King County

**Metropolitan King County Council**
**King County Auditor's Office**
**Cheryle A. Broom,** *King County Auditor*
King County Courthouse
516 Third Avenue, Room W1033
Seattle, WA 98104-3272
**206.296.1655** Fax 206.296.0159
**Email:** KCAO@kingcounty.gov
TTY 206.296.1024
www.kingcounty.gov/auditor

# MANAGEMENT LETTER

DATE: April 12, 2012

TO: Metropolitan King County Councilmembers

FROM: Cheryle A. Broom, King County Auditor

SUBJECT: Review of Capital Project Risk Scoring and Requirements for Closer Scrutiny and Mandatory Phased Appropriations

## EXECUTIVE SUMMARY

This review mandated by Ordinance 16764 provides an evaluation of the risk scoring tool and requirements for projects selected for closer scrutiny and mandatory phased appropriations. The risk scoring and project selection process is operating as directed in the ordinance, but it is too early to tell how effective the provisions in the ordinance are at achieving desired outcomes. For example, only one project has experienced mandatory phased appropriations, some are not using earned value management, and few reports have reached County Council and County Executive staff for their use in project oversight.

Preliminary analysis of costs and benefits of the ordinance indicates that increased costs have been minimal so far, and benefits in the form of increased capital project accountability and transparency have been realized. In addition to recommending further analysis when more information is available, we identified two opportunities to improve the efficiency of the risk scoring and closer scrutiny process.

## BACKGROUND

In November 2006, in response to issues related to capital project cost and schedule overruns and lack of timely access to adequate project information, the King County Council created the Capital Projects Oversight Program (CPO) as a function of the King County Auditor's Office. The Auditor's Office then retained PMA consultants to design a legislative oversight model for major capital projects. In its August 2007 report, the PMA team recommended selecting a limited number of high-risk projects on which to focus oversight. For these selected projects, PMA recommended that the County Council release funding in phases tied to the completion of design milestones and performance of best practices in project management.

In June 2009, based on its review of King County construction management from July 2005 through June 2008, the Washington State Auditor's Office (SAO) found that "the lack of adequate performance measures and expectations prevents the King County Executive and County Council from providing adequate oversight of construction activity." In response to the SAO audit and PMA recommendations, the County Council passed Ordinance 16764 in March 2010. The ordinance outlined a procedure by which a limited number of projects would be selected for closer County Council and County Executive scrutiny and rigorous cost controls, and required those projects to:

- Undergo mandatory phased appropriations;
- Provide quarterly reports during the implementation phase comparing project performance with budget and schedule targets;
- Establish and maintain a risk register; and
- Apply earned value management (EVM) to the design and construction phases.

The County Council tasked CPO with developing a scoring tool to provide objective risk comparison between eligible projects with a total project cost estimate of over ten million dollars to facilitate the selection of a limited number of these projects to undergo the new controls.[1] Each year, the Joint Advisory Group (JAG), a capital project review group comprised of senior executive and legislative branch officials, uses the risk scores as a basis for selecting projects with characteristics that increase the likelihood of being completed late or over budget at a potentially significant financial or other cost to the county.

Over the first two scoring rounds (2010 and 2011), eight implementing agencies (Wastewater Treatment Division, Solid Waste Division, Roads Services Division, Facilities Management Division, Water and Land Resources Division, Metro Transit, King County International Airport, and Department of Transportation-Water Taxi) scored a total of 35 projects. JAG selected 15 projects for closer scrutiny and mandatory phased appropriations.

The ordinance also required the King County Auditor's Office to evaluate the implementation of the new requirements for identifying, managing, and reporting on projects selected for closer scrutiny and mandatory phased appropriations and deliver a report to the County Council by April 15, 2012. Specifically, our objectives were to (1) evaluate the functionality and efficacy of the risk scoring tool, (2) evaluate the extent to which agencies responsible for selected capital projects are implementing the new requirements, (3) identify any benefits to agencies, the County Council, the County Executive, and/or CPO of the new scoring and reporting requirements, (4) identify any challenges and/or costs associated with implementing these requirements, and (5) briefly assess the project phase descriptions and data requirements for appropriation and lease requests for lease-based projects. This was a limited non-audit review.

To conduct this work, we reviewed the scoring tool, data and reports on risk scores, capital projects, and project management initiatives, and interviewed officials from the County Council and County Executive staffs, CPO, the Office of Performance, Strategy, and Budget (PSB), and seven implementing agencies.

**SECTION I: Risk Scoring Tool Functions Well, But Correlation to Project Performance Remains Unproven**

According to agency officials responsible for using the risk scoring tool, it is fairly easy to use and generate reasonable assessments of project risk. Our review found that the tool is designed and implemented according to the specifications in the ordinance. Specifically, it incorporates all the required information to assess the likelihood of a project being completed late or over budget at a potentially significant financial or other cost to the County. Although a few agencies experienced some technical problems during the first round of scoring, by the second round, most of the problems had been resolved. One agency of the seven we interviewed continued to have technical difficulties implementing the tool but received technical assistance from CPO to generate and submit scores.

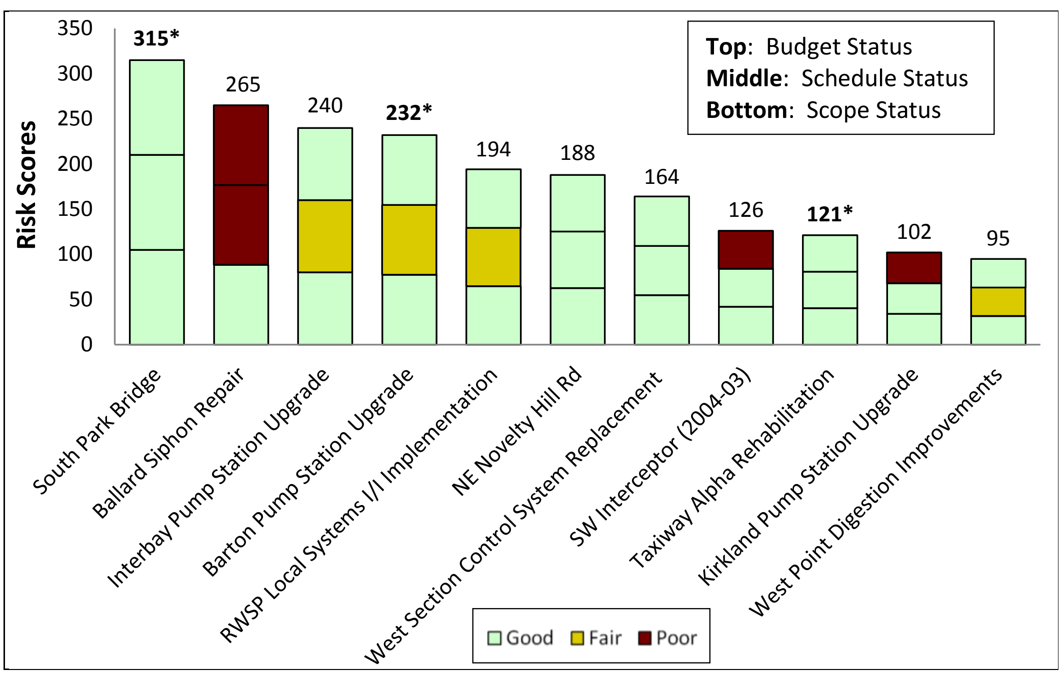
[1] Eligible projects are capital projects as defined in K.C.C. 4.04.020, except they do not include information technology projects, transit acquisitions, affordable housing and community development projects that are developed and managed by non-County entities, energy savings performance contracts or lease-based projects. (Ordinance 16764 2.A.4)

The timing of the scoring and selection cycle has changed from the dates specified in the ordinance. Originally, scores were to be transmitted by March 1, and JAG would select projects by March 31. According to PSB and JAG officials, County Council and County Executive staff agreed that agencies would submit scores in June/July and JAG would make selections in August to provide time for agencies to generate scores and modify budget requests for any projects selected for phased appropriations.

Assessing the effectiveness of predicting risk is difficult, since by definition, risk is only the *possibility* of events occurring. Without a large volume of data to identify trends, one cannot draw firm conclusions. In the case of the capital project risk scoring tool, performance data are only available for 11 scored projects because the baseline targets that make performance measurement possible are set when the project has completed 30-40 percent of the design phase. The sample only includes projects that were scored at a later point in their life cycle than the projects for which performance data is not yet available. Since the scoring tool assigns lower risk to projects that are farther along in their life cycles and thereby have fewer unknowns, these 11 projects have lower risk scores than they might have had if they had been scored earlier.

Performance data for these projects compares budget, schedule, and scope status as of the 4th quarter, 2011 to baseline targets. For the purposes of this review, we have interpreted projects reporting budget, schedule, or scope as "on-track" to meet baseline targets as having "good" performance, those with "minor variance" as having "fair" performance, and those with "major variance" as having "poor" performance. Exhibit A shows projects with both high and low risk scores reporting fair or poor performance in one or more categories, indicating that risk scores and project performance are not highly correlated for this limited sample. The sample size of 11 projects is too small to draw conclusions as to the predictive ability of the risk scoring tool. Moreover, the tool can only incorporate risks project or agency staff can anticipate, which may or may not be primary drivers of project performance. Events outside of the control of a project management team may lead to better or worse than average performance, no matter how well they are managing the project. Further, since these projects are still in progress, performance data are not final. Therefore, projects currently experiencing difficulty may improve, and projects on track to meet baseline targets may deviate from their baselines as they progress.

**Exhibit A: Comparison of Risk Scores to Project Performance**




**NOTE**: Asterisk indicates project selected for closer scrutiny and mandatory phased appropriations.

CPO plans to perform ongoing analysis of the risk scoring tool by conducting outreach to determine the causes of poor project performance over time. If accumulated data suggest the need to adjust the tool in the future to increase the likelihood of correctly predicting performance problems, CPO will take steps to identify possible changes.

The greatest advantage of the risk scoring tool is to identify risks early in the project life cycle—before performance data are available—so that the County Council and County Executive can proactively monitor projects selected for closer scrutiny and mandatory phased appropriations.

The goal of closer scrutiny and mandatory phased appropriations is to mitigate the likelihood of projects exceeding baseline budget, schedule, and scope targets and/or incurring significant financial or non-financial costs to the County. Three of the scored, baselined projects were selected for closer scrutiny, which may have positively affected their performance. As shown in Exhibit A, the three projects selected for closer scrutiny (indicated by an asterisk next to the risk score), are performing at the same level or better than the adjacent projects with comparable risk scores. Specifically, the South Park Bridge project is meeting budget, schedule, and scope targets, whereas the project with the most comparable score, Ballard Siphon Repair, is experiencing significant variance from its budget and schedule baseline targets. Barton Pump Station Upgrade is performing at the same level as the projects with similar risk scores (Interbay Pump Station Upgrade and RWSP Local Systems I/I Implementation). The Taxiway Alpha Rehabilitation project is meeting baseline targets, whereas projects with similar risk scores (SW Interceptor 2004-03 and Kirkland Pump Station Upgrade) report significant variance from baseline budget targets. These results may be simply coincidental, however, as the sample size is exceedingly small. Unfortunately, there is no way to know whether the projects would have performed just as well had they not been selected for closer scrutiny.

Further analysis of the predictive value of the scoring tool and effectiveness of closer scrutiny will be informed by additional performance data when more scored and selected projects establish baselines. If closer scrutiny is having the desired effect, selected projects should demonstrate better performance than non-selected projects with similar risk scores. If the tool correctly highlights challenges to project performance before those challenges are actualized, and if increased management attention results in better project performance, then the tool will have acted as an early warning indicator and shown that closer scrutiny was beneficial.

Finally, the ordinance provides for JAG to remove closer scrutiny from projects where an updated risk score reflects a significant reduction in risk.[2] None of the agency officials we interviewed were aware of this process and no projects had been removed from closer scrutiny as of March 2012. The ordinance states that "the number of projects selected…should be small enough to allow for focused, meaningful oversight by the County Council and County Executive ." As more projects are selected for closer scrutiny each year, it is important to ensure that meaningful oversight is not diluted by projects that do not truly require continued County Council and County Executive scrutiny.

**SECTION II: Most Agencies Do Not Use Earned Value Management and Some Required Reports Were Not Filed, But Agencies Are Otherwise Ready to Comply With Requirements**

More than half of the implementing agencies are not using Earned Value Management (EVM), according to agency officials. (See Appendix I for detailed compliance information.) The ordinance requires agencies to apply EVM (a systemic way to compare planned budget and schedule to actual budget and schedule) to the design and construction phases on projects selected for closer scrutiny. Three agencies routinely use EVM to manage construction contracts but question the return on investment for using it to manage design contracts or analyze the project as a whole. Some agency officials indicated that EVM can be difficult to apply to design contracts because work does not always progress in a linear, quantifiable manner, making value assessments more subjective than with

[2] Ordinance 16764 2.C.6

physical work, such as construction. Further, they stated that rolling all project costs, including indirect costs, up into whole-project EVM might provide useful information, but that the cost of obtaining it outweighed the management benefit. Some agency officials were not familiar with EVM at all. By underutilizing EVM, agencies may not fully benefit from its capacity to provide early warnings of pending performance problems by highlighting over- or under-spending.

Two agencies missed filing required quarterly reports for projects selected for closer scrutiny. Specifically, of the three selected projects in the implementation phase—when quarterly reports are required—only one submitted all required quarterly reports. However, beginning in the third quarter of 2011, the reports that were filed utilized a consistent, easy-to-read format that included all the required elements. According to a senior County Executive official, reporting procedures are being clarified to ensure that all required reports are submitted on time.

A central requirement for projects selected for closer scrutiny is mandatory phased appropriations. However, very few projects have been subject to phased appropriations because most had adequate funding to continue work or have not changed phase since they were selected. Only one project of the 15 selected for closer scrutiny has received phased funding so far. Twelve projects are not changing phase this year, and two already had all necessary funds secured prior to being selected. Officials representing implementing agencies are divided in opinion about mandatory phased appropriations, although all expressed willingness to try the new funding process. Some stated that they use phased appropriations by default on large projects because it takes more than one year to complete each phase, and they have not experienced any problems. Others expressed concern that projects with sensitive time frames might be delayed by having to apply for funds before each phase. County Council and County Executive staff both stated that, if appropriations requests are submitted with a reasonable amount of lead time, access to funds should not be a problem.

Another requirement for projects selected for closer scrutiny is use of a risk register, which details analysis of all identified risks, including probability of occurrence, impact, proposed responses, and current status. Agency officials indicated that risk registers are being used on 14 of the 15 projects selected for closer scrutiny. Some also stated that risk registers can be useful to monitor risks and take action to reduce the probability and the potential impact of specific risks.

**SECTION III: The Ordinance Benefited the County Council and County Executive by Providing Mechanisms for Oversight and Encouraging Countywide Project Management Improvements**

Legislative and Executive officials agreed that adopting the practice of setting project baselines and using them as a basis for performance measurement represents a great improvement in project management and oversight at King County.[3] County Council and County Executive staff indicated that quarterly reports comparing project budget and schedule status with the project baseline are useful in providing oversight. In addition, although the County Council has not yet had the opportunity to employ phased appropriations for the vast majority of selected projects, staff are optimistic that mandatory phased appropriations will enhance accountability by providing opportunities for policy discussion during project development and a mechanism for easy oversight during implementation.

The ordinance also encouraged countywide project management improvements, such as the creation of the Capital Project Management Work Group (CPMWG), which operationalized many of the ideas promulgated in the ordinance. CPMWG convened designated staff with expertise in project management, reporting, contracting, budgeting, and performance measurement to develop consistent, comprehensive standards for capital project budgeting, reporting, management and performance measurement. Their achievements include developing:

---

[3] According to PSB officials, they are working on getting baselines established for all capital projects costing $1 million or more. Many projects already have baselines set and their performance is being measured against those baselines.

- Common definitions and terminology for project phases aligned with provisions in the ordinance and the new Accountable Business Transformation (ABT) high-level cost categories;
- Common standards for developing and using project baselines;
- A standard project management manual template that includes core state, county, and agency-specific requirements (agencies are currently developing individual project management manuals based on this standard template); and
- A consistent format for quarterly reports to the County Executive and County Council on projects costing over $1 million that, among other things,
    - Focuses on a limited number of reporting elements, each with a clear purpose in terms of supporting project management and oversight;
    - Uses a color-coded "dashboard system" tied to established thresholds for variance reporting to alert the County Executive and County Council of significant departures from established baseline scope, schedule, and budget;
    - Supports comparisons of current and life-to-date expenditures with budget authority and the established baseline for the project; and
    - Is designed to allow for automated, Web based report generation to the greatest extent possible, recognizing the current status and phasing of ABT implementation.

These project management and reporting improvements, in conjunction with the tools the ordinance provides the County Council and County Executive for efficiently focusing and conducting oversight, will greatly strengthen capital project accountability and transparency.

**SECTION IV: Requirements Have Resulted in Minimal Cost Increases So Far**

Agency staff did not express any major concerns about time or other resources expended to comply with new requirements such as participating in the risk scoring process, using risk registers, or generating quarterly reports. EVM and phased appropriations are not currently increasing project management costs, but hold the potential for doing so depending on how they are applied. Agencies that use EVM were using it before the ordinance required them to, so they did not experience increased costs. Agencies that are not using EVM avoid it because they question the value of conducting EVM compared to its cost. Agency officials maintain that diligent project management can achieve the same goal with much less expense.

As mentioned above, few projects have been subjected to mandatory phased appropriations because they have not changed phase or needed additional funding while under closer scrutiny, so any associated costs are as yet unknown. Agency officials stated that phased appropriations may require more frequent supplemental budget requests as the County moves to a biennial budget cycle, which could result in additional costs to process requests outside the standard timeframe. Officials expressed concern that significant costs could be incurred if agencies cannot obtain funds in sufficient time to avoid project schedule delays. In cases where project constraints require funding of multiple phases at one time, agencies will need to make use of the provision in the ordinance for multi-phase appropriations.[4]

[4] Ordinance 16764 2.E.2

**SECTION V: Requirements for Lease-Based Projects Codify Current Practices**

The provisions for lease-based projects in the ordinance codify the process the County has been using to carry out these projects, according to a senior Facilities Management Division official. However, CPO staff are not aware of any lease-based projects since the ordinance was enacted that have proceeded to a point where such provisions would be required. In addition, they stated that project management procedures for alternative project delivery methods such as lease-based projects could be more fully defined. County Council Motion 13498 requests the County Executive to review county procedures for management of capital projects with alternative delivery methods, streamline the County's retail lease approval process, and develop strategies to support County project managers in managing public-private partnership projects by April 30, 2012.

**RECOMMENDATIONS**

To further assess and improve the effectiveness and efficiency of the requirements in Ordinance 16764, we recommend the following three actions:

1. As part of their programmatic work, CPO should conduct additional analysis as more data become available to monitor the effectiveness of the ordinance.
2. The County Executive should conduct further assessment of and training on best uses of EVM in managing the county's capital projects.[5]
3. The County Council and County Executive should ensure agencies are aware of the process for removing closer scrutiny and mandatory phased appropriations from projects where updated scores show substantially diminished risk.

Laina Poon, Senior Management Auditor, conducted this review under the supervision of Larry Brubaker, Senior Principal Management Auditor. Please contact Laina at 206-296-0368, or Larry at 206-296-0369 if you have any questions about this management letter.

CB:LP:jl

cc: Dow Constantine, County Executive
Fred Jarrett, Deputy County Executive
Rhonda Berry, Assistant Deputy County Executive
Dwight Dively, Director, Office of Performance, Strategy & Budget (PSB)
Caroline McShane, Deputy Finance Director, Finance & Business Operations
Sid Bender, Manager, CIP and Technology, PSB
Mark Melroy, Policy Staff, King County Council (KCC)
Pat Hamacher, Policy Staff, KCC
Polly St. John, Policy Staff, KCC
Amy Tsai, Policy Staff, KCC
Tina Rogers, Capital Projects Oversight Manager, King County Auditor's Office

**ATTACHMENT**

Appendix 1: Projects Selected for Closer Scrutiny and Mandatory Phased Appropriations

[5] An Executive order directs the CPMWG to evaluate and make recommendations on earned value methodologies for use in County capital project management. [CIP 8-2 (AEO) September 30, 2011]

## APPENDIX I: PROJECTS SELECTED FOR CLOSER SCRUTINY AND MANDATORY PHASED APPROPRIATIONS

| Project Name | Agency | COMPLIANCE | | | | | Most Recent Risk Score | Project Phase(3) | Date Baseline Targets Established(4) | Estimated Cost | Appropriations to date | Estimated Completion Date | Legislative District |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Using Phased Appropriations? | All Required Quarterly Reports Submitted(1) | Number of Missing Reports | Using Risk Register? | Using EVM?(2) | | | | | | | |
| Taxiway Alpha Rehabilitation | Airport | **N/A** All project funds already secured | ✓ | 0 | ✓ | ✗ | 121 | Implementation | Nov-10 | $25,406,000 | $26,653,000 | December 2013 | 8 |
| South Park Bridge Replacement | Roads | **N/A** All project funds already secured | ✗ | 2 | ✓ | ✓ | 315 | Implementation | Feb-12 | $161,360,316 | $161,638,320 | June 2015 | 8 |
| East Lake Sammamish Master Plan Trail | Parks/ FMD | ✓ | ✗ | 2 | ✓ | ✗ | 189 | Implementation | Sep-10 | $72,500,000 | $21,405,380 | December 2015 | 3 |
| Soos Creek Trail Phase V & VI | Parks/ FMD | Have not yet started a new phase | N/A | N/A | ✗ | ✗ | 197 | Design | Jan-12 | $37,800,000 | $4,261,647 | August 2016 | 9 |
| South Kirkland TOD (Transit Oriented Development) | Transit | **N/A** Now a lease-backed project | N/A | N/A | ✓ | ✗ | 254 | Preliminary Design | N/A | $7,624,678 | 7,624,678 | December 2014 | 6 |
| RapidRide Line F, Burien to Renton | Transit | **N/A** All project funds already secured | N/A | N/A | ✓ | ✗ | 244 | Preliminary Design | N/A | $10,741,000 | 10,741,000 | September 2013 | 8, 5, 9 |
| Sunset/Healthfield Pump Station Replacement & Forcemain Upgrade | WTD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 222 | Planning | N/A | $80,496,000 | $3,750,000 | January 2021 | 6 |
| Fremont Siphon | WTD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 335 | Preliminary Design | N/A | $80,000,000 | $9,200,000 | December 2016 | 4 |
| CSO Control & Improvements - North Beach | WTD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 257 | Preliminary Design | N/A | $15,373,690 | $6,500,000 | July 2015 | 4 |
| CSO Control & Improvements - Murray | WTD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 407 | Preliminary Design | N/A | $49,425,000 | $24,400,000 | August 2015 | 8 |

# APPENDIX I (continued)

| Project Name | Agency | COMPLIANCE | | | | | Most Recent Risk Score | Project Phase(3) | Date Baseline Targets Established(4) | Estimated Cost | Appropriations | Estimated Completion Date | Legislative District |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Using Phased Appropriations? | All Required Quarterly Reports Submitted(1) | Number of Missing Reports | Using Risk Register? | Using EVM?(2) | | | | | | | |
| Barton Pump Station Upgrade | WTD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 232 | Final Design | May-10 | $22,725,675 | $20,400,000 | May 2010 | 8 |
| South County Recycling and Transfer Station | SWD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 355 | Planning | Apr-18 | $81,290,000 | $22,043,000 | December 2017 | 7 |
| North County Recycling and Transfer Station | SWD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 353 | Planning | Apr-18 | $86,205,000 | $6,490,000 | December 2017 | 4 |
| Factoria Recycling and Transfer Station | SWD | Have not yet started a new phase | N/A | N/A | ✓ | ✓ | 330 | Preliminary Design | N/A | $77,487,000 | $25,996,000 | December 2014 | 6 |
| Cedar Hills Regional Landfil Area 7 Closure Project | SWD | Have not yet started new phase | N/A | N/A | ✓ | ✓ | 141 | Preliminary Design | N/A | $29,053,000 | $6,320,000 | December 2019 | 9 |

***Sources: Capital Project Oversight Group and Performance, Strategy, and Budget documents; interviews with agency staff***

**TABLE NOTES**

All data current as of December 31, 2011

(1) N/A indicates the project has not reached the implementation phase (when quarterly reports are required)

(2) Earned Value Management

(3) The Planning phase is prior to the Preliminary Design phase

(4) N/A indicates baseline has not yet been established