AV Parking System Review

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Office of the County Auditor
Evan A. Lukic, CPA
County Auditor
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EXECUTIVE SUMMARY

This report presents the results of our review of the Parking Access and Revenue Control System (PARC/S) at the Fort Lauderdale-Hollywood International Airport. The purpose of this review was to assess general controls for the management and administration of the PARC/S system as well as controls over parking transactions.

PARC/S is an integral component of airport parking operations. PARC/S was installed as the revenue control system for all airport parking operations during the construction of the Hibiscus Parking Garage, which was completed in October 2000. Since installation, the Broward County Aviation Department (BCAD) has contracted with the manufacturer and installer, CTR Systems Parking, Inc. (CTR), to administer the parking software system and underlying network. Both the Aviation Department and USA Parking Associates III, the contracted parking management company, are heavily reliant on the PARC/S to control access to the FLL parking facilities and to capture and report on the results of operations. PARC/S is essential to parking revenue accounting, as it is the system of record for all parking transaction details.

Parking is a major source of airport revenues. In fiscal year 2010, BCAD reported $36.9 million in public parking revenues processed through the PARC/S system.

We reviewed selected parking revenue transactions during 2010 and related system and management controls. Our review disclosed the following:

1. The current level of BCAD parking contract administration is not adequate to ensure accountability for purchased vendor services and compliance with stated contract provisions.

2. The accuracy, completeness and integrity of reported parking revenues are at risk due to noted deficiencies in internal controls.

Our report includes specific recommendations designed to address these deficiencies and improve management of the PARC/S and parking operations. During the course of our review, BCAD management initiated several steps to address our findings and recommendations including obtaining credits totaling $379,727 from CTR, improving coordination with between CTR, USA and BCAD, and implementing new procedures governing parking fee waivers. We appreciate BCAD’s efforts and continuing commitment to address the issues identified by this review.
OBJECTIVES, SCOPE AND PROCEDURES

The objectives of our review of the Airport Parking System at the Fort Lauderdale-Hollywood International Airport were to determine whether:

- General system controls are in place and operating effectively for the Parking Access and Revenue Control System (PARC/S). This includes evaluating how PARC/S is developed, managed, secured and controlled. Since CTR Systems Parking, Inc. (CTR) is under contract to administer and control PARC/S, our evaluation of general controls includes procedures to evaluate BCAD’s administration of CTR services.

- Operational processes are aligned with PARC/S features and functions. Since USA Parking Associates III (USA) is the primary user of PARC/S, we evaluate how BCAD oversees parking operations and coordinates the interaction between USA, CTR, and BCAD staff.

- Automated application controls are in place and operating effectively over transactions processed in PARC/S, to ensure completeness, accuracy and integrity of transaction processing.

The scope of our review included parking transactions processed during fiscal year 2010. We reviewed the following technology and major processes used in transaction processing:

- The parking system, inclusive of the software application, network, database of parking transactions, and parking equipment controlled by the software.

- Actual parking operations which utilize the PARC/S technology and equipment.

- Processes for administering, maintaining and supporting the Parking System and related operations.

Accordingly, through interviews, observation, review of supporting evidence and data analysis, we performed the following procedures:

- Gathered information about the parking system, such as specifications and controls for the network, server, and operating system.

- Evaluated controls over the interfacing application system modules, which were used to record and process transactions for public parking areas, tenant employee parking, and BCAD parking.
• Worked with Aviation Department staff and staff from USA and CTR to develop an understanding of how the PARC/S system functions and supports the airport’s parking processes.

• Reviewed internal controls including general controls over PARC/S; automated application controls over transaction input, processing and reporting; and management controls over the parking processes.

• Analyzed approximately 180,000 parking transactions from two weeks in May and two weeks in June 2010, to validate system processing of revenue transactions.

BACKGROUND

BCAD – Operations Section is responsible for the parking operations and facilities at the Fort Lauderdale-Hollywood International Airport (FLL). Parking revenues are primarily generated by fees charged for daily, valet (including optional car care services), hourly and economy lot parking, according to rates established in the Broward County Administrative Code\(^1\).

On average, there were 5,720 parking transactions each day during FY 2010 at FLL. In addition to public parking access using the ticket entry system, 7,918 proximity access cards were issued to employees of FLL tenants and concessionaires to use discounted on-site parking facilities. In fiscal year 2010, BCAD recorded approximately $36.9 million in public parking ticket fees and $911,000 in tenant employee parking fees from the use of proximity cards, net of sales tax.

In addition to fee-based parking, the Broward County Administrative Code\(^2\) provides for courtesy parking for several classes of parking customers, including but not limited to government agencies (such as Transportation Security Administration, US Immigration, US Customs, the US Department of Agriculture), airport volunteers, elected officials, visitors to FLL for special events, and vendors working on premise. Courtesy parking is granted through a parking ticket validations process. According to system reports of parking validations during FY2010, over $1.2 million in parking fees were waived as a courtesy. Another type of non fee parking is provided for administrative vehicles using automated vehicle identifier (AVI) parking devices. Fees waived for administrative vehicles using AVI devices are not quantified.

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1 Broward County Administrative Code, Chapter 39 FEES AND OTHER CHARGES, AVIATION
2 Broward County Administrative Code, Chapter 39 FEES AND OTHER CHARGES, AVIATION; Part I. Section 2. Rates, Fees and Charges--Fort Lauderdale-Hollywood International Airport, Subsection k. Courtesy Parking
The following table provides a summary of parking capacity and utilization at FLL for all of fiscal year 2010 and through February of fiscal year 2011:

**Table 1: FLL Parking Capacity and Utilization by Facility**

<table>
<thead>
<tr>
<th>Parking Facility</th>
<th>FY 2010</th>
<th>FY 2011 (through February)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parking Capacity</td>
<td>Average Daily Demand</td>
</tr>
<tr>
<td>Palm Garage</td>
<td>2,484</td>
<td>2,155</td>
</tr>
<tr>
<td></td>
<td>Hourly</td>
<td>570</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
<td>1,315</td>
</tr>
<tr>
<td></td>
<td>Valet</td>
<td>599</td>
</tr>
<tr>
<td>Hibiscus Garage</td>
<td>4,937</td>
<td>2,994</td>
</tr>
<tr>
<td></td>
<td>Hourly</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
<td>4,494</td>
</tr>
<tr>
<td></td>
<td>Valet</td>
<td>253</td>
</tr>
<tr>
<td>Cypress Garage</td>
<td>4,284</td>
<td>2,787</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
<td>1,571</td>
</tr>
<tr>
<td></td>
<td>Employee Parking</td>
<td>2,713</td>
</tr>
<tr>
<td>Park 'n Save Lot</td>
<td>4,012</td>
<td>1,336</td>
</tr>
<tr>
<td>Total Parking Capacity (excluding overflow parking)</td>
<td>15,717</td>
<td>9,272</td>
</tr>
</tbody>
</table>

(Source: BCAD summary of Daily Average Parking Demand)

To manage FLL parking operations, BCAD relies upon the services provided by two separate parking contractors, CTR Systems and USA Parking, as follows:

*USA Parking Associates III (USA)* provided management and operator services for the FLL parking facilities, including public self parking (at FLL garages and remote lots), valet parking, and employee parking. USA’s fees were $590,000 in fiscal year 2010.

*CTR Systems Parking, Inc. (CTR)* provided administration, maintenance and support services for PARC/S. CTR’s fees were $590,000 in fiscal year 2010.

In its capacity as parking operator, USA is the primary user of the parking system. USA relies on the parking system to control access to the FLL parking facilities and to capture and report on the results of operations to BCAD – Finance Division. The parking system is essential to parking revenue accounting, as it is the system of record for all parking transaction details, such as:

- Entry time/date/location
- Vehicle inventory/overnight location
- Time/date/location ticket is presented for payment
• Calculation of fees (elapsed time x applicable rate based on entry data and location where ticket is presented for payment)
• Point-of-sale details of payment tender, including credit card processing
• Exit time/date/location
• Proximity card access validation used for FLL tenant employees and concessionaires to access designated parking areas
• AVI transponder access validation for BCAD authorized vehicles

The County acquired the parking access and revenue control system for the Airport from CTR. The parking system was originally installed during the construction of the Hibiscus Garage and accepted by BCAD in October 2000. The initial cost of the parking system was included in the garage construction costs and could not be specifically identified.

In 2005, BCAD contracted with CTR to upgrade existing components and expand the airport parking system into the Cypress Garage and a new main exit plaza at a cost of $5.7 million. In 2008, BCAD amended the 2005 agreement to include additional equipment, hardware, software, and signage for an additional $2.2 million. Since 2005, change orders and work authorizations of $332,000 have increased the total project capital budget to $8.2 million for the airport parking system.

The parking system is a complex network of software, computer devices (hardware), mechanical equipment, and communication components. Physical parking system components are installed throughout the parking facilities, including:

15 – Entry Lanes into the four active parking facilities
21 – Exit Lanes from the Cypress Garage, the Remote Lot and the Main Exit Plaza
18 – Pay-on-Foot Kiosks (POF) in the Hibiscus and Cypress Garages
3 – Valet Cashier Stations in the Palm and Hibiscus Garages
2 – Supervisor Terminals at USA Parking Offices in the Hibiscus Garage

The software which controls devices, equipment and components is “PARC/S” – Parking Access and Revenue Control System, from CTR. CTR supports and maintains the PARC/S access and control software, computer hardware devices, and the parking communications network.

CTR works in conjunction with staff from BCAD Maintenance Division to maintain and support mechanical parking system devices and equipment. Depending on the parking component, multiple integrated technology devices and equipment are required. The
necessary equipment and devices may vary by location and component. For example, an entry lane does not require the same level of equipment as a POF kiosk. The following devices and equipment, or various combinations thereof, are required to operate the parking system:

- Parking Computers (PARC/S Software, Memory And Processors)
- Ticket Printers
- Magnetic Stripe Readers (For Tickets and Credit Cards)
- Cash Register Workstations
- Customer Receipt Printers
- Proximity Card Readers
- Antennas (For Automated Vehicle Identifier (AVI) and Sunpass Transponders)
- Video Cameras
- Intercoms
- Barrier Arm Equipment at All Entry and Exit Lanes and throughout Parking Facilities (e.g., in the Hibiscus Helix to Control Traffic Flow)
- Underground Sensors to Detect Vehicle Movement at All Entry and Exit Lanes
- Electronic Signs to Display Transaction Amounts at Exit Lanes and Valet Stations
- P-O-F Computer Terminals
- Underground Sensors to Count Vehicle Movement in and between Garages
- Optical Sensors to Count Vehicle Movement in and between Garages
- Integrated Electronic Signage to Indicate Parking Status/Availability
- Parking System Servers and Controllers
- Network Communication Devices
- Uninterruptible Power Supply (UPS) Devices
- Necessary Electrical/Communications Wiring

The availability and integrity of the parking system depends on the orchestration and coordination of automated controls and supporting management controls employed by USA, CTR and BCAD Divisions (Operations, Maintenance and Finance). In the course of our review, we determined the following division of control activities over PARCS:

- CTR administers general system controls (access to the computer/electronic system and components and the parking network) and application processing.
- USA administers controls over parking facilities and revenue processes (e.g., cashier controls), as well as customer service to parking clients.
- BCAD – Maintenance Division is the first responder to service calls on mechanical parking equipment to ensure parking facilities are available for use; CTR provides
preventive maintenance services and manufacturer support on mechanical components.

- BCAD – Finance Division reconciles and compiles USA reported revenue with actual bank deposits, to record parking revenues.

- BCAD – Operations is responsible for contract administration and oversight of CTR and USA activities.

FINDINGS AND RECOMMENDATIONS

Contract Administration

Finding 1

Parking contract administration is not adequate to ensure accountability for purchased vendor services, compliance with contract provisions and optimization of system functionality.

The Administrative Code\(^3\) of Broward County requires all contract administrators to ensure both the County and the vendor are in compliance with all terms and conditions of the contract. Our review disclosed the following issues which raise concerns as to the adequacy of BCAD’s parking contract administration in ensuring accountability for purchased vendor services and compliance with stated contract provisions:

- **A one-time $125,000 credit on annual maintenance fees was not received from CTR.**
  The 2005 PARC/S upgrade agreement with CTR provided for a one-time adjustment to account for equipment warranty periods, which overlapped with CTR maintenance services. Although the County was eligible to claim the credit at time of final acceptance in 2008, we found no evidence that the maintenance fee adjustment was received.

- **Maintenance fees totaling $254,727 were paid for unused License Plate Recognition (LPR) Software.** LPR software was included in the 2005 system upgrade agreement with CTR. However, at the time of our review, we observed and confirmed with BCAD staff that the LPR was being tested in a pilot program. Even through LPR software is not being used in parking operations, BCAD paid maintenance fees totaling $254,727 for the LPR software since July 2006.

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\(^3\) Administrative Code of Broward County, FLORIDA Administrative Code, Chapter 21 Operational Policy, Procurement Code Finance and Administrative Services, PART II. Procurement Organization, Section 21.22. Contract Administration, part a. Contract Administrator. After the award of any contract, the Agency using the service, or in some cases the Resource Manager, will assume the role of Contract Administrator and will insure that both the County and the Vendor are in compliance with all terms and conditions of the contract including maintaining current insurance certificates.
• **A reported system malfunction, which adversely impacted parking revenues, was not resolved in a timely manner.** The system malfunction was reported in August 2009, but not resolved until November 2010. According to CTR, a defective component in the parking equipment at one entry lane was producing entry parking tickets with a future date and time encoded on the magnetic stripe. Upon exit, PARCS calculated the parking fees on these tickets based on the false entry time/date. Customers may have enjoyed no fee parking, or a significantly discounted fee, if the actual parking duration was beyond the future date. After querying the transaction data, CTR determined that a total of 448 entry tickets were affected; however, CTR reports the amount of revenue lost due to the malfunction cannot be determined, because the actual entry times/dates were not captured.

• **Delayed implementation of cost saving recommendations.** In December 2008 USA recommended the County reduce the cost of credit card processing fees, by changing our clearing house provider and system interfaces. The changeover was not implemented until March 2011. Due to the recent nature of the change, actual cost savings are not available; however, USA Parking estimated in May 2010, potential cost savings of $100,000 annually in credit card processing fees.

• **The PARCS system lacks functionality to process separate payments for parking fees.** As a result, when a customer requests to pay a parking fee in part with cash and in part with a credit card, USA parking cashiers “work-around” the system to process the separate payments. BCAD has not coordinated a practical, controlled alternative to address this lack of system functionality with CTR, and BCAD accepts the current USA practices for accommodating daily customer demand.

• **Comprehensive routine testing of the disaster and recovery plans as required by the agreement with CTR has not been performed.** With an average daily parking volume of 5,720 transactions or approximately $101,000 in daily revenues, PARCS is critical to parking operations. Recovery plans must be tested regularly, to validate response procedures as current and effective for a quick recovery in the event of an interruption.

We informed BCAD management of the above issues during the review, whereupon BCAD requested, and CTR voluntarily provided, credits for the warranty adjustment and LPR maintenance fees totaling $379,727. Further in June 2010, BCAD began recording minutes of weekly parking meetings attended by staff from BCAD, USA and CTR. BCAD also began a formal process of documenting and monitoring parking issues to help manage contractor and BCAD tasks required to resolve parking operating issues.
RECOMMENDATIONS

The issues enumerated above indicate a lack of management attention to contract administration to ensure accountability for purchased services, compliance with stated contract provisions and optimization of system functionality. Accordingly, we recommend the Board of County Commissioners direct the County Administrator to:

1. Increase the level of BCAD oversight of parking contractor activities and the administration of contracted services.
2. Validate CTR’s estimated impact of the future date system malfunction and determine the potential for recovery of lost revenues.
3. Establish a higher priority for CTR’s response to system issues affecting the integrity of revenue processing and transaction data.
4. Routinely review parking operations to enable timely identification, evaluation and implementation of improvements to customer service, cost reductions, or competitive position.
5. Evaluate ‘gaps’ in system functions, such as PARCS inability to handle separate payments on a parking fee ticket, to determine whether system modifications are warranted.
6. Require CTR to perform regular testing and validation of recovery plans in accordance with their agreement.
7. Establish periodic updates and progress reports on parking initiatives to the Director of BCAD.

Internal Control Weaknesses

Finding 2  The accuracy, completeness and integrity of parking revenues are at risk due to deficiencies in internal controls.

Internal controls are vital to managing the risks associated with parking access and revenue processes. Internal controls facilitate safeguarding assets and preventing and detecting errors and fraud. Well designed controls promote effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations.
In our review we noted internal control deficiencies with respect to revenue reconciliation processes, access controls and parking fee waivers as discussed below:

**Reconciliation Processes**

- **Reconciliation of revenues.** A reconciliation of reported revenues to operating activity is not performed. A Reconciliation of reported revenues to operating activity from the parking access system has not been performed. A fundamental control over revenues is to reconcile revenues to operating activity to determine whether reported revenues are reasonable given the volume of operating activity. Given the reliance on USA for reported revenues, it is imperative for BCAD to reconcile parking activity to revenues reported to ensure all revenues are properly accounted for and received. While BCAD Finance staff reconciles daily receipts with deposits, a reconciliation of revenues to parking activity reports is not performed. Reconciliation of cash receipts to deposits is an important control over cash handling, but it does not provide assurance as to the completeness of deposited revenues compared to parking activity levels.

- **Reconciliation of deposits to USA Parking Revenue Reports for employee parking.** BCAD Finance reported gross parking fee revenue (includes sales tax) of $965,324, while USA reported gross parking fee revenue of $1,103,344. BCAD attributes the $138,020 variance to parking accounts receivable, timing differences on credit cards at year end and accounting for credit card fees; however, there was no reconciliation of the difference at year end. As a result, we could not verify the completeness of recorded employee parking revenues.

- **Reconciliation of parking access cards to employee/tenant accounts.** A reconciliation of all issued and active parking access cards to current authorization forms and/or accounts has not been performed. Our comparison of the database of user accounts and the database of access cards showed differences in the number of cards. As a result, we were unable to verify whether appropriate parking fees had been collected for all issued and active cards or whether only authorized users were parking in the restricted areas designated for employees of airlines, concessionaires, and government agencies. Parking cards provide access to restricted parking areas in the airport, where a ticket is not used to calculate timed parking fees. Periodic reconciliation of issued cards to authorized users is important to ensure only authorized individuals have parking cards, and completeness of associated revenues.

**PARC/S Access Control Deficiencies**

- **Administrator access.** Our review of PARC/S user accounts identified a total of 65 user accounts of which 15 had been assigned administrator access. All 15 users with
Administrator access were CTR employees. Administrator access enables an individual to modify and delete any element of the parking system, including transaction data, system reports, and automated controls. Further, an administrator can conceal their activities in the system by deleting or modifying audit trails. A good practice for protecting the integrity of an automated environment is to restrict administrator access to the minimum number of individuals necessary for daily system administration and maintaining audit logs of administrator activities for regular monitoring by an independent supervisor or manager.

- **Segregation of duties within PARC/S.** The parking system access controls utilize group profiles to categorize users by responsibility and facilitate access administration. We observed 5 out of 9 group profiles had access to all available system functions; likewise, 6 of the same 9 group profiles had access to all system reports. BCAD has not restricted group access permissions, so that users can perform only their assigned work tasks. Matching system access to a user’s job is important to control the functions a user can employ, to avoid conflicting functions, and to establish user accountability.

- **Deactivation of access.** We identified 5 active accounts for which CTR did not act on BCAD requests to remove/deactivate access. A current employee with knowledge of the dormant account ID and password could falsely use the account for unauthorized activity without detection. This exposure is partially mitigated by physical controls which restrict access to PARCS terminals.

- **Password sharing.** We noted user accounts were shared by cashier staff and password controls were not consistently applied in violation of BCAD Information Security Policy, the IT Security Policy from the County’s Internal Control Handbook or CTR’s own security guidelines.

**Control over parking fee waivers**

We were unable to determine whether the waivers of $1.2 million in parking fees were granted in accordance with County Policy governing courtesy parking. In reviewing courtesy parking, we found the following procedural deficiencies:

- Validation methods do not consistently and accurately identify the validating agency.
- Pre-printed parking vouchers are not reconciled or consistently controlled.
- System reports of waived parking fees lacked evidence of regular review or monitoring by BCAD parking management.

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• Manual logs of courtesy validations showed gaps in ticket sequences and contained duplicate ticket numbers.
• Manual logs lacked evidence of periodic verification.

RECOMMENDATIONS

We recommend the Board of County Commissioners direct the County Administrator to:

8. Implement procedures to reconcile parking revenues to operating activity reports.

9. Reconcile the differences in employee parking revenues between our operator’s (USA) records and BCAD Finance records to ensure complete and accurate reporting of parking revenue.

10. Reconcile employee parking access cards to employee/tenant accounts to ensure appropriate fees are collected for parking services and appropriate parking access restrictions are in place.

11. Restrict administrator access privileges to the minimum number of users required for system management responsibilities, and institute regular monitoring of system administrator activities.

12. Establish group profiles which match system access privileges to assigned duties/work tasks.

13. Establish a BCAD process for managing requests to CTR for maintenance of security access accounts including verifying timely completion.

14. Establish cashier password authentication controls to align access security settings with the BCAD Information Security Policy.

15. Establish controls over courtesy parking to ensure parking fees are only waived in accordance with the Administrative Code.