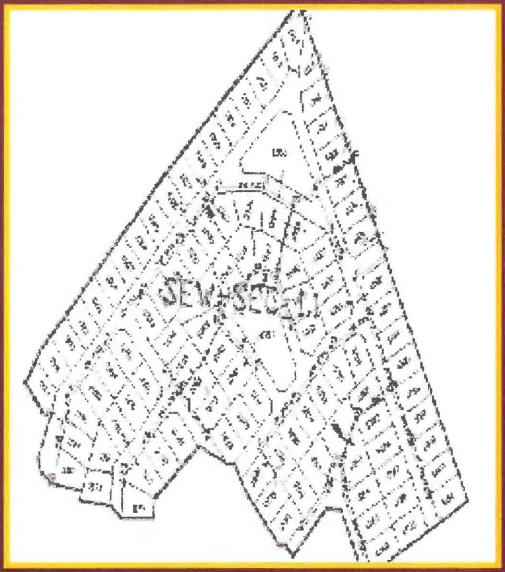
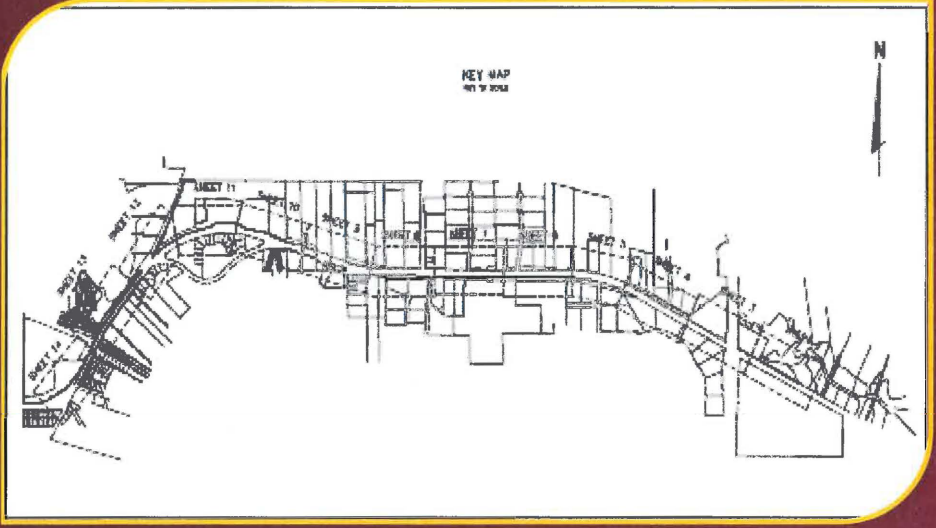
DIVISION OF INSPECTOR GENERAL

KEN BURKE, CPA
CLERK OF THE CIRCUIT COURT AND COMPTROLLER
PINELLAS COUNTY, FLORIDA

FOLLOW-UP AUDIT OF PINELLAS COUNTY GIS INFRASTRUCTURE CONSTRUCTION WATER AND SEWER INFORMATION





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December 1, 2016

The Honorable Chairman and Members of the Board of County Commissioners

We have conducted a Follow-Up Audit of the Pinellas County GIS (Geographic Information Systems) Infrastructure Construction Water and Sewer Information. The objectives of our review were to determine the implementation status of our previous recommendations.

Of the four recommendations contained in the audit report, we determined that three have been partially implemented and one is no longer applicable. The status of each recommendation is presented in this follow-up review.

We appreciate the cooperation shown by the staff of the Pinellas County GIS Infrastructure Construction Water and Sewer Information during the course of this review.

Respectfully Submitted,

Hector Collazo Jr.
Inspector General/Chief Audit Executive

Approved:

Ken Burke, CPA*
Clerk of the Circuit Court and Comptroller
Ex Officio County Auditor

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INTRODUCTION

Scope and Methodology

We conducted a follow-up audit of the County Geographic Information System (GIS) process covering the utility layer and the upgrade/implementation of the Enterprise Geographic Information System (eGIS) application. The purpose of our follow-up review is to determine the status of previous recommendations for improvement.

The purpose of the original audit was to:

1) Evaluate the ability of the Utilities GIS unit to supply GIS services to the Utilities users.
2) Determine if the policies and procedures for the Utilities GIS function were adequate to assure the Munsys GIS Utility Layer was current and accurate.
3) Determine the ability of the Utilities GIS unit to recover the data to update the Munsys Utility GIS Layer.
4) Evaluate the Business Technology Services (BTS) plan for the application update to assure it supports the Utilities GIS unit operations.

To determine the current status of our previous recommendations, we surveyed and/or interviewed management to determine the actual actions taken to implement the recommendations for improvement. We performed limited testing to verify the process of the recommendations for improvement.

Our follow-up audit was conducted in accordance with the *International Standards for the Professional Practice of Internal Auditing* and the *Principles and Standards for Offices of Inspector General,* and, accordingly, included such tests of records and other auditing procedures, as we considered necessary in the circumstances. Our follow-up testing was performed during the month of October 2016. The original audit period was October 1, 2014 to May 30, 2015. However, transactions and processes reviewed were not limited by the audit period.

Overall Conclusion

Of the four recommendations in the report, we determined that three were partially implemented and one is no longer applicable. We commend management for partially implementing three recommendations related to the eGIS system. We continue to encourage management to fully implement the remaining recommendations. We further commend management for implementation of the new eGIS system, which on June 28, 2016 was globally recognized with the 2016 Enterprise GIS Award from GIS software technology company Esri.

Status

OFI NO.	PREVIOUS RECOMMENDATION	IMPLEMENTATION STATUS				
		Implemented	Acceptable Alternative	Partially Implemented	Not Implemented	No Longer Applicable
1	***Policies And Procedures Were Not In Place To Support The Munsys System Data Update For The Munsys GIS Utility Layer.***					
	A. Develop and implement a clearly written manual readily available to all departments.			✓		
	B. Written policies and procedures should, at a minimum, include: 1. Policies for each major department responsibility with corresponding procedures that list the instructions, step-by-step, on how to complete the related job tasks. All examples, reports, or forms mentioned in the procedures should be included in the manual as exhibits. 2. A requirement that reviews verifications and approvals be documented to ensure data reliability. Each person involved in the process flow for updating eGIS data needs to be accountable for the information's accuracy and completeness. 3. Standard methods to correct errors, including the uniformity of notations and forms to be used, such as corrections on drawings or equipment size specifications.			✓		

OFI NO.	PREVIOUS RECOMMENDATION	IMPLEMENTATION STATUS				
		Implemented	Acceptable Alternative	Partially Implemented	Not Implemented	No Longer Applicable
	4. Samples of unusual or past problems and their solutions. This information would decrease the amount of research time needed to investigate and resolve similar current problems. 5. An individual assigned responsibility for updating the manual and distributing the changes.					
2	***The Data To Update The New eGIS Application, GIS Utility Layer When Implemented, Is Not Available In An Organized Structure To Assure The Utility Layer Will Be Current.***					
	Develop and implement a plan for bringing Water and Sewer Information map data current. The plan should be based and included in their policies and procedures for capturing As-Built information.			✓		
3	***A Sub-Level Project Plan Is Needed For The eGIS Project To Support Development And Implementation Of The eGIS Utility Layer.***					
	Continue to partner with BTS to develop a project plan for the eGIS Water and Sewer Information System at the sub-project level showing what is needed to make the system operational.					✓

Background

GOVERNANCE

The Business Technology Services Board (BTS Board) established the Enterprise Geographic GIS Steering Committee (Executive Committee) in June 2010. The primary mission of this committee is to process and assess information, develop a plan to provide GIS services at an enterprise level, and make recommendations to appropriate entities, constitutional officers, appointing authorities, and the Board of County Commissioners (BCC). The GIS service initiative was named Enterprise Geographic Information System (eGIS).

The Executive Committee will oversee the establishment and adoption of eGIS Project policies, procedures, and standards. The Executive Committee will also review, approve, prioritize, and obtain funding for all Pinellas County GIS initiatives including any GIS application development activities and the purchase of GIS technology, data, and consulting services. The Executive Committee will be responsible for:

- Ensuring that GIS solutions are implemented when required to support legislative mandated requirements.
- Improve efficiency to enhance the accountability of our business.
- Provide more effective delivery of services to our internal users.
- Provide more effective delivery of services to our external customers and citizens.

Initially, the tasks will be prioritized by the Executive Committee based on the factors of quality, business understanding, and effective cost management. Geospatial data-management is one of the essential components for addressing the management of the business of government, and for supporting the effective and economical use of tax dollars.

In May 2014, Pinellas County eGIS Project staff began migrating legacy spatial applications and databases into its eGIS Project environment, and leveraging the local government data model and associated applications. At the same time, the Steering Committee and Working Group have been formed as part of the County's governance process. These groups are chartered with the formation and prioritization of all eGIS projects and initiatives, and fostering high level communication between internal and external stakeholders. The development of a centralized, enterprise-wide GIS database through a well-established governance process is part of Pinellas County's strategic technology plan.

BTS is still in the process of moving from the legacy Munsys System to eGIS. One of the major tasks is to develop the new application interface, which will allow the user staff to view account, work order, and Utilities infrastructure data for each customer through a new mapping interface.

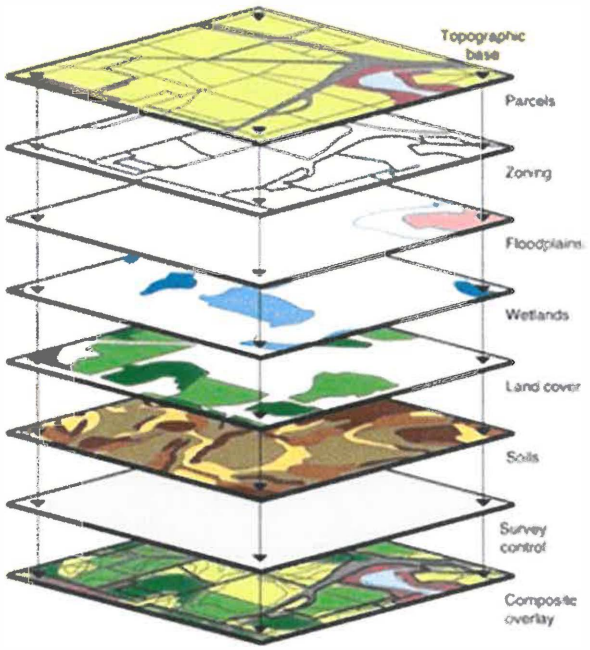
At the time of completing our audit fieldwork in May 2015, the Water and Sewer Information System was not yet operational for eGIS. The anticipated date of the project completion has

not yet been revised from June 1, 2015. The scope of this audit only includes the Utilities level of the GIS application.

GEOGRAPHIC INFORMATION SYSTEMS INFORMATION

At the simplest level, GIS can be thought of as a high-tech equivalent of a map. The key word to this technology is Geography. This usually means that the data is spatial (data that is in some way referenced to locations on the earth).

GIS stores and manages information as a collection of layers linked together through geographic references.



In addition to the Infrastructure information, the Pinellas County GIS Data Sets are:

Parcels	Congressional Districts	Commission Districts
Roads	EMS (911) Grid	Soils
Municipal Boundaries	Fire Districts	Street Lighting Districts
County FEMA (Flood Maps)	Homeowner Associations	Traffic Analysis Zones
Pinellas County Boundary	House Districts	Zip Codes
2000 Census Tracts	Marquis Pinellas Trail	Voter Precincts
Annexation Planning Areas	Pinellas County Schools	Basins
Large Commission Districts	Section Grid	County Senate Districts

STATUS OF RECOMMENDATIONS

This section reports our follow-up on actions taken by management on the Recommendations for Improvement in our original audit of the Pinellas County GIS Infrastructure Construction Water and Sewer Information. The recommendations contained herein are those of the original audit, followed by the current status of the recommendations.

1. Policies and Procedures Were Not In Place To Support The Munsys System Data Update For The Munsys GIS Utility Layer.

There are no written policies and procedures in place and operational for updating Water and Sewer Information for the Munsys GIS Utility Layer for the Munsys application. In addition, over the past few years, even procedures for receiving As-Built drawings (Final Engineers and Surveyors drawings for the project) have not been operational.

Since there are no current policies and procedures based on the business process, when the new County eGIS Project application becomes operational for water, sewer, and reclaimed water lines, policies and procedures will need to be created rather than just modified.

The eGIS Steering Committee has issued a two-page Policies and Standards document that touches on passwords and security, importing and sharing data for the eGIS database, and ArcGIS (online data entry Application). However, the eGIS Steering Committee policies do not address Water and Sewer responsibilities to update eGIS with As-Built information.

In the Fieldwork Exit Meeting with the Utilities GIS unit management, they expressed concerns that the pending additional changes in business structure and staff responsibilities within the unit may impact the ability to develop and deliver new procedures for the Utilities GIS process.

The department reorganizations were cited as the reason that the business process for capturing As-Built information in the Munsys GIS Utility Layer seemed to stop. The utility layer business process in the past received the As-Built information from Internal Design Projects, Consulting Designed Projects, and other projects from Engineering and Technical Support.

The reorganization and changes in the business process had a major impact. Utilities and Public Works engineering functions were combined in 2010. The reorganization affected the submitting of As-Built drawings.

In 2014, the Department of Environment and Infrastructure (DEI) was reorganized into the Public Works Department, Utilities Department, Office of Business Support, and *Engineering and Technical Support,* under which the Utilities GIS unit now reports. The changes may impact the flow of the GIS project data update process.

Without functioning policies and procedures for the Utilities GIS process, the Munsys GIS Utility Layer database has not been updated. Management confirmed that the layer was not updated for the required project since 2012.

Current policies and procedures for the Utilities GIS process are a requirement to assure that the appropriate project data is updated to the Munsys GIS Utility Layer. The source of the information, such as the proper name/number of the form, certificate, or report, is needed.

We recommended management:

A. Develop and implement a clearly written manual readily available to all departments.

B. Written policies and procedures should, at a minimum, include:

1. Policies for each major department responsibility with corresponding procedures that list the instructions, step-by-step, on how to complete the related job tasks. All examples, reports, or forms mentioned in the procedures should be included in the manual as exhibits.

2. A requirement that reviews verifications and approvals be documented to ensure data reliability. Each person involved in the process flow for updating eGIS data needs to be accountable for the information's accuracy and completeness.

3. Standard methods to correct errors, including the uniformity of notations and forms to be used, such as corrections on drawings or equipment size specifications.

4. Samples of unusual or past problems and their solutions. This information would decrease the amount of research time needed to investigate and resolve similar current problems.

5. An individual assigned responsibility for updating the manual and distributing the changes.

Status:

A & B. Partially Implemented. The eGIS application replaced the Munsys application in October 2015. Management indicated this Opportunity for Improvement was no longer applicable; however, we conclude the necessity to create policies and procedures addressing the work processes required to maintain current GIS system data remains a valid recommendation for the eGIS application and was not nullified by the system upgrade. Management is in the process of updating workflows to reflect the current organization and processes associated with the eGIS application, which are required to maintain current GIS system data. Management anticipates full completion and approval of the workflows during the second quarter of Fiscal Year 2017.

2. The Data To Update The New eGIS Application, GIS Utility Layer When Implemented, Is Not Available In An Organized Structure To Assure The Utility Layer Will Be Current.

The Utilities GIS unit has not maintained information and data that is needed to update the Munsys GIS Utility Layer. However, the As-Built drawing for some completed projects may be available, such as the Keystone Project. In addition, management did not maintain a list of completed projects that require GIS updates, which were not completed. Based on our analysis, Utilities did not have a process in place to:

A. Determine what projects would generate the requirement to update the Munsys GIS Utility Layer.

B. Maintain the date/information needed to update the Munsys GIS Utility Layer (i.e., As-Built drawings).

C. Review the project data for errors or additional information required.

Based on our analysis, the main cause of not properly maintaining project update data and information was the reorganization that left a gap in the assignment of responsibility of the Utilities Department deliverables. A secondary cause was the lack of policies and procedures noted in Opportunity for Improvement No. 1.

The Munsys GIS Utility Layer database has not been updated for the past few years. Staff stated that the updates stopped in approximately 2012. The impact of the update issue on operational use of the Munsys GIS Utility Layer has not been defined. The completed projects have to be reviewed to determine update requirements associated with the changes resulting from the replacement and relocation of infrastructure.

The Utilities GIS unit should assure that the data and information from completed projects are available to update the Munsys GIS Utility Layer.

We recommended management:

Develop and implement a plan for bringing Water and Sewer Information map data current. The plan should be based and included in their policies and procedures for capturing As-Built information.

Status:

Partially Implemented. Management anticipates bringing all private development assets current in the eGIS application within the next 90 days and anticipates obtaining the required capital asset information necessary to update the eGIS application in Fiscal Year 2017.

3. A Sub-Level Project Plan Is Needed For The eGIS Project To Support Development And Implementation Of The eGIS Utility Layer.

The overall eGIS Project Plan (Plan) does not contain the sub-project information necessary to plan the allocation of resources to bring the eGIS Water and Sewer Information layer operational. The Plan, following the Agile Scrum methodology (Software Development Life Cycle), does not have a formal written project plan. The tasks are developed in six-month time frames. BTS is performing the overall project management under PMBOK (a system project building process used by BTS) through Clarity (on-line project tracking software used by BTS) by task.

A sub-project plan would allow the user (Utilities GIS unit) to see how the completion of the sub-projects in each six-month release contributes to the final implementation for the eGIS Utility Layer. The sub-project plan is needed for the Utilities GIS unit to schedule their personnel to help with the deliverables they would be involved in, such as data conversion verification, user acceptance testing, training, and implementation. The Utilities GIS unit also has their department responsibilities to accomplish, particularly implementing the policies and procedures and catching up on the backlog of As-Built drawings.

The Utilities GIS unit has been meeting with the BTS eGIS project team to obtain the additional information for the sub-project plan. The additional information will be updated and shared by both parties.

The BTS Project Management processes for the overall eGIS Project provides a suitable model. However, the Utilities GIS unit does not see a project plan and schedule that when finished will have Water and Sewer Information map layers that they can update, view, and share. Currently, there is no stated date when Utilities will be able to use their layer.

The project plan needs to be at sufficient levels to permit the layer level users adequate information to support the project in a timely manner. In addition, the eGIS Project stated that the need for department plans be communicated so that anticipated tasks can be completed for their section of the project.

We recommended management:

Continue to partner with BTS to develop a project plan for the eGIS Water and Sewer Information System at the sub-project level showing what is needed to make the system operational.

Status:

No Longer Applicable. The original Opportunity for Improvement was specifically geared toward a plan to develop and implement the eGIS application. The eGIS application was implemented in early October 2015; therefore, this finding is no longer applicable to the current system in operation.

Division of Inspector General

Ken Burke, CPA

Clerk of the Circuit Court
& Comptroller
Pinellas County, Florida

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