcels	Subdivision Boundary Map
Topographic Map	Utility Engineering	Utility Mapping
Wetland Mapping	Zoning Category Analysis	Zoning Map

An application was deemed a potential Focus Application if it met at least one of the three following conditions:

1. A minimum of twenty-five percent of the total survey respondents indicated a need for the application
2. A minimum of thirty percent of the participating departments or agencies indicated a need for the application
3. The application has the potential for providing an obvious benefit to the citizens of Suffolk, in terms of personal safety and expected quality of life

Subsequently, each participating department, the City's GIS Committee, and Baker staff evaluated these potential applications to objectively determine the ten top ranked focus applications. This evaluation was based on a set of objective criterion, as described in the following table:

Criteria	Scoring System	Evaluating Group
1. Departmental budgets	1-5 points	Participating departments
2. The estimated cost of providing current services without the benefit of GIS applications	1-5 points	
3. The percentage of citizens or land parcels that could potentially be effected by the implementation of the application	5 percent increments	
4. The importance of the application within each participating department	1-5 points	
5. The estimated cost to implement the application	1-5 points	Baker
6. The availability of data to support the application	1-3 points	
7. The ease with which the application can be implemented	1-5 points	
8. The application's impact on multiple user departments	1-3 points	
9. The application's contribution to City Council initiatives	1-3 points	GIS Committee
10. The application's importance to the City as a whole	1-3 points	

This series of rating criterion was developed in order to achieve an objective evaluation of each application's potential for Focus Applications. A GIS Focus Application Rating Workbook was distributed among the City's participating departments and GIS Committee to support each group's independent evaluation. Upon the completion of the evaluations, the results were compiled in the GIS Focus Application Summary Worksheet (included in Appendix A) to determine the ten top ranked Focus Applications. This determination was made based on the highest scoring applications. The results of this evaluation yielded a total of twenty-six individual applications that achieved a score indicative of a Focus Application.

Further investigation determined that many of these individual applications were actually derivatives of the same main application category. Therefore, the applications were further grouped into ten individual application categories based on their inherent dependencies. The resulting Focus Application categories, and associated applications are as follows:

Focus Application Category	Associated Applications
GIS Viewer	Ad Hoc Viewing Applications
Parcel Mapping	Property Assessment Maps; Address Assignment; Strategic Parcels/Mapping/Search
Real Property Assessment	CAMA Interface
Area Analysis	Zoning Map; Zoning Category Analysis; Subdivision Boundary Map; Neighborhoods; Business Districts
Development	Strategic Building Mapping; Housing Development; Community Development; Housing Inventory
Infrastructure	Public Facilities Mapping; Existing Land Use Map; General Plan Map; Public Transportation; Road Construction; Utility Mapping
Census Analysis	Census Data Analysis
Permitting/Inspection	Inspections Tracking
Dispatching	Emergency Dispatch
Routing	Emergency Routing

The purpose of determining the Focus Applications, in the previous manner, is to identify those applications that:

- Best serve the City's needs
- Will provide the best return on the initial investment
- Provide the best opportunity for an "early success"

It is important to note that the data required to support the Focus Applications will, in most cases, support additional, non-focus applications. The initial system design, budget, and implementation plan is determined from the focus applications.

The Focus Application Data Requirements Table, presented on pages 4-5 and 4-6, details the various data sets required to support each of the Focus Applications. The order of application implementation and data development will be determined as part of the Implementation Planning phase of the project.

The following legend should be use to interpret the Focus Application Data Requirements Table:

Focus Application Data Requirements Table Legend		
Application Category	1	GIS Viewer
	2	Parcel Mapping
	3	Real Property Assessment
	4	Area Analysis
	5	Development
	6	Infrastructure
	7	Census Analysis
	8	Permitting/Inspection
	9	Dispatching
	10	Routing
X	Indicates the data set is required to support the selected application	
X	Indicates the data set adds functionality to the selected application, but is not required	

CHAPTER 5 – PRELIMINARY APPLICATION DESIGN AND DEFINITION

GIS VIEWER

AD-HOC VIEWING/QUERYING APPLICATIONS

The GIS Viewing applications will provide users with desktop (intranet) and/or dial-up (internet) access to the City's various geographic data sets. The applications will be designed to provide access to both graphic and tabular data through a GIS data viewer such as ESRI's Internet Map Server, or Intergraph's GeoMedia Web Map.

The selected viewer(s) will be configured to allow users to select their desired viewing area by dragging a box across a City key map, or by querying on a specific boundary or address. Users will select/deselect the desired data sets (coverages), such as parcels, buildings, utilities, hydrography, contour lines, transportation networks, etc. by toggling the appropriate selection on/off through a simple interface. The viewer(s) will also be configured to provide scale-based display of the data, whereby the display of features is governed by the scale to which the user is zoomed. For example, fire hydrants and valves (selected for display) will not be displayed until the user zooms into, or beyond, a pre-defined scale, such as 1" = 200'. The application will also provide access to the City's digital orthophotography files, to be displayed as tiled backdrops to the various GIS data sets. The user will be able to select (mouse click) displayed graphic features to review the feature's attributes.

The GIS Viewing applications may also serve as a "front end" to the other defined Focus Applications, with user access and data security being managed by the GIS System Administrator through the use of pre-defined passwords and log-in scripts. Additionally, these applications may be further developed to provide ad hoc map production capabilities. Users will be able to print and publish various thematic maps utilizing pre-developed borders, scales, and legends.

The GIS Viewer applications will initially offer limited functionality, due to the limited availability of data and user demand. As the City's GIS matures, user demand increases, and additional data sets become available, increased functionality will be added to the viewer applications.

PARCEL MAPPING

Every one of the City's major Focus Application categories requires accurate parcel level and address data to fully support each of the intended applications.

The various inter-related parcel mapping applications listed below will provide the City's GIS users with the tools needed to maintain the City's tax maps; automatically assign parcel addresses; locate parcels of specific interest, based on user defined criteria; and generate thematic parcel maps. These applications will provide the tools needed to develop and maintain the graphic and attribute features for each of the City's real property parcels. The Parcel Mapping applications will be tightly integrated with the CAMA interface application to provide a powerful set of query and display functions for those users concerned with parcel features.

PROPERTY ASSESSMENT MAPS

This application will utilize a commercially available, or customized, parcel maintenance module, designed to operate within the selected GIS software platform, to both automate and re-engineer the City's existing property assessment map maintenance processes. The application will enable the Assessor to maintain an up-to-date digital tax map and Real Estate database capable of supporting all land recordation, permitting, licensing, and planning work flows. The application will also enable users to view both graphic and tabular parcel data directly within the GIS, through the GIS viewer application.

The Property Assessment Map Maintenance application will enable the Assessor to update graphic and tabular parcel data directly within the City's GIS, thereby eliminating the current manual updating work flow, which involves numerous departments. The application will provide the Assessor's staff with the coordinate geometry and digitizing tools needed to perform the daily parcel maintenance operations required by the various splits and combines. The application will also permit the Assessor's staff to record all deed transfer information through the GIS for immediate posting in the Real Estate database.

The overall functionality of the Property Assessment Map Maintenance application will ensure an up-to-date parcel map layer and Real Estate database that will be immediately available to all users of the City's GIS through the various GIS viewing applications.

ADDRESS ASSIGNMENT

This application will both automate and re-engineer the City's current parcel addressing work flow. The application will be designed such that parcel addresses will be assigned through the GIS for immediate, or batch, posting to the Real Estate database. The Address Assignment application will ensure that users have access to the most current address database by eliminating the existing time delay (sometimes many months), which currently exists between the time an address is assigned, and when it is posted into the Real Estate database. While this application will enhance all land recordation, permitting, licensing, and planning operations, it is most important to the efficient operation of the City's planned Emergency Dispatch application.

In support of the Address Assignment application, the City may wish to consider the development of an automated parcel addressing algorithm, which will auto-assign parcel addresses based upon a parcel's geographic location in relation to the street centerline intersections. An example of one such addressing algorithm would allot 1,000 sequential parcel addresses (500 even; 500 odd) for each mile of roadway. Parcels would be addressed in accordance with the following:

Distance from Start Point (feet)	Address Range (100 even; 100 odd)
0 - 1,000	0 - 99
1,001 - 2,000	100 - 199
2,001 - 3,000	200 - 299
3,001 - 4,000	300 - 399
4,001 - 5,000	400 - 499
5,001 - 6,000	500 - 599
10,001 - 10,100	1100 - 1199

Even numbered parcels would be located along one side of the street, while odd numbered parcels would be located on the opposite side.

STRATEGIC PARCELS

This particular application will aid the City in their mission of promoting and attracting development by mapping and describing parcels targeted for specific development. The goal of this application is to enhance the City's ability to perform analyses, and generate various thematic map displays to better coordinate services between City departments. A focus of this application is to improve the maintenance, coordination, and accessibility of parcel databases in order to provide information that will facilitate land use decision-making.

This application will permit users to query the GIS parcel database based on selected criteria (attributes). For example, a user will be able to develop a query to identify all parcels one acre in size or larger that are located no more than one mile from railroad tracks, and have access to water and sewer utilities. The GIS software will then process the query and return a list of parcels matching the selected search criterion.

This application will be accessed via the GIS Viewer front-end application, and will be integrated with the Strategic Parcel Mapping application to provide a graphic display of the selected parcels.

STRATEGIC PARCEL MAPPING

This application will permit users to generate thematic parcel displays based upon a set of user selected criteria (refer to Strategic Parcels above). The focus of the application is to enable the production of maps displaying the locations of strategic parcels throughout the City. This thematic mapping application provides a sound and efficient implementation tool by which the City will be able to manage and guide the growth and development of the City. Proper implementation of this application is dependent upon accurate digital parcel data (graphic and tabular) maintained through the previously described Property Assessment Maps application.

STRATEGIC PARCEL SEARCH

This application will enhance the City's parcel tracking and query operations by increasing the strategic parcel search capabilities for each of the City's GIS users. A primary goal of this application is to enable users to search for specific parcels that meet certain development criteria such as zoning, assessments, deeds, land use, building permits, licenses, geographic proximity, etc. This particular application will provide users access to a variety of parcel and infrastructure data, based upon user selected criteria, in order to support the City's mission of promoting and attracting business to the area.

REAL PROPERTY ASSESSMENT

CAMA INTERFACE

This application will provide an interface between the City's computer assisted mass appraisal (CAMA) system (AS400) and the GIS database. The CAMA system contains information on building and land characteristics and also tracks parcels based on zoning category, tax map number, account number, owner name and property address. The CAMA interface will assist the Assessor's Office in providing equitable real estate assessments for all properties located within the City, and enable the City's GIS users to easily obtain the most current parcel assessment information via the GIS software.

Depending upon the implementation schedule, this application may require an interfacing program to be developed for the exchange of data between the CAMA (AS400) and the GIS database (Windows NT). The Assessor's office is planning on upgrading the current CAMA software to a Window's based version once the software becomes commercially available. An early 1999 release date is anticipated. The new CAMA software will support an open architecture, thereby eliminating the need for significant customized programming.

The GIS – CAMA interface will support a re-engineered addressing work flow, whereby parcel addresses can be assigned through a GIS application, and appended to the CAMA database. This will ensure that all system users (GIS, CAMA, and CAD) always have access to the most current parcel address information.

The GIS – CAMA interface will also enable users to generate a variety of user-defined queries from within either the GIS or CAMA software, and create map based displays of the results through the GIS software.

AREA ANALYSIS

ZONING MAP

This particular application will aid in the management and coordination of property zoning district maps. The application will support the automatic generation of thematic zoning maps based on the parcel zoning attributes maintained in the Assessor's CAMA database. For example, when a parcel, or group of parcels, is re-zoned or issued a variance, users will be able to automatically recreate the Zoning map based on the subject changes. Conversely, when the zoning map is modified to reflect zoning updates, the application will permit the automated update of the parcel zoning attributes in the Assessor's CAMA database. This application will eliminate the departments' need to manually update the existing hard copy zoning map every several years. It will also eliminate any discrepancies between the zoning map and the parcel zoning attributes.

To support this desired functionality, the zoning map application will be integrated to the Assessor's CAMA database through the previously described GIS – CAMA interface.

ZONING CATEGORY ANALYSIS

In conjunction with the automatic generation of zoning maps, this particular application will provide many departments with numerous reporting, querying, and analyses tools that will assist agencies with planning and presenting cases to the City's various planning, zoning, etc. boards. A function of this application is to also enhance the analysis capabilities for zoning districts by size, location and category, which will thereby improve the overall operating efficiencies of many departments.

The Zoning Category Analysis application will enable users to perform a variety of analyses based on user-defined criteria such as geographic proximity, parcel size, zoning category, etc. The results of the query can then be thematically displayed via the previously described Zoning Map application.

SUBDIVISION BOUNDARY MAP

The Subdivision Boundary Map application focuses on the automatic generation of up-to-date subdivision boundary map features, used to track of all major subdivisions and boroughs located throughout the City. This application will support the automatic generation of thematic subdivision boundary maps based upon a variety of user-defined criteria.

The application may be bundled with a variety of other Focus Applications such as Parcel Mapping, Public Facilities Mapping, Census Analysis, and others to provide additional analyses, reporting, and querying capabilities.

NEIGHBORHOODS

This particular application will aid in the management and coordination of neighborhood development and revitalization throughout the City. The application will support neighborhood mapping and analysis capabilities designed to target areas in need of revival. Similar to the Subdivision Boundary Map

application, this application will support the automatic generation of thematic neighborhood boundary maps based upon a variety of user defined criteria.

The Neighborhood application will prove most effective when it is bundled with a variety of other Focus Applications such as Parcel Mapping, Public Facilities Mapping, Census Analysis, and others to provide additional analyses, reporting, and querying capabilities.

BUSINESS DISTRICTS

The Business District application focuses on the automatic generation of up-to-date business district maps features, used to keep track of all major places of business (shopping centers, medical offices, industrial parks, etc.) located throughout the City. A function of this application is to also enhance the area analysis capabilities for business districts by size, location and category, which will thereby improve the overall economic development operations of the City.

This application may be bundled with a variety of other Focus Applications such as Parcel Mapping, Public Facilities Mapping, Census Analysis, and others to provide additional analyses, reporting, and querying capabilities.

DEVELOPMENT

STRATEGIC BUILDING MAPPING

In conjunction with the automatic generation of building maps, this particular application will provide many departments with numerous reporting, querying, and analyses tools that will assist agencies with planning and presenting cases to the City's various planning, zoning, etc. boards. A function of this application is to enhance the analysis capabilities with regard to key commercial and industrial buildings based upon their availability and location within the municipality.

The application will enable users to develop thematic maps based upon a variety of user-defined criterion. This functionality will be supported via a link between the building footprint features (developed as part of the GIS base map) and the various relational databases (GIS and CAMA).

HOUSING DEVELOPMENT

This particular application will enable the City to analyze, track, and map housing development trends. In addition, the application will aid the enforcement of the Uniform Statewide Building Code and City building codes pertaining to housing construction and development by enhancing the management of all housing permit information. The housing development application will ensure rapid access to the most up-to-date parcel information, thereby improving the overall operating efficiencies of many departments throughout the City.

Similar to the Strategic Building mapping application, this application will enable users to develop thematic maps based upon a variety of user-defined criterion. This functionality will be supported via a link between the building footprint features (developed as part of the GIS base map) and the various relational databases (GIS and CAMA).

COMMUNITY DEVELOPMENT

The focus of this application is to increase the management and analysis capabilities of city planners for the integration of land use, zoning boundaries, and other broad based spatial information. These increased site selection capabilities will aid in the evaluation of City properties to continually assess development strategies so as to preserve community aesthetics and enhance property values.

The Community Development application will generally be a combination of many different parcel mapping and boundary analysis applications bundled together to provide the desired community development functionality.

HOUSING INVENTORY

This particular application will aid the City with the infrastructure management of all residential parcels. By creating an up-to-date housing inventory, the City's analysis capabilities for tracking structure information such as structure age and condition by census tract or neighborhood will be greatly enhanced.

Similar to the Strategic Building mapping application, this application will enable users to develop thematic maps based upon a variety of user-defined criterion. This functionality will be supported via a link between the building footprint features (developed as part of the GIS base map) and the various relational databases (GIS and CAMA).

INFRASTRUCTURE

PUBLIC FACILITIES MAPPING

This facility mapping application focuses on the automatic generation of up-to-date maps to keep track of all public facility parcels and structures located throughout the municipality. This can include not only buildings used for office space, but also public school facilities, recreation buildings, maintenance buildings, and any municipal warehouses used for storage. Also included will be public properties such as parks, airports, and water treatment complexes. Detailed attribute information (such as size, age, use, location, number of employees, available parking, handicapped accessibility) can be linked to each of the public facilities for retrieval and review.

The Public Facilities Mapping application serves two primary functions: 1) As a comprehensive inventory analysis and review tool, and 2) As an inventory database to be used as reference by other City departments. As an analysis tool, this application will increase the accuracy of the current public facility inventory for report writing and analysis purposes. This mapping application will become useful during the review of capital budgets by providing age and condition assessments for all municipal structures.

As an inventory database, the public facilities mapping application can be used as a reference tool for numerous purposes, including locating public space that is suitable for polling sites, public information meetings, as well as internal municipal needs.

This application will generally be a combination of numerous other Focus Applications bundled together to provide the desired public facilities mapping functionality.

EXISTING LAND USE MAP

The Existing Land Use Map serves as a useful guide when reviewing development applications, zoning changes and variances, and creating neighborhood development plans. In addition, the Land Use map is used on a daily basis for reference purposes. By having the Existing Land Use Map available as a GIS application, this daily review and analysis is streamlined at the desktop.

The inclusion of parcel query, pan and zoom capabilities, will enable the user to utilize this particular application to manage and coordinate public information requests, impact analysis, and "what if" development scenarios. This application will support the automatic generation of thematic land use maps based on current usage and also provide increased analysis capabilities of land use allocations throughout the City.

In conjunction with the various other Focus Applications, the Existing Land Use Mapping application will enable the City to maintain a digital up-to-date existing land use map. As such, the GIS existing land use map will show newly developed subdivisions, shopping centers, road improvements, and other major development changes.

GENERAL PLAN MAP

The General Plan Map is the primary guide to the growth and development of the City. Similar to the Existing Land Use Map application, the General Plan Map application will be utilized as a reference guide, and will provide the information (graphic and tabular) needed for the review of development applications, zoning changes and variances, and creating neighborhood development plans.

By linking the contents of the City's general plan document as attribute information, users can reference the plan's development goals, guidelines, and use recommendations at the desktop. Using the parcel

query, pan and zoom capabilities, this particular application will also aid in the daily management and coordination public information requests. This application will support the automatic generation of thematic maps based on general plan category and also provide increased analysis capabilities of land use allocations throughout the City. Although the General Plan is not updated as frequently as other GIS data sets, the GIS application will enable easier and more accurate updates.

PUBLIC TRANSPORTATION

The main goal of this application is to provide a means of efficiently managing the Tidewater Regional Transit (TRT) transit systems that are maintained by the City. The route system, including fixed routes, stops, and Maxi-ride service areas, are maintained by the Tidewater Transportation District Commission (TTDC). TTDC is currently in the process of analyzing the potential to up-grade their system to a full GIS with automatic-vehicle-locator (AVL) capabilities. It is envisioned that the City's GIS will be able to interface with the TTDC system thereby providing an efficient means of exchanging data between the two systems.

As the location of bus routes, along with timing and scheduling being maintained by TTDC, the focus of the City's Public Transportation application would be to serve as a reference source for all departments as well as for public inquiry. The application would allow for the printing and display of one or all of the 6 routes that cover approximately 187 miles. Buffer and walking distance analysis could also be performed to determine public transit accessibility to proposed developments or new public facilities.

ROAD CONSTRUCTION

The focus of this application is to more efficiently manage and map the locations of all existing road construction projects throughout the City. This includes new road construction, road widening, and road repaving.

This application will enhance the management of construction efforts allowing the City to make more efficient use of field crews' time and resources. In addition, this application will provide many departments with the necessary tools to better coordinate services between other City departments and

outside agencies. For example, paving programs may be better coordinated with utility operations such as upgrades or installations, thereby saving valuable funding resources. The reporting and analysis functionality of this application will facilitate the preparation of reports and thematic maps that depict current construction, planned construction, and recently completed efforts.

As road construction efforts typically require the closing of travel lanes that result in degraded Level Of Service (LOS), this information is critical to E 911 dispatchers and the emergency respondents. By avoiding areas where construction is occurring, unnecessary response time delay can be minimized. This functionality of the application will be interfaced with the planned Emergency Dispatch and Emergency Routing applications.

UTILITY MAPPING

The primary goal of the Utility Mapping application is to provide the tools needed to maintain an up-to-date, digital, geo-spatially accurate, inventory of the City's utility infrastructure water, sanitary sewer, storm sewer, etc. This digital inventory of utility infrastructure features will, in turn, support a broad range of additional applications.

Accurate, up-to-date utility information is required to support a variety of additional Focus Applications, including Real Property Assessment, Development, Infrastructure, Permitting/Inspection, and Dispatching.

The Utility Mapping application will support the development of a valuation analysis tool that will provide the City with the ability to evaluate the condition and value of the existing utility infrastructure. Utility feature attributes (install date, material, size, cost, etc.) can be extracted from the GIS database to support the Public Utilities' and Finance Departments' valuation exercises.

Users will also be able to interface the Utility Mapping application with a work order management module to assist with the planning, coordination, routing and scheduling of construction, repair, and maintenance to the public utility infrastructure. A variety of commercially available work order management systems, that are designed to interface with GIS programs, are available for this purpose.

Such an interface will enable users to track the maintenance history of all public utility infrastructure features, and generate the thematic maps needed to identify trends, and support inspection and maintenance scheduling.

The Utility Mapping application will provide the information (graphic and attribute) needed to support the City's engineering modeling (water and sewer) requirements. The graphic and attribute data can be extracted from the GIS to develop the input files needed by the City's engineering analysis software packages. The Utility Mapping application may also be configured to interface directly with the engineering analysis modules. This application interface will allow the City's engineers to perform a variety of "what if" scenarios to assess the impact of planned development on the City's existing utility infrastructure.

As previously mentioned, the City's utility information is critical to many of the other planned Focus Applications. As such, these applications will require that accurate locational and attribute information be maintained on the City's utility infrastructure. The Utility Mapping application will provide the tools needed for the developing and maintaining this critical information within the City's GIS. City Engineers will be able to post and geo-reference digital data sets to the GIS database. The application will also offer the tools necessary for digitizing paper source documents into the GIS database. Attribute information will be updateable through a simple graphic user interface (GUI). In addition, this application will be governed by the necessary security procedures needed to ensure the integrity of the City's utility infrastructure data.

CENSUS ANALYSIS

CENSUS DATA ANALYSIS

The City currently performs, to some degree, growth, population, and socio-economic analyses for nearly every new development request, neighborhood plan, and/or revitalization effort. The Census Analysis application will provide the tools needed to speed up the current analysis process by offering desktop access to the latest relevant data sets. In addition, the application will support the annual or quarterly preparation of such reports for the purpose of establishing and tracking City-wide growth and

development trends. This analysis is especially important for the predominantly rural, yet aggressively developing Suffolk.

The Census Analysis application provides quick and targeted analysis of census tract and block group data. The granularity of this application is limited only by the level of detail of the collected data. By providing data on the Census Tract and Census Block Group level, analysis can be macro or micro in nature. As necessary, analyses can also be performed by zip code, voting district, or borough. Pan and zoom functionality will allow the user to target specific neighborhoods or business districts.

In addition to readily available Census data, a wide range of economic and consumer related information is available for purchase from private vendors at moderate prices. This type of reporting can be very valuable when trying to attract new retail businesses looking for a suitable market, or large businesses looking for a suitable labor pool.

PERMITTING/INSPECTION

INSPECTIONS TRACKING

This application's main focus is to support the electronic storage and retrieval of the City's permitting and inspection data. Proper implementation of this application should effectively reduce the amount of property research time required by the existing permitting and inspection work flows. This application focuses on the need to integrate and organize information, such as schedules, type of permit, and status of the inspection so as to improve all management and analysis tasks associated with the City's inspection and permitting process.

There is a wide range of daily and weekly inspections that are required by Neighborhood Development Services, as well as other departments. These inspections cover a number of disciplines, including business, construction, and housing. This entire effort creates the need to track and maintain all permits and inspections, their current status, needed follow-up, and case histories.

The Inspections Tracking application will be integrated with the previously detailed CAMA application to provide users with the ability to track and review permits and applications by parcel address, owner name, date, and other user defined criteria. The application will provide the tools needed to generate a variety of thematic maps needed to identify and track trends and schedule inspections.

DISPATCHING

EMERGENCY DISPATCH

The successful implementation of the Emergency Dispatch application will provide a valuable interface between the City's GIS and its Computer Aided Dispatch system. This application will take advantage of the City's accurate parcel and infrastructure data, maintained in the GIS, to provide the emergency dispatchers and respondents with the vital information they need to protect the well being of the citizens.

When a call for emergency services is placed to the City's call center, the E911 equipment automatically displays the caller's telephone number (Automatic Number Identification or ANI) and the caller's address (Automatic Location Identification or ALI). The ALI is typically a tabular record of the telephone customer's name and address. The ANI/ALI information is then sent to the CAD equipment, where it is used to query a combined database commonly referred to a Master Street Address Guide (MSAG). MSAGs are created and updated in close coordination with the local telephone companies and the U.S. Postal Service.

The Emergency Dispatch application will compare the MSAG information to the GIS address database, and appropriately display the caller's location on the GIS base map. In addition to the caller's location, information such as the location and operating condition of nearby fire hydrants; the presence and location of stored hazardous materials; whether or not citizens with special needs reside at the location; etc. can also be displayed on the GIS base map for use by the call taker. All of this pertinent response information will be processed by the call taker and disseminated to the appropriate response units, thereby enabling them to make a number of appropriate decisions prior to arriving on scene.

ROUTING

EMERGENCY ROUTING

The main goal of this application is to increase the dispatching, tracking, and coordination capabilities of all City emergency response efforts. The application will utilize impedance (travel direction, speed limit, level of service, construction projects, detours, etc.) information maintained on the City's transportation network to support the automatic routing of emergency response units (police, fire, and rescue). Emergency dispatchers will be able to dispatch the appropriate respondents based upon unit response time.

The incorporation of Automatic Vehicle Location (AVL) technology will further enhance this application by enabling the "real time" location of the City's emergency vehicles. An AVL system combines Global Positioning System (GPS) technology and radio communications to deliver "real time" integrated mobile positioning information directly through the CAD system. The AVL system will enable dispatchers to display the emergency response vehicle locations, in "real time", on the GIS base map. This vehicle location/mapping link will enable dispatchers to quickly identify the nearest available unit to dispatch.

CHAPTER 6 – LANDBASE FEATURE AND ACCURACY REQUIREMENTS

INTRODUCTION

The "landbase" or "base map", as it is sometimes referred, is the set of commonly shared cultural and physical features that, when represented on a map, provide the spatial references necessary to support various GIS applications. A digital landbase is the foundation upon which the GIS is built. The various data sets, or themes, required to support the City's GIS applications must be referenced, or tied to, the landbase. Given the importance of the landbase to the overall functionality of the GIS, it is imperative to properly select the landbase features, scale, and accuracy such that it will support the City's current and anticipated needs.

The results of the Needs Assessment indicate that Suffolk requires a landbase that will support a variety of applications ranging from property and utility infrastructure mapping to emergency dispatching and routing. The landbase definition (feature, scale, and accuracy requirements) is determined by evaluating the following considerations:

- Application feature and attribute requirements
- Scale and accuracy requirements required to support each application
- Landbase acquisition/development options
- Landbase costs

Based upon these criteria, the City of Suffolk's landbase requirements have been determined, and are presented in this chapter, along with a variety of development alternatives.

GENERAL LANDBASE REQUIREMENTS

The City's landbase should be compiled from aerial photography to be developed during the early Spring of 1999, when there is minimal leaf cover on the trees, and the sun is positioned at an optimal angle, thereby eliminating excessive shadows. This photography should be of the quality and scale necessary to photogrammetrically compile the landbase features, and develop the digital orthophotography files required by the GIS.

As previously noted, the landbase scale and accuracy requirements are determined by the various GIS applications that the landbase must support. Given the underlying characteristics and application requirements of the City, a multiple scale landbase approach may prove feasible, from both an initial development cost and data maintenance standpoint. Under this scenario, a larger scale landbase (1"=100') would be developed for the denser, northern and downtown portions of the City; while a smaller scale landbase (1"=400') would be developed for the more rural southern portion of the City, which is typified by larger, agricultural use parcels. However, to develop and maintain a multiple scale landbase will ultimately limit the City's ability to implement numerous applications falling within the general categories of Parcel Mapping, Development, Infrastructure, and Routing. As an alternative, the City may find it most feasible to develop a 1"=100' scale landbase for the entire City. The case for a 1"=100' scale landbase may be made based upon the level of available funding, the added system functionality, and participation by neighboring localities and utility companies. While the initial costs will be approximately 25 – percent greater for a landbase developed entirely at 1"=100', the added benefits of accuracy and functionality should outweigh the initial investment over the life of the GIS.

FEATURE CLASSES AND PLANIMETRIC DATA REQUIREMENTS

The features typically included in the landbase definition are those physical and cultural features which are readily identifiable from the aerial photography. These include such items as building footprints, hydrography (lakes, rivers, swamps, etc.), pavement edges, fence lines, power poles, ruins/foundations, cemeteries, tree lines, etc. These items are photogrammetrically compiled from the aerial photography, and become the basis for capturing and referencing additional data sets.

There are other planimetric features, not typically considered in the landbase definition, that warrant compilation during the landbase development due to their ease of recognition, and the economies of capturing all of the data possible at one time. These items include such features as utility manholes, fire hydrants, telephone pedestals, driveways, sidewalks/curbs, bridges/overpasses, storm water management facilities, etc. Depending upon the scale of the aerial photography, many of these features may need to be field located (paint or targets) prior to flying the City, in order to ensure their accurate recognition and capture.

The landbase and planimetric features required to support the various applications can be grouped into the following major categories:

- Cultural
- Recreation
- Utilities
- Hydrography
- Transportation
- Vegetation

Based upon the identified application requirements, the following features should be photogrammetrically compiled from the aerial photography for inclusion in the City's GIS database:

Features	Feature Categories						Features	Feature Categories					
	Cultural	Hydrography	Recreation	Transportation	Utilities	Vegetation		Cultural	Hydrography	Recreation	Transportation	Utilities	Vegetation
Airports/Runways v				4			**Land Fills** v					4	
Alleys v				4			Manholes					4	
Billboards	4						**Marinas** v		4				
Box Culverts					4		Medians				4		
Bridges/Overpasses v				4			Parking Lots				4		
Buildings v	4						**Parks** v			4			
Bulkheads/Jetties v		4					**Pavement Edges** v				4		
Canals v		4					**Power/Telephone Poles** v					4	
Catch Basins					4		**Railroads** v				4		
Cemeteries v	4						**Rivers** v		4				
Cultivated Fields						4	**Ruins/Foundations** v	4					
Curbs				4			Sidewalks				4		
Dams v		4					**Streams/Creeks** v		4				
Docks/Piers v		4					Street Lights					4	
Driveways				4			Street Trees (in ROW)						4
Drop Inlets					4		**Swamps/Wetlands** v		4				
Excavated Areas	4						Timber Stands						4
Fence Lines v	4						**Tree Lines** v						4
Fire Hydrants					4		**Unpaved Road Edges** v				4		
Lakes/Ponds v		4					Valve Boxes					4	

Note: Bold type features marked with a v in the above table represent typical landbase features.

Additional features that may be captured during the landbase development include:

- Athletic fields
- golf courses
- trails
- swimming pools
- recreational courts
- etc.

However, it should be noted that, landbase development costs may be impacted, depending upon the number and types of additional features captured.

Most of the features listed above will only be accurately identified and captured through the use of specialized stereo viewing equipment, which significantly reduces feature identification and capture errors (i.e. exact building corners and roof lines versus shadows; stained pavement versus manholes or valve boxes; etc.). In order to further assure accurate identification and placement, existing plans, drawings, and map products should be used to aid in location and identification of these features. It is also important to note that all of these features must be captured simultaneously in order to realize a data capture cost-savings benefit.

LANDUSE BY DEPARTMENT

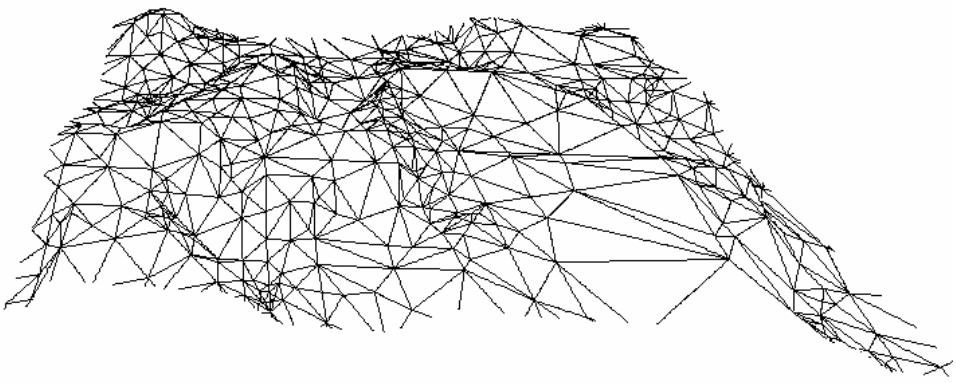
Each department's landbase use is determined by their required applications. The following table details the landbase features required by each of the City's departments:

Landbase Features	User Departments																				
	5th District Court Service Unit	Assistant City Manager – Development	City Assessor	City Managers Office	Commissioner of the Revenue	Economic Development	Finance	Fire	Fleet Management	Health	Information Technology	Neighborhood Development Services	Parks and Recreation	Personnel	Planning	Police	Public Schools	Public Utilities	Public Works	Registrar	Social Services	Virginia Cooperative Extension
Airports/Runways		4	4	4		4	4	4	4			4	4		4	4		4	4			4
Alleys		4	4	4		4	4	4				4	4		4	4		4	4			4
Bridges/Overpasses		4	4	4		4	4	4				4	4		4	4	4	4	4			4
Buildings		4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4		4	4
Bulkheads/Jetties		4	4	4		4	4	4				4	4		4	4		4	4			4
Canals		4	4	4		4	4	4				4	4		4	4		4	4			4
Cemeteries		4	4	4		4	4	4				4	4		4	4		4	4			4
Dams		4	4	4		4	4	4				4	4		4	4		4	4			4
Docks/Piers		4	4	4		4	4	4				4	4		4	4		4	4			4
Fence Lines		4	4	4		4	4	4				4	4		4	4		4	4			4
Lakes/Ponds		4	4	4		4	4	4				4	4		4	4		4	4			4
Land Fills		4	4	4		4	4	4				4	4		4	4		4	4			4
Marinas		4	4	4		4	4	4				4	4		4	4		4	4			4
Parks		4	4	4		4	4	4				4	4		4	4		4	4			4
Pavement Edges		4	4	4		4	4	4			4	4	4	4	4	4		4	4			4
Power/Telephone Poles		4	4	4		4	4	4				4	4		4	4		4	4			4
Railroads		4	4	4		4	4	4				4	4		4	4		4	4			4
Rivers		4	4	4		4	4	4				4	4		4	4		4	4			4
Ruins/Foundations		4	4	4		4	4	4				4	4		4	4		4	4			4
Streams/Creeks		4	4	4		4	4	4				4	4		4	4		4	4			4
Swamps/Wetlands		4	4	4		4	4	4				4	4		4	4		4	4			4
Tree Lines		4	4	4		4	4	4				4	4		4	4		4	4			4
Unpaved Road Edges		4	4	4		4	4	4				4	4	4	4	4		4	4			4

TOPOGRAPHIC CONTENT REQUIREMENTS

The results of the Needs Analysis indicate that the City requires a topographic map product, providing 2-foot contours, to support a variety of permitting, planning, and engineering applications. This product should be stereo-compiled from the aerial photography utilizing a series of digital terrain models (DTM) and triangulated irregular networks (TIN).

The DTM, created as the planimetric features and break lines (road edges, walls, drainage structures, etc.) are captured from the aerial photographs provides a model of the earth's surface. From this, a TIN is created in order to develop the requisite contour intervals. A TIN is a compilation of irregularly spaced data points (elevations) and break lines connected to form a series of non-intersecting triangles that represent the earth's contours. Once created, a TIN can be displayed from directly overhead (contour lines), or at an oblique angle (three-dimensional). A TIN can also be used to create a moving, "fly-by" view. A TIN is of practical use for: identifying slope problems in gravity sewer and storm sewer engineering applications; determining building height restrictions; surface water/run-off modeling; and various other problem solving measures which are directly related to elevation and slope. The following graphic provides an example of a typical TIN.



TIN viewed at an oblique angle

ACCURACY REQUIREMENTS

In order to ensure a successful, cost effective, GIS, it is critical to develop a base map that meets the horizontal and vertical accuracy requirements dictated by the selected applications. After these requirements have been determined, the appropriate National Map Accuracy Standards (NMAS) must be

applied. NMAS standards state that, ***"not more than ten percent of the well-defined points on the map shall be in error by more than 1/30 inch, as measured on the published map scale, for "large scale" maps (maps with publication scales larger than 1"= 2,000'), or 1/50 inch for "small scale" maps (maps with publication scales of 1"=2,000' or smaller)."*** NMAS vertical accuracy requirements dictate that, ***"not more than ten percent of the elevations shall be in error by more than one half of the contour interval."***

Based on these requirements, the City's 1"=100' base map would provide a horizontal accuracy of at least ±3.3 feet, and a vertical accuracy of ±1 foot. The 1"=400' base map would provide a horizontal accuracy of at least ±13.3 feet, and a vertical accuracy of ∀1 foot.

A 1"=400' base map product will not adequately support utility infrastructure mapping and associated applications since the horizontal locations of mapped features will only be accurate to within ±13.3 feet. As the southern portion of the city develops, incremental landbase updates may be required.

LANDBASE ACQUISITION OPTIONS

The City of Suffolk has a variety of landbase development/acquisition options from which to choose. Each option is described below, along with the benefits and disadvantages of each:

Option 1 - Landbase and Planimetric Features Compiled from New Aerial Photography

Under this scenario, the City would procure new aerial photography, for the entire city, which meets the previously specified minimum requirements. Utilizing this photography, the City will develop the necessary digital landbase (1"=100' and 1"=400', or 1"=100'), planimetrics, and orthophotography. Employing this option will ensure that the most up-to-date source data is used for the project. Additionally, this option provides the City with the greatest level of control over the content, scale and accuracy of the landbase. The City may desire to investigate the possibility of including neighboring localities and local utilities in this venture. This would provide the City with an opportunity to share the data, and associated acquisition and maintenance costs, equitably among the participating groups. One drawback to this option is the high up-front costs associated with establishing the required ground control,

and developing the landbase, topographic data, and digital orthophotography. These costs generally require a large outlay of capital expenditures. A second drawback is the fact that, once developed, the digital orthophotography quickly becomes outdated. This fact will require the City to maintain the digital orthophotography and landbase files through the acquisition of regular updates. While not nearly as expensive as the initial product, these updates will also require significant capital expenditures.

Option 2 - Lease Existing Digital Orthophotography and Planimetric Data Sets from VARGIS

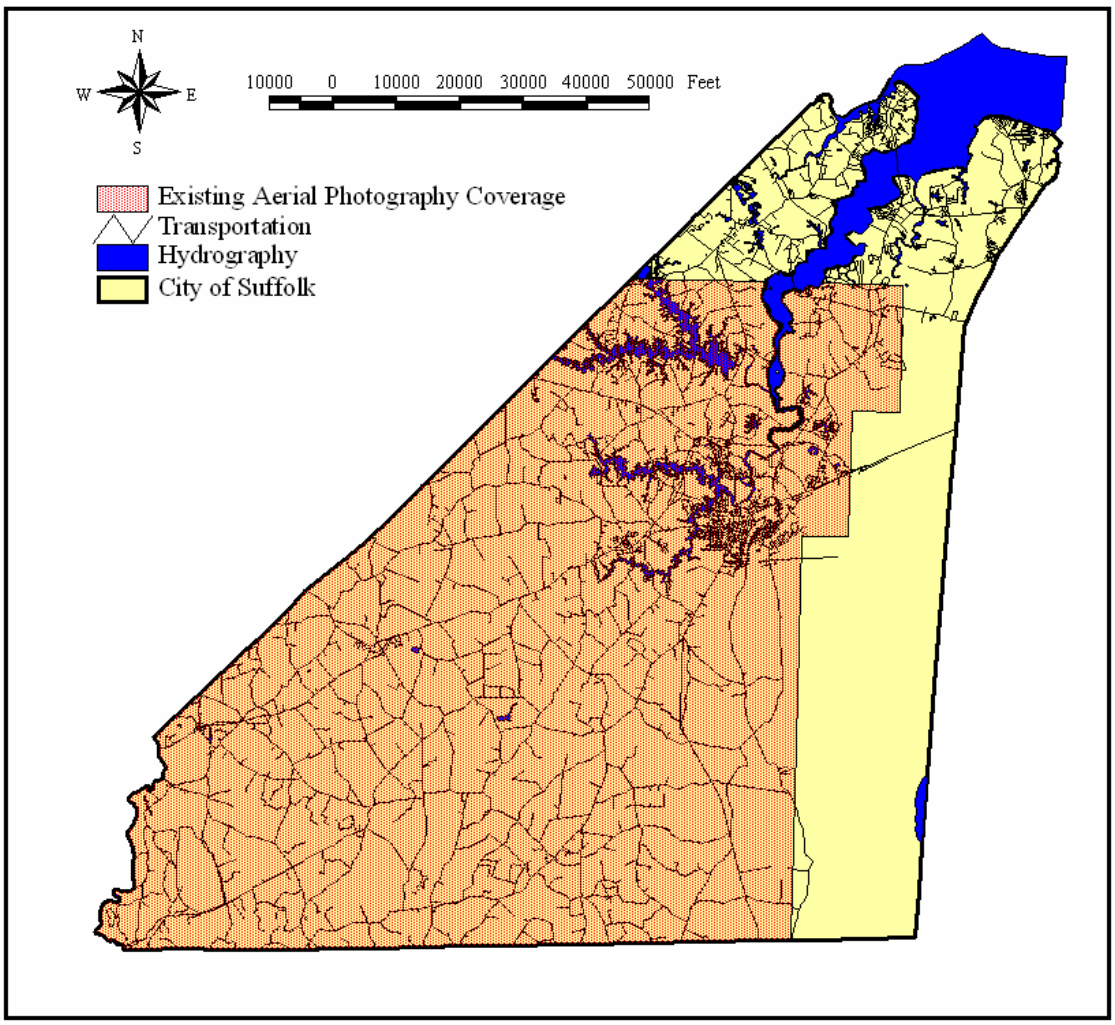
Virginia Natural Gas (VNG) is currently in the process of developing digital orthophotography and planimetric mapping to support their own corporate GIS. Once completed, this data will be available through a leasing arrangement with VARGIS, a company that acquires and maintains various GIS data sets for resale. While the VNG data will not completely support the City's needs, a large portion of the digital orthophotography required for the southern portion of the City can be acquired under this option. The specifications for this data are as follows:

VNG1 photos (163 sq. mi.): orthorectified at 1"=200', with a ground resolution of 1.0 foot, and an absolute horizontal accuracy of ∀5 feet. An Organizational Perpetual License is priced at $195 per square mile. VNG1 tiles are 2,000' (east, west) by 3,000' (north, south) with 120' overlap. File size is 22 MB per tile.

VNG3 photos (142 sq. mi.): orthorectified at 1"=400', with a ground resolution of 3.0 feet, and an absolute horizontal accuracy of ∀10 feet. An Organizational Perpetual License is priced at $75 per square mile. VNG3 tiles are 6,000' (east, west) by 9,000' (north, south) with 120' overlap. File size is 20 MB per tile.

Both data set coordinates are VA State Plane, NAD 83 US Survey Foot. Also, both orthophoto sets are 8 bit panchromatic color type.

The graphic on the following page illustrates the extent of the VNG orthophoto coverage within the City's limits:



By selecting this option, the City could potentially save a significant portion of the cost required to develop digital orthophotos. However, the scale, accuracy, and coverage provided by this existing data is not sufficient to meet all of the identified application requirements. The planimetric features that VNG is capturing from the photography are limited to street centerlines, expanded right-of-way, and building locations (via a standard building symbol). Since this option will not completely support the City's digital orthophotography, landbase, or planimetric mapping requirements, the City will be required to develop additional photography, landbase, and planimetric files.

Option 3 - Lease Current Digital Orthophotos and Landbase Data

This option combines the benefits of Options 1 and 2 to provide the City with a comprehensive set of digital orthophotos and landbase files that completely meet each of the previously defined scale, accuracy, and content requirements. Under this scenario, the City will negotiate a data leasing agreement with a vendor, similar to the one between VARGIS and VNG. This option will allow the City to specify the required content, scale, and accuracy of the photography, landbase, and planimetrics. The selected vendor would provide the City with a series of updates, delivered incrementally throughout the life of the lease. The City would also be able to amortize the cost of the data, thereby avoiding the large capital outlay associated with traditional mapping contracts. While this may be the most attractive option for the City, finding a vendor willing to assume the initial cost and risk associated with such a venture may prove challenging. Since the City's mapping requirements far exceed those of the surrounding localities and local utilities, coupled with the fact that VNG's data is already available through a similar arrangement, this option may not prove viable.

Option 4 - Photgrammetrically Compile Landbase and Planimetrics from VNG's Existing Digital Orthophotography

Under this option, the City would procure VNG's digital orthophotography from VARGIS, and utilize it to compile the required landbase and planimetric features. Similar to Option 2, this option could potentially save the City a significant portion of the cost required to develop digital orthophotos. Additionally, the cost to photogrammetrically compile the landbase and planimetric features would be reduced as well. However, the scale, accuracy, and coverage provided by this existing data is not sufficient to meet all of the identified application requirements. Also, the accuracy with which the required features can be photogrammetrically captured is much less than that which can be achieved utilizing stereo-compilation methods. Selection of this option will require the City to develop additional photography, landbase, and planimetric files, and will not provide the level of accuracy needed to completely support the required applications.

Option 5 - Stereo-Compile Landbase and Planimetrics from VNG's Existing Source Photography

VNG has expressed an interest in partnering with the City of Suffolk in regards to obtaining and maintaining various GIS data sets. Specifically, VNG could make their existing source photography (refer to Option 2) available to Suffolk in return for various base map and planimetric features. Employing this option would permit the City to stereo-compile the required base mapping and planimetric features from recent aerial photography. This would provide the City with the necessary landbase and planimetric features at the desired level of accuracy. The City could then procure VNG's digital orthophotos from VARGIS to be used as a backdrop to the landbase files. However, similar to Options 2 and 4, the City will be required to develop additional photography, landbase, and planimetric files in order to completely support the required applications.

Option 6 - Photgrammetrically Compile Landbase and Planimetrics from City's Existing 1996 Aerial Photography

The details of this option are very similar to those of Option 4. The City could utilize their existing aerial photography, which was developed by MSAG in 1996. Data developed under this option could be used to supplement the coverages deficiencies noted in Options 2 –5. The necessary digital orthophotography could potentially be developed from this existing aerial photography. One major drawback to this option is the fact that the existing photography is nearly three years old. Areas of the city which have undergone significant changes since 1996, such as the northern portion of the city, would not be accurately represented.

Option 7 - Compile Landbase from Existing Paper Source Documents

This option would require the conversion of existing paper source documents to develop the required digital landbase and planimetrics. Since the City does not currently maintain sufficiently accurate paper source documents detailing the required landbase and planimetric features, this option was determined to not be a viable solution.

CHAPTER 7 – IDENTIFIED ISSUES BEYOND THE SCOPE OF THE PROJECT

There are currently no identified issues that are beyond the current scope of this project.

APPENDIX A - ANALYSIS CHARTS AND DIAGRAMS

APPENDIX B - CITY DEPARTMENTS AND APPLICATIONS

APPENDIX C - WORK FLOW ANALYSIS DIAGRAMS