



Review of Airport Parking Revenues and Parking Information Systems

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Report No. 17-11



Office of the County Auditor

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Executive Summary

This report presents the results of our review of controls over parking revenues and parking information systems at Fort Lauderdale – Hollywood International Airport (Airport).

The objectives of this review were to;

- ❖ evaluate controls over parking revenues and parking information systems at the Airport for calendar year ended December 31, 2015; and
- ❖ assess the status of the recommendations in the Airport Parking Systems Review presented to the Broward County Board of County Commissioners on September 13, 2011 (Report No. 11-01).

We conducted interviews with appropriate Broward County Aviation Division (BCAD) personnel, and parking operations and information technology contractors. We reviewed and analyzed parking procedures, system reports, selected parking revenue transactions, and related manual and system controls. Our review included procedures to determine the remediation status of the recommendations included in Report No. 11-01.

During our preliminary analysis, we noted no significant control weaknesses over revenues from self and valet parking; however, we observed potential control weaknesses over revenues from employee parking and focused our review in this area.

Our review disclosed a general lack of manual and automated controls over employee parking revenue and parking information systems; specifically, the lack of adequate:

- ❖ internal control over employee parking revenue;
- ❖ oversight of employee parking operations;
- ❖ physical access and environmental controls at BCAD's server rooms housing production and backup data for parking applications;
- ❖ compliance with County information technology security policies and industry best practice within parking information systems; and
- ❖ disaster recovery and business continuity planning.

In addition, our review disclosed that BCAD had not addressed 60% of the recommendations included in Report No. 11-01 as of September 22, 2016 (See Appendix A).

Our report includes specific recommendations designed to address these deficiencies and improve management controls over employee parking revenues and parking information systems.

During the course of our review, BCAD and the management of its parking contractors have initiated several steps to address our findings. We appreciate their efforts and continuing commitment to address the issues identified by this review.

Purpose and Scope

The objectives of this review were to:

- ❖ evaluate controls over parking revenues and parking information systems at Fort Lauderdale – Hollywood International Airport (Airport) for calendar year ended December 31, 2015; and
- ❖ assess the status of the recommendations in the Airport Parking Systems Review presented to the Broward County Board of County Commissioners on September 13, 2011 (Report No. 11-01).

Methodology

To accomplish our objective we:

- ❖ Reviewed;
 - ✓ revenue collection, deposits, accounts receivable, and billing activity reports provided by SP+ and BCAD
 - ✓ the management agreement between BCAD, SP+ and HUB Parking Technology
 - ✓ system reports from parking information systems
 - ✓ Broward County Administrative Code
 - Chapter 21: Operational Policy, Procurement Code Finance and Administrative Services
 - Chapter 39: Fees and Other Charges, Aviation
 - ✓ County Administrative Policy and Procedures, Volume 7: Enterprise Technology Services (ETS), Chapter 3: IT Administration
 - ✓ United States Government Accountability Office, Federal Information System Controls Audit Manual
 - ✓ National Institute of Standards and Technology Special Publication 800-53, Security and Privacy Controls for Federal Information Systems
 - ✓ Federal Information Systems Controls Audit Manual
 - ✓ Center for Internet Security, CIS Microsoft Windows Server 2012 R2
 - ✓ Broward County Financial Statements
- ❖ Interviewed appropriate personnel from SP+, HUB and BCAD
- ❖ Consulted with the County Attorney's Office
- ❖ Toured parking lots and server rooms
- ❖ Reviewed the status of the recommendations included in the prior Airport Parking Systems Review report

Background – Employee Parking Revenue

Overview of Parking Revenues

Broward County Aviation Division's (BCAD) Operations Division is responsible for oversight of the parking operations and facilities at the airport. Parking revenues are primarily generated by fees charged for self, valet, and employee parking according to rates established in the Broward County Administrative Code¹.

To manage Airport parking operations, BCAD relies upon the services provided by two separate parking contractors. HUB Parking Technology (HUB) and SP+ (formerly Standard Parking Corporation). Exhibit 1 shows the responsibilities for managing employee parking operations.

Exhibit 1 Parking Responsibilities	
Entity	Responsibilities
HUB	Manages the computer devices (hardware), mechanical equipment, communication components, services, and ongoing maintenance of the applications and systems that control parking at the Airport.
SP+ ²	Provides management and operator services for Airport parking facilities, including public self-parking, valet parking, and employee parking. In its capacity as parking operator, SP+ is the primary user of the parking systems. SP+ also administers the billing system for employee parking.
BCAD	Manages BCAD network infrastructure, backup, and recovery activity. Responsible for contract administration and oversight of HUB and SP+ activities.

The availability and integrity of the parking system depends on the coordination of automated and manual controls employed by SP+, HUB, and BCAD.

Revenues from parking operations totaled \$44.3 million in fiscal year (FY) 2015 which was an increase of 8.5% from FY 2013. Exhibit 2 shows the increase of parking revenues for the three year period FY 2013 through FY 2015.

¹ Broward County Administrative Code, Chapter 39 Fees and other charges, Aviation

² The County executed a five year management agreement with SP+ effective December 15, 2013. The agreement requires SP+ to manage and operate facilities designated for self-parking, valet services and tenant employee parking.

Exhibit 2
Total Parking Revenues FY13 – FY15

	FY 2013	FY 2014	FY 2015
Self-Park (Note 1)	\$34,026,902	\$34,729,597	\$35,710,257
Valet	5,506,150	5,834,778	6,892,186
Employee Parking	1,261,762	1,242,663	1,655,844
Total	\$40,794,814	\$41,807,038	\$44,258,287

Source: Broward County Comprehensive Annual Financial Reports and BCAD Finance Division

Note 1: Self-parking includes off airport economy parking

During our preliminary analysis, we noted no significant control weaknesses over revenues from self and valet parking; however, we observed potential control weaknesses over revenues from employee parking and focused our review in this area.

Employee Parking

Employees of airport tenants such as airlines, rental car operators and concessionaires are referred to as tenant employees. Tenant employees park at Airport garages at a reduced charge or at no charge. They are issued Proximity Cards that restrict parking to designated employee parking areas, or courtesy parking (DP) cards that allow parking in any Airport garage.

Proximity Cards

Tenant employees are assigned Proximity Cards by SP+ that allow entrance to the Airport garages and restrict parking to designated employee parking areas³. To obtain the Proximity Card, the tenant employee completes an application indicating whether they are assigned to work at the Fort Lauderdale-Hollywood International Airport (base employee) or another airport (non-base employee). The applicant must obtain the approval of the authorized tenant representative (Station Manager) and designate whether the monthly fee will be paid by the employee or employer.

Chapter 39.2 of the Administrative Code authorizes the County to provide Proximity Cards to tenant employees at a monthly charge of \$10 for base employees or \$35 for non-base employees.

Proximity Card Revenue

Billing and payment transactions for tenant employee parking are processed in a billing system⁴ owned and managed by SP+. SP+ prepares monthly invoices that are electronically transmitted or mailed to employees or employers. Payments are processed

³ Floors 7, 8, and 9 of the Cypress Garage.

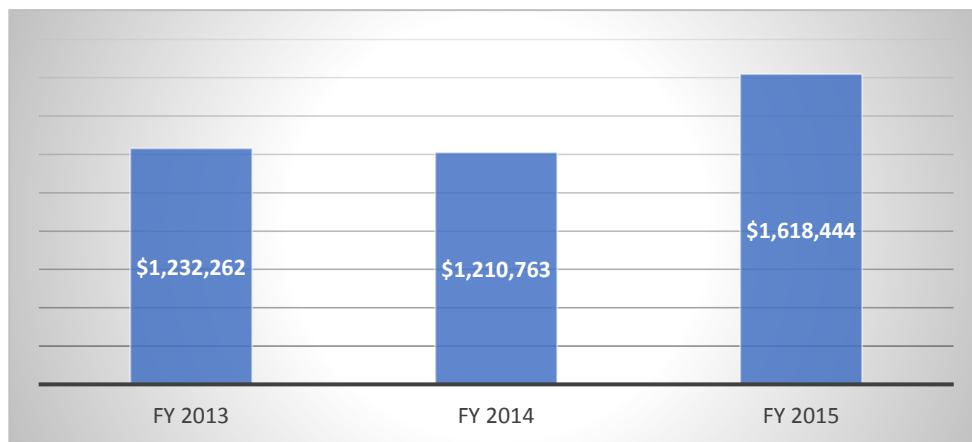
⁴ The CARS billing system. See "Overview of Parking Information Systems" on page 15.

via electronic funds transfers, automatic debit or credit card, mail, or in person at the SP+ office located in the Hibiscus Garage. Payments collected by SP+ are deposited in the County's bank within one day of collection.

As of December 31, 2015, SP+ issued approximately 11,600 Proximity Cards of which 7,900 are billed to employers, 3,100 are billed to employees, and 600 have no monthly billing charge as per the Administrative Code⁵.

Proximity Card revenue was approximately \$1.6 million in FY 2015, an increase of 31% over FY 2013. Exhibit 3 shows the increase in tenant employee parking revenues for the three year period FY 2013 through FY 2015.

Exhibit 3
Proximity Card Revenue FY13 – FY15



Source: Broward County Comprehensive Annual Financial Reports and BCAD Finance Division.

DP Cards

DP Cards are issued by BCAD Operations section to airlines, and other tenants based on either the percentage of airline passenger traffic or the number of employees at the Airport. DP cards allow entrance to Airport parking garages using automatic vehicle identification (AVI) technology that allow tenant employees to park in any Airport garage.

Chapter 39.2 of the Administrative Code authorizes BCAD Operations to provide up to a maximum of ten DP cards per tenant, five at no charge and five billable at \$100 per month per card as shown in Exhibit 4.

⁵ The Administrative Code (Chapter 39.2.i) authorizes BCAD to provide parking at no charge to employees of County contractors and government agencies such as the Transportation Security Administration, Department of Homeland Security, Broward Sheriff's Office, and the Federal Aviation Administration.

Exhibit 4
DP Card Allowance

Airline Passenger Traffic	Number of Employees Based at FLL	No-Charge DP Cards	Maximum Purchased DP Cards
5.0% or less	149 or less	2	2
5.1% to 10.0%	150 to 249	3	3
10.1% to 12.5%	250 to 300	4	4
Greater than 12.5%	Greater than 300	5	5

The Administrative Code (Chapter 39.2.i) also authorizes BCAD to provide parking at no charge to employees of County contractors and government agencies such as the Transportation Security Administration, Department of Homeland Security, Broward Sheriff’s Office, and the Federal Aviation Administration.

To obtain a DP card, the tenant employee completes an application that requires approval by the Station Manager. The application is submitted to the BCAD Parking Manager for approval, then to the Administrative Coordinator to open the account and activate the DP card⁶. Card activation is a two-step process:

- ❖ The DP card is initialized by the SP+ office to program the magnetic strip with the card number and expiration date.
- ❖ The DP card is activated by the Administrative Coordinator at BCAD Parking Office when the applicant is approved.

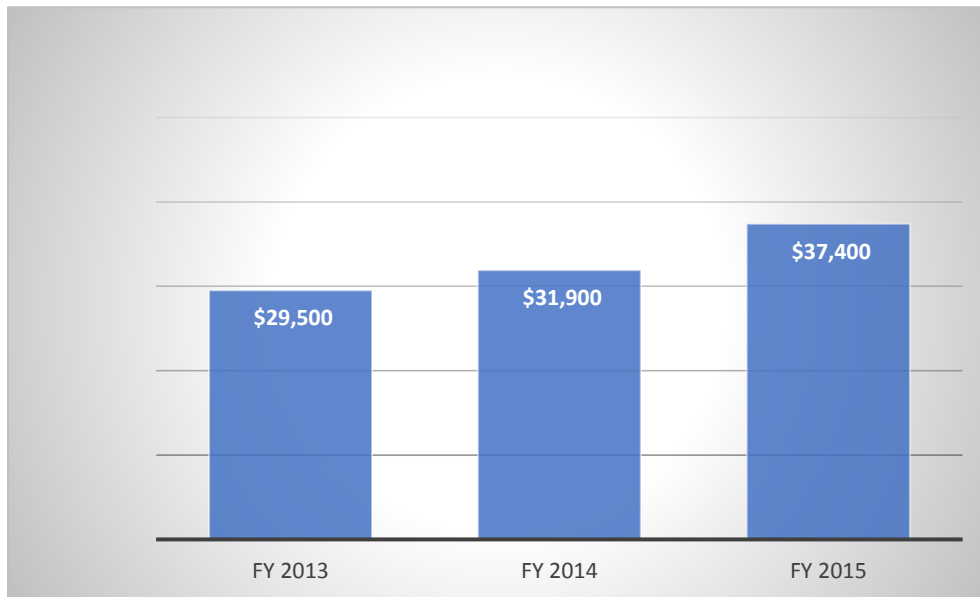
The Administrative Coordinator maintains a list of cards assigned to users and notifies BCAD Finance of billable cards to be included in tenants’ monthly rent invoices. As of December 31, 2015, BCAD issued approximately 1,600 DP Cards of which approximately 30 are billable.

DP Card Revenue

BCAD Operations notifies Finance Division when billable DP cards are issued to tenants. The Finance Division includes the monthly billing for DP cards as a line item in the tenant’s lease invoice. DP card revenue was approximately \$37,000 in FY 2015, an increase of 27% over FY 2013. Exhibit 5 shows the increase of DP card revenue for the three year period FY 2013 through FY 2015.

⁶ DP cards are activated in the WebPARCS Systems. See “Overview of Parking Information Systems” on page 15.

Exhibit 5 DP Card Parking Revenues



Source: BCAD Finance Division.

Findings – Employee Parking Revenue

Finding #1: Revenue Controls

Lack of adequate internal control over employee parking revenue

Establishing and maintaining effective internal controls in the revenue process is a prerequisite to ensuring all funds owed are collected and appropriately recorded. Good internal control of the revenue process includes adequate segregation of duties, control over collection of revenues and taxes, timely deposits, safekeeping of cash, proper recording and reconciliation of revenue, and supervisory review.

A. Job duties for tenant employee parking operations are not adequately segregated.

Three employees have the ability to issue Proximity Cards, access card inventory, open and close tenant employee accounts, process card payments, perform collection activities, and write off past due amounts. These duties, when combined, increase the risk of undetected errors and theft. Segregation of duties is a preventive control designed to preclude improper activity and is essential to ensure that errors or irregularities are detected timely during the normal course of business.

B. The employee parking cash handling process is manual and does not include the use of a cash register as required by the Parking Management Agreement.

Cash is maintained in a cashbox accessible to other SP+ employees in the general office area and pre-numbered, hand written receipts are issued for payments; however, these receipts are not adequately tracked or reconciled. Article 4.1 of the Parking Management

Agreement requires BCAD to provide SP+ with a Parking Access and Revenue Management (PARM) System, including cash registers. The absence of cash register creates a lack of accountability and may reduce accuracy of cash transactions.

C. SP+ does not follow established County policy for past due accounts receivable.

We noted that SP+ does not perform timely collection efforts, and writes off uncollectible accounts without determination of collection status by the County Attorney's Office, or approval by the Board as required by County policy. Failure to comply with County policy may result in loss of parking revenue.

The Accounting Division Internal Control Handbook requires:

- ❖ a reasonably diligent effort, to collect County receivables;
- ❖ that delinquent receivables (outstanding 120 days or more) be referred to the County Attorney's Office for determination of collection status; and
- ❖ that uncollectible accounts be initially submitted to the Board prior to re-classification to inactive (uncollectible) status and again after a period of four years prior to removal from the Accounting records.

D. Internal controls over issued and unissued Proximity and DP cards are not adequate.

i. Management of Issued Cards

BCAD's and SP+'s established processes require that prior to the issuance of the Proximity card or DP card, tenant employees complete an application that must be authorized by the tenant's management representative (Station Manager). We noted the following:

- ❖ There was no evidence of authorization for 5% (4 of 86) Proximity Cards and 29% (12 of 41) DP cards sampled.
- ❖ Two Proximity Cards (one current account and one past due account) were authorized for two of 20 employees sampled.
- ❖ SP+ does not periodically confirm continued eligibility of Proximity cardholders.
- ❖ BCAD issued five DP cards to two tenants in excess of maximums authorized by the Administrative Code. Administrative Code provides for up to ten cards for tenants (See Exhibit 4).
- ❖ BCAD failed to bill monthly fees for six DP cards resulting in \$5,400 of unbilled revenues.

ii. Management of Unissued Cards

Proximity and DP cards are documents of value to the County as they represent either parking revenue or the displacement of parking revenue and should be protected from unauthorized use. We noted that card inventory controls are not adequate:

- ❖ Inventories of unissued cards and cards returned by former cardholders are not tracked.

- ❖ Employees who issue, activate and deactivate cards also have access to the inventory of unissued and returned cards creating a segregation of duties conflict.
- ❖ Card inventories are not periodically counted and reconciled by someone other than the card custodians. Volume 8 of the Internal Control Handbook requires that documents of value are inventoried and reconciled monthly by someone other than the custodian.

E. SP+ has no written procedures to guide staff through day to day processes for tenant employee parking.

SP+ does not have written procedures for employee parking operations to help ensure that transactions are processed uniformly and consistently, provide management directives, serve as a reference guide to staff, and aid in training and transitioning new employees. Lack of written procedures increases the risk of processing errors and inconsistencies.

F. BCAD failed to comply with Administrative Code and Florida Statutes regarding the collection of sales tax.

BCAD does not bill tenants and airlines for sales and use tax on fees for DP cards. Failure to comply with County policy and Florida Statutes leads to increased legal and tax liabilities.

Florida Statute Section 212.03(6) requires the collection of sales tax on fees for the use of parking. The Accounting Division Internal Control Handbook requires each County agency to collect State Sales and Use Tax in compliance with the Florida Statutes as they pertain to the agency's operation.

G. System controls restricting employees from parking outside of designated areas within Cypress Garage were not in operation for at least 3 months.

Employees are required to enter the employee access point on the 7th floor of the Cypress Garage within 15 minutes of entering in order to park in the designated employee parking area and exit without paying hourly and daily fees. On March 16, 2016, we tested the security access controls on level 7 of the Cypress garage and found no 15-minute restriction preventing admittance to the employee parking area. HUB repaired the controls on May 11, 2016. SP+ and HUB confirmed that the 15 minute restriction was not in place for months (undetermined) prior to our test date. During the time this system control was not in operation, employees were able to park in any airport parking garage, displacing self-parking revenue. The amount of lost self-parking revenue could not be determined.

Recommendations

We recommend the Board of County Commissioners direct the County Administrator to require BCAD to work with SP+ and HUB to:

1. separate incompatible duties so that more than one individual is responsible for completing a process or transaction;
2. install cash registers as required by the parking management agreement;

3. follow County policies and procedures for accounts receivables, including write-off of uncollectible accounts;
4. document procedures for the management of issued and unissued Proximity and DP cards to ensure that:
 - a. properly completed and authorized applications support the issuance of each Proximity and DP card;
 - b. card issuance procedures are adequate to preclude an employee from having more than one Proximity Card;
 - c. inventory and segregation of duties controls over unissued Proximity and DP cards are implemented;
 - d. periodic reviews of Proximity Cardholders to confirm continued eligibility are performed;
 - e. the number of DP cards issued to tenants comply with the Administrative Code; and
 - f. amounts due for all unauthorized cards are billed and collected.
5. develop written procedures to guide staff through day to day processes for tenant employee parking;
6. include sales and use tax on monthly fees billed for DP cards;
7. collect sales and use tax on prior parking fees billed to tenants and remit taxes collected to the State of Florida; and
8. periodically test employee parking system access restrictions to ensure they are operational.

***Finding #2:
Operations Controls***

Lack of adequate oversight of employee parking operations

A. BCAD does not adequately reconcile employee parking payments received by SP+ and does not record accounts receivable in the County's financial records.

BCAD records only the amounts deposited by SP+ in the County's bank account in the County's financial records; however, BCAD does not periodically reconcile payment transactions processed in the billing system used by SP+ (CARS) to amounts deposited in the County's bank account to validate that deposits are complete as recommended in Report 11-01. In addition, we noted that BCAD does not record accounts receivable in the County's financial records as required by County policy and Generally Accepted Accounting Principles.

BCAD does not have access to the SP+ billing and collection system and their failure to reconcile deposits against system revenue reports increases the risk that errors and inappropriate activity will not be detected. Failure to record accounts receivable in the County's financial records understates revenue and reduces the integrity of the County's financial statements.

The Accounting Division Internal Control Handbook states: *“When goods or services are provided by a County agency and payment is not received at the time of delivery, this transaction results in a receivable.*

- 1) *The receivable must be recorded in the accounting system of the County.*
- 2) *The receivable must be monitored to ensure payment.”*

Generally Accepted Accounting Principles require revenues to be properly recorded in the financial records, including unpaid revenues (accounts receivable).

B. BCAD and SP+ charge or waive certain parking fees without approval by the Board of County Commissioners.

During our review, we noted the following:

- ❖ Fees for stolen DP cards are waived by BCAD with a police report resulting in loss of revenue. Chapter 39.2 does not authorize a waiver of the replacement fee of \$35 with a police report.
- ❖ SP+ charges a \$35 replacement fee for lost Proximity cards and waives the fee for stolen cards if the employee provides a police report. Chapter 39.2 does not authorize a replacement fee of \$35 or a waiver with a police report.

Chapter 39.2 of the Administrative code establishes all authorized fees for Aviation. Article 6.9 of the Parking Management Agreement states “Operator shall charge users of the Airport’s parking facility only those rates which are established in writing by the County”.

Recommendations

We recommend the Board of County Commissioners direct the County Administrator to require BCAD to work with SP+ to:

9. periodically reconcile payment transactions in CARS to amounts deposited in the County’s bank account;
10. record accounts receivable from parking operations in the County’s financial records; and
11. ensure that parking fees are collected or waived only as authorized by Chapter 39.2 of the Administrative Code.

Background – Parking Information Systems

Overview of Parking Information Systems

There are four parking information systems used to manage employee parking activity (WebPARCS, CARS, PARIS and ADAPT). Exhibit 6 shows the primary function, administrator, and owner for each parking information system.

Exhibit 6 Parking Information Systems			
System	Primary Function	Administrator	Owner
WebPARCS	Software controls parking devices, equipment and components. Activation and deactivation of courtesy parking (DP) cards.	HUB	BCAD
CARS/eCARS	Tenant employee parking billing and payment processing system for Proximity Cards.	SP+	SP+
PARIS	Activation / deactivation of Proximity Card accounts. Manages account holder information.	HUB	BCAD
ADAPT	Employee parking activity tracking and validation.	HUB	BCAD

Our review included an evaluation of the information systems general controls for these systems to ensure that they comply with County policy and industry best practices. Information system general controls includes automated and manual processes to ensure that:

1. access to computer resources (data, equipment, and facilities) is reasonable and restricted to authorized individuals;
2. changes to information system resources are authorized and systems are configured and operated securely and as intended;
3. incompatible duties are effectively segregated; and
4. contingency planning:
 - a. protects information resources and minimize the risk of unplanned interruptions; and
 - b. provides for recovery of critical operations should interruptions occur.

Findings 3 to 5 relate to our evaluation of the information systems general controls for parking information systems.

Findings – Parking Information Systems

**Finding #3:
Physical and
Environmental Controls**

BCAD's IT server rooms lack adequate physical and environmental controls

A. Environmental controls are not adequate in the server room to maintain an environment suitable for valuable computer resources and data.

Parking information systems are housed in an enclosed room in an Airport parking garage. This room does not have sufficient environmental controls to safeguard valuable computer resources including adequate temperature, humidity, and fire suppression systems. As a result, the servers used to support employee parking operations are not adequately protected against fire, water or temperature fluctuations increasing the risk of outages and lost data.

Federal information systems guidelines require that appropriate environmental controls are implemented to prevent or mitigate potential damage to facilities and interruptions in service⁷.

B. An excessive number of individuals have physical access to the server rooms housing parking information systems.

An excessive number of employees have physical access to server rooms housing parking information systems increasing the risk of theft, modification, or accidental damage to critical parking system resources and data. At the time of our review, we noted that access was not appropriately restricted to the least number of people based on job responsibilities:

- ❖ 187 individuals had access to backup servers and databases.
- ❖ 42 individuals had access to production servers and databases.

Federal information systems guidelines⁸ require that access to facilities are limited to personnel having a legitimate need for access to perform their duties. It also requires that management periodically review the list of persons authorized to have physical access to sensitive facilities, including contractors and other third parties.

Recommendations

We recommend the Board of County Commissioners direct the County Administrator to require BCAD to work with SP+ and HUB to;

12. evaluate the continued suitability of the primary location for production parking information systems;
13. ensure that appropriate procedures are in place to restrict physical access based on job responsibilities; and

⁷ Federal Information Systems Controls Audit Manual, Contingency Planning (CP-2.2)

⁸ Federal Information Systems Controls Audit Manual, Access Controls (AC-6.3)

14. periodically review physical access to validate that only those individuals who require access as part of their job responsibilities are authorized.

**Finding #4:
Information Security
Controls.**

Lack of compliance with County information technology security policies and industry best practice within parking information systems.

A. Security controls in the PARIS application are not adequate to tie transactions within the application to a specific user and access is not restricted based on job responsibilities.

Users of the PARIS application are not required to log-in to gain access to the application, and system files supporting PARIS can be modified by any user. Access is not restricted based on job duties as required by County policy⁹. The PARIS application does not have the functionality to enforce appropriate security controls increasing the risk of unapproved or inappropriate additions, modification, or deletion of employee parking data and files.

B. Security controls in the ADAPT application are not adequate to tie system administrator activity within the application to a specific user and restrict user access based on job responsibilities.

We noted the following security weaknesses:

- ❖ HUB IT support personnel share an administrator, supervisor, and test account to manage the ADAPT application. The use of shared accounts reduces user accountability as activity cannot be tied to one individual and violates County policy against sharing passwords¹⁰.
- ❖ Password and account lockout settings¹¹ do not meet the minimum requirements set by County policy¹².
- ❖ User access is not appropriately restricted based on job responsibilities and appropriate segregation of duties are not enforced as required by County policy¹³. All users have administrator access and can perform all functions.

The combination of issues noted above increase the risk of unauthorized or inappropriate access and modifications to employee parking transactions.

⁹ County Administrative Policy and Procedures (CAPP), Volume 7: Enterprise Technology Services (ETS) Chapter 3: IT Administration, Section 5.2.L

¹⁰ County Administrative Policy and Procedures (CAPP), Volume 7: Enterprise Technology Services (ETS) Chapter 2. Acceptable Use Policy, Section 5.2.E

¹¹ Center for Internet Security, CIS Microsoft Windows Server 2012 R2, v1.1.0, Section 1.2.1-3; 2.3.7.3

¹² County Administrative Policy and Procedures (CAPP), Volume 7: Enterprise Technology Services (ETS) Chapter 2. Acceptable Use Policy, Section 5

¹³ County Administrative Policy and Procedures (CAPP), Volume 7: Enterprise Technology Services (ETS) Chapter 3: IT Administration, Section 5.2.L

C. The WebPARCS application security is not managed and configured according to BCAD's policies and procedures.

The WebPARCS application is not managed and configured according to BCAD's policies and procedures. During our review we noted the following:

- ❖ All sections of WebPARCS Access Request Form are not consistently completed as required by WebPARCS policies and procedures when requesting or modifying user access to the WebPARCS application. The access request form outlines and authorizes each employee's access based on job responsibilities as well as acknowledgements by management and the employee on compliance with BCAD's policies.
- ❖ User access is not consistently implemented on the WebPARCS application as authorized by management on the access request form.
- ❖ User access reviews are not consistently performed as required by WebPARCS User Review and Access Request Procedures and County policy¹⁴.
- ❖ Three of 41 employee accounts no longer requiring access to the WebPARCS application were not disabled or removed¹⁵ as required by County policy. One of these accounts was assigned to a terminated employee, and the other two accounts belonged to employees who changed job responsibilities and no longer required access.
- ❖ BCAD documented specific access permissions and restrictions for groups of employees in the WebPARCS Access Policy. These access permissions define what these groups of users are allowed and not allowed to do on the application. We compared the access permissions defined in the policy against the access permissions granted in the application and noted that the WebPARCS group access permissions deviated from access permissions defined in the WebPARCS Access Policy. This includes the granting of administrator capabilities to users who do not require this access for the performance of job responsibilities.

The combination of issues noted above increase the risk of unauthorized or inappropriate access and modifications to parking transactions.

D. Minimum password requirements for the Cashier's system (FXCR) do not comply with County policy.

Cashier passwords do not expire every 45 days as required by County Policy¹⁶ increasing the risk of unauthorized or inappropriate access to the Cashiering system.

¹⁴ County Administrative Policy and Procedures (CAPP), Volume 7: Enterprise Technology Services (ETS) Chapter 3: IT Administration, Section 4.1

¹⁵ County Administrative Policy and Procedures (CAPP), Volume 7: Enterprise Technology Services (ETS) Chapter 3: IT Administration, Section 4

¹⁶ County Administrative Policy and Procedures (CAPP), Volume 7: Enterprise Technology Services (ETS) Chapter 2. Acceptable Use Policy, Section 5

E. Change management procedures are not documented and do not enforce appropriate segregation of duties for infrastructure changes.

Management has implemented a process to authorize, test and document changes made to the parking applications as part of a change requested by BCAD or in support of a change made by the vendor; however, we noted the following:

- ❖ Management has not documented established change management policies or procedures related to these applications as required by Federal information system controls standards¹⁷.
- ❖ Changes to parking applications are tracked manually in a separate spreadsheet and not in the ticketing system where these changes are reviewed and approved as required by federal information system controls standards¹⁸.
- ❖ Change management procedures do not ensure proper segregation of duties as required by federal information system controls standards¹⁹. We noted that the same individual authorizes, performs and tests infrastructure changes supporting the parking applications.

Lack of documented procedures and appropriate segregation of duties for infrastructure changes may lead to inappropriate or unauthorized changes to parking applications and infrastructure.

F. The domain administrator account is shared by three users reducing user accountability.

The domain administrator account has full control of the Aviation network and servers on which the parking information systems hosted by BCAD reside. This account is shared by three users; therefore, activity performed by this account cannot be tied to one individual reducing user accountability and increasing the risk of inappropriate activity. A compromise of this account potentially jeopardizes the reliability of the control functions for the network on which the parking information systems reside. Federal information systems standards²⁰ discourages the use of shared accounts.

Recommendations

We recommend the Board of County Commissioners direct the County Administrator to require BCAD to work with SP+ and HUB to:

15. ensure that application, network, and database security features comply with County information security policies;
16. ensure that a periodic review of user access to parking applications is performed to validate that access is assigned based on job responsibilities and appropriate segregation of duties. This should include a review of group profile permissions to which employees are assigned;
17. ensure that employees no longer requiring access to parking information systems, including terminated employees, are removed immediately;

¹⁷ Federal Information Systems Controls Audit Manual, Change Management Controls (CM-3.1.1)

¹⁸ Federal Information Systems Controls Audit Manual, Change Management Controls (CM-3.1.14)

¹⁹ Federal Information Systems Controls Audit Manual, Change Management Controls (CM-3.1.12)

²⁰ Federal Information Systems Controls Audit Manual, Access Controls (AC-2.1.12)

18. ensure the use of shared passwords is restricted;
19. ensure that change management policies and procedures are documented and that changes are tracked in the ticketing system; and
20. enhance the current change management process to ensure that infrastructure changes are not authorized, performed and tested by the same individual.

**Finding #5:
Contingency Planning**

Disaster Recovery and Business Continuity Plans are inadequate.

A. Disaster Recovery and Business Continuity Plans do not include key requirements of Federal information security standards.

Management has documented its system backup procedures and manual processes related to parking operations in the absence of information technology systems; however, management has not developed a disaster recovery or contingency plan that includes the following Federal information security standards²¹:

- ❖ assessment of the criticality and sensitivity of business applications through a Business Impact Analysis (BIA) or equivalent;
- ❖ documentation of resources required to support critical operations and functions;
- ❖ detailed procedures for recovery and reconstitution of the system's (infrastructure, operating systems, applications, data) original state after a disruption including system test and data validation procedures;
- ❖ documentation and management's approval of processing priorities;
- ❖ periodic training for operational and support personnel on their emergency roles and responsibilities;
- ❖ inclusion or reference to incident response plans and communication plans to be used in an emergency;
- ❖ requirements for the periodic testing, revalidation, or enhancement of recovery procedures;
- ❖ spare or backup hardware to be used in meeting system recovery time objectives defined in the BIA;
- ❖ documentation of approval by key affected groups, including senior management, information security and data center management, and program managers;
- ❖ clear assignments and responsibilities for recovery;
- ❖ identification of an alternate processing facility and the backup storage facility;
- ❖ identification critical data files;
- ❖ sufficient detail to be understood by all entity managers; and

²¹ Federal Information Systems Controls Audit Manual, Contingency Planning Controls (CP-3.1)

- ❖ coordination with related plans and activities (vendor, agency wide).

The absence of a comprehensive disaster recovery and contingency plan inhibits management's ability to recover or restore business applications and functions timely in the event of a disaster.

Recommendations

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

21. enhance current disaster recovery documentation and create a comprehensive business continuity plan including the elements listed in Finding #5 above;
22. periodically test the plan under conditions that simulate a disaster at least annually once a comprehensive plan has been developed and approved; and
23. document test results and continually update the plan based on the test results.

Status of Recommendations: Airport Parking Systems Review (Report No. 11-01)

Overview of Airport Parking Systems Review (Report No.11-01)

On September 13, 2011, (Item No. 33), the Office of the County Auditor presented its AV Parking System review (Report No. 11-01) to the Broward County Board of County Commissioners. The report presented the results of our review of the WebPARCS²² system at the Fort Lauderdale-Hollywood International Airport. The purpose of the review was to assess the general controls for the management and administration of the WebPARCS system as well as controls over parking transactions.

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 was 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 were at risk due to noted deficiencies in internal controls.

Our 2011 report included specific recommendations designed to address these deficiencies and improve management of the WebPARCS system and controls over parking operations.

We followed-up on the status of the recommendations included in Report No. 11-01 and documented our observations in Appendix A. **Our review disclosed that BCAD had not addressed 60% of the recommendations included in Report No. 11-01 as of September 22, 2016.**

Recommendations that have not yet been addressed are included in the body of this report as referenced in Appendix A.

²² In 2011, the WebPARCS system was known as PARCS

Appendix A

A: Status of Prior Audit Recommendations

The following table summarizes the findings and recommendations contained within the prior Airport Parking Systems Review report and the remediation status of each recommendation as of September 22, 2016. Findings and recommendations for the items that had **not** been remediated are included in the body of this report as referenced below.

#	Finding	#	Recommendation	Management's Response	Status as of September 22, 2016
1.	Parking contract administration is not adequate to ensure accountability for purchased vendor services, compliance with contract provisions and optimization of system functionality.	a.	Increase the level of BCAD oversight of parking contractor activities and the administration of contracted services.	Agree with recommendations. Staff is pursuing restitution from CTR for the loss of revenue as a result of the future date system malfunction and expects for this issue to be resolved by October 31, 2011.	Not Remediated (See Finding #2)
		b.	Validate CTR's estimated impact of the future date system malfunction and determine the potential for recovery of lost revenues.	CTR has committed additional resources to rectify system deficiencies affecting the integrity of revenue processing, transactional data collection, and the overall operational success of PARCS.	Resolved <i>No such instances were noted in the current period.</i>
		c.	Establish a higher priority for CTRs response to system issues affecting the integrity of revenue processing and transaction data.	In addition to process improvements, staff will prepare monthly parking program updates to the BCAD Director for review, ensuring that issues are addressed in a timely manner.	Resolved
		d.	Routinely review parking operations to enable timely identification, evaluation and implementation of improvements to customer service, cost reductions, or competitive position.		Resolved

#	Finding	#	Recommendation	Management's Response	Status as of September 22, 2016
		e.	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.		Resolved
		f.	Require CTR to perform regular testing and validation of recovery plans in accordance with their agreement.		Not Remediated (See Finding #5)
		g.	Establish periodic updates and progress reports on parking initiatives to the Director of BCAD.		Resolved
2	The accuracy and integrity of parking revenues are at risk due to deficiencies in internal controls.	a.	Implement procedures to reconcile parking revenues to operating activity reports.	Agree with recommendations, and many have already been implemented.	Resolved
		b.	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.	Staff has incorporated additional reconciliation procedures consistent with the Auditor's recommendations. Staff has worked with the vendor, USA Parking Management, to implement an on-line payment solution for the Employee Parking Program to streamline the revenue collection process. The on-	Not Remediated (See Finding #2A)

#	Finding	#	Recommendation	Management's Response	Status as of September 22, 2016
		c.	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.	line payment option will serve as an audit mechanism and will include verification of signatures on file, current account status with a new expiration date, and valid authorization from the tenant managers.	Not Remediated (See Findings #1D and 2B)
		d.	Restrict administrator access privileges to the minimum number of users required for system management responsibilities, and institute regular monitoring of system administrator activities.	Additional protocols were implemented to administer the Courtesy Parking Program and manage Restricted Administrator Access privileges to PARCS. In support of this initiative, BCAD Staff has discontinued the use of validation stamps to eliminate potential misuse of the Courtesy Parking privilege.	Not Remediated (See Finding #4C)
		e.	Establish group profiles which match system access privileges to assigned duties/work tasks.		Not Remediated (See Finding #4C)
		f.	Establish a BCAD process for managing requests to CTR for maintenance of security access accounts including verifying timely completion.		Not Remediated (See Finding #4C)
		g.	Establish cashier password controls to align access security settings with BCAD Information Security Policy.		Not Remediated (See Finding #4D)
		h.	Establish controls over courtesy parking to ensure parking fees are only waived in accordance with the Administrative Code.		Not Remediated (See Finding #2B)