PRINCE WILLIAM COUNTY

Prince William County, Virginia
Internal Audit Report: Smart Device Management

May 16, 2019

RSM

PRINCE WILLIAM COUNTY

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TRANSMITTAL LETTER

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May 16, 2019

The Board Audit Committee of
Prince William County, Virginia
1 County Complex Court
Prince William, Virginia 22192

Pursuant to the internal audit plan for calendar year ending ("CY") 2018 for Prince William County, Virginia ("County" / "PWC"), approved by the Board of County Supervisors ("BOCS"), we hereby present the internal audit of smart device management. We will be presenting this report to the Board Audit Committee of Prince William County at the next scheduled meeting on June 25, 2019.

Our report is organized into the following sections:

Executive Summary	This provides a high-level overview and summary of the observations noted in this internal audit, as well the respective risk ratings.
Background	This provides an overview of the smart device management and utilization, as well as relevant background information.
Objectives and Approach	The objectives of this internal audit are expanded upon in this section, as well as a review of our approach.
Observations Matrix	This section gives a description of the observations noted during this internal audit and recommended actions, as well as Management's response including responsible party, and estimated completion date.
Process Maps	This section illustrates proposed future state process maps.

We would like to thank the staff and all those involved in assisting our firm with this internal audit.

Respectfully Submitted,

RSM US LLP

Internal Auditors

PRINCE WILLIAM COUNTY

EXECUTIVE SUMMARY

Background

Cellular devices (smart devices) such as, cell phones, 4G Tablets, and air cards/MiFis are assigned to County employees by their respective departments based on business need. All devices are purchased and owned by the County, there are no device allowances or reimbursements.

The County's smart device management is decentralized. Therefore smart devices are purchased and managed at the department/agency level. Each department has their own variation of the process for purchasing, monitoring, and deactivating smart devices.

AirWatch, a mobile device management application, is utilized for information security on the County's devices. This application is used for device provisioning, security and encryption. The Department of Information Technology (DoIT) is responsible for provisioning all devices, but some departments/agencies, such as the Police Department and the Department of Fire and Rescue, have access for their own staff to add devices to AirWatch which will notify DoIT to complete the provision.

There is no county-wide policy for smart device management, but all departments must follow the DoIT policy for *Acquisition of Information Technology Goods and Services #3.2*; the Finance Department's *Asset Disposal Procedure Governed by Purchasing Regulation §1000*, as well as the *Inventory and Controlled Non-Capital Assets Accounting and Control Policy.*

There is no designated smart device budget for the County or individual Departments. We estimated total spend on related services of ~$2,335,414 for fiscal year ending June 30, 2018, based on invoices related to major cellular providers identified in the system of record.

Overall Summary / Highlights

The observations identified during our assessment are detailed within the pages that follow. We have assigned relative risk or value factors to each observation identified. Risk ratings are the evaluation of the severity of the concern and the potential impact on the operations of each item. There are many areas of risk to consider in determining the relative risk rating of an observation, including financial, operational, and/or compliance, as well as public perception or 'brand' risk'.

Objectives and Scope

The primary objective of this internal audit was to assess opportunities to centralize oversight, usage monitoring and change control management (policies and procedures), with the goals of improvements to process efficiencies, productivity gains, and to intensify County-wide cost reduction measures. The focus also included the use of computer assisted audit techniques ("CAATs") for data analytics, where data usage information was available, and could be reasonably formatted in a manner conducive for analytics to be performed.

It should be noted that because of the decentralized nature of contract management, there were challenges and limitations of the availability of vendor invoice records. In order to analyze usage data, one (1) month worth of invoices was requested from the forty-six (46) surveyed departments/agencies. Sixty-nine (69) invoices were received from twenty-five (25) departments/agencies from one or multiple providers. RSM manually transposed the data from the sixty-nine (69) invoices into a format feasible for data analytics.

We were not able to obtain completeness of the data, as such there are limitations on the extent of the data analytics that could be performed and results identified in this report.

The scope of this audit included smart devices (cell phones, 4G tablets, and Air Cards) that incurred monthly charges during the audit period of fiscal year ending June 30, 2018.

Information technology governance over smart device management, information security controls and smart device decommissioning and salvage compliance risks were not included within the scope of this internal audit, but will be considered as a future audit area.

Fieldwork was performed October 2018 through February 2019.

Summary of Observations Ratings
(See page 4 for risk rating definitions)

	High	Moderate	Low
Smart Device Management	-	4	-

We would like to thank all County team members who assisted us throughout this audit.

EXECUTIVE SUMMARY – CONTINUED

Observations Summary

Following is a summary of the observations noted in the areas reviewed. The detailed observation is included in the observations matrix section of the report. Definitions of the rating scale are included below.

Summary of Observations	
Observations	**Rating**
1. Smart Device Strategy and Management	**Moderate**
We recommend that DoIT develop and own the smart device strategy and administration process; and that the County employ a more modern approach to smart device issuance authorization, usage monitoring, and physical inventory verification, etc. Currently, there is no County-wide smart device strategy. Smart devices are independently procured and managed at the department/agency level. In addition, there is no County-wide policy and procedure in place for management and oversight of smart devices and the related processes.	
2. Purchasing and Contract Management	**Moderate**
We recommend development of a plan to consolidate contracting and maximize buying power, while at the same time not jeopardize operations. Because all departments/agencies handle devices their own way, inefficiencies in how devices are acquired may be missed. The County could improve this with a strong partnership across the Finance Department/Purchasing Division and DoIT. Supporting Data: We estimated that ~$146,017 is spent annually across departments/agencies for the labor cost to manage a non-optimized telecom and device management program. The County utilizes several different contracts among the four (4) major cellular providers (AT&T, Sprint, Verizon, and T-Mobile) for the procurement of related devices and services. It was estimated that ~ 59 devices are incurring monthly access charges greater than the highest priced unlimited (talk/text/data) plan currently contracted with existing county vendors ($65) amounting to ~$1,447/month, ~$17,364 annually, in potentially unnecessary costs.	
3. Usage Monitoring	**Moderate**
We recommend the establishment and implementation of a smart device monitoring process by the DoIT, with accountability for and participation in regular reviews of device usage by the departments/agencies who utilize smart devices. Supporting Data: An estimated 657 devices with monthly access charges amounting to ~$24,769, incurred either zero or low cellular usage; the questioned costs would be equal to $297,228 in annual costs for zero or low cellular use devices. We anticipate an even greater number of questioned devices actually exist since data was not provided form all of the departments/agencies surveyed.	
4. Smart Device Inventory	**Moderate**
We recommend the establishment and implementation of an annual smart device monitoring inventory process by the DoIT, with required procedures and reporting by the department/agency. Supporting Data: It is estimated that there are over 2,800 voice and data devices issued to and used by County employees. We noted that the departments/agencies do not maintain complete smart device inventories, nor perform physical inventories, including the associated service plan, or have an inventory system in place, in order to safeguard and account for these wireless devices and services.	

EXECUTIVE SUMMARY – CONTINUED

Observations Summary – Continued

Provided below is the observation risk rating definitions for the detailed observations.

Observation Risk Rating Definitions	
Rating	**Explanation**
Low	Observation presents a low risk (i.e., impact on financial statements, internal control environment, brand, or business operations) to the organization for the topic reviewed and/or is of low importance to business success/achievement of goals.
Moderate	Observation presents a moderate risk (i.e., impact on financial statements, internal control environment, brand, or business operations) to the organization for the topic reviewed and/or is of moderate importance to business success/achievement of goals. Action should be in the near term.
High	Observation presents a high risk (i.e., impact on financial statements, internal control environment, brand, or business operations) to the organization for the topic reviewed and/or is of high importance to business success/achievement of goals. Action should be taken immediately.

BACKGROUND

Overview

The purpose and objective of a smart device (cell phones, 4G tablets, and air cards/MiFis) program is to provide County employees the ability to perform their duties effectively, with flexibility, and to improve communication channels throughout the County. Prince William County's smart device program management is decentralized, and all devices are purchased and owned by the County, there are no device allowances or reimbursements.

As of fiscal year ending June 30, 2018, the County spent ~$2,335,414 on smart device services. **Figure 1**, illustrates the breakdown of expenditures by department/agency, as well as the number of different service providers each department/agency utilized.

Smart devices are purchased by and assigned to County employees by their respective department/agency based on business need. The departments/agencies are responsible for managing and monitoring usage of their smart devices. Each department/agency has their own variation of the process for purchasing, monitoring, and deactivating smart devices.

Since each department/agency is responsible for managing their own smart device program, they are also responsible for negotiating their contracts with cellular providers. Departments/Agencies either use a "rider" contract or negotiate their price/terms for the procurement of devices and associated service plans. "Rider" contracts are intended to benefit the County by utilizing a vendor selection process already performed by another local government.

DoIT is responsible for provisioning the mobile devices, which involves installing all of the required safety and security software on the mobile devices to manage County data and prevent data sharing with inappropriate parties or networks. The software and system utilized is called AirWatch. Once a device is provisioned, AirWatch deploys configuration policies to the smart devices upon enrollment that automatically apply County-defined settings, policies and restrictions, such as encryption and access passcodes. Some departments/agencies, such as the Police Department and the Department of Fire and Rescue, have access for their own IT Administrator(s) or staff to add devices to AirWatch which will notify DoIT to complete the provision.

Devices that fail to meet the following requirements are not able to gain access to the County's network and email: device must be encrypted, device must utilize a password (minimum 4 characters), device must lock after 15 minutes requiring password to unlock, device will wipe itself to factory default settings after 10 incorrect password login attempts, device must allow Exchange to manage the device (allows wipe, logging, etc).

There is no county-wide policy for smart device management, but all departments/agencies must follow the DoIT policy for *Acquisition of Information Technology Goods and Services #3.2*; the Finance Department's *Asset Disposal Procedure Governed by Purchasing Regulation §1000*, as well as the *Inventory and Controlled Non-Capital Assets Accounting and Control Policy.*

Figure 1: Smart Device Plan Expenditures FY18

Department Code	Department/Agency	# of Service Providers	Total Invoiced $
28	DoIT	3	$ 502,227.27
65	Fire & Rescue*	4	$ 448,136.00
71	Police	4	$ 430,822.89
72	Public Safety Communications	3	$ 270,223.12
44	Social Services	2	$ 118,415.65
46	Community Services	4	$ 114,764.82
13	Parks, Recreation & Tourism	2	$ 86,380.59
15	Public Works	2	$ 78,731.11
10	Development Services*	1	$ 62,953.55
73	Sheriff	1	$ 41,671.48
60	Adult Detention Center	2	$ 35,366.59
17	Transportation*	2	$ 26,630.76
20	Board of County Supervisors	2	$ 23,473.96
11	Economic Development*	1	$ 14,244.00
40	Aging	1	$ 13,483.56
22	County Attorney	1	$ 11,376.12
26	Human Resources	2	$ 8,454.51
42	Housing and Community Development	1	$ 6,838.55
90	Non-Departmental	1	$ 5,589.49
24	Executive Management	2	$ 5,115.15
68	Juvenile Court Services Unit	1	$ 4,824.19
12	Library	1	$ 4,648.10
25	Finance	2	$ 4,266.08
23	Elections	1	$ 3,798.54
14	Planning	1	$ 3,476.80
64	Criminal Justice Services	2	$ 2,836.55
63	Commonwealth Attorney	2	$ 2,287.11
27	Human Rights Office	1	$ 2,122.80
29	Management & Budget	1	$ 1,707.21
62	Clerk of the Court	1	$ 547.17
	Total		**$ 2,335,414**

BACKGROUND – CONTINUED

Data Analysis

In order to gain an understanding of smart device management at the decentralized level, we submitted surveys to forty-six (46) departments/agencies across the County, and conducted interviews with a sample of departments/agencies. We obtained responses to surveys from thirty-seven (37) departments/agencies.

It should be noted that because of the decentralized nature of contract management, there were challenges and limitations of the availability of vendor invoice records. In order to analyze usage data, one (1) month of invoices were requested from the forty-six (46) surveyed departments/agencies. Additionally, surveys were inconsistently completed by departments/agencies causing limited responses to certain questions. Therefore, analysis of responses and the charts developed vary in terms of departments/agencies included since information may not have been collected for specific aspects of a department's/agency's smart device program management. Sixty-nine (69) invoices from one or multiple providers were received from twenty-five (25) departments/agencies. RSM manually transposed the data from the sixty-nine (69) invoices into a format feasible for data analytics. We were not able to obtain completeness of the data, as such there are limitations on the extent of the data analytics that could be performed and results identified in this report.

Service Provider Contracting

Based on surveys and inquiry with forty-six (46) departments/agencies[1] the following vendors were identified as having active contractual agreements with the County as of fiscal year ending June 30, 2018.

Figure 2: Service Provider Contractual Agreements[2]

Vendor	Existing Contract	# of Depts. Utilizing Contract
AT&T	Rider Contract #4400006674 - Fairfax County Schools	2
Sprint	Rider Contract #4400006677 - Fairfax County Schools	7
	PO# 5022024 - Direct agreement w/ Sprint	1
	Rider Contract #1907 - State of Nevada Western States Contracting Alliance	5
	PO# 535651 - Direct agreement w/ Sprint	1
Verizon	Rider Contract #5000339 - State of Nevada Western States Contracting Alliance	1
	Rider Contract #1907 - State of Nevada Western States Contracting Alliance	5
	GSA Federal Supply Schedule Contract Number GS-35F-0119P	1
	Rider Contract #4400006679 - Fairfax County Schools	3
T-Mobile	Rider Contract #1907 - State of Nevada Western States Contracting Alliance	1

[1] Received contract detail responses from twenty-seven (27) of the 46 departments/agencies surveyed.

[2] Due to the decentralized nature of smart device management at PWC, we were not able to confirm completeness of the information received. As such, this may not include all contracts being utilized.

BACKGROUND – CONTINUED

Data Analysis – Continued

Invoice and Device Inventory

Based on of one (1) month of invoices received from twenty-five (25) of forty-six (46) department/agencies surveyed, the following is an estimated breakdown of the devices by service provider by department/agency.

Figure 3: Devices by Service Provider by Department/Agency

	# of phone numbers				
Department/Agency	**AT&T**	**Sprint**	**T-Mobile**	**Verizon**	**Total**
Fire & Rescue	-	3	101	1,067	**1,171**
Police*	11	606	66	3	**686**
Parks, Recreation & Tourism	-	-	-	249	**249**
Social Services	-	171	-	-	**171**
Development Services	-	-	-	147	**147**
Executive Management	-		-	46	**46**
Adult Detention Center	98	-	-	-	**98**
Sheriff	-	56	-	-	**56**
DoIT	6	13	-	9	**28**
Transportation	-	18	-	7	**25**
Finance	-	16	-	8	**24**
Library	-	-	-	23	**23**
Planning	-	22	-	1	**23**
Economic Development*	-	-	-	23	**23**
County Attorney	-	17	-	-	**17**
Criminal Justice Services	2	10	-	-	**12**
Housing and Community Development	-	10	-	-	**10**
Human Rights Office	-	6	-	-	**6**
Aging	-	4	-	-	**4**
Clerk of the Court	2	-	-	-	**2**
Management & Budget	-	2	-	-	**2**
Total	**119**	**954**	**167**	**1,583**	**2,823**

*Based on additional data provided by the department. All devices were not included in our invoice analysis.

BACKGROUND – CONTINUED

Data Analysis – Continued

Level of Effort Managing Devices

Based on the survey responses received, the following chart depicts the estimated labor costs associated with processing invoices and managing smart devices. An estimated labor rate of $30.25/hour was utilized, which is based on the average salary of an "Administrative Support Coordinator 1 / G 12" and "Administrative Support Coordinator 2 / G 13" positions, as depicted in the County's FY 2019 General Pay Plan. The labor rate does not include any fringe benefit costs.

Figure 4: Estimated Labor Costs of Current Smart Device Management Structure

Department/Agency	# of Employees	Processing Invoices (hrs./month)	Managing Devices (hrs./month)	Estimated Annual Labor Cost to Process Invoices	Estimated Annual Labor Cost to Manage Devices	Estimated Annual Total to Manage Program
Fire & Rescue	2	4.25	100	$ 1,543	$ 36,300	$ 37,843
Parks, Recreation & Tourism	1	2	60	726	21,780	22,506
Social Services	1	1	40	363	14,520	14,883
Adult Detention Center	3	3	35	1,089	12,705	13,794
Aging	1	1	20	363	7,260	7,623
Community Services	1	6	15	2,178	5,445	7,623
Economic Development	4	2	16	726	5,808	6,534
Police	1	3	15	1,089	5,445	6,534
DoIT	1	8	1	2,904	363	3,267
Finance	7	2.5	6	908	2,178	3,086
Public Works	2	4	4	1,452	1,452	2,904
Housing and Community Development	2	1.5	5	545	1,815	2,360
Library	2	2	4	726	1,452	2,178
Transportation	5	4	2	1,452	726	2,178
Public Safety Communications	1	5	1	1,815	363	2,178
County Attorney	1	1	4	363	1,452	1,815
Commonwealth Attorney	1	1	4	363	1,452	1,815
Executive Management	3	1.25	3	454	1,089	1,543
Board of County Supervisors	1	2	2	726	726	1,452
Planning	2	2	0	726	-	726
Elections	1	1	1	363	363	726
Human Resources	1	1	1	363	363	726
Criminal Justice Services	1	0.5	1	182	363	545
Sheriff	1	0.5	1	182	363	545
Human Rights Office	1	0.5	0.5	182	182	363
Management & Budget	1	0.25	0.25	91	91	182
Juvenile Court Services Unit	1	0.25	0	91	-	91
Totals	**49**	**60.5**	**341.75**	**$ 21,962**	**$ 124,055**	**$ 146,017**
Average Per Department	*1.8*	*2.2*	*12.7*	*$ 813*	*$ 4,595*	*$ 5,408*

BACKGROUND – CONTINUED

Data Analysis – Continued

Zero-Usage

Based on one (1) month of invoices received from twenty-five (25) of forty-six (46) department/agencies surveyed, it is estimated that there are approximately four-hundred-and-forty (440) devices with zero-usage for that billing month, with an estimated monthly cost of $15,361. These zero-usage devices did not have minutes, texts, or data used and were included on detailed invoices obtained. Not all invoices obtained included the detail required to be included in this analysis.

Figure 5: Zero-Usage Analysis

Department/Agency	1 Month of Zero-Usage Access Charges	# of Devices
Fire & Rescue[1]	$ 8,724	253
Parks, Recreation & Tourism	$ 2,311	70
Social Services	$ 1,101	31
Adult Detention Center	$ 931	31
Development Services	$ 504	14
Executive Management	$ 474	11
DoIT	$ 287	8
Finance	$ 236	5
Transportation	$ 205	4
Library	$ 181	4
County Attorney	$ 178	3
Police	$ 74	2
Sheriff	$ 53	2
Planning	$ 56	1
Criminal Justice Services	$ 46	1
Total	**$ 15,361**	**440**

[1] Public Safety holds emergency devices that are not utilized unless an emergency event occurs that requires them. Therefore, Public Safety departments/agencies may currently have a higher number of zero-usage devices relative to other departments/agencies.

OBJECTIVES AND APPROACH

Objectives

The primary objective of this internal audit was to assess opportunities to centralize oversight, usage monitoring and change control management (policies and procedures), with the goals of improvements to process efficiencies, productivity gains, and to intensify County-wide cost reduction measures. The focus also included the use of computer assisted audit techniques ("CAATs") for data analytics, where data usage information was available and could be reasonably formatted in a manner conducive for analytics to be performed.

The scope of this audit included smart devices (cell phones, 4G tablets, and air cards/MiFis) that incurred monthly charges during the audit period (fiscal year ending June 30, 2018). We were not able to obtain completeness of the data, as such there are limitations on the extent of the data analytics that could be performed and results identified in this report.

Approach

Our audit approach was consistent with our internal audit methodology, which consisted of the following phases:

Understanding and Documentation of the Process

During this phase of this audit, we conducted interviews with the appropriate representatives from the Finance Department and the Department of Information Technology ("DoIT") to discuss the scope and objectives of the audit work, obtained preliminary data, and established working arrangements. We obtained and reviewed 1) copies of financial information; 2) applicable Code of Virginia regulations and County policies related to this audit and 3) other documents deemed necessary; and performed walkthroughs of the process(es) and key controls to gain an understanding of the function and assess the design of the process/key controls. In order to gain an understanding of smart device management at the decentralized level, we submitted surveys to forty-six (46) departments/agencies across the County, and conducted interviews with a sample of departments/agencies. We obtained responses to surveys from thirty-seven (37) departments/agencies.

Evaluation of the Design and Operating Effectiveness of Process and Controls

The purpose of this phase was to test operations, compliance and internal controls based on our understanding of the processes obtained in the first phase. Audit steps included procedures such as vouching, analysis, and review where applicable. It should be noted that because of the decentralized nature of contract management, there were challenges and limitation of the availability of vendor invoice records. Thus, in order to gain an understanding of the cost of the rate plans, we requested one (1) month of invoices from forty-six (46) departments/agencies. We received sixty-nine (69) invoices from twenty-five (25) departments/agencies and manually transposed the data from the invoices into a format feasible for data analytics. Specific procedures performed included:

- Assessed internal controls over existence (inventory) of billed smart phone devices/services.
- Assessed adequacy of personnel smart device usage monitoring.
- Determined if department/agency and County-wide smart device contracts, including usage plans, are appropriately maximized, consistent with the best-interests of the County, and are monitored and updated in order to maximize the utilization of cost reduction measures.
- Assessed department/agency smart device acquisition (determination of who require a smart device and purchasing process)/ activation and return/ deactivation controls are adequate.
- Performed data analytics, by transposing sixty-nine (69) invoices for one billing period, to identify: zero and low-usage devices, devices utilizing international plans, devices with monthly access charges greater than the lowest priced unlimited plans, and duplicate usernames.
- Assessed the adequacy of applicable policies, procedures and guidelines for consistency and completeness.

Reporting

At the conclusion of this audit, we summarized our findings into this report. We conducted an exit meeting with the appropriate Management personnel, and have incorporated Management's response into this report.

OBSERVATIONS MATRIX

Observation	1. Smart Device Strategy and Management
Moderate	Currently, there is no County-wide smart device strategy, and smart devices are independently procured and managed at the department/agency level. Noted below are policies and procedures related to certain aspects of the smart device process. There is no County-wide policy and procedure in place for management and oversight of smart devices and the related processes. • The Department of Information Technology ("DoIT") Policy, *Acquisition of Information Technology Goods and Services #3.2* • The Finance Department's *Inventory and Controlled Non-Capital Assets Accounting and Control Policy* • The Finance Department's *Asset Disposal Procedure Governed by Purchasing Regulation §1000* A fully decentralized smart device management approach, combined with a lack of smart device management policies and procedures increases the County's risk of process inefficiencies; productivity losses; and fraud, waste and abuse of County funds and resources. Documented policies and procedures for smart devices serve to establish guidance and define expectations and consequences for noncompliance.
Recommendation	<u>Centralized Smart Device Strategy and Administration, with Decentralized Management</u> Over the years, it has been noted that smart device management has emerged as an essential component of an organization's information technology (IT) function. In order to maximize business opportunities and minimize IT challenges and risk, and to be in alignment with the County's IT Modernization Plan, we recommend 1) the development of a County-wide smart device strategy that aligns with the current information technology modernization goals, and 2) centralization of smart device management. The development of the smart device strategy and administration of the centralized smart device process should be a responsibility of the DoIT function; with specific smart device implementation and management aspects such as smart device issuance authorization, usage monitoring, and physical inventory verification being the responsibility of the departments/agencies. The County utilizes the approach of centralized process strategy and administration, with decentralization of the management of the process for various processes such as: employee out boarding, timekeeping, purchase card, purchasing, contract administration and inventory. This approach can create efficiencies, while providing departments/agencies the functionality they require for operations. Development of a County-wide smart device strategy and implementation of this process will require input and collaboration between DoIT and various County departments/agencies. The DoIT will need to appropriately prioritize risks, activities and resources along with the various on-going and planned initiatives. In addition, to avoid disrupting critical service requirements/accessibility of certain County functions, such as public safety, implementation should occur in a phased approach. In addition, departments such as Police and Fire & Rescue may have deviations from a true centralized approach. It should be noted that, because of the level of risk and exposures due to mandatory service requirements (i.e. 24/7 accessibility) and other intricate deployment responsibilities and requirements, the Police Department and Department of Fire & Rescue currently have high functioning smart device management processes. As such, there is a potential for synergy and leverage of lessons learned by the Police Department and the Department of Fire & Rescue. For example, smart device management functions could be performed by civilian positions as opposed to sworn officers for these departments. <u>Policies and Procedures</u> As the smart device program administrator, we recommend that DoIT develop centralized and standardized policies and procedures over the smart device management program. The policies and procedures should specifically address DoIT's responsibilities for supporting smart device services, including procedures to be followed by DoIT and County personnel responsible for smart device administration processes. The policy should be reviewed and updated periodically to meet the needs of the County, departments/agencies, and users.

OBSERVATIONS MATRIX – CONTINUED

Observation	1. Smart Device Strategy and Management – Continued
Recommendation – continued	Policies and Procedures – continued The policy should address aspects of smart device management program, including: • Defined purpose and scope; • Clearly defined roles and responsibilities, both at the user and department/agency level; • Governance, compliance, acceptable use, training/user awareness, and exceptions to the policy; • Management of sensitive or confidential data; • Remote access to the network, including acceptable access methods; • Minimum security configurations (for example, password requirements and encryption); • Acceptable use of mobile devices; • Ownership of/access to County data (regardless of device ownership); • Acquisition (device and plan) – Defining and documenting the business need of a device for each user at the time of approval, allowing for the most appropriate and cost effective phone plan to be selected for each device. In addition, centralized purchasing/contract management, **see Observation #2**; • Device issuance – i.e. acknowledgement form; • Usage monitoring – **See Observation #3**; • Device deactivation/disposal and removal of County data; and • Inventory / tracking both active and inactive devices, i.e. other than through the wireless provider's invoice, **see Observation #4**. Duties should be segregated for critical smart device administration processes, including but not limited to: processing requests or orders, receiving devices, activating services and recording and making changes to inventory records.
Management's Action Plan	**Response:** DoIT sees very strong potential in this area and is prepared to advance accordingly. This would be driven from our Infrastructure Division which is currently executing the IT Modernization. **Responsible Party:** DoIT – Telecom Services Management Program (Not yet Created) **Estimated Completion Date:** TBD (based on IT Modernization and HCM as top priorities – Estimate late FY 2020 for program deliverables listed). Comprehensive and scalable system that can address • Asset Inventory and Telecom Bundles • Product Recommendations & Standards • Monitor and Manage Device Assignment and Usage • Integrated Contact & Services Management • Dispute Detection & Resolution • Chargeback • Dashboards and Reporting

OBSERVATIONS MATRIX – CONTINUED

Observation	2. Purchasing and Contract Management
Moderate	Currently, each County department/agency has responsibility over procuring smart devices and the related contract management. In order to gain an understanding of smart device management at the decentralized level, we submitted surveys to forty-six (46) departments/agencies across the County, and conducted interviews with a sample of departments/agencies. We obtained responses to surveys from thirty-seven (37) departments/agencies. ***Time spent by County Resources*** Based on survey responses, the following was noted (**see Figure 4**): • ~49 employees are involved in the management of smart devices throughout the County. • ~403 hours in total are spent each month in smart device activities. o ~61 hours are spent each month processing cellular invoices. o ~342 hours are spent each month managing smart devices. Current hourly labor costs, for the employees most commonly in the positions responsible for smart device management, amount to ~$30.25 per hour, excluding fringe benefits. Therefore, we estimate ~$146,017 is spent annually in labor costs related to the management of smart devices throughout the County. While tasks may be completed appropriately in the current decentralized structure, this creates potential for large inefficiencies and ineffective processes. A decentralized program increases the risk of inefficient allocation of County resources by duplicating the work of processing invoices, monitoring devices, and the maintenance of devices across each department/agency. ***Varying Contracts*** Based on survey responses, the following was noted: • The County is currently utilizing ten (10) different contracts with the four (4) major cellular providers (AT&T, Sprint, Verizon, and T-Mobile) for the procurement of related devices and services. **See Figure 2** • Because of the decentralized nature of contract management, the County has limited insight into the procurement of devices and varying plans utilized. • ~ 59 devices are incurring monthly access charges greater than the highest priced unlimited (talk/text/data) plan currently contracted with existing county vendors ($65) amounting to ~$1,447/month, ~$17,364 annually, in potentially unnecessary costs. • It is estimated that there are over 2,200 devices issued to County employees utilizing a variety of contracts. The decentralized nature of the process likely limits the County's ability to negotiate and maximize better rates or discounts. Having a decentralized process does provide certain benefits including, having a relationship with carrier representatives for pending national programs, 24/7 support as required by the departments/agencies, and the ability to negotiate for required coverage and competitive rates. On the flip side, a decentralized function can create fragmented contracts and service plans which result in overall higher costs, decreased control and potentially higher security risks.

OBSERVATIONS MATRIX – CONTINUED

Observation	**2. Purchasing and Contract Management – Continued**
Recommendation	To minimize costs and maximize efficiencies, the County should devise a plan to consolidate contracting and maximize buying power, while at the same time not jeopardize operations. While lowering total costs is important and a benefit of consolidating service plans, maintaining adequate service coverage will be critical for certain operations such as Public Safety. The Purchasing Office and DoIT, in collaboration with certain departments such as public safety agencies, will need to identify specification requirements such as the geographical service coverage areas that are of greatest concern to the County. The County may choose to contract with different carriers, but consolidate the bulk of devices with one vendor. There is no "one-size-fits-all" plan. Consolidation of contracts should lead to discounted pricing and a reduction in time spent by County resources. The level of effort and need for continuous coverage should not be underestimated when consolidating plans. DoIT will need to collaborate with the departments/agencies to properly account for the amount of time consolidation of the process will take. Factors such as the complex requirements (i.e.; changes due to network type or network changes) and costs (i.e.; configuration costs) associated with switching/consolidating contracts need to be considered as part of this process. County departments/agencies should be required to review smart device shipments, verify and certify order quantities, and send receiving reports to DoIT. DoIT should then be responsible for comparing the purchase order, receiving reports, and invoice quantities and pricing prior to approving smart device provider invoices. Consolidation and centralization of the plans will allow contract monitoring procedures to be performed within DoIT as the smart device program owner. **See Observation #1** for details regarding a phased-approach for implementation.
Management's Action Plan	**Response:** Management concurs with this recommendation. As we modernize the County Infrastructure, we will look to modernize how we buy technology, and especially Telecommunications services (including high speed circuits and 5G networks as 5G becomes available). The Finance Department/Purchasing Division and DoIT will work collaboratively to form a cross-functional team to develop the specifications and requirements for contract consolidation, including conducting a cost benefit analysis in regards to the issuance of a County specific RFP for phone services and mobile devices versus consolidating the majority of devices to a few cooperative contracts as such options do represent very effective options for saving time and money for state and local governments. However, this initiative will require a significant time commitment of staff resources by Finance and DoIT and will need to be prioritized against other major initiatives such as IT Modernization. **Responsible Party:** Finance Department/Purchasing Division and DoIT **Estimated Completion Date:** TBD

OBSERVATIONS MATRIX – CONTINUED

Observation	3. Usage Monitoring

Moderate	As previously noted, each department/agency is responsible for managing and monitoring smart devices, with varying approaches to monitoring usage. There is no standard procedure for monitoring devices and usage.
	
	In order to gain an understanding of smart device management at the decentralized level, we submitted surveys to forty-six (46) departments/agencies across the County, and conducted interviews with a sample of departments/agencies. We obtained responses to surveys from thirty-seven (37) surveyed departments/agencies. The following was noted:
	• The majority of the departments/agencies noted that they do not obtain device usage reports from their service providers.
	• Departments/agencies did not have consistent procedures for monitoring smart devices within the department/agency.
	
	Usage Monitoring
	It should be noted that because of the decentralized nature of contract management, there were challenges and limitations of the availability of vendor invoice records. In order to analyze usage data, one (1) month of invoices were requested from the forty-six (46) surveyed departments/agencies. Sixty-nine (69) invoices from one or multiple providers were received from forty-two (42) departments/agencies. RSM manually inputted the data from the sixty-nine (69) invoices into a format feasible for data analytics. We were not able to obtain completeness of the data, as such there are limitations on the extent of the data analytics that could be performed and the results identified this report.
	
	Note the following analysis was performed on only one (1) month of data and should not be used to represent the full fiscal year, but to illustrate the importance of having proper monitoring controls in place.
	
	An estimated 657 devices with monthly access charges amounting to ~$24,769, incurred either zero or low cellular usage. We anticipate an even greater number of questioned devices actually exist since data was not provided form all of the departments/agencies surveyed. While these costs appear marginal relative to the County's budget when annualized they become much more material. In this case, the questioned costs would be equal to $297,228 in annual costs for zero or low cellular use devices. The below is a breakout of this analysis:
	• ~440 devices had zero-usage (data, voice, text) with monthly access charges amounting to $15,361. **See Figure 5**
	  o Note: public safety agencies maintain emergency devices in the case that an event occurs which requires additional devices to be immediately available.
	• ~126 devices, with zero voice or text activity, utilized less than 100 MB of data with monthly access charges amounting to $5,349. While calculating data requirements for smart device functions is not an exact science, generally, an email uses 1 MB to send, an hour of internet browsing uses 50 MB, and an hour of navigation app uses 100 MB. Therefore, devices which utilize less than 100 MB of data, with no voice or text incurred, can be considered low-use.
	• ~91 devices utilized less than 30 minutes of voice minutes and less than 10 texts with monthly access charges amounting to $4,059.
	  o ~21 of these devices utilized less than 30 minutes of voice minutes, less than 10 texts, and zero data with monthly access charges amounting to $450.
	  o ~16 devices utilized less than 30 minutes of voice minutes, less than 10 texts, and less than 100 MB data with monthly access charges amounting to $755.
	
	Monitoring procedures surrounding smart device management allows for timely identification of usage inconsistencies, improper usage, and/or potential cost saving opportunities.

OBSERVATIONS MATRIX – CONTINUED

Observation	3. Usage Monitoring – Continued
	Multiple and/or Duplicative Devices Per review of the invoices, it appears that each device has a username (typically first and last name of user) assigned which appears on each invoice. Usernames allow for effective invoice review since it provides reviewers transparency and a complete listing of who holds each device. The following was noted: • 72 usernames, were used for three or more devices, associated with a total of 684 devices (~31% of all devices). • 109 device usernames were blank (~5% of all devices). Since there is no asset tracking for smart devices, including phones numbers and device location, we were unable to determine if County employees are actually assigned multiple devices such as, a phone, tablet with cellular service, or air card/MIFI, including the business need of multiple devices. In addition, we were unable to determine if devices and plans are issued to former employees of the County. County employees with multiple devices of the same type require restrictive controls to prevent: • Users from having more devices than they need, resulting in unnecessary County costs; and • Device lending, which promotes the circumvention of controls around data security, device contracting and device user tracking.
Recommendation	We recommend the establishment and implementation of a smart device monitoring process by the DoIT, with required review and reporting by the department/agency. The objective of monitoring procedures should facilitate timely identification of inconsistencies, improper usage, and/or to identify possibly cost savings (for example zero-usage, international charges, hotspots, in addition to MiFis, "pay as you go", bring your own device etc.), if any. In addition, DoIT should consider utilizing a system to intake carrier data related to all County smart devices to allow for automated monitoring and reporting. Monthly invoices can be voluminous, therefore manual monitoring by departments/agencies may be unreasonable, cost prohibitive, and yield and inconsistent result. Elements of the monitoring process should include: • Generation of a monthly zero-usage report by DoIT to facilitate identification of devices that have not been utilized during the previous three (3) consecutive months. The respective department/agency designated contact would be notified of those devices that haven't been used for three months or longer and are responsible for requesting deactivation if deemed necessary. • Departments/agencies to report inconsistencies, and/or to identify possible savings to DoIT and the respective department/agency Director within 30 days of receiving their respective monitoring reports. • Require carrier data to be uploaded and department/agency notification be disseminated by the fifth (5th) business day of each month. An individual from the Finance Department should notify DoIT, if they have not received their notification by the fifth (5th) business day of the month. • Establish guidelines for departments/agencies to facilitate for proper wireless device monitoring and required action. For example, the County may decide that if a device has had zero-usage for more than three (3) consecutive months and the department/agency has not provided an appropriate response, that the device should be deactivated by DoIT. • Thresholds and exceptions to the rule should be established and defined, such as a device with zero-usage for a consecutive number of months will be deactivated unless they have email approval (exception) from the appropriate party. This exception list is critical since certain departments/agencies require devices that may not be utilized frequently (i.e. emergency devices). Another example could be instances where certain devices be on a "Do Not Deactivate" list, which would be re-evaluated annually by DoIT to determine if the need is still valid and justified.

OBSERVATIONS MATRIX – CONTINUED

Observation	3. Usage Monitoring – Continued
Recommendation – continued	Elements of the monitoring process should include: - continued • All devices which utilize a global/international plan should be reviewed to validate necessity. If international access is no longer necessary the plans should be reverted to a domestic plan. A review should occur at least semi-annually to identify any international plans which may be no longer needed. • All emergency devices should be clearly named, tracked, and utilize cellular plans which are optimal for a device not used for long periods of time (ex. "pay-as-you-go"). All emergency devices should appear on the departments cellular bill as "Emergency #" or similar and be clear for any reviewer. • Protocols to limit individuals from having both an activated "hot spot" on their wireless device and use of a MiFi. If a "hot spot" provides enough WiFi bandwidth/functionality for a user, a MiFi should not also be utilized. If a MiFi is required due to "hot spot" limitations, a MiFi should be utilized and the "hot spot" should be deactivated. • Review all users identified for having multiple devices of the same type. Inquiries should be made to users to determine if the associated user is actually utilizing all of the devices. If they are sharing devices, no longer use the device(s), or the device(s) has switched owners the information within AirWatch should be updated. Any necessary steps to bring newly identified users into compliance should be completed. This can be performed as part of the annual inventory process, **see Observation #4**. • Periodically review the smart device listing for users who are no longer employed with the County, and cancel respective unauthorized services. This should be part of an employee's out-boarding process. See observations noted in the Out-boarding report accepted by the BOCS May 10, 2016, in which the observations reported remain open at this time.
Management's Action Plan	**Response:** DoIT could perform this function and would plan to automate several aspects of the recommendations for "***Elements of the monitoring process***" listed page). DoIT has invested in mobile security products that will allow us to pursue secure BYOD policies and practices that will further cut the cost of mobile devices for the County. **Responsible Party:** DoIT – Telecom Services Management Program (Not yet Created) **Estimated Completion Date:** TBD (based on IT Modernization and HCM as top priorities. Estimate: FY2020 with resources to develop program)

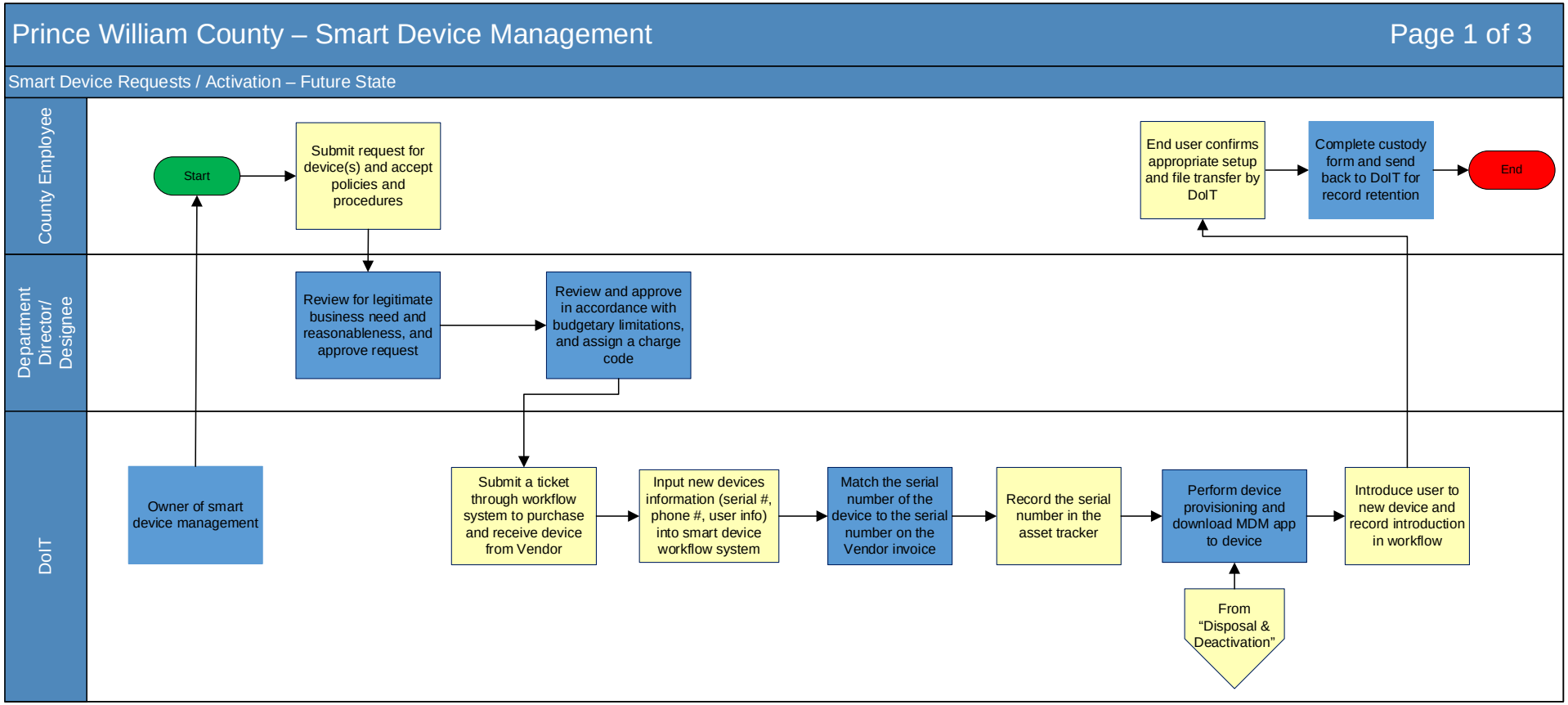
OBSERVATIONS MATRIX – CONTINUED

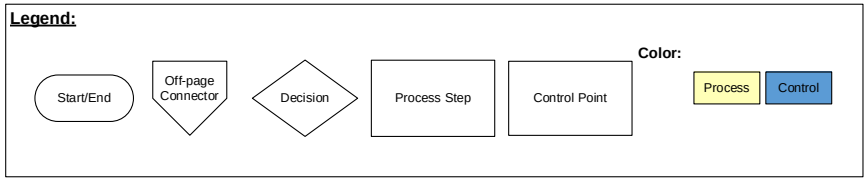
Observation	4. Smart Device Inventory
Moderate	It is estimated that there are over 2,800 voice and data devices issued to and used by County employees. We noted that the departments/agencies do not maintain complete smart device inventories, nor perform physical inventories, including the associated service plan, or have an inventory system in place, in order to safeguard and account for these wireless devices and services. While the value of a smart device itself may be less than $500, loss of the device or unauthorized access to the data on that device could result in consequences exceeding the value of the device. Thorough inventory processes reduce the risk of unauthorized and invalid use.
Recommendation	We recommend the establishment and implementation of an annual smart device monitoring inventory process, including service plan review, by the DoIT, with required procedures and reporting by the department/agency. At a minimum, the following should be performed: • The County should work to identify and implement an enterprise accountable asset system to track all assets assigned to County employees, allow for employees to receive automated emails periodically (ex. quarterly) and click to certify those assets are still in possession, and improve the off-boarding process of employees. The proper solution will allow for tracking, monitoring and management of smart device assets, service providers and service plans. Having a system such as this allows for non-capital assets to be better managed, reduces unnecessary spending, and improves accountability throughout the County. This system should be used for all assigned assets not only wireless devices. • Require execution of a formalized and documented annual inventory process, including review and sign-off of results by an independent knowledgeable supervisory level person or designee within each department/agency, with review and sign-off by DoIT. The purpose of the inventory should be to validate existence of the smart device and completeness of inventory records. The inventory records should include the below, at a minimum: o User's name or employee identification number; o Department/Agency and associated cost center; o Smart device unique identification number; o Type of device; and o Service plan type and cost. • Require each department/agency to confirm active smart devices for which expenditures are being incurred; • Compare inventory count results to control records and report discrepancies to DoIT; • Unaccounted for wireless devices should be deactivated immediately; and • Include the above as policies and procedures including responsibilities for involved parties, and appropriate document retention requirements for an audit trail.

OBSERVATIONS MATRIX – CONTINUED

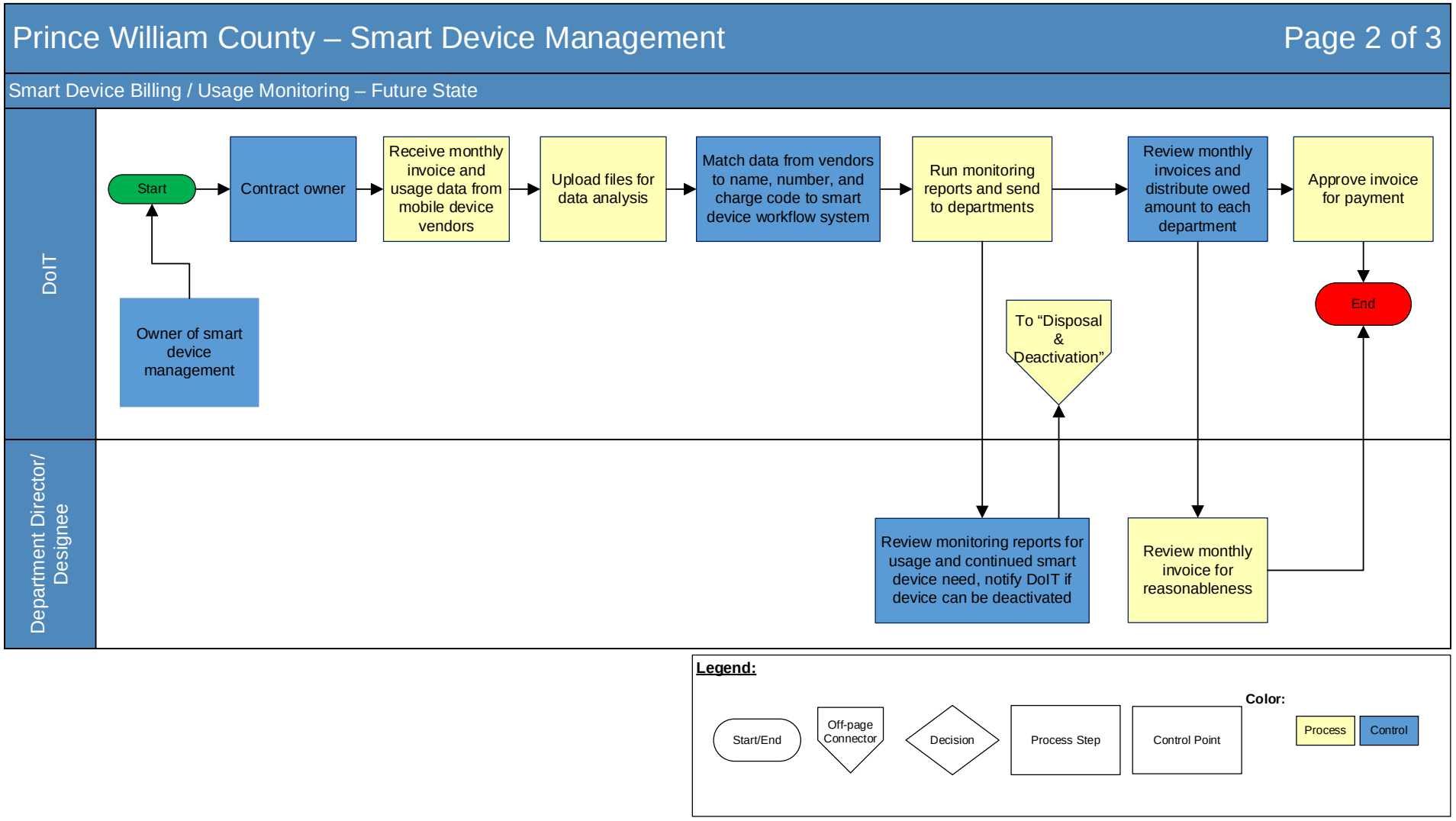
Observation	4. Smart Device Inventory – Continued
Management's Action Plan	**Response:** DoIT could execute the Inventory requirement here by taking advantage of existing PC asset tracking processes and enhanced technology that we have identified to manage telecom services and enhance the inventory process. We have also identified a Telecommunications Operations Management Software platform that could be used to manage the entirety of the processes mentioned in this audit finding. We would leverage Cloud Software As A Service offerings to meet this requirement. **Responsible Party:** DoIT – Telecom Services Management Program (Not yet Created) **Estimated Completion Date:** TBD (FY2020 with resources to develop program)

PROCESS MAPS

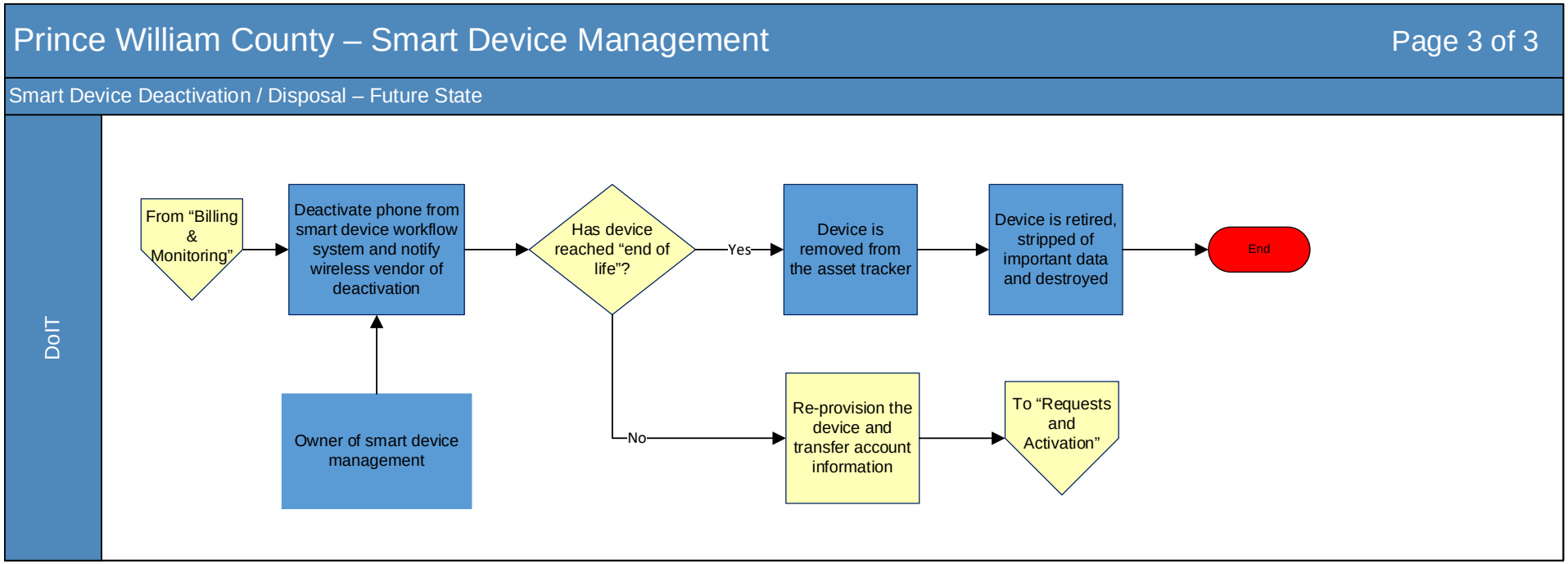




PROCESS MAPS – CONTINUED



PROCESS MAPS – CONTINUED



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