

A. Objectives, Scope, and Methodology

We have completed our review of the City of Chesapeake (City’s) Capital Project Management Practices for Fiscal Year (FY) 2009 through FY 2015. Our review was conducted for the purpose of determining whether the City’s capital project management practices were economical, efficient, and effective, whether goals and objectives were being achieved, and whether they complied with applicable City and Department procedures.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusion based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Each fiscal year, the City Manager prepares a five-year capital improvement budget and presents it to City Council for appropriation approval. Not all capital projects were able to be completed within a fiscal year; therefore some projects were started or approved in previous fiscal years. Also, some projects not scheduled to commence during the current fiscal year were placed on the five-year capital improvement budget (CIB) to designate future funding. There were 285 capital projects listed on the City’s CIB for FY15, with projected funding as follows:

FY15 Capital Project costs and funding

FY15 FIVE YEAR BUDGET PLAN		FY15 ACTIVE CAPITAL PROJECTS	
FY 2015	\$63,563,428	Previous Funding	\$ 879,012,647
FY 2016	\$83,343,266	5 Year Total	\$ 345,507,000
FY 2017	\$68,074,403	Funding Beyond 5 Years	\$ 279,423,838
FY 2018	\$68,563,428	Total Project Funding	\$1,503,943,485
FY 2019	\$39,571,064		
5 Year Total	\$345,507,000		

Major Observations and Conclusions

Based on our review, we determined the City had accomplished its overall mission of oversight and maintenance for capital projects. However, we did identify several areas of concern that needed to be addressed. Those areas included standardization of project reports, planning for common historical costs contingencies and others.

This report, in draft, was provided to City officials for review and response, and their comments have been considered in the preparation of this report. These comments have been included in the Managerial Summary, the Audit Report, and Appendix A. City management, department heads, supervisors, and their staffs were very helpful throughout the course of this audit. We appreciated their courtesy and cooperation on this assignment.

Methodology

To conduct this audit, we reviewed differing aspects of the lifespan of sampled capital improvement projects conducted by Public Works, Public Utilities, and Information Technology. We interviewed stakeholders, decision makers, program managers, department heads, accounting personnel, and project managers. We reviewed data available from PeopleSoft, City Ordinances, completed and active project records, current and previous approved budgets, contracts, invoices, and observed project managers. Additionally, we reviewed completed capital project files and financial data.

In addition to these items, we reviewed operating policies, procedures, and practices from the departments reviewed. This review included testing and evaluation of the departmental operations and practices. We conducted extensive walkthroughs and interviews with the various department's staff to better understand control practices.

B. Performance Information

1. Project Management Definition:

The Project Management Institute describes a project as a temporary endeavor that has a defined beginning and end in time, and a defined scope and resources.

“A project is unique in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal. So a project team often includes people who don’t usually work together – sometimes from different organizations and across multiple geographies.

Projects may include the development of software for an improved business process, the construction of a building or bridge, the relief effort after a natural disaster, the expansion of sales into a new geographic market. Projects should be expertly managed to deliver the on-time, on-budget results.

Project management is the application of knowledge, skills and techniques to execute projects effectively and efficiently. It’s a strategic competency for organizations, enabling them to tie project results to business goals — and thus, better compete in their markets.”

A project manager essentially was the (City’s) owner representative, dealing with vendors and government (City and State permits, EPA, Army Corps of Engineers, and various state and federal agencies, etc.) for the completion of the assigned project. Project managers needed sufficient technical background to understand the complexities of the project, have the competencies to manage human resources, and effectively communicate problems, potential problems, and status to the stakeholders.

Ideally, a project life cycle would consist of:

- An end-user identifying and requesting needs and wants to decision makers;
- decision makers determining feasibility of the project;
- decision makers appropriating resources for the project;
- decision makers appointing a project manager;
- project manager overseeing and directing a vendor/contractor completing the deliverable;
- project manager providing timely and accurate status reports concerning time, performance, and cost;
- project termination through successful completion;
- decision makers and the project manager conducting project post-mortems on project that incorporates lessons learned and adjustments to the policies and procedures.

2. Capital Project Descriptions:

Capital projects were delineated into nine general categories, seven typical Improvement types, and seven typical project statuses:

Improvement Categories	Improvement Types	Project Status
Community Facilities	Addition or Expansion	New
Economic Development	Equipment	Feasibility Study
Education	New Facility	Planning and Design
Information Technology	Renovation or Rehabilitation	Permit Application
Parks, Recreation, and Tourism	Replacement	Procurement
Public Safety	Study	Construction- Implementation
Public Utilities		Post-construction
Stormwater Projects	System Acquisition or Upgrade	Complete
Transportation		

Although not completely inclusive, the major areas were:

Improvement Categories Definitions;

- Community Facilities – included items such as the Jordan Bridge memorial, handicap ramps, the Human Services building, libraries, and municipal parking lots
- Economic Development – included items such as Fentress encroachment purchases, Conference Center renovations, and road and infrastructure repairs in Tax Increment Districts.
- Education – related to schools
- Information Technology – included software and computer systems for city-wide use. Also included items for specific departments such as Public Communications, Libraries, and Public Safety.
- Parks, Recreation, and Tourism – related to parks, community centers, and playgrounds.
- Public Safety – related to Fire, Police, Sheriff, and courts.
- Public Utilities – concerned installation or repair of water mains, water towers, sewer lines, and water production facilities,
- Stormwater Projects – included replacing, installing, or repairing culverts, drainage systems, and stormwater systems.
- Transportation – included non-routine repair or replacement of bridges (fixed and draw), roads, and trails,

Improvement Type Definitions:

- Addition or Expansion – significant alterations to existing facilities, extension of a roadway, installing an upgrade such as a new park trail or parking area, and expanding water main or drainage systems.
- Equipment – major purchases of equipment such as critical Fire safety and related equipment, park and playground equipment, WCTV studio cameras, and emergency generators.
- New Facility – acquisition of property (land), and design and construction of new facilities and/or infrastructure.
- Renovation or Rehabilitation - urgently needed non-routine repair projects to City buildings that were beyond the capability of in-house staff capabilities or annual appropriations. These projects were necessary to prevent deterioration of City buildings and interruption of vital services and operations.
- Replacement – replacement of existing facilities and/or infrastructure.
- Study – items such as compliance with Virginia Pollution Discharge Elimination System Permits, updating Stormwater Inventory Mapping and Master Drainage Plan, development of strategic plans, and best plan development.
- System Acquisition or Upgrade – upgrades and replacement of existing software, purchase and installation of new software systems, purchase of development rights for land in accordance with intergovernmental agreements, and upgrades to telephone systems.

Project Status Definitions:

- New – added to the five-year budget plan.
- Feasibility Study – funds allocated for the development of needs and wants, possible locations, and construction cost estimates.
- Planning and Design – typically, contracting with an architect and engineering firm, or in-house conversion of needs and wants to an actionable work breakdown schedule (WBS) with accompanied costs.
- Permit Application – the federal and/or state approval process for work to be done at a particular site. Examples would include Army Corps of Engineers approval for wetlands studies and development, EPA review for possible Clean Water Act compliance, or Virginia Department of Transportation approval.
- Procurement – use of the competitive bid process to purchase goods and services.
- Construction/Implementation – work performed to complete project in accordance with WBS.
- Post Construction – period for final project acceptance.
- Complete – termination of project.

3. City Council Study:

In October 2012, two members of City Council reviewed the Animal Services facility construction project and developed findings and recommendations. Although their report focused specifically on the Animal Services facility, many of the issues they discovered were applicable to other City facility projects. Their findings were as follows:

1. No prequalification of bidders;
2. Construction drawings and bid documents containing omissions;
3. Scheduling Issues (the contractor fell behind relative to the project schedule);
4. Contract Deadline extension without appropriate authorization;
5. Contractor failed to agree to new completion date;
6. Change orders needed further authorization;
7. Claims (disputes with contractors);
8. Unexplained time extension charges;
9. Tour observations included lack of fenced area for visitors, cages stacked three high, and (potentially) more office space than needed.

Their recommendations included:

1. Investigation of potential authorization issues.
2. Establishment of guidelines for administering contract in Facilities Construction.
3. Assigning Contract Administrators with expertise as project managers to specific contracts and allowing them follow through from contract start to completion.
4. Steps to ensure electronic projects records were not deleted.
5. Steps to ensure any paper files were maintained.
6. Obtaining an outside consultant to review projects.
7. Sending change orders resulting from design errors and omissions to the design engineering firm for response and potential contract adjustments.
8. More guidance and oversight to keep costs down.
9. Revisiting City policy on change order adjustment/overruns.
10. Finding a use for excess office space.
11. Pursuing liquidated damages if appropriate.

We noted that while some of these recommendations, such as recommendation #9, have been implemented, others, most notably #2 and #8, had not been implemented, and arose during our review as well.

C: Project Estimating

Our review of the City’s capital project management practices identified a number of issues and control deficiencies that had not been addressed as well as practices that could be enhanced. These issues included areas of cost estimation review and planning prior to approval and of inclusion of common and recurring obstacles in cost estimations.

1. Independent Review of Project Scope Cost Estimates

Finding – There was no consistent independent review of initial project scope cost estimates and no consistent process for managing projects against original cost estimates.

According to the Government Accountability Office (GAO) publication, “Best Practices for Developing and Managing Capital Program Costs (GAO09-3SP)”, Integrated Baseline Review helps program managers fully understand the detailed plan to accomplish program objectives and identifies risks so they can be included in the risk register and closely monitored.

From the 285 capital projects, we drew a sample of 30, all of which were initiated in FY 2015 or year prior to FY 2015. These 30 projects had initial estimated project cost of \$49,104,656. We noted in reviewing the FY 2015 budget the “Estimated Project Cost” for these same 30 projects had grown to \$53,331,845. We noted significant estimate increase for several of the projects. Specific examples included:

**Table 1
Examples of Project Estimate Increases**

Project Number	Description	Initial Budget	Subsequent Approval	Fiscal Year
1191200100	South Norfolk TIF Poindexter Street Scape	\$1,000,000		FY09
Original estimate for FY10 was \$2,500,000. Included the additional costs of sewer replacement that had not been initially included. Also included scheduling adjustment to the completion sequence.			\$4,500,000	FY10
FY09 Estimated five-year project cost - \$3,500,000				
FY15 Estimated five-year project cost was \$5,600,000				

Project Number	Description	Initial Budget	Subsequent Approval	Fiscal Year
1091400100	Human Services HVAC/Emergency Exit	\$1,120,000		FY10
The HVAC system was renovated, including the addition of a dedicated air handler to distribute fresh outside air.				
Competitive bids higher than estimate.			\$500,000	FY11
Redirected \$140,000			(-\$140,000)	FY13
FY10 Estimated five-year project cost \$1,120,000				
FY15 Estimated five-year project cost \$1,480,000				
Project Number	Description	Initial Budget	Subsequent Approval	Fiscal Year
1461700300	Triple Decker Bridge Rehabilitation	\$650,000		FY13
Rehabilitation was necessary to avoid implementation of a weight restriction on the existing bridge structure.				
Appropriation after completion of 30% design due to estimated funding shortfall.			\$470,000	FY15
FY13 Estimated five-year cost requirements was \$650,000				
FY15 Estimated five-year cost requirements after consolidation was \$1,120,000				

Note that the estimate for the South Norfolk project increased from \$3,500,000 to \$5,600,000, a 60% increase. The Human Services Project increased from \$1,120,000 to \$1,480,000, a 32.14% increase. Finally, the Triple Decker bridge project increased from \$650,000 to \$1,120,000, a 72.30% increase.

There were a number of factors that contributed to these increases. Public Works had extensive and detailed procedures and checklists for project management of street and roads projects, but had not developed them for facilities projects. Facilities Construction and Facilities Management (Public Works divisions) had not developed separate procedures and checklists. In addition, we noted a number of instances where this lack of independent review had adverse project impacts: (Note: these instances were taken from the review of completed capital projects.)

- Requests were made for change orders after project approval, and funds were appropriated for items such as installation of water meter touchpads, a new granite paver over an existing time capsule, installation of operable and inoperable customer service windows, an extended elevator warranty, and louver blinds for an atrium.

- Project scope increases occurred for items such as the complete build-out of a jury trial courtroom, conference room, vestibule, jury deliberation room, and toilet which increased project costs by \$399,685.
- Requested action outside the original scope of work included powdered coating of cat cages (rejected by City due to a proposed contract deadline extension request); installation of a wall-hung sink in a lavatory; and signage for the cages.
- Other factors for cost increases to various projects included initial funding for design with later appropriation for construction and land purchase.

These project estimate issues appear to have resulted from insufficient review of the original scope of work and related cost estimates by the end-users and affected City departments, forcing subsequent project cost adjustments. If this practice continues, there will likely continue to be unplanned costs associated with those capital projects.

Recommendation – All capital projects should have a comprehensive review of the scope of work by all affected City departments at least during the feasibility phase.

Comprehensive reviews of cost estimates should occur for all projects. As was noted during our 2012 Public Works audit, procedures similar to the ones used for road projects should be developed for other projects, particularly facility projects. Also, this comprehensive review should incorporate lessons learned from other on-going and completed projects, and should incorporate foreseeable adjustments and project needs.

Response:

We agree that comprehensive reviews of the scope of work should be completed before or during the feasibility phase of projects and will install procedures to ensure it occurs. Having said that, we also expect that estimated costs will change even after feasibility studies are conducted. There are many reasons that costs estimates are not static once projects are identified in the capital improvement program. Typically, projects are programmed before design occurs. Until designs are completed, project costs are very difficult to predict. Even after a design is completed, actual project costs are dependent on market conditions and commodity prices at the time of bid. Market conditions at the bid point are often very different from architect and engineering estimates during the design phase. After bid and during construction it is not uncommon to discover design errors/omissions, differing site conditions, and user requested changes. Design errors are usually rectified at no cost by the architect / design engineer and user requested changes are now reviewed, justified and approved by the user department head.

With respect to findings and recommendations of the 2012 review of the Animal Services facility, Public Works implemented several procedures including:

- **Formal prequalification required for large complex projects**

- **Constructability reviews to identify omissions for large complex projects**
- **Change orders require authorization beyond the project manager**

2. Planning for Recurring Obstacles:

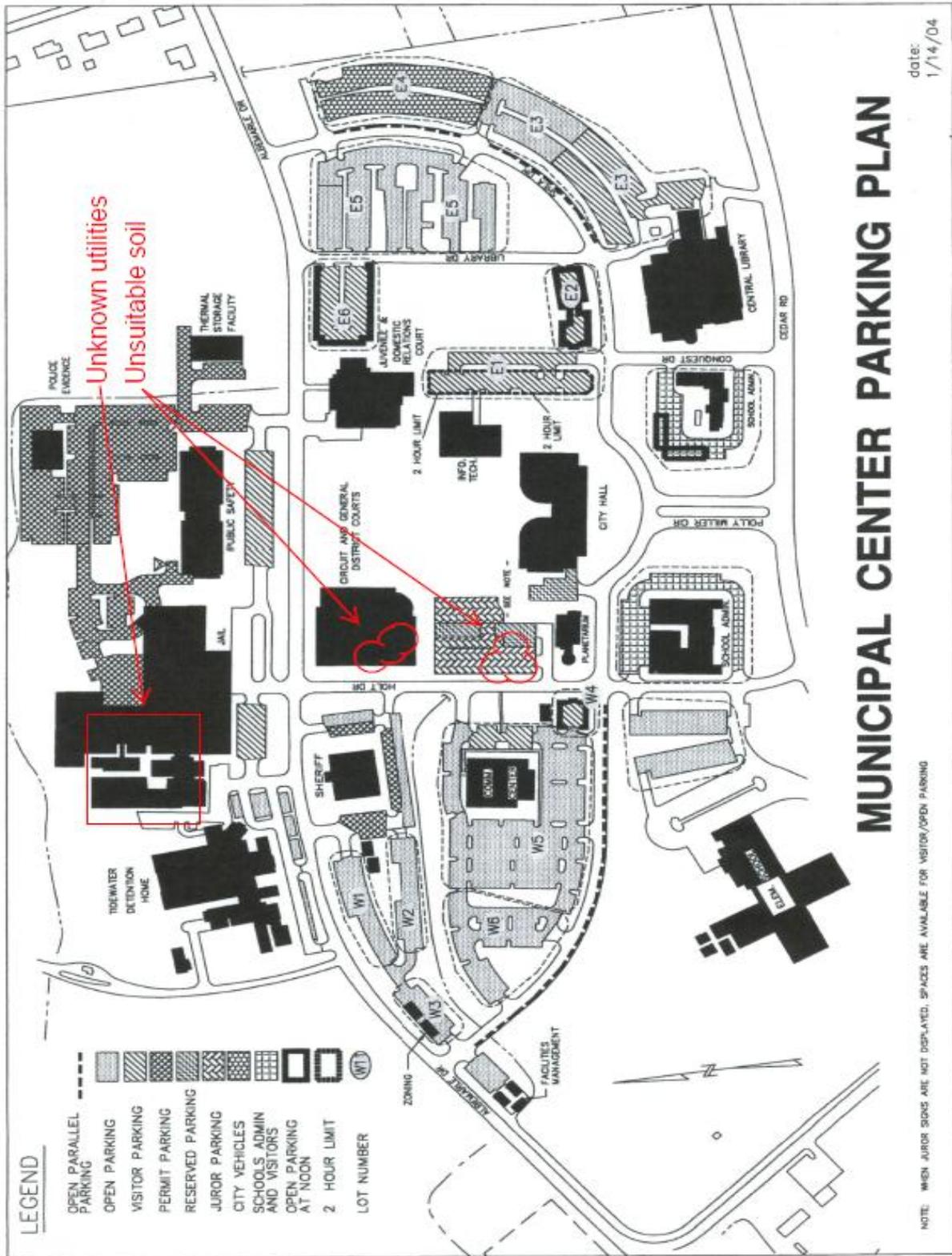
Finding – Planning for capital projects did not sufficiently consider consistently recurring obstacles such as soil usability.

The Government Accountability Office’s “Best Practices for Developing and Managing Capital Program Costs” recommends the use of historical costs when planning and budgeting. Thus, previous projects at a proposed site should be considered in the planning process.

We noted that, although soil sampling was conducted according to reasonable sampling standards, during the feasibility phase, the soil was often found unsuitable during the actual construction phase, requiring change orders to remove and replace it. Soil conditions in Chesapeake often significantly varied with a few feet across parcels.

We reviewed files for several completed Capital Improvement Budget projects on the City Hall Campus and found that several had cost increases due to unexpected unsuitable soil or existing utilities. However, the City had not previously mapped these conditions. These instances are shown in Figure 1 and 2.

Figure 1
Municipal Campus area



This situation occurred because the City did not maintain maps of soil or utility issues that could be used to plan future projects. If this situation continues the City will continue to rely on change orders to address these items, increasing costs and time delays.

Recommendation – The City should compile a GIS map of previous capital project issues that can be used to identify potential change orders and costs on future projects.

A more complete mapping of the City Hall campus should be created since there are likely to be more projects on the campus. Similarly, additional mapping can occur in areas where parks or roads are expected to expand. Finally, the City should also compile a listing of other common historical costs to be incorporated in project planning and estimating, such as the vandalism and theft that occurred at the Animal Control Facility during construction.

Response:

We are concerned about the finding and agree that the regularity of obstacles concerning soil conditions and the presence of utilities is frequent enough that we should assume that such obstacles will be present during the planning and design phases. During design, geotechnical and sub-surface utility locating engineering studies are performed. If we assume conditions will be suboptimal, then we can include allowances in the site development plans to account for additional costs – such as removal and replacement of unsuitable material or longer pile lengths. However, we are not convinced that a GIS map is the solution; soil conditions are highly variable throughout the City. We agree with the need to maintain reliable records of soil conditions and utility locations and we agree that GIS mapping may be an appropriate tool. However, the recommendation does not address the fact that projects often occur in areas where the City has no recent experience of building or the existing infrastructure is so old that records simply do not exist. Since each project stands on its own we perform the necessary engineering studies to reduce the risk of differing site conditions.

D. Other Operational Findings and Recommendations

Our review of Capital Project Management Practices identified a number of other areas for improvement. These areas included creating a standard format for progress and status reports, and changing the entry level skills and experience requirements of the job classification Project Manager.

1. Standardized Citywide Reporting

Finding – There was no established standardized capital projects summary report that could be used on a citywide basis. Additionally, the City did not consistently perform reviews of contractors’ financial records to ensure that invoiced items agreed with contract terms.

According to Government Accountability Office (GAO) publication Best Practices for Developing and Managing Capital Program Costs (GAO09-3SP), “Contract performance reports (CPR) formally submitted to the agency should be examined for reasonableness, accuracy, and consistency with other program status reports.”

Capital projects and project managers were assigned to various departments, with the project manager reporting directly to the department head or program manager. Although the various stages of a project were the same without regard to the deliverable, there was no standardized progress review report available for all authorized capital projects that contained sufficient detail on project status.

- CityPoint had a “Project Management Office” which had entries for capital projects and various projects. The status of each active project was not consistently updated.
- The PeopleSoft system produced budget status financial reports of processed transactions but did not provide a report of all active projects with a narrative. The PeopleSoft reports were not capable of including pending changes of time and charges of change orders.

Also, we noted that not all the departments providing oversight of capital projects performed an independent review of contractors financial records to ensure that invoices matched actual contract terms. The departments either relied upon a contracted project management vendor or did not perform the review at all.

This situation occurred because individual departments reported on their own individual capital projects using their own reports instead of providing information for a cumulative status report that could be used on a citywide basis. If it continues, there could be delays in management’s awareness of potential time delays, cost increases, and idle projects passing milestones without action. Additionally, without consistent review of contract invoices, rebates and other cost savings may not be identified and recovered.

Recommendation – The City should consider developing a citywide status report document for centralized capital projects reporting. The City should also take steps to ensure that project invoices are consistently reviewed against contract term requirements.

The citywide status report document should include all active projects regardless of activity and start date, and be structured in a format that allows for sorting. Report fields should include the following:

Project ID, PeopleSoft ID, AC# (used by Public Works), title, description, previous update status, previous update date, current status, current status update date, original budget, current budget, pending adjustments, current expenditures, original completion date, next milestone and projected completion date, current completion date of the project.

An example from Public Works is provided below:

Exhibit 1
Excerpt from Public Works Capital Projects Summary – September 2014

<u>Volvo Pkwy & Independence Pkwy Roundabout:</u>	
Construct a roundabout at the above referenced intersection. Currently negotiating with adjacent Battlefield Corporate Park to finalize right-of-way compensation to achieve project final cost.	
Status:	Complete:
Budget:	\$2,969,000
Project Final Cost:*	\$1,924,430
<u>Volvo Pkwy Streetscaping:</u>	
Construct turn lanes, sidewalks and street lights replacements. Notice to proceed given April 23, 2012 and is currently working with punch list items required for completion.	
% Complete:	99%
Project substantial completion:	Feb. 2013
Funds Appropriated:	\$958,472
Construction Contract Value	\$833,454
Contract Modifications	\$61,289
Current Contract Value	\$894,743

The document should be available electronically so that it may be merged with the status reports from the various departments using the same format and fields.

Finally, the City should develop a standardized process for review of contract terms against invoices received. If a third party performs the review, standards should be developed to ensure the review is adequate. Additionally, the City may wish to periodically allow contract audits of significant capital projects, to ensure that contract expenditures were consistent with contract terms on a large scale basis.

Response:

We agree with the finding that standardized project reporting is important and should be implemented across all affected departments. Staff has been and continues to investigate affordable computer-based reporting tools that address reporting needs for capital projects. Representatives from the departments that are primarily involved with capital projects will meet to determine the appropriate format and content of project reporting along with how it will be prepared, distributed, and maintained.

2. Job Description

Finding – The citywide job description of Project Manager did not include an experience requirement related to successful completion of multi-million dollar projects.

Project managers must have sufficient technical background to understand the complexities of the project and have the competencies to manage human resources and effectively communicate problems, potential problems, and status to the stakeholders.

We found that project managers hired by City departments were not necessarily required to have capital project management experience as stated by the job description. Capital Improvement Projects typically involved multi-year planning and execution, and multi-millions in funds allocated for completion. Also, the City did not require a recognized independent project manager certification process such as Project Management Institute (PMI) as a “preferred candidate”.

These conditions existed due to the employee hiring processes’ reliance on the various departments to select a qualified candidate versus a screening process to match skills to the level of the task. If this situation continues, because of closely timed retirements and other loss of experienced employees, there could be a negative impact on completion of capital projects.

Recommendation – The City should consider including a minimum budget range experience requirement or independent project manager certification for future project managers.

The City should consider improving the process of advertising job postings of project managers for capital projects by including notices placed in trade journals. Any additional cost for advertisement could be imposed on the requesting department. Also, since capital projects are time sensitive, the City should require project manager certification or experience handling sizable capital projects to ensure that the newly hired managers have those capabilities.

Response:

We agree that project managers require specialized training and that many projects are very complex and require experienced project managers. However, not all projects are large and complex and the City staff can handle routine, lower cost projects very capably. On large or complex facility and transportation projects the City now engages skilled Construction Management (CM) consulting firms to augment the City staff. City staff function then as the Owner's Representatives while the CM firm coordinates the design firms and construction contractor's activities. The cost of these additional Construction Management services is being added to the original project cost estimates. By using CM firms the City expands its ability to match the appropriate contract project manager with the complexity and scope of the project.