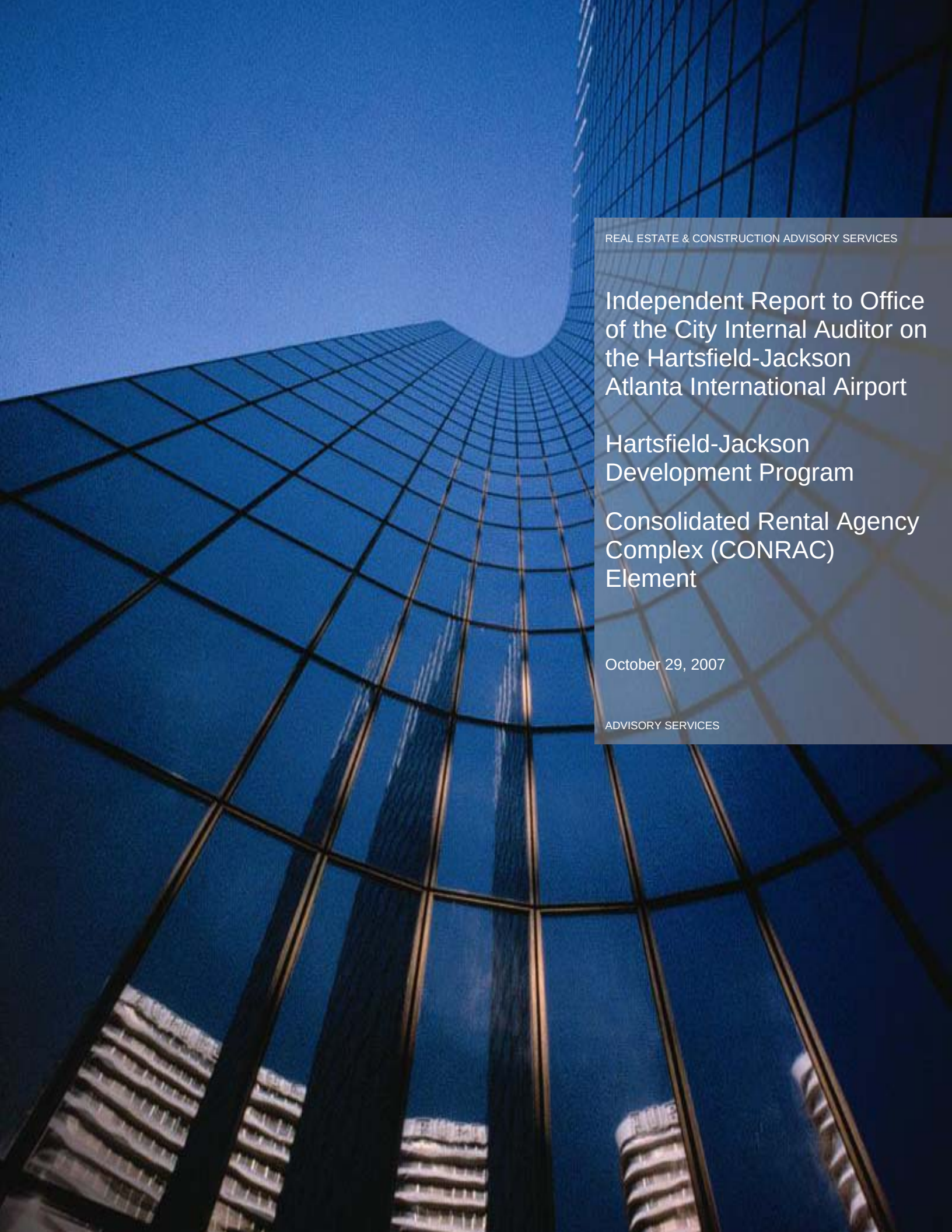

REAL ESTATE & CONSTRUCTION ADVISORY SERVICES

Independent Report to Office of the City Internal Auditor on the Hartsfield-Jackson Atlanta International Airport

Hartsfield-Jackson Development Program

Consolidated Rental Agency Complex (CONRAC) Element

October 29, 2007

ADVISORY SERVICES

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I. EXECUTIVE SUMMARY

While most capital projects are unique and involve a degree of uncertainty and risk, there are key fundamental components common to all capital programs and projects. The success or failure of a capital project is partially measured by how well an organization plans, manages, and executes these individual components for each project. The City of Atlanta's Department of Aviation (DOA) has developed a master plan for over $6 billion in capital construction at Hartsfield-Jackson Atlanta International Airport extending into 2013. The master plan includes seventeen new or expansion programs with over 400 associated projects. The sheer size of the master plan presents unique risks and constant management challenges.

The Consolidated Rental Agency Complex (CONRAC) program or master plan "element" comprises fifteen distinct projects for construction of the CONRAC facility and Automated People Mover (APM) system for transporting customers to the facility. The CONRAC facility, new APM stations, access roadway, and other related facilities are being constructed using a construction manager at risk (CMR) contract. Construction of the APM guideway, maintenance and storage facility, acquisition of APM trains and related control equipment, and the subsequent operation and maintenance of the facilities and equipment is performed under a design-build-operate-maintain (DBOM) contract. A general contractor was recently selected to construct the access roadway to the CONRAC Customer Service Center (CSC) facility. Other component projects of the CONRAC include land acquisition and stream mitigation.

KPMG's Objectives and Scope

KPMG was engaged by the City of Atlanta (the City or COA) to perform a program assessment of the CONRAC element at the Hartsfield-Jackson Atlanta International Airport (HJAIA). The CONRAC is an element of the Hartsfield-Jackson Development Program (HJDP) master plan for expanding and improving facilities at HJAIA, which was adopted by the COA City Council in January 2000.

KPMG's objectives and our scope of work focused on the work performed under the CMR contact for construction of the CONRAC facility and under the DBOM contract for construction of the APM. Specifically, the Office of the City Auditor requested our assistance with the following activities:

- Assessing the Department of Aviation's effectiveness in managing the CONRAC project and construction contracts
- Identifying factors that pose a risk of future cost increases to the CONRAC project
- Providing guidance on the appropriateness of the CMR contract for the CONRAC project
- Providing guidance on the appropriateness of the DBOM contract for the CONRAC project

We developed our work plan based on discussions with the City Auditor's Office and our understanding of the objectives and scope of work. We requested documents and conducted interviews to gather relevant data and performed evaluations, assessments and testing of the data as appropriate. Our assessment was limited to information obtained through interviews and the documents provided to us in response to our

request for documents. We relied solely upon interviews, emails and project documents submitted to us by the DOA and the HJDP office (Program Office).

The Department of Aviation's Effectiveness in Managing the CONRAC Program

Overall, we found the HJDP has controls that appear designed and adequately documented for standardized use across the development program. The Program Office performs periodic testing and reports to management on the effective design and operation of the controls. However, we did find instances where personnel are either not following or inconsistently following policies and procedures, which may have resulted in reduced management efficiencies, increased levels of effort, and increased costs. We make nineteen observations and recommendations that are summarized in Sections III of the report, the most significant of which are summarized below.

Planning and Design Process

The CONRAC element planning and design process is described in HJDP policies and procedures. We identified seven key controls within the planning and design process, which are not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC. However, contract requirements over contract design deadlines were not always enforced and design work was slowed to accommodate procurement of other contractors.

There was only minimal planning for the CONRAC element prior to the preparation of the MII Ballot in July 1999. The Program Office's focus at the time was on the more significant projects demanded by the airlines—in particular, Runway 10-28. Planning for CONRAC began in earnest in late 1999. The CONRAC *Conceptual Design Study* was completed in July 2000. There was little or no activity with respect to the CONRAC element until January 2004, when the Rental Agency Complex (RAC) design team was selected. The RAC designer missed significant milestone dates in its contract, which contributed to substantial project delays and ultimately impacted the CONRAC budget.

Procurement of the CMR contractor (Austin-PRAD) for the RAC facility was also delayed. The CMR RFP was advertised in December 2004, and ten months passed by before the CMR contract was signed. During this time, the Program Office put the RAC designer on hold because the CMR contract included preconstruction value analysis and constructability activities. Similarly, even though the DBOM contract was advertised in June 2004, it was not awarded to Archer Western, J.V. until October 2005, approximately sixteen months later. The length of time involved in procuring these contracts contributed to certain issues encountered during this stage of the work.

Cost and Schedule Estimating Process

The CONRAC element cost and schedule estimating process is described in HJDP policies and procedures. We identified nine key controls within the cost and schedule estimating process, which are not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC. Nevertheless, the CONRAC element has encountered difficulty with the accuracy of the estimates.

The CONRAC estimating function is performed by International Aviation Consultants (IAC). As the controls manager for the development program, IAC is responsible for developing budgets and reviewing estimates for all of the elements and projects within the program, including the CONRAC element. IAC uses both internal and external resources to create, update, and monitor the overall budget for CONRAC.

The cost estimate for the CONRAC element in the MII Ballot was erroneous and unsupported. Numerous DOA and HJDP personnel stated that the $275 million figure included for CONRAC in the MII Ballot was not a *budget*, as it was incorrect and incomplete from the start and was deemed insufficient to meet program requirements. Fairly or unfairly, the MII Ballot created false expectations regarding the budget for the overall airport master plan. Even following the approval of the first ELIP budget, there has been significant growth in the CONRAC budget that is not entirely the result of unusual material escalation or labor shortages due to current market conditions. HJDP's estimating function needs to do a better job at understanding the Atlanta construction marketplace and applying this understanding to future estimates.

Several budget estimates have been produced by IAC over the course of the project from the time of the first approved ELIP estimate of April 2003 through the current ELIP estimate of May 2006. The current ELIP estimate approved by DOA for the CONRAC element is in the amount of $506 million. In July 2007, HJDP commenced another cost update and the resulting CONRAC element cost estimate is now approximately $600 million including program general and administrative costs.

Procurement Process

The CONRAC element procurement process is described in HJDP policies and procedures. We identified four key controls within the procurement process, which are not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC. However, we found that lengthy procurement times have contributed to the cost escalation experienced by the CONRAC element.

As a City agency, DOA is required to follow the procurement process for airport projects with the City's Department of Procurement (DOP). DOP prequalifies proponents for RFP based procurements and enforces Equal Business Opportunity requirements consistent with the City's overall procurement policies. While the procurement process appears to have been completed in compliance with the City's policies and procedures, extended procurement cycles caused delays and cost impacts to the CONRAC element. These delays occurred prior to the start of construction for CONRAC at a time when inflation and cost escalation was relatively low. Yet, because of these early period delays, the construction phase was pushed into a period of higher inflation and increased cost escalation, coupled with local labor shortages. Had these procurement cycles been reduced, and had DOA transferred its pricing risk to the CMR contractor earlier, potential savings to the CONRAC element may have been significant.

Construction Management/Contract Administration Process

The CONRAC element construction management/contract administration (CM/CA) process is described in HJDP policies and procedures. We identified fifteen key controls within the CM/CA process, which are

not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC.

The CM/CA process is critical for managing a program with budget and time constraints. Within the overall HJDP management structure, the CONRAC element CM/CA process is managed by a professional construction management team identified as Hartsfield Atlanta Construction Managers, LLC (HACM). One of the most important cost control functions is change management, yet changes have not been issued and recorded in a timely manner. One example of this relates to a significant scope transfer made from the CMR contract to the DBOM contract. The net effect is that presently the scope of work for building the CPTC and Gateway APM stations is included in both contracts.

Administration of the CMR contract is also an issue in that the Program Office and Austin-PRAD have been unable to negotiate a satisfactory guaranteed maximum price (GMP) for the RAC work scope. As a result, HJDP has continued to issue Component GMPs (CGMPs) on a piecemeal basis. This approach removes pricing risk from Austin-PRAD—the "at risk" contractor—and shifts it back to the City. Austin-PRAD still retains the performance risk.

Financial and Risk Management

The CONRAC element financial management process is described in HJDP policies and procedures. We identified six key controls within the financial management process, which are not inconsistent with industry standards, and we found that HJDP policies and procedures are generally sufficient for a program of CONRAC's size and complexity. However, we noted several issues that should be addressed to provide more efficient and effective financial management of the CONRAC element.

HJDP policies and procedures are not followed on a consistent basis. This appears to be due, at least partially, to high personnel turnover within the last year and the lack of recent training on this topic. Personnel tend to follow processes, policies and procedures from their employer or that they have learned over time. This leads to inconsistencies and unexplained entries in Deltek Cobra system, used to record and monitor cost at the project and element level. This also leads to differences of opinions of policies and procedures.

Accrual and actual cost supporting documentation are sometimes incomplete or not available. During our work, we randomly selected fifty transactions related to the CONRAC element from Cobra for invoice testing. We were unable to locate proper supporting documentation for nine of the fifty, or eighteen percent, of the transactions tested. The result is a limited audit trail and amounts posted in Cobra may not accurately reflect correct allocations to projects.

HJDP policies and procedures require all documents that qualify as records be processed and retained following Document Control and Records Management procedures. However, there is no definition, explanation, or listing of the types of documents that qualify as project records. This leads to inconsistencies regarding the level of documentation retained by personnel.

The risk management process has been inadequate and lacking in substance; however, the Program Office has instituted new processes to address this area. High-level risk management meetings are held on a weekly basis and include personnel from DOA, HACM, the CMR contractor, and the DBOM contractor. DOA has recently engaged the services of a schedule and claims consultant to prepare a master schedule for the CONRAC element. There are still areas that the Program Office must address to implement a robust risk management process.

Factors Posing a Risk of Future Cost Increases

The lack of strong risk management (both schedule and cost) will continue to be a threat to project costs going forward. Despite significant strides in the creation of an element-level milestone/interface schedule and a corresponding risk matrix, program risk management does not measure up to construction industry standards.

The most critical risk currently facing CONRAC is the turnover date of the Customer Service Center (CSC) from the CMR contractor to the DBOM contractor. Without any action by Austin-PRAD to accelerate or resequence its work plan, there will be a delay of approximately six months between Archer Western's need date for the CSC and Austin-PRAD's planned turnover date.

There is a high probability of claims from the DBOM and the CMR contractors on the CONRAC element. Such claims may result from such events as the late turnover of the APM train control room by the CMR contractor or other contractor coordination issues. The Program Office generally agrees that such claims probably will be submitted in the future. This issue is how to manage the coordination of the work to attempt to avoid potential claims and resolution strategies to mitigate cost growth to the CONRAC.

The HJDP organizational structure is also a continuing risk factor. While the organizational structure appears logical and appropriate, it has not demonstrated maximum efficiency with respect to CONRAC. While detailed policies and procedures, roles and responsibilities, process flows, and organizational structures are in place, these seem to be in flux and constantly changing. Although the Program Office recently undertook an effort to revise and consolidate policies and procedures, roles and responsibilities, and organizational structure, this process is not expected to be complete until the end of this calendar year.

There is a risk that past program management lapses could continue into the future. Previously, when project costs came in over budget, management's response was to direct the program team to reduce scope or to value engineer the project so that project costs remained within budget. This policy does not work in an environment of high cost escalation where time spent in value engineering may actually result in a cost increase to the project. Also, several Program Office personnel stated that cost is not the primary driver of the overall development program, and as long as there is sufficient funding from Passenger Facility Charge (PFCs) Customer Facility Charge (CFCs) and other sources, the driver of the program is on identifying and meeting the airport's long-term needs.

Appropriateness of the CMR Contract for the CONRAC Project

Based on interviews conducted by KPMG and on our review of information in the project record, the choice of the CMR project delivery method was appropriate for the RAC project. We concluded that DOA's choice of the CMR project delivery method was appropriate because CMR is a preferred delivery method where:

1) there is no preference for a single source of accountability (i.e., for design, construction, inspection, and commissioning)
2) design specifications and construction drawings will be used to describe the work scope
3) the scope of work is moderately to highly complex
4) cost control early in the project is an important factor
5) a "fast-track" schedule is anticipated
6) the owner and its representatives are experienced and involved in all aspects of the project

Overall, the CMR delivery method was an appropriate strategy for the CONRAC project. However, the DOA's delayed implementation and management of the contract resulted in further delays and cost overruns. Many of these delays and cost overruns may have been avoided if the DOA had a better appreciation for the schedule demands of the CMR project delivery method and if the Program Office's budget estimates more closely reflected market conditions at the time Austin-PRAD submitted its GMP proposal.

Appropriateness of the DBOM Contract for the CONRAC Project

We concluded that DOA's choice of the DBOM project delivery method was appropriate because Design-Build is a preferred delivery method where:

1) there is a preference for a single source of accountability (i.e., for design, construction, inspection, and commissioning)
2) performance specifications will be used to describe the work scope
3) there is significant design development needed to clarify the scope
4) the scope of work is moderately complex
5) cost control early in the project is an important factor
6) completion to a firm budget is critical
7) a "fast-track" schedule is anticipated

Based on KPMG's interviews and its review of the DBOM project documents, there has been considerable progress completing the DBOM contract. The APM vehicles are approved and in manufacturing, the elevated guideway and station platform construction is nearly complete, and Mitsubishi is working on the design and manufacture of the vehicle control system. The APM vehicles are expected to arrive in Atlanta in January 2008. The DBOM contractor has met expectations to date and

continues to pursue the design, construction, and installation of the APM system in a professional manner.

The DBOM was an appropriate delivery method. The risks were separated according to industry convention; however, the DOA may not have anticipated the level of trust that was needed to release control over the design process. One area of improvement would be to document the decision making process of choosing a delivery method. Nevertheless, the Archer Western contract appears to be managed appropriately with regards to key contract provisions.

II. INTRODUCTION

Background

In November 1999, the City of Atlanta's (COA or the City) Department of Aviation (DOA) released a master plan for expanding and improving the facilities at Hartsfield-Jackson Atlanta International Airport. The plan envisioned a $5.4 billion development program referred to as the Hartsfield-Jackson Development Program (HJDP) to be completed by December 2010. The program consisted of constructing a new runway, international terminal, south terminal complex, consolidated rental car facility; renovation and expansion of the existing terminal; and improving the airfield and support facilities. The City Council adopted the plan in January 2000 and included it in the City's Comprehensive Development Plan. The current master plan is expected to cost over $6 billion, includes seventeen new or expansion elements, with over 400 associated projects, and is scheduled to completed in 2013.

The Consolidated Rental Agency Complex (CONRAC) element comprises fifteen distinct projects for construction of the CONRAC facility and the Automated People Mover (APM) system for transporting customers to and from the main terminal building. The CONRAC facility, APM guideway, new APM stations, APM vehicles and control systems, access roadway, and other related facilities are being constructed using a combination of delivery strategies and contract types including construction manager at risk (CMR), design-build-operate-maintain (DBOM), and traditional design-bid-build. Other component projects of the CONRAC element include land acquisition and stream mitigation.

Objectives and Scope of Work

KPMG's objectives and our scope of work focused on the work performed under the CMR and DBOM contact for construction of the CONRAC facility and included the following:

- Assessing the Department of Aviation's effectiveness in managing the CONRAC project and construction contracts
- Identifying factors that pose a risk of future cost increases to the CONRAC project
- Providing guidance on the appropriateness of the CMR contract for the CONRAC project
- Providing guidance on the appropriateness of the DBOM contract for the CONRAC project

KPMG Approach

Our approach to this engagement was in four primary phases – initiation and planning, data gathering, draft report and final report.

As outlined in our engagement letter, our work was performed in accordance with AICPA Consulting Standards. We developed our work plan based on discussions with the City Auditor's Office and our understanding of the objectives and scope of work. We requested documents and conducted interviews to gather relevant data and performed evaluations, assessments and testing of the data as appropriate. KPMG

utilized a structured risk-based process that evaluates five process evaluation areas as outlined below. Our controls assessment included the following activities:

- Assessment of the strengths and weaknesses of key processes, policies, procedures and controls
- Identification of potentially ineffective, unreliable or non-existent process controls needing attention or corrective action
- Identification of process control areas for further testing

As part of our work, KPMG interviewed selected individuals as identified by the City, reviewed CONRAC element and project delivery process documentation, including policies and procedures, guidelines, and standards. Our work also included a review of sample documentation from current projects to assess adherence to established protocols in the following areas:

- Project Strategy, Organization, and Administration
  - Project strategy, initiation & authorization
  - Roles and responsibilities and overall project integration among departments
  - Program and project level reporting and tracking
  - Program infrastructure (reporting systems and tools)
  - Policies and procedures
  - Communication planning & document management
- Financial Management
  - Project budgeting, estimating and cash flow forecasting
  - Project cost coding and cost accounting procedures
  - Payment processing and administration
  - Program and project cost reporting
  - Project variance analysis and historical trend analysis
- Procurement Management
  - Procurement planning, solicitation planning and solicitation
  - Source selection and contract negotiation
  - Contract administration, standards and contract closeout
  - Value engineering
  - Materials management
- Project Controls and Risk Management
  - Change management
  - Design standards and specifications
  - Regulatory compliance
  - Risk management
  - Quality control and inspection

  - Project assessments and compliance auditing
  - Customer satisfaction
  - Environmental, health and safety

- Schedule Management
  - Schedule development processes and procedures
  - Schedule integration and change management
  - Schedule management process

Overall, we found the HJDP has controls that appear designed and adequately documented for standardized use across the development program, and some periodic testing is performed to report to management on the effective design and operation of the controls. However, we did find instances where personnel are either not following or inconsistently following policies and procedures, which may have resulted in reduced management efficiencies, increased levels of effort, and increased costs. These issues are identified and discussed in following sections of this report and we have provided recommendations to help address the issues.

Limitations of Our Analysis

Our assessment was limited to information obtained through interviews and the documents provided to us in response to our request for documents. We relied solely upon interviews, emails and project documents submitted to us by the DOA and the HJDP office (Program Office). Over 180 documents were provided to us by the Program Office in both hard copy and electronic format. A list of these documents is included at ***Appendix A*** of this report. We also interviewed over twenty individuals during the course of our work. A list of these individuals is found at ***Appendix B*** of this report.

Use of Acronyms

Due to the number of acronyms used throughout our report, we have included a listing of acronyms at ***Appendix C*** of that report for the reader's reference.

III. CONRAC PROGRAM CONTROLS ASSESSMENT

While most capital projects are unique and involve a degree of uncertainty and risk, there are key fundamental components common to all capital programs and projects. The success or failure of a capital project is partially measured by how well an organization plans, manages, and executes these individual components for each project. The City of Atlanta's Department of Aviation (DOA) has developed a master plan for over $6 billion in capital construction at Hartsfield-Jackson Atlanta International Airport (HJAIA) extending into 2013. The master plan includes seventeen new or expansion programs with over 400 associated projects. The sheer size of the master plan presents unique risks and constant management challenges.

The HJDP policies and procedures have evolved over time. HJDP policies and procedures were supplemented with more detailed procedures developed primarily by HACM. Currently an effort is underway to update the HJDP policies and procedures including procedures for program level and project level risk management.

KPMG's scope was limited to assessing the CONRAC program or "element." To evaluate the DOA's performance on the CONRAC element, KPMG reviewed contracts, studied HJDP policies and procedures, conducted interviews, and examined program and project level records from July 10, 2007 through August 24, 2007. In response to the City Internal Auditor's request, our work focused specifically on the following program components:

- Planning and Design
- Cost and Schedule Estimating
- Procurement
- Project Management/Contract Administration
- Financial and Risk Management

Our findings and recommendations for each of these program components are detailed below

Planning and Design

General Findings

The CONRAC element planning and design process is described in HJDP policies and procedures. We identified seven key controls within the planning and design process, which are summarized in the bullets below:

- Mapping of scope from MII Ballot to Element Level Information Package (ELIP)
- Formal initiation/approval of planning effort
- Scope definition with design services provider
- Execution of planning study (concept design) by design services provider
- Concept approval and internal handoff from *Planning* to *Design*

- Design management from schematic phase through completion of construction documents
- Document collection and storage

These controls are not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC.

There was only minimal planning for the CONRAC element prior to the preparation of the MII Ballot in July 1999. The Program Office's focus at the time was on the more significant projects demanded by the airlines— in particular, Runway 10-28. Planning for CONRAC began in earnest in late 1999. The design services provider was directed to determine the needs of the various, somewhat disparate, rental car agencies and develop a concept that would accomplish the goal of having a remote consolidated facility with direct airport access via an automated people mover as well as vehicular roadways. The designer was not specifically requested to perform a check estimate of the $275 million figure included for CONRAC in the MII Ballot. Numerous DOA and HJDP personnel stated that the $275 million figure included for CONRAC in the MII Ballot was not a *budget*, as it was incorrect and incomplete from the start and was deemed insufficient to meet program requirements.

R.L. Brown/HNTB Corporation (RLB/HNTB) completed the CONRAC *Conceptual Design Study* in July 2000. There was little or no activity with respect to the CONRAC element until the preparation in November 2002 of the draft CONRAC ELIP. The estimated cost of CONRAC in the draft ELIP was approximately $536 million. A revised CONRAC ELIP was prepared and forwarded for DOA's approval approximately five months later. This revised ELIP, approved in April 2003, set the initial budget for CONRAC at approximately $479 million and allowed handoff from the planning stage to the design stage.

Selection of the Rental Agency Complex (RAC) design services provider took nine months. In January and February 2004, the design team validated the CONRAC concept design against the program. In addition, the design team prepared an "Estimate of Probable Cost" solely for the RAC facility in the amount of $161.2 million, which was $25.5 million over the program cost limitation prepared by the Program Office. The design team offered various cost saving opportunities and value engineering options with the hope of reducing costs to within the construction cost limitation amount of $135.7 million. In retrospect, the design team's estimate was significantly below the competitive value in the marketplace as shown by an independent estimate commissioned by one of the rental agencies. The estimate, prepared by Hanscomb Faithful & Gould in October 2005, predicted the cost of the CONRAC project at approximately $206 million (even excluding escalation costs of approximately $22.4 million). The design team's Estimate of Probable Cost was unrealistic and based on poor or inadequate market data. Additionally, the RAC designer missed significant milestone dates in its contract, which contributed to substantial project delays and ultimately impacted the CONRAC budget.

Procurement of the CMR contractor for the RAC facility was also delayed. The Program Office began developing the CMR Request for Proposal (RFP) in early 2004. The CMR RFP was advertised in December 2004, and ten months passed by before the CMR contract was signed. During this time, the Program Office put the RAC designer on hold because the CMR contract included preconstruction value analysis and constructability activities.

Similar issues arose with the design of the automated people mover system (APM). The Program Office selected the DBOM project delivery method to have a single source of supply for both the design and construction of the APM. The scope of the DBOM contract includes design of the elevated guideway and station platforms, manufacture and supply of the APM vehicles, and installation of automatic station doorways and all control systems. The DBOM contract was advertised in June 2004 and awarded to Archer Western, J.V., in October 2005, approximately sixteen months later.

Specific Findings and Recommendations for Improvement

1) HJDP policies and procedures require its A-E firms to design projects within budget limitations. To control construction costs, A-E's are required to provide construction cost estimates based on current market prices reflecting the probable cost of construction. The design team's estimate was unrealistic and based on poor or inadequate market data.

   Recommendation: The Program Office should enforce policies and procedures applicable to the design process to help keep projects within budget. Design firms working for HJDP should be held accountable for designs that exceed the budget unless the Program Office specifically authorizes program changes and budget modifications in writing. Designs that exceed the authorized budget should be sent back to the design team for re-design within budget. This is generally done at the design team's cost.

2) HJDP policies and procedures require its A-E firms to prepare detailed design schedules. To control delays, A-E's are required to provide design schedule updates throughout the design process. The Program Office did not enforce these policies and procedures on the CONRAC element, and as a result, the design process was delayed, which ultimately resulted in overall delays to the CONRAC element.

   Recommendation: The Program Office must enforce policies and procedures applicable to the design process to keep projects on schedule. Design firms working for HJDP should be held accountable for performing their work on schedule unless the Program Office specifically authorizes program changes and time extensions in writing. Design schedules showing likely delays in the completion of the construction documents should be sent back to the design team for preparation of a recovery schedule at the design team's own cost.

Cost and Schedule Estimating

General Findings

The CONRAC element cost and schedule estimating process is described in HJDP policies and procedures. We identified nine key controls within the cost and schedule estimating process, which are summarized as follows:

- Preparation of planning estimates
- Preparation of program element budget estimates

- Preparation of construction probable cost estimates
- Value engineering
- Use of cost estimating service providers
- Cost estimate reconciliation by design services provider
- Preparation of forecast estimates
- Cost estimate reporting
- Schedule estimating

These controls are not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC.

The CONRAC estimating function is performed by International Aviation Consultants (IAC). As the controls manager for the development program, IAC is responsible for developing budgets and reviewing estimates for all of the elements and projects within the program, including the CONRAC element. IAC uses both internal and external resources to create, update, and monitor the overall budget for CONRAC.

The formal estimating process for CONRAC began with preparation of the first ELIP. A draft CONRAC ELIP, prepared by the Program Office in November 2002, placed the estimated cost of the CONRAC element at approximately $536 million. The first approved (April 2003) CONRAC ELIP estimated the cost of CONRAC at approximately $479 million, or $57 million *less* than the draft ELIP. A closer look at the individual line items shows that the approved ELIP removed costs for planning, design, construction management, and project management, along with some direct construction costs. In June 2003, RLB/HNTB issued its *Final Concept Report***,** which included an overall CONRAC cost estimate of $537 million. In retrospect, the earlier draft ELIP was probably a more accurate reflection of the total CONRAC element cost than the first approved ELIP, if for no other reason that it included necessary planning, design, and other project related costs required to complete the CONRAC element.

With the *Final Concept Report* estimate for CONRAC in line with the draft ELIP, HJDP was challenged to manage the budget to the lower approved budget. No revisions were made to the ELIP budget from April 2003 to April 2004. However, in 2005 the Program Office further reduced its CONRAC budget estimate to approximately $468 million (see chart below).

	MII	Red Book	Draft ELIP	App'd ELIP	Final Concept	App'd ELIP	App'd ELIP	App'd ELIP	Draft ELIP
	1999	2000	2002	2003	2003	2004	2005	2006	2007
CMR Scope	168.3	205.2	307.4	257.1	296.1	255.4	238.1	258.4	335.3
DBOM Scope	57.8	114.6	182.5	177.2	199.9	179.6	191.9	187.5	190.8
Land Acquisition	7.8	37.1	13.4	13.3	16.9	13.2	13.1	21.5	22.0
Contingency	41.3	55.5	23.8	22.6	23.8	22.6	16.8	22.6	22.6
ATL Prop/Other	-	-	9.2	9.2	-	8.6	8.4	16.7	29.6
Total	275.2	412.4	536.3	479.4	536.7	479.4	468.3	506.7	600.3
Completion Date		Jun-04	Nov-06	Mar-07	N/A	Mar-08	Dec-08	Jan-09	Aug-09

The CMR and DBOM contracts were executed in September and October 2005, respectively, shortly after Hurricane Katrina struck New Orleans. In January 2006 Austin-PRAD, the CMR contractor, adjusted its preliminary Guaranteed Maximum Price (GMP) to include costs for escalation due to labor and material shortages resulting from Katrina recovery efforts. The escalation was due to the number of contractors working on hurricane recovery efforts and the demand for labor and materials to support these efforts. Likewise, due to escalation and delays in awarding its contract, Archer Western also made a successful claim for a contract adjustment due to price escalation. Thus, just at the time when the Program Office was preparing to award the CMR and DBOM contracts, the Program Office found that its baseline ELIP budget, which had been prepared two years earlier, was too low. The ELIP budget did not include the cost of escalation, which at the time was estimated to be in the range of four to six percent.

Consequently, in May 2006 HJDP updated its cost estimate for CONRAC and proposed a new ELIP budget in the amount of $506 million. DOA approved the proposed ELIP recognizing the deficiencies in the baseline ELIP budget and the circumstances of labor shortages and cost escalation due to market conditions at that time. This ELIP budget of $506 million is the current budget notwithstanding further cost pressures since May 2006. In July 2007, HJDP commenced another cost update and the resulting CONRAC element cost estimate is now approximately $600 million including program general and administrative costs. The Program Office is reviewing this estimate internally before proposing it for approval by the DOA/Airlines Executive Committee. The approval request is expected to occur in late September or October 2007.

Specific Findings and Recommendations for Improvement

3) The cost estimate for the CONRAC element in the MII Ballot was erroneous and unsupported. Fairly or unfairly, this created false expectations regarding the budget for the overall airport master plan. Even following the approval of the first ELIP budget, there has been significant growth in the CONRAC budget that is not entirely the result of unusual material escalation or labor shortages due to current market conditions. HJDP's estimating function needs to do a better job at understanding the Atlanta construction marketplace and applying this understanding to future estimates.

   Recommendation: To improve the estimating function, we recommend that HJDP use the CONRAC element to develop a *lessons learned* assessment of estimating shortfalls and document the causes of its ELIP budget increases. After completing a self-assessment, we recommend that the Program Office request a peer review from a similarly situated program management organization to furnish a technical basis for improving the estimating function.

4) According to HJDP policies and procedures, ELIPs must be updated when the budget or schedule changes by more than five percent or when there are any significant scope changes to the project. From May 2006 to August 2007, the Program Office has not issued a budget revision to the CONRAC ELIP even though the overall program cost has increased by more than five percent. This has impacted the transparency of costs to senior HJDP management and the joint DOA/Airline Executive Committee. ELIP updates are also important in the

HJDP reporting structure because these are the only documents that compare current program costs to the original program budget.

Recommendation: We recommend that the Program Office enforce policies and procedures intended to keep program budgets up-to-date. Specifically, the CONRAC ELIP budget must be adjusted on a timely basis—possibly monthly or quarterly—to provide senior management with better visibility into program cost drivers. Per HJDP policies and procedures, program estimates must include escalation cost to the midpoint of the construction period, and program contingencies should be supported by standard industry risk management practices.

5) Value Engineering (VE) benefits were minimal on the RAC facility because of delays in procuring the CMR contractor. VE was initiated after design development was forty to sixty percent complete and at a point where the VE process had little chance of influencing costs.

   Recommendation: If VE activities are planned as part of a construction manager's preconstruction services, the construction manager contract must be awarded in sufficient time to obtain maximum VE benefits. Maximum VE benefits are usually obtained when the construction manager is hired at the start of the design process, but no later than the start of design development.

6) There is no evidence of an integrated baseline schedule for CONRAC at the time the CONRAC ELIP was approved. This made it difficult for the Program Office to monitor compliance with master plan milestones, manage program resources, maintain cost efficiencies, and understand the impact of delays at both the program and master plan levels. The Program Office proposed a new set of schedule completion dates when the CONRAC ELIP budgets were changed, but there is no documentation justifying why the completion dates were extended, how these dates were determined, and who is responsible.

   Recommendation: Establish an element or program level baseline schedule during the planning process. Develop schedule milestones for design, procurement, construction, and closeout activities identifying those individuals responsible for meeting the schedule milestones. Manage the program to meet schedule milestones. Maintain documentation regarding schedule development, additions and deletions, and milestone changes. Implement a monitoring program with default procedures for reporting to senior management when schedules are delayed by more than five percent of their total duration.

Procurement

General Findings

The CONRAC element procurement process is described in HJDP policies and procedures. We identified four key controls within the procurement process, which are summarized as follows:

- Solicitation planning
- Solicitation
- Bid evaluation and recommendation of award
- Contract award

These controls are not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC.

As a City agency, DOA is required to follow the procurement process for airport projects with the City's Department of Procurement (DOP). DOP prequalifies proponents for RFP based procurements and enforces Equal Business Opportunity requirements consistent with the City's overall procurement policies.

There is no formal process for selecting a project delivery strategy. Based on its internal analysis and program needs, the Program Office initiated the selection of the CMR and DBOM project delivery methods for the CONRAC program. Once selected, however, DOP provided comments and relayed its experience to the Program Office on another project the City completed using the CMR project delivery strategy. DOP did not have any previous experience with the selection or execution of a DBOM project delivery strategy on other City projects. Project records for CONRAC document a comparison of the pros and cons of various project delivery strategies; however, the Program Office's selection of the delivery strategies for CONRAC was not documented.

While the procurement process appears to have been completed in compliance with the City's policies and procedures, extended procurement cycles caused delays and cost impacts to the CONRAC element. The relevant periods of delay included:

- Procuring the RAC designer from the time of ELIP approval in April 2003 to contract award in January 2004 took nine months.

- The CMR procurement process from the time the RFP was advertised in December 2004 to the date of contract award in September 2005 was approximately nine months.

- The DBOM procurement process from the time the RFP was advertised in June 2004 to contract award in October 2005 took approximately sixteen months. This resulted from both procurement delays and price negotiations to meet budget objectives.

These delays occurred prior to the start of construction for CONRAC at a time when inflation and cost escalation was relatively low. Yet, because of these early period delays, the construction phase was pushed into a period of higher inflation and increased cost escalation, coupled with local labor shortages. Had these procurement cycles been reduced, and had DOA transferred its pricing risk to the CMR contractor earlier, potential savings to the CONRAC element may have been significant.

Specific Findings and Recommendations for Improvement

7) Procurement of the DBOM and CMR contracts took longer than expected for similar construction contracts in a public procurement environment. Because of delays in awarding and executing these contracts, the City has incurred and may continue to pay for labor and material price escalation. As an example, the DBOM contractor was able to include approximately $1.6 million for cost escalation in its contract for the period between contract pricing and execution. This has also been an issue with agreeing to a GMP for the CMR contract.

   Recommendation: We believe that procurement planning should include development of a milestone schedule that is to be strictly followed by the parties involved with each procurement. Should a milestone be missed, the parties should meet in person or by phone to identify and discuss the issue causing the delay and ways to bring the process within the schedule. Additionally, HJDP, DOA and the City should work together to determine if there are ways to shorten time to complete the lengthy procurement cycle.

Construction Management/Contract Administration

The CONRAC element construction management/contract administration (CM/CA) process is described in HJDP policies and procedures. We identified fifteen key controls within the CM/CA process, which are summarized as follows:

- Document Control
- Maintaining logs and records of field orders (FOs), noncompliance notices (NCNs), requests for information (RFIs), change notices (CNs), change notice requests (CNRs), and change orders (COs)
- Change management
- Disputes management
- Field inspections
- Progress payments
- Coordination with utilities, airport operations, FAA, GDOT
- Security coordination with DOA
- Crisis communications planning
- Accident-incident reporting
- Commissioning and startup
- Punchlist management
- Final inspection

- Contract closeout
- Final payment

These controls are not inconsistent with industry standards, and we found HJDP policies and procedures to be generally adequate for a program the size of CONRAC.

The CM/CA process is critical for managing a program with budget and time constraints. Within the overall HJDP management structure, the CONRAC element CM/CA process is managed by a professional construction management team identified as Hartsfield Atlanta Construction Managers, LLC (HACM). For each major project within the CONRAC element, HACM assigns a resident engineer, office engineer, and two or more field inspectors to carry out the key CM/CA controls. Thus, for example, there is one HACM team assigned to the CMR contract and another HACM team assigned to the DBOM contract. Each HACM team reports directly to the integrated HJDP management team composed of representatives from DOA, IAC, HACM, and HJCM.

One of the most important cost control functions is change management, yet changes have not been issued and recorded in a timely manner. One example of this relates to a significant scope transfer made from the CMR contract to the DBOM contract. For risk mitigation purposes the Program Office decided to transfer construction work at the CPTC and Gateway APM stations from the CMR contractor's scope to the DBOM contractor's scope. This decision, made in the first quarter of 2007, was intended to limit the degree of coordination needed to build both the stations and guideway using two separate contractors. The Program Office accomplished the scope transfer by issuing Change Order 1 to the DBOM contract; however, there was no corresponding descoping change order issued to the CMR contractor. The net effect is that presently the scope of work for building the CPTC and Gateway APM stations is included in both contracts. Another example of weak project controls is the lack of approval signatures on five *Miscellaneous Modifications* (MMs) out of a total of twenty issued on the DBOM contract. Based on the documentation reviewed by KPMG, we were unable to determine if the Program Office fully complied with established policies and procedures.

Administration of the CMR contract is also an issue in that the Program Office and Austin-PRAD have been unable to negotiate a satisfactory guaranteed maximum price (GMP) for the RAC work scope. The CMR agreement contemplates that the CMR contractor will issue its GMP proposal when construction documents (prepared by the designer) are sixty percent complete. By August 2006, the RAC drawings reached this level of completion, but Austin-PRAD's check estimate of approximately $270 million was considered too high by the Program Office. Following extended negotiations and clarification of Austin-PRAD's *Outstanding Issues* and *Inferred Scope* costs, and after the parties' agreement that Austin-PRAD would exclude the Access Roadways and Gateway APM Station from the proposal, Austin-PRAD submitted a GMP of approximately $180.2 million (including previously authorized Component GMPs). Once again, the Program Office considered this proposal to be too high and it was rejected. As a result, HJDP has continued to issue Component GMPs (CGMPs) on a piecemeal basis. This approach removes pricing risk from Austin-PRAD—the "at risk" contractor—and shifts it back to the City. Austin-PRAD still retains the performance risk.

Specific Findings and Recommendations for Improvement

8) The ability of the HJDP/Airline Executive Committee to fully understand its cost and schedule exposure is limited by not following established CM/CA change management policies and procedures.

   Recommendation: The Program Office should enforce change management policies and procedures when adding and removing scope from contracts. Cost estimates and ELIP budgets must be updated to reflect scope changes and transfers from one contract to another.

9) The Program Office's continued issuance of CGMPs to Austin-PRAD on a piecemeal basis removes pricing risk from Austin-PRAD and shifts it back to the City. This has resulted in increased CONRAC element costs.

   Recommendation: In the future, upon choosing a CMR or other project delivery strategy, take actions consistent with the delivery strategy in order to maximize the City's benefits and place project risk with the appropriate party. The appropriate party is generally the party in the best position to manage the risk.

10) A review of the policies and procedures contained in HACM's *Construction Management Manual* reveals no procedure for conducting on-site progress meetings and documenting progress, delays, and challenges.

    Recommendation: HACM should add a section to its *Construction Management Manual* addressing on-site progress meetings and the appropriate documentation that should be maintained.

Financial Management

General Findings

The CONRAC element financial management process is described in HJDP policies and procedures. We identified six key controls within the financial management process, which are summarized below:

- Budget, funding, commitment and forecasting controls
- Progress billing, invoice compliance and pay application controls
- General and administrative cost controls
- Actual cost and cost management controls
- Cost auditing processes and reconciliations
- Reporting and document retention processes

These controls are not inconsistent with industry standards, and we found that HJDP policies and procedures are generally sufficient for a program of CONRAC's size and complexity. However, we noted several issues that should be addressed to provide more efficient and effective financial management of the CONRAC element.

HJDP uses a number of systems to manage costs and prepare financial reports. Primavera Project Planner or P3 is used to create and manage CONRAC element and project schedules. Deltek Cobra (Cobra) is used to record and monitor cost at the project and element level. An On-Line Invoice System (OLIS) is used to record and monitor the details of vendor invoices, including construction Applications for Payment. A Controls Report Writer (CRW) is used to produce reports that are not generated in the above systems. DOA uses Oracle for its financial accounting system to track projects at the appropriate level of detail.

Budgets are documented by ELIPs at the element level and are supported by Project Information Packages (PIPs). ELIP updates are required only when the approved budget or the planned time for completion increases by more than five percent. Senior HJDP management is responsible for making sure the budget numbers are correct, including reserves for escalation as appropriate.

Commitments against budget are established as contracts are awarded and executed. Funding availability for contracts is verified prior to award as required by the City. Approved commitments are also entered into Cobra as received. The Program Office is currently conducting a financial analysis to verify that all funding uses are appropriate and properly recorded at the PIP level, and that all interim or temporary funding has been properly reimbursed.

Progress payments for direct construction invoices start with a draft, or "pencil copy," of the payment application submitted by the contractor. The payment application is reviewed by the HACM Resident Engineer, Area Resident Engineer, and Inspectors along with the designer, who note any exceptions to the amounts requested. If there are exceptions, the payment application is returned to the contractor for discussion, documentation, and resolution. Once resolved, the final version of the payment application is submitted. The payment application is also routed to the Invoice Audit and Compliance Group (IACG), which performs contractual reviews and notes any discrepancies. IACG reconciles purchase order balances, and financial activity in OLIS and COA MARS/G systems, and reconciles differences between the two systems. Before a payment is processed, additional approvals are required from the following individuals: 1) the HJDP Area Manager, 2) the Director of Project Management, 3) the DOA Director of P&D, and 4) the DOA Executive.

Indirect Costs, which are costs related to the Program Office's management of the CONRAC element, are allocated to projects at the rate of 2.54 percent of direct project costs. General and Administrative costs are incurred at the element level and updated monthly in Cobra. The budget and actual costs of work performed are reported on a monthly basis.

<u>Specific Findings and Recommendations for Improvement</u>

11) We found no written policies or procedures related to preparation, administration and monitoring of ELIPs and PIPs. We noted instances where the ELIP had exceeded the 5% threshold, but had not been updated in a timely manner.

Recommendation: The Program Office should develop more detailed policies and procedures for ELIPs and PIPs. Managing the variance by exception is appropriate, but there appears to be a void of direction regarding the steps necessary to update and monitor the CONRAC ELIP and PIP.

12) Currently, there is a significant amount of data entered and reconciled manually into the various systems used by the Program Office, which creates a risk of data entry errors.

Recommendation: The Program Office should expedite its efforts to transform these manual efforts to electronic processes. This would increase the efficiency and effectiveness of personnel performing these functions and allow more for more analysis of data.

13) HJDP policies and procedures are not followed on a consistent basis. This appears to be due, at least partially, to high personnel turnover within the last year and the lack of recent training on this topic. Personnel tend to follow processes, policies and procedures from their employer or that they have learned over time. This leads to inconsistencies and unexplained entries in Cobra, as well as differences of opinions of policies and procedures.

Recommendation: We recommend that all new personnel be trained on the current policies and procedures, and all HJDP, IAC, HACM, HJCM, etc. personnel be reminded of the current policies and procedures. This should help ensure consistency, completeness and accuracy in the procedures and reporting across the HJDP.

14) There are no reconciliations performed between OLIS and Cobra. Cobra is reconciled to the Financial Activity Summary, which is based on OLIS, but there are still instances where Cobra data related to actual costs was incorrect. Additionally, while changes can be made to historical OLIS information, no procedures are in place to verify or review and approve the changes.

Recommendation: The Program Office should make development of electronic reconciliations between all relevant systems a priority. Leveraging technology would increase overall efficiency and effectiveness of personnel, minimize the risk of data entry errors, ensure completeness, and help minimize the time required to perform the reconciliation.

15) Cost and schedule functions are currently the responsibility of only one individual with the title of Cost and Schedule Engineer (CSE). Common practice is to segregate these functions into *cost* and *schedule* and to have the two functions report to a project controls manager.

Recommendation: Cost control and schedule control functions should be performed by separate individuals for more effective and efficient project controls results, as individuals would perform tasks more suited to their skill sets.

16) Accrual and actual cost supporting documentation are sometimes incomplete or not available. During our work, we randomly selected fifty transactions related to the CONRAC element from Cobra for invoice testing. We were unable to locate proper supporting documentation for nine of the fifty, or eighteen percent, of the transactions tested. The result is a limited audit trail and amounts posted in Cobra may not accurately reflect correct allocations to projects.

    Recommendation: HJDP personnel should maintain appropriate documentation for all entries in the various project control systems. Such documentation would facilitate future audits and increase efficiency and effectiveness of efforts to resolve issues, respond to questions from management and explain the reasons for the entry and help ensure correct allocations of invoices.

17) Accrual entries in Cobra are made on a rolling basis and cleared at calendar year end. It was not always apparent what the accrual included, as each month's accrual was an incremental amount. This makes it difficult to identify the entries for reconciliations, and there is no clear audit trail.

    Recommendation: Accrual entries in Cobra should be matched directly to the reason for the accrual entry and reversed in their entirety when the actual cost is posted. This will provide a clear audit trail and provide more transparency in Cobra. When combined with the recommendation for more complete supporting documentation, this should also reduce the level of effort in responding to management and audit requests for information.

18) HJDP policies and procedures require all documents that qualify as records be processed and retained following Document Control and Records Management procedures. However, there is no definition, explanation, or listing of the types of documents that qualify as project records. This leads to inconsistencies regarding the level of documentation retained by personnel.

    Recommendation: Records should be defined so it is clear what should be processed and retained. This should lead to clearer and more complete documentation of CONRAC events, decisions, system entries, etc. providing a more transparent and complete picture of the CONRAC.

Risk Management

General Findings

High-level risk management meetings are held on a weekly basis and include personnel from DOA, HACM, the CMR contractor, and the DBOM contractor. DOA has recently engaged the services of a schedule and claims consultant to prepare a master schedule for the CONRAC element. The consultant's scope of work will also include development of a risk matrix that identifies risk issues, potential schedule delays, and activities that require significant coordination between the parties.

Specific Findings and Recommendations for Improvement

19) For a program the size of CONRAC, we found the risk management process to be inadequate and lacking in substance. This could limit the Program Office's understanding of the HJDP's exposure to cost and schedule risks. Although the Program Office holds weekly high-level risk management meetings and prepares a summary level risk matrix, there is little or no documentation of who is responsible for the identified risks, who is charged with developing a risk management plan, what the residual risks are, and how the reasonable value of risk is calculated. There are several acceptable methods used in the industry for identifying the likelihood and impact of program risks and quantifying their value. These methods are used to calculate and rationalize a reasonable program contingency.

Recommendation: The Program Office should engage the services of a qualified construction risk management professional to implement a robust risk management process for CONRAC and the remaining master program elements. The risk management process should be able to anticipate and explain potential risks and avoid budget surprises.

IV. CURRENT AND FUTURE CONRAC RISK FACTORS

Based on interviews conducted with numerous CONRAC personnel, both within and external to the HJDP management organization, KPMG identified factors posing risks for future cost increases to the CONRAC element. These risk factors are discussed under the headings below. We focused specifically on the CMR and DBOM work scopes and contracts—not on risk factors related to land acquisition or program/construction management costs. While the Program Office is aware of these risk factors, it is difficult to say if they are being proactively managed and mitigated where possible.

CMR Contract Risks

Once the City approves the remaining CGMP packages (7 and 8) on the CMR contract, the major price escalation risks on the RAC facility will have been mitigated. There will still be a small residual risk that the remaining CGMP packages will come in over the expected amounts. Schedule performance risk will also have been transferred to the CMR contractor and its subcontractors. At that point, the City will then retain the typical risks of most construction owners including the following:

- managing design clarification and approvals (RFIs, Submittals, etc.)
- managing change orders and time extensions
- managing any potential claims
- managing key interface dates between the CMR and DBOM contracts

Delayed Turnover of the Customer Service Center

The most critical risk currently facing CONRAC is the turnover date of the Customer Service Center (CSC) from the CMR contractor to the DBOM contractor. According to the preliminary CONRAC *Master Schedule* and *Coordination Point* (CP) log, the original CSC turnover was scheduled for November 26, 2007. The most recent construction schedule from Austin/PRAD shows CSC turnover on September 18, 2008; which is after the current contract completion of June 15, 2008. The need date for the DBOM contractor is May 11, 2008. Thus, without any action by Austin-PRAD to accelerate or resequence its work plan, there will be a delay of approximately six months between Archer Western's need date for the CSC and Austin-PRAD's planned turnover date. There are conflicting opinions within the Program Office as to whether or not the CMR will be able to provide the CSC on the earlier date. The general consensus is that it will not happen.

The delay cost to Archer Western is several hundred thousand dollars per month. Additional cost from Austin-PRAD may also materialize if it is directed to accelerate its work unreasonably. The Program Office is currently negotiating with both contractors and identifying ways to mitigate this risk factor.

Lack of Strong Project Risk Management

The lack of strong risk management (both schedule and cost) will continue to be a threat to project costs going forward. Despite significant strides in the creation of an element-level milestone/interface schedule and a corresponding risk matrix, program risk management does not measure up to construction industry

standards. For a program of CONRAC's complexity, a robust risk management process would include cost-risk analysis using Monte Carlo simulation, schedule risk analysis, and development of contingency strategies to support program budgets. Project-specific risk registers would also be more detailed than what the Program Office is currently producing and would quantify the probable cost impacts of potential risk events.

Claims

There is a high probability of claims from the DBOM and the CMR contractors on the CONRAC element. Such claims may result from such events as the late turnover of the APM train control room by the CMR contractor or other contractor coordination issues. The Program Office generally agrees that such claims probably will be submitted in the future. This issue is how to manage the coordination of the work to attempt to avoid potential claims and resolution strategies to mitigate cost growth to the CONRAC. The Program Office will need to develop and implement a strong claims management process utilizing both in-house and external resources. Most importantly, the Program Office will need to begin now to document the causes and impacts of delays, contractor interferences, design impacts, etc., that may later reappear as claims.

Organizational Structure Risks

The HJDP organizational structure is a continuing risk factor. While the organizational structure appears logical and appropriate, it has not demonstrated maximum efficiency with respect to CONRAC. Although detailed policies and procedures, roles and responsibilities, process flows, and organizational structures are in place, nevertheless, these seem to be in flux and constantly changing. This may be due to the diversity of skills, training, and project experiences of the many people and groups that make up the program development team. There seems to be a lack of cohesive organizational structure that manifests itself in a "my contract first" environment where individuals are more concerned with personal/company risks rather than operating as an integrated project team with the best interests of the City in mind.

Contractor feedback from both the CMR and the DBOM contractors indicates that dealing with the HJDP organization structure is a challenge. The contractors claim that there is no single point of authority or accountability at HJDP for contract management. Although the Program Office recently undertook an effort to revise and consolidate policies and procedures, roles and responsibilities, and organizational structure, this process is not expected to be complete until the end of this calendar year.

Program Strategy Risks

There is a risk that past program management lapses could continue into the future. Previously, when project costs came in over budget, management's response was to direct the program team to reduce scope or to value engineer the project so that project costs remained within budget. This policy does not work in an environment of high cost escalation where time spent in value engineering can actually result in a cost increase to the project. An example of this is the value engineering exercise on the RAC facility that took place from July 2006 to January 2007. Even though value engineering identified over $5 million in potential cost savings, cost escalation in the months following the team's value engineering exercises negated any potential savings to the contract as a whole.

Also, several Program Office personnel stated that cost is not the primary driver of the overall development program, and as long as there is sufficient funding from Passenger Facility Charge (PFCs), Customer Facility Charge (CFCs) and other sources, the driver of the program is on identifying and meeting the airport's long-term needs. While this viewpoint may be rational in the context of planning for continued growth at the airport, it is contrary to the enforcement of budget and cost control discipline typically expected in a project environment. HJDP leadership must be clear about the message it sends to its staff and contractors: that projects must be completed on schedule and within budget limits approved by the City.

V. APPROPRIATENESS OF THE CMR CONTRACT

Project Delivery Strategy

The Construction Manager at Risk (CMR) project delivery method is an alternative approach to the traditional design-bid-build method to which most public agencies are accustomed. The CMR project delivery method offers advantages where the CMR contractor participates in the design development process to: 1) evaluate constructability, 2) assist the designer in the specification of equipment and materials, 3) identify design deficiencies, and 4) develop realistic cost and schedule targets. Selection of the CMR contractor is based on qualifications, prior experience, and "best value" rather than the standard lowest responsible and responsive bidder. The CMR project delivery method often results in a quicker performance period due to the ability of the CMR contractor to solicit and award early work packages before the construction documents are finished.

After completion of the design development process and upon the commencement of the construction drawings by the designer, the CMR contractor's preconstruction services cease, and its role shifts to that of a more traditional contractor, but with several notable exceptions. As construction manager, the CMR contractor typically solicits bids from three or more specialty subcontractors for each work package and obtains the owner's approval prior to award. The CMR contractor assembles work packages in a logical and sequential manner to maximize the efficiency of the construction process and take advantage of the local trade market. Work packages, for example, may include site clearing and excavation, foundations and structure, mechanical and plumbing systems, electrical systems, curtainwall systems, elevators, interior partitions and drywall, painting and finishes, and landscaping. The CMR contractor solicits bids and typically awards a fixed price contract for each work package as the final construction drawings for the package are released by the designer. In a traditional CMR contract, the owner is kept informed of the CMR contractor's progress in awarding bid packages, and contract commitments are transparent between the CMR contractor and the owner.

The CMR contractor is responsible for performing the work to a contractually specified maximum amount known as the Guaranteed Maximum Price or "GMP." Included in the GMP are trade contractor costs, general conditions costs, the CMR contractor's fee—usually expressed as a percentage of cost—and a contingency budget for unknown risks. The contingency budget is often controlled jointly by the contractor and the owner requiring the parties' agreement that a contingent event or risk has materialized. Changes in scope are not normally defined as contingent events, and where the owner issues a change in scope, the parties negotiate a change order with associated cost and schedule adjustments. The CMR contractor bears the risk of all costs exceeding the adjusted GMP amount.

By involving the CMR contractor early in the design process, an owner may obtain the following benefits:

- providing alternative approaches to design challenges
- fewer design conflicts and delays
- shortened construction schedule

- generating the interest of more experienced subcontractors
- better quality construction due to the CMR contractor's experience with particular construction materials and equipment

There are, however, a few disadvantages an owner may experience including the following:

- loss of competition in bidding for the CMR contractor's costs and fees
- increased costs due to unanticipated delays in the design process
- failure to "lock in" the GMP before commencing construction

Choice of CMR for the Rental Agency Complex (RAC)

Based on interviews conducted by KPMG and on our review of information in the project record, the choice of the CMR project delivery method was appropriate for the RAC project. KPMG spoke to numerous project personnel in the HJDP organization, including the Department of Aviation (DOA), IAC, and HACM, along with a representative of the CMR contractor. KPMG evaluated the DOA's processes in the selection of the CMR delivery method and in the qualification and award of the CMR contract.

In our assessment of the appropriateness of CMR as a project delivery strategy for the RAC, we considered the following alternative project delivery methods:

- Turnkey
- Design-Build
- Design-Bid-Build
- Construction Manager at Risk (CMR)
- Agency Construction Manager (CM)
- Owner as General Contractor

For each of the project delivery methods identified above, we considered the advantages of and preferences expressed by the DOA for performing the work in relation to the following nine criteria:

- accountability – single source or multiple parties
- specification – performance based or design based specifications
- scope clarity – completeness of the design prior to commencing the work
- project complexity – facility and/or process requirements are standard or complex
- cost control – requirement to develop project costs early in the delivery process
- cost growth – criticality of limiting project costs
- schedule – accelerated schedule versus normal schedule
- change control – likelihood of numerous scope changes
- owner involvement – degree of involvement and staff experience

We concluded that DOA's choice of the CMR project delivery method was appropriate because CMR is a preferred delivery method where:

1) there is no preference for a single source of accountability (i.e., for design, construction, inspection, and commissioning)
2) design specifications and construction drawings will be used to describe the work scope
3) the scope of work is moderately to highly complex
4) cost control early in the project is an important factor
5) a "fast-track" schedule is anticipated
6) the owner and its representatives are experienced and involved in all aspects of the project

We also noted that the DOA enlisted the help of an expert from Georgia Institute of Technology to provide guidance on a project delivery method to use for the RAC project. In his report, the expert also identified CMR as an appropriate project delivery method along with Design-Build.

Contract Implementation and Enforcement

The Program Office began work to develop the Request for Proposals for the RAC facility in 2004. Procurement records indicate that the Program Office received the CMR contractors' proposals in mid February 2005, but delays in negotiations extended the contract award date until September 27, 2005. Austin Commercial LP and PRAD Group, Inc., Joint Venture (Austin-PRAD) was the successful proponent. The Notice to Proceed (NTP) date was October 10, 2005.

The scope of the CMR contract includes the following RAC components:

- North Parking Garage
- South Parking Garage
- Customer Service Center (CSC) Building (levels 1-3)
- CSC APM Station (level 4)
- Civil Work and Site Paving
- Quick Turn Around (QTA) Facilities
- Airport Access Roadway
- Central Passenger Terminal Complex (CPTC) APM Station
- Gateway International Convention Center (GICC) APM Station

Under the CMR contract, Austin-PRAD has a total of 979 calendar days from the date of the NTP to complete all of the work. Based on an NTP date of October 10, 2005, the current contract completion date is June 15, 2008.

The contract contemplates a preconstruction period of five months, during which time Austin-PRAD would make recommendations to the designer for the selection of systems and materials and cost reducing alternatives; notify the designer of any defects in the design, drawings, and specifications; review and comment on long lead procurement items; and work with the designer to develop trade packages for solicitation and award. Upon completion of the preconstruction phase and when the construction

documents are sixty percent complete, Austin-PRAD was to submit a GMP for the total scope of the work.

The construction documents were less than sixty percent complete in March 2006. In fact, the construction documents only reached sixty percent completion in July or August 2006, excluding the QTA facilities, which were further delayed. Because of this, Austin-PRAD requested, and the Program Office authorized, the commencement of work under the Component GMP (CGMP) provisions of the contract. These provisions allow portions of the work to begin without establishing agreement on the GMP—for instance, where not all of the contract documents are complete to the level required to issue a comprehensive GMP. To date, the following CGMPs have been authorized totaling $118,180,726:

CGMP 1	Preconstruction Services	$1,929,869
CGMP 1a	Extension of Preconstruction Services	$907,023
CGMP 1b	Extension of Preconstruction Services	$0
CGMP 1c	Extension of Preconstruction Services	$394,585
CGMP 1d	Extension of Preconstruction Services	$794,121
CGMP 2	Assignment of Mass Grading Contract	$13,060,130
CGMP 4	Structural Steel Bid Package	$24,651,495
CGMP 5	Concrete Superstructures Bid Package	$60,005,682
CGMP 6	Cable Stays and Conveyance Bid Package	$16,437,821

In December 2006, Austin-PRAD submitted a Pending Budget Estimate totaling $199 million; however, this did not include the QTAs, the CPTC Station, or preconstruction services charges. For comparison purposes, we added back the value of these missing components based on their values in previous estimates. With this adjustment, Austin-PRAD's December 2006 Pending Budget Estimate had a comparative value of $270 million. The Program Office rejected CGMP-3 because its approval would have caused an overrun of the available RAC budget. Instead, the work has proceeded on a piecemeal CGMP-by-CGMP basis with Austin-PRAD having little or no pricing risk. In addition, this manner of proceeding has resulted in additional delays, for which Austin-PRAD may seek a time extension under its contract. Currently, Austin-PRAD's construction schedule shows a planned completion date of June 1, 2009, a delay of nearly one full year from the original contract completion date.

From the information gathered by KPMG in interviews and project records, there was no indication that the Program Office was not enforcing all material provisions of the CMR contract.

Management of the CMR Contract

A critical component of managing any contract is managing pricing risk and having the ability to firm up the contract price at the earliest possible date. In the case of the CMR contract, the benefit of financial risk mitigation to the owner is based on locking in the GMP as soon as the required design conditions are met. Thus, it was in DOA's interest to obtain a GMP as soon as the RAC construction documents reached the sixty percent stage of completion. KPMG's review of related documents and interviews surfaced several key management issues that have contributed to the challenges in managing the CONRAC element.

Design Drawing Development and Preconstruction

Industry convention is to create a competitive GMP environment early in the schematic or conceptual design phase. As part of its preconstruction services, the CM would assist the owner to develop budgets, and when it came time to bid, the CM should be allowed to compete with the other proponents in responding to the RFP proposal. In the present case, the CMR was brought on board around the thirty percent design development stage, which is later than expected for optimal results.

The concept plan for the CONRAC element was initially submitted in September 2002, but was not approved until the spring of 2003. Twenty months elapsed, from April 2003 to November 2004, from the time the CONRAC budget was approved until the Program Office issued the CMR solicitation. From this point, it took an additional ten months for the Program Office to review the CMR proposals and recommend a CMR contractor. While not all of this time can be linked directly to delays in the start of the RAC construction, it is possible that much of the material cost escalation, normal inflation, and labor shortages currently impacting the RAC budget might have been avoided if the Program Office and DOA had coordinated the project delivery method with the overall schedule.

Construction Document Development

The CMR contract anticipated Austin-PRAD's preconstruction services to be completed by mid March 2006. At this point, Austin-PRAD's Revised Check Estimate for the RAC, based on incomplete construction documents, was $242 million. However, the sixty percent construction documents were not issued until July 2006. In October 2006, Austin-PRAD submitted its 60% Budget Estimate of $285 million and a Revised 60% Budget Estimate of $274 million. Both of these were rejected by the Program Office and the DOA. In January of 2007, CGMP-3 was submitted in the amount of $263 million. This amount was intended to be the Final GMP for the CONRAC element.

One of the key concerns expressed by the Program Office was the amount of money within the estimate for "reasonably inferred scope contingency" and "outstanding issues." KPMG's review of the estimates revealed that these two items totaled over $31 million dollars, which the Program Office did not accept as reasonable cost estimates. From October 2006 until February 2007, the Program Office and DOA held strategic sessions to determine the best way to deal with Austin-PRAD and to determine if there was a way to mitigate the indicated budget overruns. The decision was made to break the project into smaller bid packages. As a result, DOA has effectively eliminated the CMR contractor's pricing risk.

Conclusions

Overall, the CMR delivery method was an appropriate strategy for the CONRAC project. However, the DOA's delayed implementation and management of the contract resulted in further delays and cost overruns. Many of these delays and cost overruns may have been avoided if the DOA had a better appreciation for the schedule demands of the CMR project delivery method and if the Program Office's budget estimates more closely reflected market conditions at the time Austin-PRAD submitted its GMP proposal.

VI. APPROPRIATENESS OF THE DBOM CONTRACT

Project Delivery Strategy

The design-build delivery strategy is based upon the original Master Builder concept used to build most pre-modern projects. Under the Master Builder approach, a central figure or organization held total project accountability. From inception to completion, the master builder was the key organizational figure and strictly liable to the owner for defects, delays, and losses. The design-build project delivery method is a return to the fundamentals of the Master Builder ideals.

The DBOM delivery strategy is popular for large, complex projects with a significant operating equipment component. DBOM integrates the responsibilities for design, construction, and operation within a single contractual entity and minimizes the owner's daily involvement and number of resources required to oversee the project. Assuming there is fair and reasonable compensation for the design-builder's preparation of the design concept plan and there is competition among contractors, design-build contracting can produce very short project schedules. The contractor assumes almost all project risk, because the contractor is the most qualified and appropriate entity to manage the risk. These risks include performance, schedule, cost, and operating risks.

The primary benefit of the DBOM delivery strategy is the single point of accountability. Instead of having several contractors and consultants to coordinate, an owner has just one contract for the project. Design revisions, project feedback, budgeting, permitting, construction issues, change orders, and billing can all be routed through the DBOM firm. This single point of contact allows maximum flexibility for the owner to issue change directives without having to readjust contracts or manage change order documentation with perhaps a dozen contractors. Rather than the distributed level of responsibility typical of the classic design-bid-build, design-build provides an integrated solution for the owner. This moves projects away from the finger-pointing that has unfortunately become commonplace in modern construction projects and allows the owner to look to one entity with questions or concerns. With one major contractual relationship, the Owner can focus resources in one area, although there is limited visibility to subcontractors.

Another benefit of DBOM is that the owner receives value-based project feedback. If the owner has selected a quality DBOM contractor, the owner should receive the maximum amount of benefit from value engineering activities because it is also in the contractor's interests to maximize value. The owner retains some control to adjust the project's program without having to re-bid the entire project.

One negative aspect of the DBOM delivery strategy relates to owner changes. Significant changes or owner caused delays can be costly if they interfere with the DBOM contractors planned means and methods for performing the work. As such, it is critical that the original performance and design specifications are well thought-out and well developed. Each time the owner revises the design after the project is started, the owner assumes risk for the results of that change. As a result, the owner must place a high degree of trust in the contractor and measure its performance through the contractor's compliance with the initial performance specifications that form the basis of the DBOM contract.

Choice of DBOM for the Automated People Mover (APM) System

The CONRAC Automated People Mover (APM) system is a 1.4 mile, three-station transportation system for delivering customers to the car rental facilities. At procurement, the project was anticipated to have an aggressive three-year schedule with some challenging right-of-way conditions that would require fast-track construction strategies.

The APM was not always intended to be a DBOM contract. Originally, the elevated guideway along with the Maintenance and Storage Facility (M&SF) were going to be procured together using a traditional design-bid-build approach administered by the City. Only the operating system (cars and car controls) were planned for procurement using the DBOM delivery strategy. To reduce the amount of interfaces between the guideway/M&SF contractor and the operating system DBOM, CONRAC management decided to include both parts under one DBOM contract. This transferred many of the key APM interface risks to the DBOM contractor.

Typical DBOM delivery strategies are based on the owner providing detailed performance specifications and then letting the design-builder complete the majority of design unhindered. The design-builder must obtain the owner's input and approvals on aesthetic issues and at key design milestones. Often, the DBOM contractor obtains the owner's sign-off on submittals. Nevertheless, the design-builder is responsible for meeting the performance specifications on which its price was based.

In our assessment of the appropriateness of DBOM as a project delivery strategy for the RAC, we considered the following alternative project delivery methods:

- Turnkey
- Design-Build
- Design-Bid-Build
- Construction Manager at Risk (CMR)
- Agency Construction Manager (CM)
- Owner as General Contractor

For each of the project delivery methods identified above, we considered the advantages of and preferences expressed by the DOA for performing the work in relation to the following nine criteria:

- accountability – single source or multiple parties
- specification – performance based or design based specifications
- scope clarity – completeness of the design prior to commencing the work
- project complexity – facility and/or process requirements are standard or complex
- cost control – requirement to develop project costs early in the delivery process
- cost growth – criticality of limiting project costs
- schedule – accelerated schedule versus normal schedule
- change control – likelihood of numerous scope changes
- owner involvement – degree of involvement and staff experience

We concluded that DOA's choice of the DBOM project delivery method was appropriate because Design-Build is a preferred delivery method where:

1) there is a preference for a single source of accountability (i.e., for design, construction, inspection, and commissioning)
2) performance specifications will be used to describe the work scope
3) there is significant design development needed to clarify the scope
4) the scope of work is moderately complex
5) cost control early in the project is an important factor
6) completion to a firm budget is critical
7) a "fast-track" schedule is anticipated

Contract Implementation and Enforcement

The Program Office began work to develop the Request for Proposals for the APM in February 2004. Procurement records indicate that a pre-proposal conference was held on July 13, 2004, where seventy-six program and contractor representatives were in attendance. The Program Office received the CMR contractors' Best and Final Offers (BAFO) in December 2004; however, all of the BAFOs submitted by the proponent contractors exceeded the DOA's budget. Nevertheless, DOA selected Archer Western Contractors Ltd and Capital Contracting Joint Venture (Archer Western) as the most qualified proponent, and the two parties began price negotiations. The negotiations extended over many months, and as a result, DOA did not award the contract to Archer Western until October 24, 2005. The Notice to Proceed (NTP) was issued by DOA on October 27, 2005.

The scope of the DBOM contract includes the following activities:

- Design and engineering for the APM system overall
- Design and construction of the elevated guideway
- Design and construction of APM station platform structures at the CPTC, GICC, and RAC
- Design and construction of the Maintenance & Storage Facility
- Design and construction of the power distribution system
- Integration of Mitsubishi vehicles, automatic station doors, and control systems
- Procurement management and pass-through purchase of the Mitsubishi vehicles and control systems

The maintenance component of the DBOM scope is to be performed under a separate contract, although the framework of the maintenance agreement and price negotiations were a part of the DBOM procurement. Under the DBOM contract, Archer Western has a total of 1,095 calendar days from the date of the NTP to complete all of the work. Based on an NTP date of October 27, 2005, the contract completion date is October 26, 2008.

Based on KPMG's interviews and its review of the DBOM project documents, there has been considerable progress completing the DBOM contract. The APM vehicles are approved and in manufacturing, the elevated guideway and station platform construction is nearly complete, and Mitsubishi is working on the design and manufacture of the vehicle control system. The APM vehicles

are expected to arrive in Atlanta in January 2008. The DBOM contractor has met expectations to date and continues to pursue the design, construction, and installation of the APM system in a professional manner.

We understand, however, that Archer Western has been frustrated in its efforts to design the APM vehicles due to numerous review comments prepared and submitted by the Program Office. As an example, Archer Western stated that the basis of its proposal was a vehicle similar in design to the one developed for the APM at Miami International Airport. Archer Western's understanding was that an agreement had been reached with DOA on that basis and that Archer Western would spend less time on vehicle design and submittals. According to Archer Western, it has spent a considerable amount of time coordinating and responding to HJDP's planning and design team on the vehicle designs.

From the information gathered by KPMG in interviews and project records, there was no indication that the Program Office was not enforcing all material provisions of the CMR contract.

Management of the DBOM Contract

The DBOM contract was procured using a two-step process. The first step involved a Request for Qualifications with the City "short listing" three firms. The second involved the issuance of a Request for Proposal (RFP). The proposals that were received went through a question and answer process followed by interviews. The City selected Archer Western as the lowest cost responsible proponent from two proponents that submitted costs in December 2004. Up to this point, the process for selection would be considered industry standard.

Post-award, the project was put on hold for ten months while the project was value engineered and the price was negotiated downward. This proved successful, as the total contract price was reduced. On the other hand, the project was hindered by the fact that if the scope of the project was changed in any significant way, the project would have to be re-bid.

A Notice to Proceed (NTP) was given to Archer Western on October 27, 2005. The total contract price was $170.5 million. Thus, the procurement process from the date the RFP was advertised in June 2004 to the issuance of the NTP was approximately sixteen months. This is significantly longer than is normally the case for procuring a DBOM contractor.

When choosing a DBOM strategy, the owner must trust the design-builder and give up much of the owner's control over the design. According to Archer Western, the Program Office has been consistently involved in the design of the project. Also, because the preliminary design sets are not approved, the Archer Western project manager feels they have not received all of the payments to which they are entitled. While such design hindrances are no longer impacting the project, it is likely that Archer Western has tracked them carefully and will request an appropriate contract adjustment at a later date.

The original intent of aligning both design and construction of the APM under one contract was to reduce schedule risks and provide flexibility regarding the interface points between the RAC and APM contracts. Despite the successful mitigation of some of these schedule risks, recent events have highlighted several critical interface points between the APM and RAC contracts that may potentially impact the time and cost of completing the CONRAC project overall. Ultimately, the risks of these delays and cost impacts will likely revert back to the DOA.

Major interface dates have already been missed because of delays to start of the CMR contract. To mitigate some of the costs associated with these missed interface dates, DOA removed some of the work scope from the CMR contract and transferred it to the DBOM contract. Specifically, the construction of the CPTC and Gateway Stations, which previously were a part of Austin-PRAD's work scope, are now the responsibility of Archer Western. These stations were already designed and ready for construction. According to the most recent ELIP, this work was valued at approximately $20.3 million (excluding general conditions). In June 2006, when the work scope was transferred, the price negotiated with Archer Western was $29.5 million. The differences include such items as estimating differences and escalation. This scope transfer also removed Archer Western's liability for not meeting one of their three schedule milestones.

Currently, the Customer Service Center (CSC) is the major schedule risk on the project. Contractually, Archer Western should get CSC turnover from Austin-PRAD on November 26, 2007. According to Archer Western, they absolutely need turnover by May 11, 2008, in order to proceed with their system testing and commissioning according to plan. Based on recent schedules, Austin-PRAD will not be able to turnover the CSC to Archer Western until September 18, 2008. This delay of four months could impact Archer Western's costs by several hundred thousand dollars per month. To mitigate this risk, the Program Office is negotiating with Archer Western regarding the absolute minimum requirements at the CSC in order for them to begin installing, testing, and commissioning the APM systems.

While the DBOM project delivery strategy provides a single point of accountability on the contractor's side, Archer Western has noted the lack of a single point of accountability on the DOA side. From Archer Western's perspective there is a disconnect at the Program Office in both the planning and design group, due to their overly zealous review and scrutiny of Archer Western's design submittals, as well as with the Program Office, which has no direct authority to issue changes or resolve problems in the field. According to Archer Western, the weekly coordination meetings with the Program Office "serve no purpose and nothing ever gets decided." We heard similar criticisms of these meetings from Austin-PRAD.

As a result of delays in bringing the CMR contractor on board, the DOA currently owns the coordination risk of delivering the CSC to Archer Western in sufficient time to avoid further delays and cost impacts.

Conclusions

The DBOM was an appropriate delivery method. The risks were separated according to industry convention; however, the DOA may not have anticipated the level of trust that was needed to release control over the design process. One area of improvement would be to document the decision making process of choosing a delivery method. Nevertheless, the Archer Western contract appears to be managed appropriately with regards to key contract provisions.

Appendix A

	Document Description	Document Date
1	Contract FC-7217-00A Hartsfield Atlanta Construction Managers, LLC (HACM)	April 19, 2000
2	Contract FC-7217-00B Hartsfield Construction Managers, A Joint Venture (H-JCM)	
3	Archer Western/Capital Contracting JV CONRAC Application #19	May 16, 2007
4	Austin/PRAD CONRAC Application for Payment #20	June 6, 2007
5	Atlanta Conceptual Estimate Package for CONRAC	April 9, 2003
6	Atlanta Conceptual Estimate for CONRAC (MODIFIED)	April 29,2004
7	Atlanta Conceptual Estimate Package for CONRAC	April 29,2004
8	Atlanta Conceptual Estimate Package for CONRAC	August 17, 2005
9	Atlanta Conceptual Estimate Package for CONRAC	April 26, 2006
10	Master Plan (CIP) MII Ballot Information	July 28, 1999
11	Review of Master Plan by Jeremy Weber	March 20, 2006
12	Contract FC-3005007808 CONRAC CM@Risk NOT DATED	September 27, 2005
13	Contract FC-7692-04 CONRAC Automated People Mover D/B & Install	October 24, 2005
14	Sitework RFI, Submittal, and Change Order Logs	July 10, 2007
15	COVER SHEET/TRANSMITTAL for APM Logs	
16	Gateway Station RFI Log dated	July 10, 2007
17	APM Guideway Open RFI Log	July 10, 2007
18	APM Guideway Complete RFI Log	July 10, 2007
19	APM Guideway Outstanding Submittal Log	July 10, 2007
20	APM Guideway Complete Submittal Log	July 10, 2007
21	APM Guideway Miscellaneous Modification Log	July 10, 2007
22	AMP Guideway PCO Log	July 10, 20077
23	HACM Policies and Procedures for CONRAC Facility	March 17, 2003
24	REVISED Organizational Chart	May 2005
25	Planning & Development Organizational Structure	May 14, 2007
26	Program Management Organization	June 1, 2007
27	CONRAC - Site Work Package Estimate from US Cost	September 27, 2005
28	CONRAC - Parking Deck Package Estimate from US Cost	September 27, 2006
29	CONRAC - Customer Service Center Estimate from US Cost	September 27, 2006
30	CONRAC C-GMP#3, Option 1	January 12, 2007
31	H.06 - CONRAC Forecast Estimates ELIP	April 16, 2003
32	AEPS CONRAC Final Concept Report	June 2, 2003
33	Austin/PRAD Original & Check Estimate Summary Sheet	March 24, 2005
34	CONRAC Monthly Report	
35	CONRAC Project Cost Performance Detail Report	
36	CONRAC Cost Performance Summary	
37	CONRAC Schedule	
38	H.06 - CONRAC Forecast Estimates ELIP	April 29, 2004
39	CONRAC Integrated Organizational Chart	April 30, 2007
40	CONRAC VE Tracking Log	October 5, 2006
41	Exhibit C: Fees and Compensation for Contract FC-7692-04 CONRAC APM	October 24, 2005

	System	
42	Change Order #1 for DBOM Contract	June 22, 2007
43	Original SOV for CM @ Risk Contract	January 19, 2005
44	C-GMP #1 for CONRAC	October 10, 2005
45	C-GMP #2 for CONRAC Site Grading	No Date
46	C-GMP #3, NOT ACCEPTED by HAIA	
47	Component Change Order #4 (C-GMP #4)	May 3, 2007
48	Component Change Order #5 (C-GMP #5)	May 21, 2007
49	Component Change Order #6 (C-GMP #6)	May 31, 2007
50	DBOM APM Modification #1	February 23, 2006
51	DBOM APM Modification #2	February 23, 2006
52	DBOM APM Modification #3	July 31, 2006
53	DBOM APM Modification #4	August 18, 2006
54	DBOM APM Modification #5	September 12, 2006
55	DBOM APM Modification #6	September 12, 2006
56	DBOM APM Modification #7	September 12, 2006
57	DBOM APM Modification #8	October 3, 2006
58	DBOM APM Modification #9	October 26, 2006
59	DBOM APM Modification #10	December 20, 2006
60	DBOM APM Modification #11	December 20, 2006
61	DBOM APM Modification #12	January 30, 2007
62	DBOM APM Modification #13	February 16, 2007
63	DBOM APM Modification #14	April 12, 2007
64	DBOM APM Modification #15	March 15, 2007
65	DBOM APM Modification #16	March 20, 2007
66	DBOM APM Modification #17	April 12, 2007
67	DBOM APM Modification #18	May 10, 2007
68	DBOM APM Modification #19	June 29, /2007
69	DBOM APM Modification #20	July 11, /2007
70	Subpart D to DBOM Contract	October 25, 2005
71	Part III, Part A - APM Special Provisions to DBOM Contract	October 25, 2005
72	Austin/PRAD CONRAC May CGMP X1 Schedule	May 5, 2007
73	HACM Resident Engineer Weekly Report	June 8, 2007
74	HACM Resident Engineer Weekly Report	June 15, 2007
75	HACM Resident Engineer Weekly Report	June 22, 2007
76	HACM Resident Engineer Weekly Report	June 29, 2007
77	Austin/PRAD Bid Plan	April 11, 2007
78	Contract Delivery Method - REVIEW by GT Professor Jeffery Beard PART 1	No Date
79	Contract Delivery Method - REVIEW by GT Professor Jeffery Beard PART 2	No Date
80	HJDP Polices & Procedures	
81	CONRAC Project Cost Performance Detail Report (Revised)	June 29, 2007
82	CONRAC Charges (Project by Cost Category)	June 1, 2007
83	CONRAC PIP - Planning	May 7, 2004
84	CONRAC PIP - Land Acquisition Phase 1	April 26, 2001
85	CONRAC PIP - Land Acquisition Phase 2	January 31, 2002
86	CONRAC PIP - Land Acquisition Phase 3	April 21, 2006
87	CONRAC PIP - Environmental Assessment	December 19, 2003
88	CONRAC PIP - Agency Construction Manager Services	April 21, 2006

89	CONRAC PIP - Existing Conditions	December 13, 2002
90	CONRAC PIP - RAC Facility	April 21, 2006
91	CONRAC PIP - Site Preparation & Development	April 21, 2006
92	CONRAC PIP - Stream Mitigation	August 17, 2005
93	CONRAC PIP - Gateway APM Station	April 21, 2006
94	CONRAC PIP - CPTC APM Station	April 21, 2006
95	CONRAC PIP - CM @ Risk Preconstruction	April 21, 2006
96	CONRAC PIP - CONRAC Automated People Mover (APM)	April 21, 2006
97	CONRAC PIP - Airport Access Roadway	April 21, 20066
98	CONRAC PIP - Atlanta Parking	May 7, 2004
99	CONRAC G&A Transfer Form	August 19, 2005
100	Claim CP-14 from Austin/PRAD for Mass Excavation & Grading Work	October 9, 2006
101	60% FOR CONSTRCUTION GMP PACKAGE Drawings Roll 1 of 4	November 6, 2006
102	60% FOR CONSTRCUTION GMP PACKAGE Drawings Roll 2 of 4	November 6, 2006
103	60% FOR CONSTRCUTION GMP PACKAGE Drawings Roll 3 of 4	November 6, 2006
104	60% FOR CONSTRCUTION GMP PACKAGE Drawings Roll 4 of 4	November 6, 2006
105	60% FOR CONSTRCUTION GMP PACKAGE - Specification Book 1 of 2	November 6, 2006
106	60% FOR CONSTRCUTION GMP PACKAGE - Specification Book 2 of 2	November 6, 2006
107	CMR June Monthly Report information from Austin/PRAD	July 13, 2007
108	HACM Job Descriptions	No Date
109	APM DBOM Master Project Plan	January 17, 2006
110	APM DBOM Quality Control Manual	July 2, 2006
111	Notice to Proceed to Austin/PRAD CMR CONRAC	October 10, 2005
112	Notice to Proceed to Archer/Western DBOM CONRAC	October 27, 2005
113	DBOM - Document Control Policies & Procedures	November 28, 2006
114	Risk & Mitigation Management Assessment - Summary	July 24, 2007
115	Risk & Mitigation Management Assessment - Site Preparation	July 24, 2007
116	Risk & Mitigation Management Assessment - Gateway APM Station	July 24, 2007
117	Risk & Mitigation Management Assessment - CPTC APM Station	July 24, 2007
118	Risk & Mitigation Management Assessment - Access Roadways	July 24, 2007
119	Risk & Mitigation Management Assessment - Automated People Mover	July 24, 2007
120	IAC "COBRA" Cost Report Summary	July 24, 2007
121	IAC "COBRA" Performance Cost Detail	July 24, 2007
122	Austin/PRAD C-GMP #1b	September 19, 2006
123	Austin/PRAD C-GMP #1d	April 2, 2007
124	CONRAC Conceptual Development Study by RBL/HNTB	July 21, 2000
125	CONRAC Working Paper #1 from HPC	July 13, 2001
126	Extended GC's for DBOM Contract from Tim Brown	March 3, 2007
127	Projected Project Cost v. Budget Spreadsheet from Bill Kraus	June 7, 2007
128	Correspondence/Email/Presentations	November 15, 2006
129	Responsibility Matrix - CPTC APM Station	May 18, 2006
130	Design Build Project Responsibility Matrix	May 22, 2006
131	CONRAC Responsibility Matrix	January 12, /2006
132	Bureau of Planning & Development - Project Execution Plan Flowchart	March 12, 2007
133	CONRAC Master Schedule	July 2, 2007
134	HJDP Job Description	
135	CONRAC CMR Decision	
136	Quality Assurance Program APM Revision Sheets	June 27, 2006

137	CONRAC APM Change Order #1	June 22, 2007
138	Section 10 Configuration and Integration Management	
139	Mitsubishi Quality Management Manual	July 8, 2005
140	CDRL 9 - Quality Manual, Rev. A	July 2, 2006
141	Planning & Development Briefing	May 25, 2006
142	Program Management Organization	December 1, 2005
143	Review of HJDP Planning Manual by Dawn Williams	March 30, 2006
144	Planning Manual: Planning Process - Project Definition (Attachment A)	August 31, 2005
145	Entrance Conference with Dept. of Aviation and H-JDP	February 14, 2006
146	Staff Meeting with the Senior H-JDP Personnel	February 20, 2006
147	Interview with H-JDP Internal Auditors	February 22, 2006
148	Review of HJ Program Management Plan (PMP)	March 22, 2006
149	Overview of Contract Administration (construction)	April 12, 2006
150	Review of Invoicing Policies and Procedures	April 13, 2006
151	Review of HJDP Policies and Procedures	April 13, 2006
152	Review of HJDP General Administration Policies and Procedures	April 19, 2006
153	Review of HJDP IT Policies and Procedures	April 19, 2006
154	Overview of Contracting Interview with Andy Orr	April 26, 2006
155	Review of HJDP Design Policies & Procedures & Follow-up Interview with Ted Allen	April 27, 2006
156	Review of HJDP by George Peoples	May 2, 2006
157	Information Technology Manual	January 1, 2001
158	Review of Controls Policies and Procedures	April 13, 2006
159	Controls Folder (Attachment A)	
160	Review of Document Controls Policies and Procedures	April 17, 2006
161	Review of Project Management Policies	April 25, 2006
162	Overall CIP Management (Attachment C)	
163	Enterprise Program Mgmt. System (EPMS) Status & Reporting Overview (Attach. B)	April 1, 2006
164	Planning & Design Committee 2 Mo. Milestone Look-Ahead (Attachment F)	February 2006
165	Summary of Recurring Audit Topics	March 27, 2006
166	Summary Work Paper on Inherent Risks to HJDP Funding Sources	September 11, 2006
167	Research on Federal Airport Improvement Program (AIP)	June 6, 2006
168	HJDP Databases and Closing Reports	June 12, 2006
169	Review of HJDP Policies and Procedures, Section 10 Construction	April 19, 2006
170	Review of Critical Controls in HJDP	May 8, 2006
171	Review of Handling of Retainage and Change Orders by HJDP	May 12, 2006
172	Project Controls Overview Presentation	April 3, 2006
173	HJDP Reports for Period Closing May 26, 2006	June 13, 2006
174	MII Breakdown	August 16, 2000
175	H-JDP Reports for Period Closing 6/29/07	July 162007
176	CONRAC Trans # 00174 to A/P Submittal & RFI Flow Charts	June 27, 2007
177	CONRAC RFI Process Flow Chart R0	
178	CONRAC Submittal Review Process Flow Chart R0	
179	CONRAC Progress Billing Invoice Process Flow Chart R0	
180	P&D Contractor Invoice Processing Procedures	
181	CONRAC First Disapproved Concept ELIP	November 5, 2002
182	H-JDP Development Program May 2007 Status Report	May 2007

183	HJDP Performance Audit	April 15, 2004
184	Critical Point Schedule for CONRAC coordination issues	August 22, 2007
185	HJDP June 2007 Monthly Status Report	July 2007
186	HJDP July 2007 Monthly Status Report	August 2007
187	HAIA Letter from Dan Malloy to Austin/PRAD re: Final GMP	
188	Procurement File Summary Sheet	No Date
189	Email from Chad Hutchison re: First Update to Master Schedule	8/23/2007
190	COA Procurement Section 6 - Construction Procurement	
191	COA Procurement Section 4 - Source Selection	
192	COA Procurement Section 7 - Contract Clauses & Administration	
193	Lexis Nexis - Georgia Code Section 13 - Contracts	
194	Letter from Austin/PRAD to HJDP re: revised GMP estimate	September 29, 2006
195	Letter from Austin/PRAD to HJDP re: Events to date driving costs	December 4, 2006
196	Austin/PRAD CGMP #3 Estimate intended to be FINAL GMP	January 17, 2007
197	Hanscomb Independent Estimate of RAC Facility commissioned by Hertz	October 31, 2005
198	Email from Austin/PRAD to HJDP re: Revised estimate	November 16, 2006
199	Most recent IAC/HACM/HJDP cost estimate for CONRAC	August 9, 2007
200	Memo from Mr. Pino to Mr. DeCosta re: CONRAC Status	March 12, 2007

Hartsfield-Jackson Atlanta International Airport
CONRAC Project Evaluation
Interviews Conducted

Appendix B

Name	Organization	Role	Interview Date
Mario Diaz	Hartsfield Jackson Int'l Airport	Deputy General Manager	July 26, 2007
Dan Malloy	Hartsfield Jackson Int'l Airport	Deputy Dir Capital Programs	July 26, 2007
Girard Geeter	City of Atlanta - Procurement	Deputy Chief Procurement	July 26, 2007
Frank Rucker	Hartsfield Jackson Int'l Airport	Director of Eng & Const	July 26, 2007
Roger Foster	IAC	Asst. Director & Area Mgr	July 26, 2007
Tim Brown	HACM	Construction Manager Exec	July 27, 2007
Cathy Donato	IAC	Controller / Finance	July 31, 2007
Bill Krauss	IAC	Estimator	July 23, 2007
Erastus Njenge	IAC	Estimator / Scheduler	July 20, 2007
Bill Perugino	HACM	Area Construction Mgr	July 26, 2007
Alan Lemeaux	HACM	APM Resident Engineer	July 24, 2007
Bob Wichmann	HACM	Access Resident Engineer	July 25, 2007
James Bunkley	HACM	RAC/QTA Resident Eng.	July 25, 2007
Scott Calhoun	US COST	Estimator	July 23, 2007
David Pino	HJDP Program Development	Director of Project Mgmt	July 26, 2007
Ralph Cook	Austin/PRAD CM @ Risk	Project Director	July 24, 2007
Dave Moyar	Archer Western DBOM	Project Manager	July 24, 2007

Hartsfield-Jackson Atlanta International Airport
CONRAC Project Evaluation
Interviews Conducted

Name	Organization	Role	Interview Date
Alan Lemeaux, James Bunkley, Bill Perugino, Tim Brown	HACM	Pay Application Review Process	August 9, 2007
Ben DeCosta and Mario Diaz	Hartsfield Jackson Int'l Airport	General Manager and Assistant General Manager	August 21, 2007
John "Andy" Orr	HACM	Contract Administrator	July 27, 2007
Susan Joyce	IAC	Invoice Compliance Manager	August 1, 2007
Cathy Donato, Joe Smith, JP Jones, Hung Yu	IAC	Project Controls	August 15, 2007
John Kapala	IAC	Program Manager	August 20, 2007
Michael Baker	IAC	Program Manager	August 20, 2007

Appendix C

LISTING OF ACRONYMS

AE	Architect-Engineer	DBOM	Design-Build-Operate-Maintain
APM	Automated People Mover	DOA	Department of Aviation
APMS	Automated People Mover System	DOP	Department of Procurement
BAFO	Best and Final Offer	EAC	Estimate at Completion
CGMP	Component GMP	EC	Executive Committee
City	City of Atlanta	ELIP	Element Level Information Package
CM	Construction Manager	FOs	Field Orders
CM/CA	Construction Management /Contract Administration	G&A	General and Administration
		GICC	Gateway International Convention Center
CMR	Construction Manager at Risk		
CNRs	Change Notice Requests	GMP	Guaranteed Maximum Price
CNs	Change Notices	HJAIA	Hartsfield-Jackson Atlanta International Airport
COA	City of Atlanta		
CONRAC	Consolidated Rental Agency Complex	HJDP	Hartsfield-Jackson Development Program
COs	Change Orders	IAC	International Airport Consultants
CP	Coordination Point	IACG	Invoice Audit and Compliance Group
CPTC	Central Passenger Terminal Complex	LOE	LOE = Level of Effort
CRW	Controls Report Writer	M&SF	Maintenance and Storage Facility
CSC	Customer Service Center	MMs	Miscellaneous Modifications
CSE	Cost and Schedule Engineer	NCNs	Noncompliance Notices

NTP	Notice to Proceed	RAC	Rental Agency Complex
OLIS	On-Line Invoice System	RFIs	Requests for Information
P&D	Planning and Development	RFP	Request for Proposal
PIPs	Project Information Packages	RLB/HNTB	R.L. Brown/HNTB Corporation
PMs	Project Managers	VE	Value Engineering
QTA	Quick Turn Around		