PRINCE WILLIAM COUNTY

Prince William County, Virginia
Fire and Rescue System Apparatus Maintenance Analysis

September 4, 2020

RSM

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PRINCE WILLIAM COUNTY

TABLE OF CONTENTS

Transmittal Letter 1

Executive Summary 2

Background 3

Objectives and Approach 13

Observations Matrix 14

Summary Analysis 16

Individual Departmental Analysis 21

Process Maps 30

Appendix 39

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TRANSMITTAL LETTER

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September 4, 2020

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") 2019 for Prince William County, Virginia ("County" / "PWC"), approved by the Board of County Supervisors ("BOCS"), we hereby present the Fire and Rescue System Apparatus Maintenance Analysis. We will be presenting this report to the Board Audit Committee of Prince William County at the next scheduled meeting on September 22, 2020.

Our report is organized into the following sections:

Executive Summary	This provides a high-level overview and summary of the observations noted in this analysis.
Background	This provides an overview of processes surrounding the apparatus maintenance system, as well as relevant background information.
Objectives and Approach	The objectives of this analysis are expanded upon in this section.
Analysis	This section a summarization of the current maintenance practices and future state recommendations, by each Department.
Process Maps	This section provides a visual depiction of the workflow of key maintenance processes as currently performed at each Department.

We would like to thank the County's Fire and Rescue System and all those involved in assisting our firm with this analysis.

Respectfully Submitted,

RSM US LLP

Internal Auditors

PRINCE WILLIAM COUNTY

EXECUTIVE SUMMARY

Background

23 fire stations operate within nine distinct Departments across the County

~363 apparatus assets owned and operated the Fire & Rescue System ("System")

~$2.4M average annual spend on apparatus maintenance

Governance

System: the combined structure (career + volunteer) created to deliver fire, rescue and emergency management services as defined in PWC Code Chapter 9.2 (adopted August 2017)

7-Member System Executive Committee:

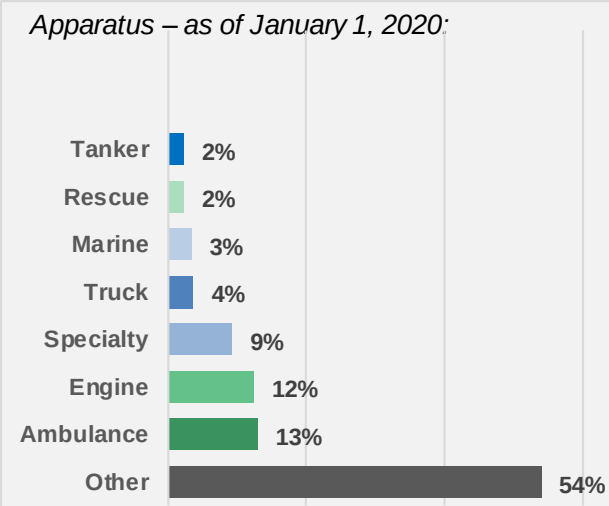
- 3 Volunteer Fire & Rescue Department ("VFD") Chiefs
- 3 Assistant Chiefs
- Operational Medical Director

Apparatus Fleet Infrastructure and Maintenance Committee

New Fleet Manager Role: Streamline and centralize asset management

Apparatus Analysis

Apparatus – as of January 1, 2020:



Analysis Highlights

Summary: Apparatus maintenance and management is siloed with no system-wide asset management system in place to support Fire & Rescue operations. Some fire and rescue stations within the System lacked the technological capability to produce basic asset maintenance data, which is vital to an effective apparatus management program within the System. As detailed in this report, to effectively move from the current siloed approach to a highly functioning asset management program, we recommend the System centralize maintenance management.

We also noted that third-party vendor contracts supporting the County's apparatus maintenance program are nearing expiration. We believe this is a great opportunity to bring key System leaders together to work with the Finance Department -- Procurement Services Division to review all maintenance contracts and issue new solicitation(s), helping to harness the purchasing power of the County.

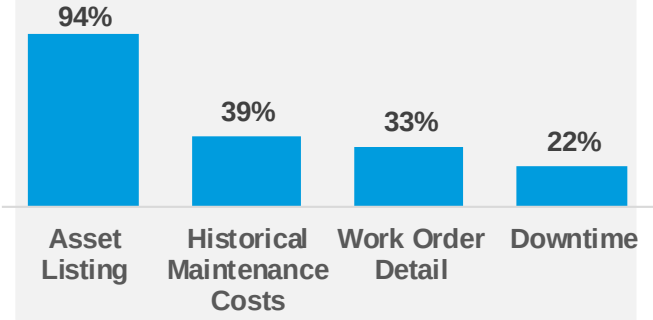
Key Risks:

- Limited ability to assess and confirm apparatus readiness, which is critical to safely delivering firefighting and emergency medical services to residents of the County
- Inability to quickly identify historical maintenance activities by apparatus
- Inability to quickly quantify historical maintenance costs by apparatus
- Manual tracking of online/offline status of apparatus may limit agility of the System to re-assign assets for critical needs
- Strategic planning hampered by available information, and based on incomplete data
- Disaggregated use of vendors may limit competition and increase costs

~70 Vendors utilized for maintenance since 2016

5 Systems utilized to manage assets

Information readily available from Departments:



BACKGROUND

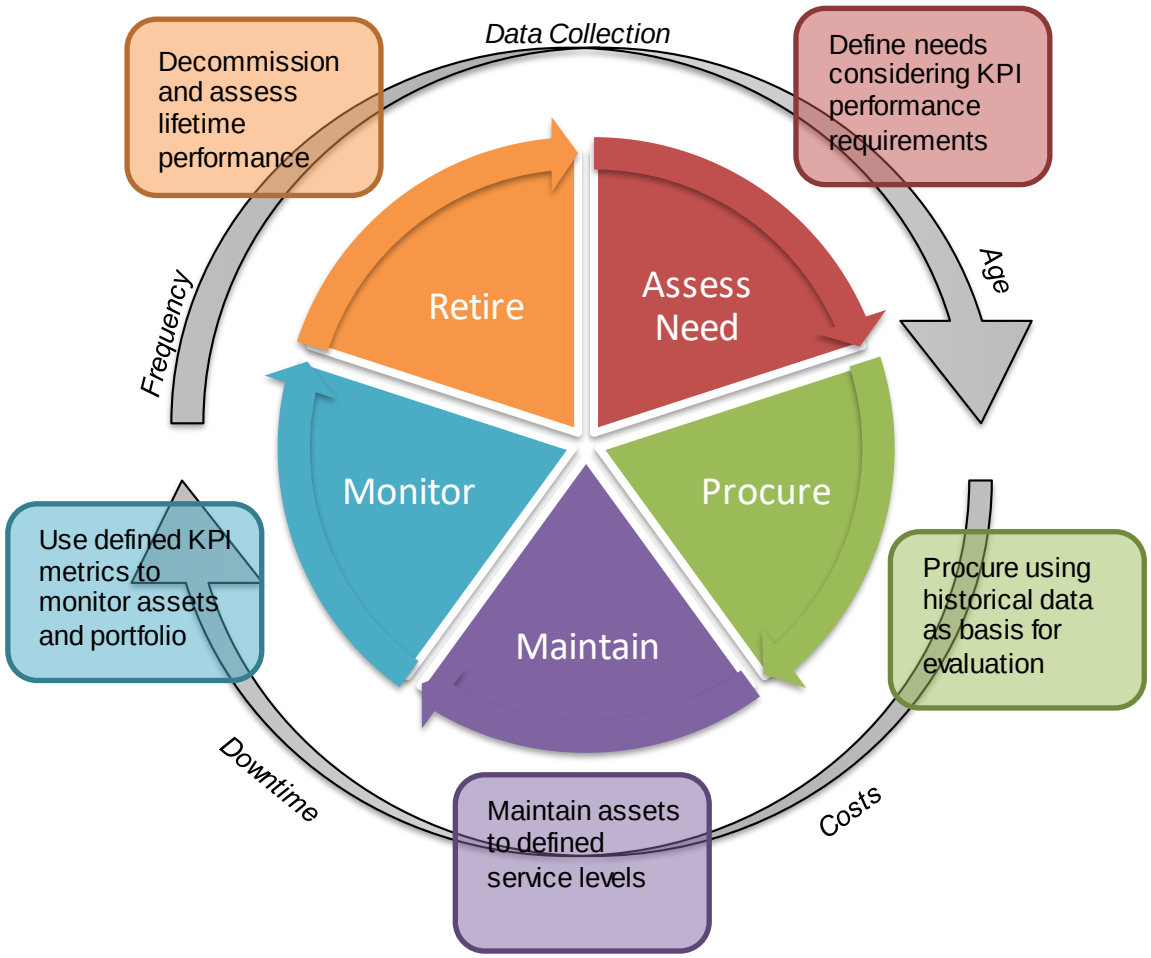
Defining Asset Management

Asset management refers to the processes that organizations use to monitor, maintain, upgrade, and replace capital assets throughout the asset lifecycle. Overall, effective asset management is the practice of managing capital assets to minimize the total cost of owning and operating assets, while maintaining the desired level of readiness. The asset lifecycle starts at the assessment of need and procurement continues with ongoing preventative and corrective maintenance, monitoring of portfolio (apparatus) health, and ends with the retirement of assets at determined thresholds. Throughout each of these processes, the collection and analysis of data is a key component to effective and informed decision-making.

A high performing asset management program can provide extensive benefits, such as:

- Prolonging asset life and improving decisions about asset rehabilitation, repair, and replacement;
- Meeting purpose demands with a focus on asset availability;
- Budgeting focused on critical activities for sustained performance;
- Meeting service expectations and regulatory requirements;
- Improving responses to emergencies;
- Improving the safety of assets; and,
- Reducing overall costs for both operations and capital expenditures.

Critical to the success of a high-performing asset management program is the collection of accurate data, as access to data provides management with information necessary to make informed decisions. Whether through analysis of historical data to measure long-term performance, or through analysis of recent data to quickly identify emerging trends and issues, the consistent and accurate collection of data is crucial to providing a foundation for accurate decision-making.



Current Capabilities

As detailed in the pages that follow, we noted that the System currently lacks the ability to provide many of the critical data elements described above in an efficient and consistent manner. This is likely due to the current siloed approach to asset management, where each Department is responsible for the scheduling, tracking, and data collection of maintenance for the assets assigned to the Department. To fully realize the advantages of a highly functioning asset management program, the System will need to integrate and centralize several key processes.

BACKGROUND – CONTINUED

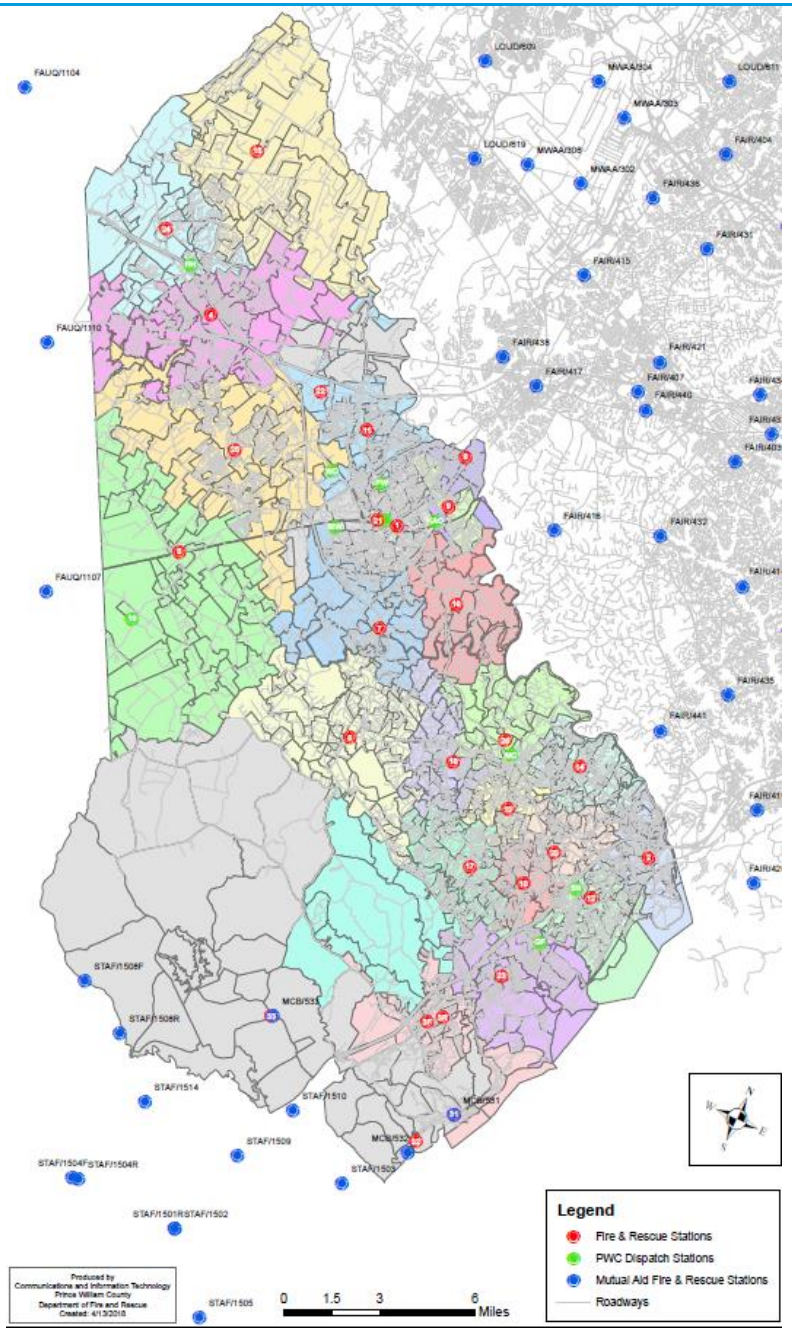
Fire and Rescue System Overview

The Prince William County Fire and Rescue System is comprised of the County's Department of Fire & Rescue ("DFR") and eight Volunteer Departments. These organizations are responsible for the provision of fire, rescue, and emergency medical services programs to Prince William County. Between the nine Departments, the County provides funding for 23 fire and rescue stations. The System operates as a combination system, with flex/combined staffing at many stations to provide 24-hour services to residents of the County.

The System's Executive Committee ("Committee") advises and consults the System Chief on matters such as policies, procedures, strategic planning, finances, audits, training requirements, and system-wide discipline of volunteer members. The Committee is comprised of seven members: three Volunteer Chiefs; Department of Fire & Rescue Deputy Chief and two Assistant Chiefs *(or other career employee designee as appointed by the System Chief)*; and the County's Operational Medical Director.

With respect to the current asset management function, each Department within the System is responsible for the assets within the Department. In an effort to streamline and centralize the collection of asset information and deployment, the System recently created a Fleet Manager role. Responsibilities of this position include assisting in the coordination of maintenance and fleet activities across the System. These activities include monitoring the health of the fleet, assisting in the coordination of replacements for downtime, continuous monitoring of maintenance schedules and vendors, and assisting in gathering and analyzing fleet data to help the System make informed decisions.

The Fleet Manager role is critical to the future state recommendations noted within this report. As described above, the role will assist in the centralization of certain key functions and data collection, and act as a liaison between all Departments. As more data becomes available, the role will also be a critical component of the continuous monitoring and analysis function. As the function increases, and as recommended below, the need to expand from a single role to a team is apparent.



BACKGROUND – CONTINUED

Fire and Rescue Apparatus

Each Department utilizes specialized equipment, which provide unique capabilities tailored to the Department's community and location. For example, some Departments maintain boats due to close proximity to the waterways, while others maintain all-terrain vehicles ("ATVs") to navigate through rough terrain.

Below is a chart summarizing each Department's fire and rescue assets (apparatus), as identified during an inventory count conducted in January 2020:

	Number of Each Apparatus by Department*								
	Ambulance	Engine	Rescue	Tanker	Truck	Specialty**	Marine	Other***	Total
Buckhall VFD	2	2		1		1		4	10
Dale City VFD	6	7	1		2	4		19	39
Department of Fire & Rescue	22	14	4	4	6	12	4	99	165
Dumfries-Triangle VFD		4	1	1		4		15	25
Lake Jackson VFD	2	2		1		3	5	6	19
Nokesville FD	4	4		1	2	3		10	24
OWL VFD	6	7	1		2	6	3	30	55
Stonewall Jackson VFD	2	2			1			5	10
Yorkshire VFD	2	2	1					5	10
Total	46	44	8	8	13	33	12	193	357

*provided by the Department of Fire & Rescue, compiled during an inventory conducted in January 2020
**examples include: Air Units, Attack, Brush Trucks, Canteen, Collapse Units, Command Units, Haz-Mat Units, MCU, Rehab, SWR Tow Vehicles, TSU
***examples include: Chief's vehicles, CIT, Emergency Management, EMS OPS, FMO, Health and Safety, Trailers, Training, Utilities

The following tables summarize the purchase costs of the apparatus assets owned by the County, as well as a count of the apparatus assets owned by the Volunteer Departments. Assets owned by the County are included within the fixed assets module within the County's financial management system, ASCEND; however assets owned by the Volunteer Departments are excluded from accounting records. Refer to the Observation section below for details related to the variance between the 159 assets included in the inventory count, and the 125 assets included in the County's accounting records.

System Assets Titled to County***	
Total owned	125
Total original cost	$ 18,153,984
Average original cost	$ 145,231

***provided by PWC Finance Department -- Financial Reporting and Control Division, Capital Assets team

System Assets Titled to Volunteer Departments	
Total Owned	204
Total Original Cost****	$ 34,729,512
Average Original Cost****	$ 170,243

****estimates provided by DFR Administrative Division

BACKGROUND – CONTINUED

Fire and Rescue Apparatus Maintenance

Apparatus maintenance activities can be generally categorized as either preventative or corrective. Preventative maintenance includes those tasks performed on a piece of equipment in order to reduce the chance of failure or need for future corrective maintenance. Preventative maintenance includes procedures such as oil changes, fluid checks, and annual inspections. Corrective maintenance is work performed on a piece of equipment that has already failed and requires repair to bring the asset back to service.

Currently, each Department has individual processes for handling and tracking the preventative and corrective maintenance for their apparatus.

Monitoring Fire and Rescue Apparatus Maintenance

Currently, each Department has individual systems and processes for managing the preventative and corrective maintenance for their apparatus. Many of the Departments utilize software tools to assist in asset management efforts; however, the functionality of each Department's software varies, depending on the tools utilized, and the level of implementation.

Many of the Volunteer Departments use a system called Volunteer Management System ("VMS"). VMS is a web-based management system that was designed specifically to help volunteer fire departments manage their day-to-day operations. The system can be used to track recruiting, training programs, duty schedules, certifications, assets, and asset maintenance. Using an individual login, any member of the department can open the status board to view the status of any apparatus that is waiting for maintenance or view the tickets that have been opened in the past that are now closed.

	AssetWorks	VMS	IRONS	In-House System	Manual System
Buckhall VFD		X			
Dale City VFD			X		
Department of Fire & Rescue	X				
Dumfries-Triangle VFD		X			
Lake Jackson VFD		X			
Nokesville VFD		X			
OWL VFD				X	X
Stonewall Jackson VFD		X			
Yorkshire VFD					X

The County's Department of Fire & Rescue coordinates with the County's Fleet Management Division (within Department of Facilities & Fleet Management) and external vendors to perform apparatus maintenance. The Fleet Management Division uses AssetWorks to track the work completed by Fleet Management including the work completed on DFR vehicles & equipment. AssetWorks is an asset management software used to track assets throughout its entire life. AssetWorks contains a module specifically for fleet management. The module oversees many aspects including maintenance schedules, work orders, and parts requests. Additionally, it contains a data analytics tool and administrative capabilities that can be used to track information related to billing, warranties, and procurement contracts.

IRONS is a module within, Podio, a web-based system used to organize team communication, business processes, data, and content in project management workspaces according to project needs. Currently, the IRONS module is used to track maintenance work orders and allows vendors to integrate with the system but has numerous project management capabilities.

OWL VFD utilizes an internally developed ticketing software that allows an apparatus user to submit a ticket whenever corrective maintenance is needed. The system automatically alerts the appropriate personnel when a ticket is submitted, allowing mechanics to fix the problem in a timely basis. Because OWL has their own maintenance facility, preventative maintenance is tracked manually in their shop.

BACKGROUND – CONTINUED

Data Tracking

Tracking data in a way that can be efficiently and effectively analyzed is an important part of any organization. Tracking costs and maintenance issues can help departments when making decisions about future apparatus purchases, building maintenance schedules, determining the biggest maintenance problems faced by each department and the related costs, and in allocating resources across departments in the event of an apparatus being down for longer than expected.

RSM requested data System-wide, including historical data regarding costs and problem tracking, to be used in our analysis. The requested items were based off what was able to be pulled from the respective maintenance record-keeping systems. The graphic below depicts the information each Department was able to provide out of their current maintenance tracking system. Refer to the Individual Department Analysis section below for further detail.

Department	Asset Listing	Historical maintenance costs of each apparatus by:			Maintenance ticket / work order details including:				Downtime
		Vendor	Labor	Parts	Apparatus Involved	Problem Reported	Date Opened	Date Closed	
PWC DFR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Buckhall VFD	Y	V	V	V	W	W	W	W	V
Dale City VFD	Y	Y	Y	Y	Y	Y	Y	Y	Y
Dumfries Triangle VFD	Y	W	W	W	W	W	W	W	M
Lake Jackson VFD	Y	P	P	P	Y	Y	Y	Y	V
Nokesville VFD	P	W	W	W	W	W	W	W	V
OWL VFD	Y	M	M	M	W	W	W	M	M
Stonewall Jackson VFD	Y	Y/M	Y/M	Y/M	W	W	W	W	V
Yorkshire VFD	Y	V	V	V	V	V	V	V	V

Legend

Y	Yes - The data/attribute is readily available and the information was provided to RSM
P	Partial – The cost data/attribute is available and was provided to RSM for certain items, but not all maintenance activities
W	Walkthrough – Based on our walkthroughs, we understand the system has capability to track this data; however, the information was not provided to RSM
V	Vendor – The data/attribute is not tracked by the department electronically, but may be available from vendors
M	Manual – The data/attribute is not tracked electronically, and gathering would require substantial manual effort

BACKGROUND – CONTINUED

Vendor Utilization

Departments may use vendors that are directly contracted with Prince William County, or through a cooperative contract (where several municipalities procure a contract together). Three Departments do not use contracted vendors to perform the maintenance of their apparatus:

- OWL VFD employs mechanics for apparatus maintenance but utilize vendors for parts.
- Dumfries-Triangle VFD performs maintenance with an in-house mechanic after warranties expire.
- Approximately 100 of the County's DFR apparatus are maintained by the County' Fleet Management Division, with the remaining 60 maintained by a contracted vendor.

Regardless of Department and vendor, all invoices are processed through the ASCEND financial management system. The following table summarizes the largest maintenance contracts, including procurement and pricing structure, and payments made from fiscal year ending ("FY") June 30, 2017 through January 2020.

Contract Details for the Top 5 Vendors (ranked by cost) Since FY 2017

Vendor	Total Spent*	Award Date	Expiration Date	Initiating Locality	Procurement Methodology	Pricing Structure
LOUDOUN SERVICES INC	$2,114,624	7/1/2017	6/30/2020	Prince William County	Competitive Bid Only 1 bidder	Labor: $1,000/annual service $90/hour for non-contract services Parts: No discount
FIRST VEHICLE SERVICES	$1,643,339	6/17/2016	12/31/2019 (with 3 renewal options available)	Loudoun County	Cooperative Procurement	Labor: $225-$1,597/Service for inspections and preventative maintenance (Depending on apparatus and service) $99/hour (Labor rate for business hours repairs, pickup and delivery rate, and travel time rate) $123.75/hour (Labor rate for non-business hours repairs) Parts: Not Specified
FINLAY FIRE APPARATUS & EQUIPMENT REPAIR	$1,557,477	11/17/2015	11/16/2020	Prince William County	Competitive bid 5 bidders 1 contract awarded	Labor: $110/hour (Shop rate and business hours field rate) $126/hour (After-hours field rate) Parts: 15% discount (for applicable manufacturers per contract)
WILLIAMS EMERGENCY VEHICLE SERVICES	$529,827	12/1/2017	3/1/2020	Houston-Galveston Area Council of Govts	Cooperative Procurement	This contract is for the purchase of Seagrave apparatus, not the maintenance of an apparatus so the pricing largely depends on the type of apparatus and specifications requested by the department. Pricing sheet lists prices between $121,043 and $1,197,352
ATLANTIC EMERGENCY SOLUTIONS	$211,699	2/22/2017	2/20/2020	Dinwiddie County	Competitive bid 4 bidders 3 contracts awarded	Labor: $870.35-$1,004/Service (Depending on apparatus and service) $100.94/hour (Labor rate for repairs) Parts: 10% discount
	$621,591	12/30/2019	1/1/2021	Prince William County	Competitive Bid	Labor: $111-$142/hour (Depending on site and time) Annual Inspections: $138.60-$4,179.30/apparatus (Depending on type of inspection) Parts: 10% discount

* Unaudited totals provided by the Finance Department -- Procurement Services Division

PRINCE WILLIAM COUNTY

BACKGROUND – CONTINUED

Vendor Utilization - Continued

Since October 2016, the System has used over 70 different vendors, excluding Procurement Cared ("P-Card") transactions. The top ten vendors account for approximately 84% of the total maintenance costs incurred, with the top three vendors accounting for approximately 65% of the total maintenance costs incurred.

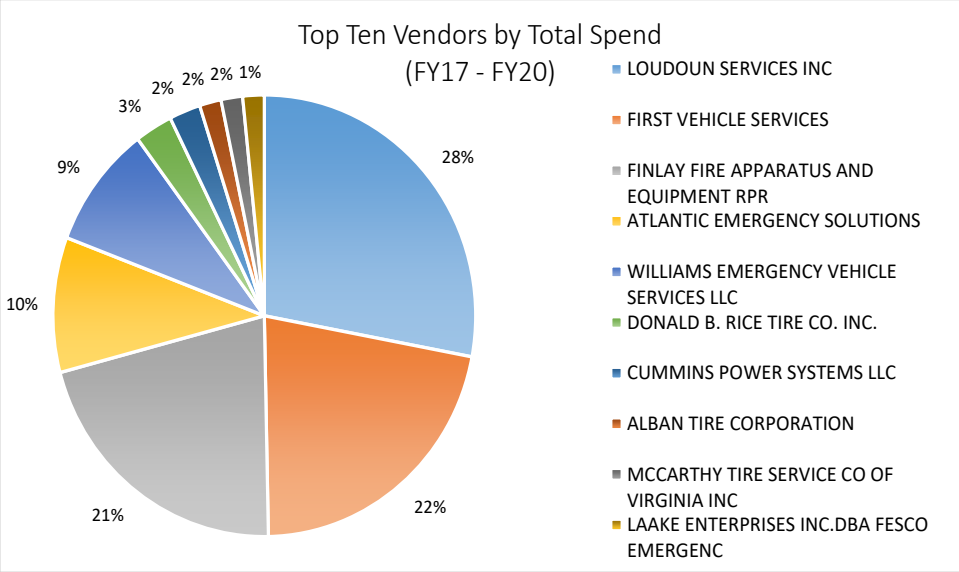
Total Spend by Vendor*					
	FY 2017	FY 2018	FY 2019	FY 2020**	Total
LOUDOUN SERVICES INC	$562,398	$499,533	$615,097	$679,104	$2,356,132
FIRST VEHICLE SERVICES	$672,018	$478,736	$386,638	$290,814	$1,828,206
FINLAY FIRE APPARATUS AND EQUIPMENT RPR	$346,888	$508,147	$450,966	$476,742	$1,782,742
WILLIAMS EMERGENCY VEHICLE SERVICES LLC	$103,245	$49,042	$339,371	$623,769	$833,254
ATLANTIC EMERGENCY SOLUTIONS	$67,135	$78,173	$64,176	$267,847	$759,504
DONALD B. RICE TIRE CO. INC.	$38,794	$52,499	$81,764	$69,676	$242,733
CUMMINS POWER SYSTEMS LLC	$19,394	$143,870	$38,503	-	$201,767
WOODDALE AUTOMOTIVE SPECIALISTS INC.	$36,279	$53,906	$32,055	$36,582	$139,474
P-CARD CHARGES	$10,216	$30,817	$55,157	$28,820	$138,630
MCCARTHY TIRE SERVICE CO OF VIRGINIA INC	$36,421	$41,200	$32,189	$43,487	$138,241
OTHER (includes 65 vendors)	$329,888	$359,785	$375,865	$137,922	$1,224,244
Total	**$2,222,676**	**$2,295,708**	**$2,471,781**	**$2,654,763**	**$9,644,928**

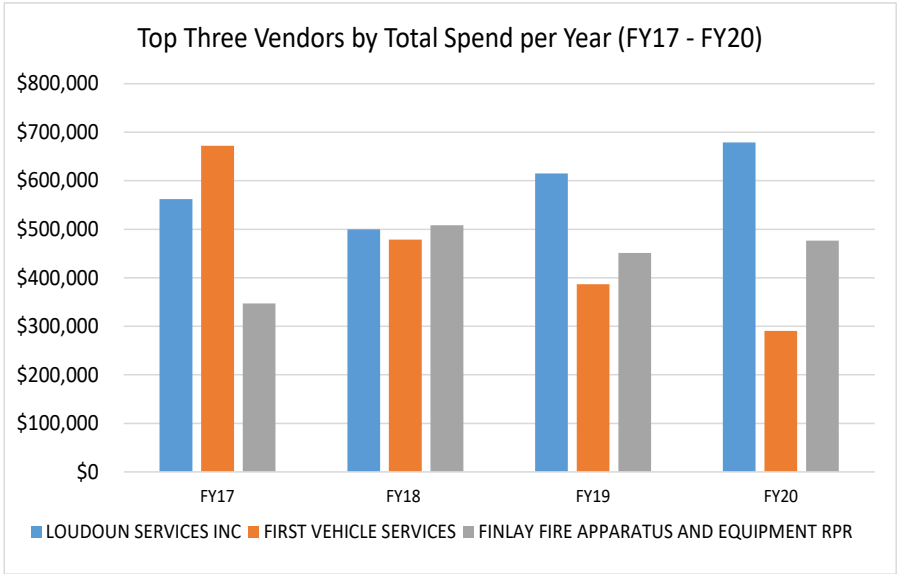
*unaudited totals provided by DFR Administrative Division

BACKGROUND – CONTINUED

Vendor Utilization – Continued

The following charts show top 10 vendors by total spend, and top three vendors each year from FY 2017 – January 2020:





BACKGROUND – CONTINUED

Vendor Utilization - Continued

Apparatus Maintenance Spending by Department*					
	FY 2017	FY 2018	FY 2019	FY 2020	Total
Buckhall VFD	$43,846	$90,312	$73,834	$44,067	**$252,059**
Dale City VFD	$800,965	$564,327	$739,585	$594,382	**$2,699,259**
Department of Fire & Rescue**	$1,333,670	$1,362,354	$1,353,270	$2,058,684	**$6,107,978**
Dumfries Triangle VFD*	$65,783	$117,670	$91,865	$39,289	**$314,607**
Lake Jackson VFD	$55,848	$70,544	$113,253	$97,782	**$337,427**
Nokesville VFD	$237,466	$319,620	$227,248	$308,000	**$1,092,334**
OWL VFD*	$189,167	$355,746	$302,220	$62,165	**$909,298**
Stonewall Jackson VFD	$117,234	$116,963	$91,893	$74,075	**$400,165**
Yorkshire VFD	$37,365	$66,866	$82,657	$65,591	**$252,479**
Total	**$2,881,344**	**$3,064,402**	**$3,075,825**	**$3,344,034**	**$12,365,605**

*unaudited totals provided by DFR Administrative Division
**DFR totals include additional costs incurred by PWC's Fleet Management Division

The charts included herein represent data currently available, are only provided for informational purposes, and are not intended to present an analysis or comparison of the System's Departments. Cost variances noted between Departments are likely attributable to a combination of variables such as the average age of apparatus, mix of heavy equipment vs. light duty vehicles, and sophistication of preventative maintenance programs, among many other variables.

While the data currently available from the System does not include key attributes necessary for performing a detailed analysis, the recommendations included in this report endeavor to significantly expand the availability of data. When available, this data will provide the System with the information and allow for the development of tools and metrics necessary to perform deep analysis of the apparatus maintenance program.

Department	Total Spend	Total Assets	Average Spend per Asset
Buckhall VFD	$252,059	13	$19,389
Dale City VFD	$2,699,259	42	$64,268
Department of Fire & Rescue	$6,107,978	159	$38,415
Dumfries Fire VFD*	$314,607	26	$12,100
Lake Jackson VFD	$337,427	15	$22,495
Nokesville VFD	$1,092,334	30	$36,411
OWL VFD*	$909,298	55	$16,533
Stonewall Jackson VFD	$400,165	10	$40,017
Yorkshire VFD	$252,479	13	$19,421
Total	**$12,365,605**	**363**	**$34,065**

**OWL and Dumfries-Triangle costs do not include the cost of labor ($253,530 and $111,789, respectively as provided by DFR Administrative Division).*

BACKGROUND – CONTINUED

Vendor Utilization - Continued

Top Three Vendors (by amount spent) for Each Department		
Vendor Name	**Amount Spent**	
Department of Fire & Rescue		
LOUDOUN SERVICES INC	$	2,356,132
ATLANTIC EMERGENCY SOLUTIONS	$	646,956
DONALD B. RICE TIRE CO. INC.	$	241,438
Buckhall Volunteer Fire Department		
FINLAY FIRE APPARATUS AND EQUIPMENT RPR	$	173,153
ATLANTIC EMERGENCY SOLUTIONS	$	46,622
MCCARTHY TIRE SERVICE CO OF VIRGINIA INC	$	19,532
Dale City Volunteer Fire Department		
FIRST VEHICLE SERVICES	$	1,643,339
WILLIAMS EMERGENCY VEHICLE SERVICES LLC	$	475,410
LAAKE ENTERPRISES INC.DBA FESCO EMERGENC	$	67,202
Dumfries Triangle Volunteer Fire Department		
CUMMINS POWER SYSTEMS LLC	$	71,634
COWLES FORD INC	$	32,683
ATLANTIC EMERGENCY SOLUTIONS	$	28,872
Lake Jackson Volunteer Fire Department		
FINLAY FIRE APPARATUS AND EQUIPMENT RPR	$	215,454
C.W. WILLIAMS & CO	$	33,490
WESTERN BRANCH DIESEL INC	$	19,266
Nokesville Volunteer Fire Department		
FINLAY FIRE APPARATUS AND EQUIPMENT RPR	$	772,188
MCCARTHY TIRE SERVICE CO OF VIRGINIA INC	$	59,533
PATRIOT FIRE LLC	$	29,136
OWL Volunteer Fire Department		
WOODDALE AUTOMOTIVE SPECIALISTS INC.	$	138,446
CUMMINS POWER SYSTEMS LLC	$	133,247
JPMORGAN CHASE BANK N.A.	$	116,226
Stonewall Jackson Volunteer Fire Department		
FINLAY FIRE APPARATUS AND EQUIPMENT RPR	$	211,554
ATLANTIC EMERGENCY SOLUTIONS	$	124,544
MCCARTHY TIRE SERVICE CO OF VIRGINIA INC	$	27,312
Yorkshire Volunteer Fire Department		
FINLAY FIRE APPARATUS AND EQUIPMENT RPR	$	163,814
MCCARTHY TIRE SERVICE CO OF VIRGINIA INC	$	14,467
FIREHOSECARE INC	$	8,002

OBJECTIVES AND APPROACH

Objectives

The objective of this analysis was to evaluate and assess the current structure of the System's fire and rescue apparatus maintenance practices and provide recommendations for improvement.

Approach

Our approach to this analysis was as follows:

Current State Analysis
Analysis of the current state consisted primarily of inquiry to obtain an understanding of the System's current structure and maintenance practices. The following procedures were conducted:

- Conducted interviews with each System Department to identify current practices for apparatus maintenance, including:
  - Identification of need (corrective and preventative)
  - Prioritization and scheduling
  - Performance of maintenance
  - Utilization of internal labor vs vendors
  - Vendor agreements and pricing
  - Documentation of maintenance performed
- In conjunction with the interviews described above, we also worked with the System to identify the complete listing of equipment recognized/maintained at each fire and rescue station, and the historical costs of maintenance (5-year lookback)
- After we obtained an understanding of current state, we conducted an analysis to identify recommended actions, in accordance with best practices, for the County to be consider during implementation of a future-state work order driven maintenance software and processes. This included analyzing controls within the following key areas:
  - Utilization of technology applications
  - Completeness and accuracy of data entry (time and materials costs)
  - Segregation of duties
  - Utilization of internal labor and vendors
  - Reporting and monitoring

Reporting
At the conclusion of this phase, we summarized the results of our analysis into this report. We conducted exit meetings with the System Executive Committee and the Board Audit Committee.

PRINCE WILLIAM COUNTY

OBSERVATIONS MATRIX

Observation	1. Apparatus Inventory Variance
High	During our analysis, we noted discrepancies between the fire and rescue apparatus inventory count conducted by the Department of Fire & Rescue, and the asset listing provided by the County's Finance Department -- Financial Reporting and Control Division, Capital Assets team. Specifically, the inventory count identified 34 assets at DFR stations that were not included in the fixed asset listing within the County's ASCEND financial management system. Through further discussions, we understand these assets were likely inherited from the County's absorption of a prior Volunteer Department, which were never entered into ASCEND. In addition to the items identified during our analysis, we also understand that other discrepancies were previously identified within the fixed asset listing in ASCEND. During the County's financial statement audit for the fiscal year ended June 30, 2018, a material weakness was identified in internal controls over financial reporting, as the County's accounting records improperly capitalized assets owned by Volunteer Departments. Although the assets were purchased with the County's fire levy, the title to the assets only listed the respective VFD, and not the County. As a result of the finding, the County removed 87[1] capital assets valued at $10.6M ($14.3M purchase costs)[2] from its accounting records. Since then, we understand the County has taken efforts to dual-title assets purchased with fire levy funds, so the assets can be recorded in ASCEND. In discussions with representatives throughout the System and the Financial Reporting and Control Division, Capital Assets team, we noted that uncertainty exists regarding the completeness and accuracy of the County's capital asset records related to fire and rescue apparatus. Considering the variance noted during our analysis, coupled with the prior finding noted during the financial statement audit, the County's financial records may not accurately reflect the portfolio of fire and rescue apparatus. Accurate accounting of assets is the first step in creating a functioning asset management program. Without a comprehensive understanding of the County's fire and rescue fleet, budgeting, operating, and capital planning decisions may be made based on incorrect or incomplete information. A complete listing of assets is also critical for the County to produce and maintain accurate financial reporting.
Recommendation	We recommend the County perform a comprehensive analysis to identify title ownership of all fire and rescue capital assets and perform a reconciliation of those records to the assets listed in ASCEND. After the reconciliation is performed, ASCEND should be appropriately updated to reflect assets titled to the County. As detailed in the pages that follow, we also recommend the County begin a robust program of tracking asset maintenance in a centralized database. To track maintenance activity by asset, details of all fire and rescue assets held by the System Departments must also be entered into the Asset Works maintenance software. When utilizing the recent asset inventory count to develop and/or reconcile the asset listing within the maintenance software, the County may also consider adding an attribute to track title status of the asset. This will allow for a recurring (annual) reconciliation between the maintenance software and ASCEND to validate that asset information remains complete and accurate within ASCEND, while also maintaining a record of all fire and rescue assets held by the System Departments in a centralized location.

[1] Per data provided by Financial Reporting and Control Division, Capital Assets team

[2] Comprehensive Annual Financial Report, June 30, 2018, finding 2018-001, pg. 297

OBSERVATIONS MATRIX – CONTINUED

Observation	1. Apparatus Inventory Variance – continued
Management's Action Plan	**Response:** The Fire and Rescue System concurs with the findings of the report. On July 16, 2020, I gave the FRS Executive Committee guidance to develop a system wide apparatus maintenance program and they have established task groups to assist with this work. The findings of this report will be shared with the FRS Executive Committee and associated task groups to accomplish their work in developing a system wide apparatus maintenance program. Updates will be provided to the FRS System Chief on a monthly basis. **Responsible Party:** FRS System Chief **Estimated Completion Date:** TBD

PRINCE WILLIAM COUNTY

SUMMARY ANALYSIS

Each System Department manages apparatus maintenance in different ways. While the majority of the Departments use a ticketing system that contains historical ticket information, few Departments have the ability to easily track costs related to specific apparatus. Because the ticket systems and the financial data are not linked, there is no visibility into the type of apparatus that require the most corrective work or what the problems that have driven historical costs. A significant portion of spending by these Departments is related to the purchase of new apparatus and the costs associated with the maintenance. By providing the County with visibility into each of these different asset management systems, a periodic analysis of maintenance vendors, costs, problems, and downtimes can be performed, helping both the County and the Departments work together to make decisions. Access to complete data will also provide the County with the ability to conduct analyses used to drive strategic decisions in regards to maintenance of apparatus, for example whether continued utilization of vendors or development of an in-house service team is most advantageous.

Vendor Management Strategy

Develop metrics for objective evaluation of vendor performance

Analyze current vendors by:

- spend
- performance
- Identify overlap in parts / scope with discrepancies in cost
- location / accessibility

Develop strategy for procurement of expiring contracts, with consideration of:

- county-wide service and buying power
- vendor pools
- non-specialized vs. specialized requirements

Centralize Data

Centralize data for comprehensive analysis through:

- When not previously captured, begin entry of data into existing systems
- Development of integrations for use in future data uploads from external sources to central record
- Migration of historical data from volunteer-owned systems to central record
- Migration of historical data from vendor systems to central record

Create Performance Metrics

Create performance metrics for evaluation of the maintenance program

Use metrics to drive daily, weekly, monthly, quarterly, annual, multi-year reporting

Examples of metrics may include reporting of the following:

- cost per mile / hour
- average down time
- maintenance frequency
- average maintenance activity cost

Above metrics may be further segregated by:

- manufacturer
- department
- equipment type
- vendor

Use Data and Metrics to Drive Decisions

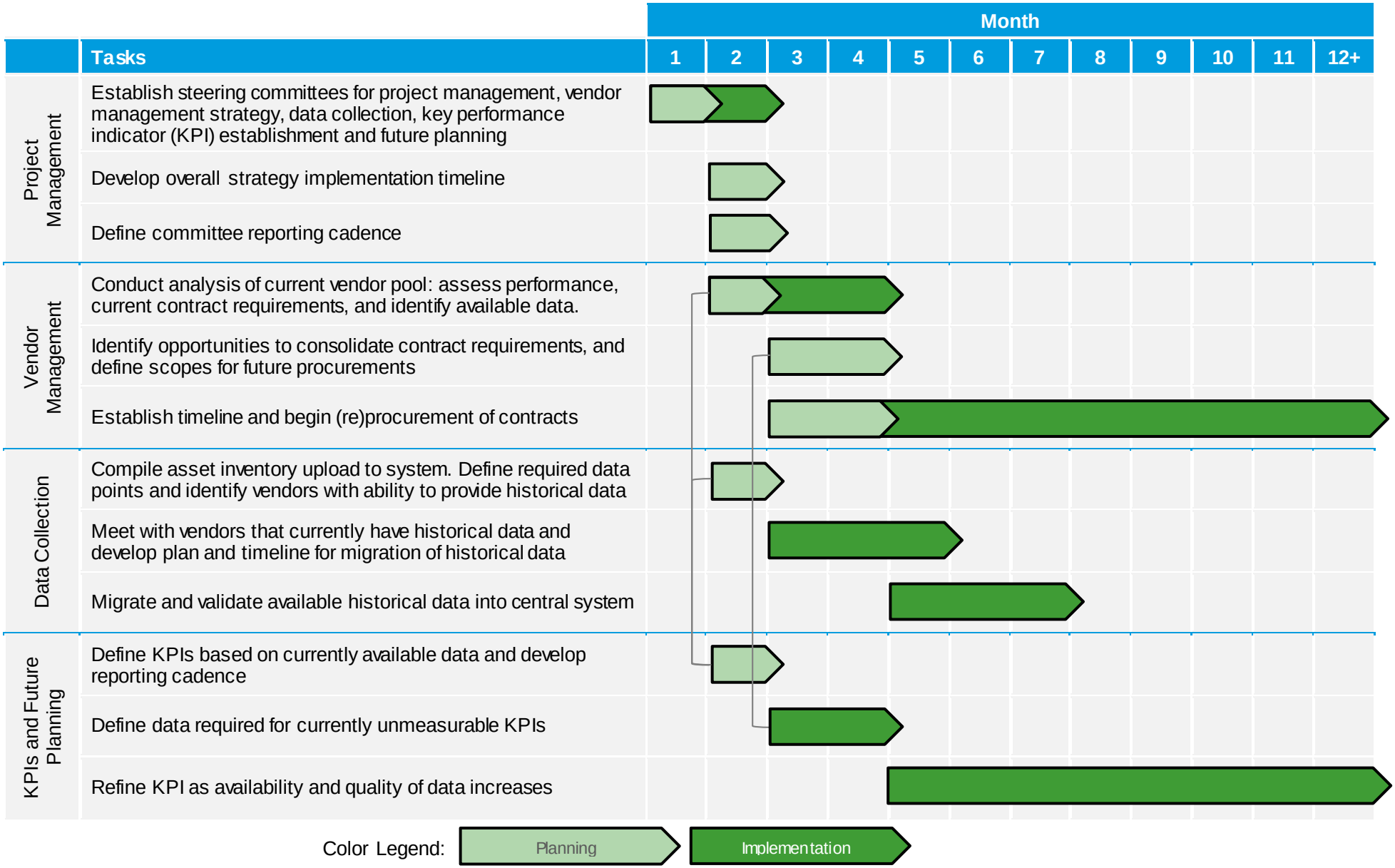
Utilize performance metrics to drive enterprise level decisions such as:

- fleet age
- fleet health
- total cost of ownership
- apparatus replacement lifecycle
- manufacturer performance
- vendor performance
- asset reliability
- down time
- long-term cost and feasibility projections
- dispose, or maintain analysis
- cost proposal vs historical cost analysis

Future analyses to drive strategic vision for maintenance and utilization of vendors versus in-house

SUMMARY ANALYSIS – CONTINUED

The chart below summarizes the major tasks and example timeline relevant to implementing the recommended actions included within this report.



SUMMARY ANALYSIS – CONTINUED

The pages that follow contain an outline of the current state of technologies, vendors, and monitoring efforts related to apparatus maintenance, with a corresponding future state recommendation and action plan for how to centralize data.

	Summary / Overall	
	Current State	**Future State Recommendation**
Technology	*AssetWorks* - The County's Department of Fire & Rescue utilizes AssetWorks to track maintenance activities and associated costs. *Volunteer Management System ("VMS")* - Many Volunteer Departments utilize VMS, though to varied degrees. VMS has the capability to track noted issues and status by equipment but is not utilized to track maintenance activity or costs. *IRONS* – One VFD uses IRONS to track maintenance activities and associated costs. *Internally Developed* - One VFD uses internally developed software to track noted issues and status by equipment. The system tracks some maintenance data but does not include costs. *Manual* – One VFD uses manual (paper) records as historical information for maintenance and cost data. Each of the systems described above operate in silos and are not currently configured to communicate or share data.	To realize the benefits associated with a highly functioning asset management program, the System will eventually require full centralization of data collection and maintenance in a capable Computerized Maintenance Management System (CMMS). For this, we recommend utilization of AssetWorks, considering the software's functionality allows for the achievement of recommendations outlined herein, and as several apparatus are already tracked within the AssetWorks system. If pursued by the System Chief after consultation with the Executive Committee, the shift to a fully centralized CMMS will require significant effort, time, and the collaboration of all nine Departments. We recommend collection of data from existing sources when available, until full centralization can occur. To facilitate the entry of data to the CMMS, we recommend the Fleet Manager work with each Department to develop an approach to obtaining Department data, either from Department software or from vendors and incorporating the data into AssetWorks. The following data points should be collected, at minimum: • Apparatus / VIN • Apparatus mileage/hours • Dates apparatus in/out of service • Dates service begin/end • Type/description of service • Parts/materials costs • Labor costs • Sub-vendor costs We understand that certain third-party vendors maintain maintenance records by each asset. As such, relevant key data including maintenance activity, parts and labor costs may be available from these vendors in a format usable by System Management. This considered, we recommend collection of historical data from the various Departments and third-parties, as available. This historical data, coupled with centralization of data going forward, will provide management with key information needed to establish a high-functioning monitoring program. *Key Risks Addressed:* • Limited ability to assess and confirm apparatus readiness, which is critical to safely delivering fire, rescue and emergency medical services to residents of the County • Inability to quickly identify historical maintenance activities by apparatus • Inability to quickly quantify historical maintenance costs by apparatus • Manual tracking of online/offline status of apparatus may limit agility of System to re-assign assets for critical needs • Strategic planning hampered by available information, and based on incomplete data • Disaggregated use of vendors may limit competition and increase costs

SUMMARY ANALYSIS – CONTINUED

	Summary / Overall (continued)	
	Current State	**Future State Recommendation**
Vendors	Usage of vendors varies widely by Department, from fully outsourced models to cover all maintenance aspects, to mostly insourced where internal staff provide maintenance services, and vendors are used only for warranty work and parts supply. In most cases, Departments individually procured contracts (or piggybacked contracts from other public entities) with a variety of vendors to preform maintenance, with assignment dependent on apparatus type, location, and complexity.	We understand the new Fleet Manager position is intended to act as a liaison between the System and vendors to assist in management of the System's entire fleet. As the System is moving to a more centralized environment, and because many existing contracts were designed around the decentralized environment, the County should re-procure the contracts to maximize the benefits to the entire County. These benefits would include: • Providing a mechanism for the System to utilize one contract • Update contract requirements to include collection and sharing of critical data, or access for utilization of AssetWorks when vendors do not possess the ability to internally track work order details • Allowing the System to negotiate terms and pricing with vendors directly, rather than relying on other jurisdictions for cooperative or piggy-backed contracts • Negotiating for advantageous pricing for entire System fleet, rather than Department-specific apparatus • Contract start/termination dates fit to the System's schedule to stagger future re-procurements We recommend the System re-procure contracts, with a focus on utilizing the Countywide purchasing power to obtain the best available pricing and provide for a variety of vendors. Understanding that many VFDs have cultivated relationships with vendors used on an ad-hoc basis over the last several years, the procurement process should solicit System-wide input during scope development. Multiple-award options should be considered to establish a prequalified pool of vendors, which can allow for vendor assignment, based on specific expertise or geographic convenience, and can minimize the risk of overburdening a single vendor. *Key Risks Addressed:* • Disaggregated use of vendors may limit competition and increase costs

SUMMARY ANALYSIS – CONTINUED

	Summary / Overall (continued)	
	Current State	**Future State Recommendation**
Monitoring	The mix of technologies used throughout the System also leads to a mix of monitoring practices. When technologies are utilized that allow for collection of data relevant to maintenance activities, the data can then be utilized to provide management with analyses for better decision-making and strategic planning. AssetWorks and IRONS offer more advanced capabilities of tracking maintenance and associated costs. The internally developed system used by one VFD allows for tracking of activities, but not associated costs. VMS allows for the monitoring of assets status on a real-time basis, but is limited in providing costs, and other historical data. Other Departments depend on monitoring performed by maintenance vendors, and/or manual data compilation for monitoring and reporting on an ad-hoc basis.	As stated in the overall Technology section above, we recommend the System use AssetWorks as the CMMS for the collection and maintenance of data. To facilitate timely and accurate collection of data, either the Fleet Manager or additional resources should coordinate with vendors and each Department to transition the upload of data collected and ongoing monitoring to a centralized platform. The CMMS should include an asset listing that is continuously updated as new apparatus are acquired by each Department, and all preventative and corrective maintenance activity System-wide. This may include performing a physical inventory count to verify the existence and completeness of the current list of apparatus. As the System continues to collect more information, we recommend personnel work to establish a set of key performance indicators ("KPIs"). The KPIs should be reviewed on a regular basis, as continuous collection of the data and review of the associated KPIs will allow the System to assess how these different elements change over time. The definition of KPIs should also be reviewed and changed, as the amount and type of information evolves. The Fleet Manager role is a critical component in the development of a robust monitoring program. The role's central involvement in the collection and analysis of data, coupled with the collaboration of various Departments throughout the System, provides a function dedicated to managing the fleet of the System. This perspective will be invaluable as the System continues to merge and monitor data. As the responsibilities of the role increase, the resource requirements may extend beyond the single role and require a team or capital asset unit. We understand that certain Departments have salaried positions functioning as a Fleet Manager for the apparatus of that Department. This considered, we also recommend the System conduct an analysis to fully define the functions and responsibilities of existing Fleet Manager roles, determine how they currently intertwine, and how these roles can, together, support the management of the System's entire fleet. *Key Risks Addressed:* • Limited ability to assess and confirm apparatus readiness, which is critical to safely delivering firefighting and emergency medical services to residents of the County • Inability to quickly identify historical maintenance activities by apparatus • Inability to quickly quantify historical maintenance costs by apparatus • Manual tracking of online/offline status of apparatus may limit agility of System to re-assign assets for critical needs • Strategic planning hampered by available information, and based on incomplete data

INDIVIDUAL DEPARTMENTAL ANALYSIS

	Prince William County Department of Fire & Rescue (DFR)
	Current State
Technology	AssetWorks is the asset management system currently used by the County's Fleet Management Division. The system is used to monitor maintenance schedules, create work orders, and track information related to billing, warranties, and procurement contracts. Work orders are created in AssetWorks for corrective maintenance issues, while the County's Fleet Management Division and primary outsourced vendor maintain the preventative maintenance schedules for their respective apparatus. AssetWorks contains electronic data interchange (EDI) capabilities, meaning that the system allows for the computer-to-computer exchange of business information in a standard and structured format.
Vendors	Within the System, the DFR uses both the County's Fleet Management Division and Atlantic Emergency Solutions ("AES") for corrective and preventative maintenance. The Fleet Management Division maintains approximately 100 apparatus and AES approximately 60 apparatus. While both the Fleet Management Division and AES maintain the schedules for preventative maintenance, the System's Fleet Lieutenant and Fleet Manager coordinate with the appropriate corrective maintenance provider for all DFR stations after a work order has been entered into AssetWorks.
Monitoring	The information available from AssetWorks includes a robust set of data points that can provide insightful information used in analysis and decision-making. These data points include work order number, status, department ID, asset number, labor hours, labor and parts costs separated by internal and commercial labor, miscellaneous costs, and total costs. On an as needed basis, the DFR reviews and analyzes the data available in AssetWorks. Specifically, the maintenance report data is used to assess the condition of apparatus that may need to be replaced or retired.

INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Buckhall Volunteer Fire Department
	Current State
Technology	Buckhall VFD ("Buckhall") uses Volunteer Management System (VMS) as the maintenance ticketing system. The system is used to create and track maintenance tickets, monitor apparatus status, and notify the involved parties of ticket creations and changes. Historical records were not provided by the Buckhall; however, based on our walkthroughs we understand that a report from VMS could be generated containing the maintenance ticket information (without costs). We also understand that Buckhall primarily uses a contract with Finlay Fire to perform maintenance work. As Finlay is contractually required to track the details of repair orders performed, the majority of data related to Buckhall's repair activities may be accessible electronically.
Vendors	Finlay Fire is the primary maintenance vendor used by Buckhall. Finlay monitors the preventative maintenance schedule of assigned apparatus and performs the majority of corrective maintenance. Non-emergency repairs are deferred until the next regularly scheduled preventative maintenance. When an apparatus is due for maintenance, Finlay coordinates with Buckhall to identify a time for the repair. If Finlay is unable to perform a given repair, other vendors may be utilized, but are scheduled, coordinated, and invoiced through Finlay. Western Branch Diesel, Atlantic Emergency Solutions, and McCarthy Tire are other vendors utilized by Buckhall, though to a lesser extent than Finlay.
Monitoring	Although VMS data was not provided to RSM, based on our walkthrough and conversations with Buckhall leadership, we understand real-time issues in VMS are monitored, and that Buckhall generates reports from VMS on an ad-hoc basis. A Buckhall administrator submits invoices to County Finance after approval by the Engineer; however, costs are not tracked alongside the maintenance ticket.

INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Dale City Volunteer Fire Department
	Current State
Technology	Dale City VFD ("Dale City") purchased a module from Podio's project management software called IRONS. Dale City uses the software to manage and track individual apparatus, to manage the related maintenance through work orders, and to aide in communication with the primary vendor on the status of apparatus needing maintenance. It serves as Dale City's internal recordkeeping tool to report issues; however, it does not include cost and resolution data. Vendors have access to close issues after related maintenance has been performed. Dale City provided reporting from IRONS that included issue(s) noted, creation date, apparatus, and details. Additional work order details by apparatus were also obtained from Dale City's two vendors that included cost and maintenance activity detail.
Vendors	First Vehicle Services (FVS) is the primary maintenance vendor and Williams Emergency Vehicle Services (WEVS) is the secondary maintenance vendor utilized by Dale City. FVS maintains the preventative maintenance schedule and alerts Dale City as an apparatus becomes due. FVS then performs the work in Dale City's in-house shop. Either FVS or WEVS perform the majority of preventative maintenance and some corrective maintenance. When an apparatus under warranty needs corrective maintenance, or if the work cannot be done in-house, other vendors may be used. FVS maintains most of the parts needed for maintenance, but Dale City keeps a small inventory in-house, for quick-fix supplies and parts.
Monitoring	Dale City currently monitors apparatus maintenance spending through a monthly report received from FVS. The report contains all of the costs by apparatus for the respective month and is reviewed by Dale City for accuracy and for any unusual trends in spending for that month. As noted above, Dale City was able to provide historical work orders obtained from FVS, an export of work order details from WEVS's system, and a report from IRONS detailing the tickets entered into the system.

INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Dumfries Triangle Volunteer Fire Department
	Current State
Technology	Dumfries-Triangle VFD ("Dumfries-Triangle") uses VMS for submission and tracking of maintenance tickets when a corrective maintenance need is identified. The VMS system notifies the Captain, the Chief, and the initiator anytime a ticket is created, updated, or closed. As the maintenance takes place, the ticket details are updated to include notes about cost, the nature of the repair, who does the repair, and the purchase order number. Dumfries-Triangle maintains the schedule for all preventative maintenance of apparatus after the warranty expires, separately from VMS. Historical records were not provided by Dumfries-Triangle; however, based on our walkthroughs we understand that a report from VMS could be generated containing the maintenance ticket information.
Vendors	Dumfries-Triangle utilizes both in-house maintenance and vendor maintenance. A salaried mechanic (also a member Captain of the VFD) performs all preventative maintenance of apparatus not covered by a warranty, as well as certain corrective maintenance activities not covered by a warranty. To service apparatus on-site, Dumfries-Triangle maintains a small inventory of parts for common maintenance issues, but typically orders as needed. Parts vendors utilized include EquipmentWorks, Northern Virginia Supply, and Alban Tire. If an apparatus is under warranty, the manufacturer is contacted to perform the maintenance.
Monitoring	Although VMS data was not provided to RSM, based on our walkthrough and conversations with Dumfries-Triangle leadership, we understand real-time issues in VMS are monitored, and that Dumfries-Triangle generates reports from VMS on an ad-hoc basis. Dumfries-Triangle indicated that costs and purchase order information is contained within the VMS notes for each activity; however, we understand that cost is not a separate attribute, and as such, creating data in a searchable and sortable format would require manual entry of costs into a separate field.

INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Lake Jackson Volunteer Fire Department
	Current State
Technology	Lake Jackson VFD ("Lake Jackson") utilizes VMS to create and track maintenance tickets, maintain preventative maintenance and inspection schedules, and to notify relevant parties. Lake Jackson utilizes a scheduling function of VMS that allows for the pre-scheduling of preventative maintenance tickets, which then automatically creates a ticket on a specified date. Tickets for corrective maintenance are entered into VMS, updated, and closed by Lake Jackson's Secretary. The VMS system sends a notification to all involved parties, including Finlay Fire, when a ticket is created or updated. We also understand that Lake Jackson primarily uses a contract with Finlay Fire to perform maintenance work. As Finlay is contractually required to track the details of repair orders performed, the cost data related to Lake Jackson's repair activities performed by Finlay may be accessible electronically.
Vendors	Finlay Fire is the primary vendor and performs all preventative maintenance, excluding inspections, and handles all corrective maintenance. If Finlay is unable to perform a given repair, other vendors may be utilized, but are scheduled, coordinated, and invoiced through Finlay. McCarthy Tire is utilized for tire work and state inspections.
Monitoring	Lake Jackson was able to provide RSM with an excel export containing ticket details of maintenance work orders. Fields included apparatus involved, asset category, repair status, repair summary, and description notes, which often contained the closed date. Based on our walkthrough and conversations with Lake Jackson leadership, we understand real-time issues in VMS are monitored, and that Lake Jackson generates reports from VMS on an ad-hoc basis.

INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Nokesville Volunteer Fire Department
	Current State
Technology	Nokesville VFD ("Nokesville") uses VMS to create and track maintenance tickets, maintain preventative maintenance and inspection schedules, and to notify the involved parties. Historical records and other supporting documents were not provided by Nokesville; however, based on our walkthroughs we understand that a report from VMS could be generated containing the maintenance ticket information (without costs). Nokesville also indicated that VMS is used to send automated notifications for each apparatus' preventative maintenance, based on a pre-determined schedule (extended for 5 years). These notifications are then used to schedule preventative maintenance tasks with vendors.
Vendors	Finlay Fire is the primary vendor used for apparatus maintenance. Finlay is contacted to schedule maintenance, after the automated VMS notification is distributed. All preventative maintenance needs scheduled via the VMS automated notification function, and corrective maintenance, with the exception of ambulance maintenance, are performed by Finlay Fire. If Finlay is unable to perform a given repair, other vendors may be utilized, but are scheduled, coordinated, and invoiced through Finlay. Work on ambulances is performed by FESCO, which is a regional authorized dealer for Nokesville's ambulance manufacturer. FESCO is contracted through a cooperative contract. The Nokesville EMS Captain contacts FESCO who then picks up the apparatus and delivers it after the repair.
Monitoring	Although VMS data was not provided to RSM, based on our walkthrough and conversations with Nokesville leadership, we understand Nokesville utilizes VMS for automated preventative maintenance schedule notifications. Nokesville also indicated that real-time issues in VMS are monitored, and that reports are generated on an ad-hoc basis. Nokesville should have the ability to create reports from maintenance tickets in VMS, but cost details would involve manual data entry from invoices. Nokesville also divides available apparatus into two fleets, on a rotational basis to minimize downtime and maximize resources available to the public.

INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Occoquan-Woodbridge-Lorton (OWL) Volunteer Fire Department
	Current State
Technology	Utilizing in-house capabilities, OWL internally developed a ticketing system for corrective maintenance reporting and tracking, designed to meet their needs as a VFD that performs nearly all maintenance activities in-house. The internally developed system tracks identification of corrective maintenance need(s), current status, notes regarding the repair, and closure of the issue after maintenance is performed, but does not track associated costs. Preventative maintenance is monitored through a detailed master schedule, manually maintained and coordinated by OWL's Maintenance Coordinator. Each apparatus has a paper file containing all past tickets, invoices, inspection reports, and other documentation related to the apparatus.
Vendors	Preventative and corrective maintenance is performed by the in-house mechanics, except for corrective maintenance needed on engines, transmissions, and suspensions. To service apparatus on-site, OWL maintains an inventory of parts for preventative maintenance and other common corrective maintenance issues. Northern Virginia Supply is the primary vendor used for ordering and replenishment of parts. Loudoun Services Inc., Atlantic Emergency Services, or Finlay Fire are utilized as vendors to perform work that OWL mechanics cannot complete on-site.
Monitoring	Although system data was not provided to RSM, based on our walkthrough and conversations with OWL leadership, we understand real-time issues in the system are monitored, and that OWL generates reports on an ad-hoc basis. Since the maintenance ticket and cost information are stored separately, we understand that significant manual effort would be required to obtain cost data by apparatus.

INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Stonewall Jackson Volunteer Fire Department
	Current State
Technology	Stonewall Jackson VFD ("Stonewall") utilizes VMS and QuickBooks (accounting software) in tandem to provide ad-hoc reporting. VMS houses issue reporting and status, maintenance schedules, and online/offline status of apparatus. QuickBooks is utilized to store cost information by vendor. Although QuickBooks is used to store costs by vendor, through discussion with Stonewall, we noted that invoices may contain multiple line items related to different apparatus, and information stored in QuickBooks is limited to the vendor name, invoice date, and total. Stonewall was able to provide a report from QuickBooks detailing costs by vendor and provided scanned copies of maintenance invoices for the previous five years. However, we understand this required significant manual entry to scan all of the invoices and compile data into a consolidated spreadsheet. Similar to many VFDs mentioned above, the Finlay Fire contract includes a provision in Attachment A that details the data tracking requirements of repair orders.
Vendors	Finlay Fire is used as the main vendor for apparatus maintenance and performs the majority of preventative maintenance and some corrective maintenance. For warranty and specialized services, other vendors are used including, but not limited to, ADX, Western Branch, Cummins, Cowles Ford, and McCarthy Tire.
Monitoring	Stonewall utilizes VMS and Quickbooks to create reports as needed for analysis. As noted above, Stonewall was able to provide a QuickBooks report and past maintenance invoices. However, since the maintenance ticket and cost information are stored in separate systems, we understand that significant manual effort was required to obtain cost data by apparatus.

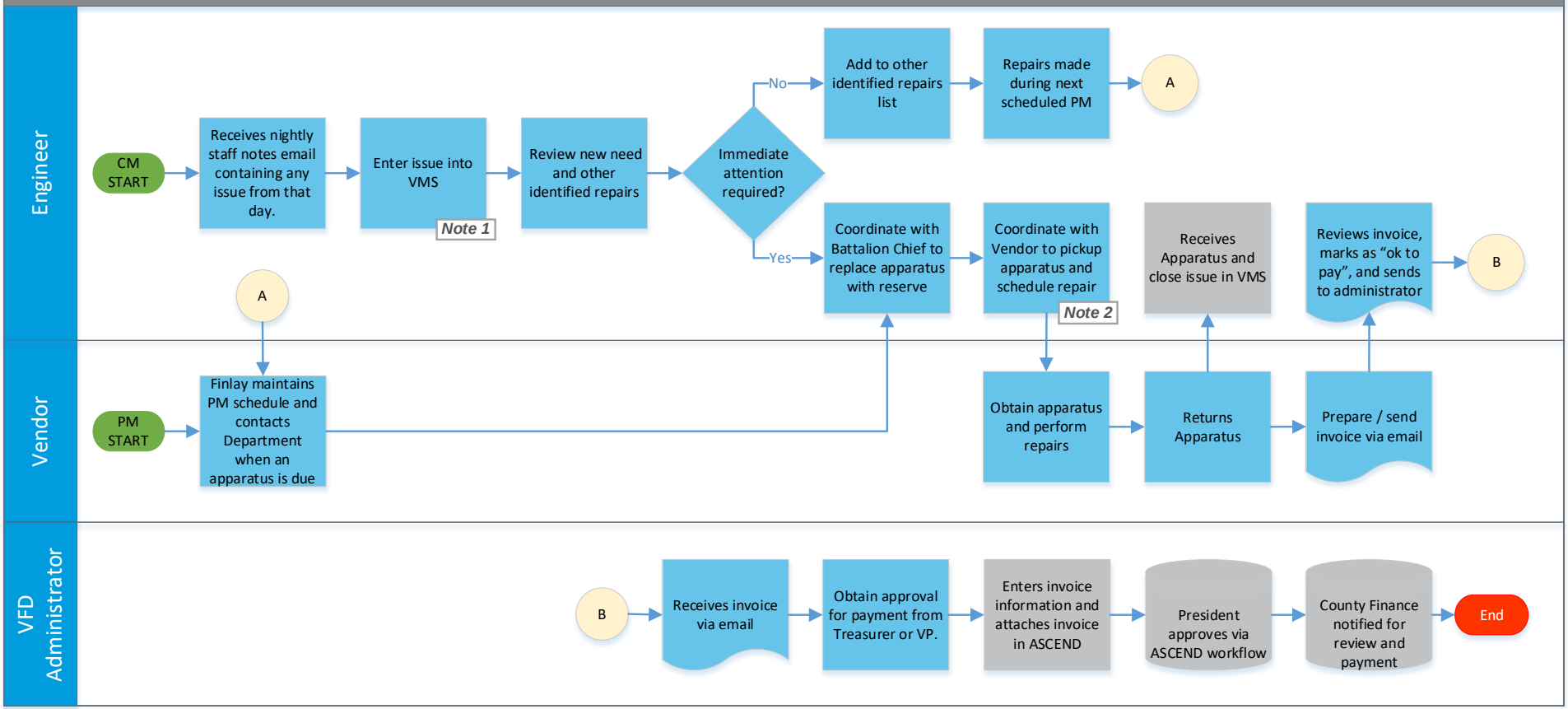
INDIVIDUAL DEPARTMENTAL ANALYSIS – CONTINUED

	Yorkshire Volunteer Fire Department
	Current State
Technology	The Yorkshire VFD ("Yorkshire") primarily uses a contract with Finlay Fire to perform maintenance work. As Finlay is contractually required to track the details of repair orders performed, the majority of data related to Yorkshire's repair activities may be accessible electronically. Separate from the data maintained by Finlay, Yorkshire maintains paper records of all maintenance and inspection activities by apparatus. The folders include all invoices, inspection records, and corrective maintenance request forms and emails. The Department can reference a specific invoice or maintenance activity with the records on hand; however, compilation of data for summarization or mining purposes would require substantial effort.
Vendors	Finlay Fire currently schedules and performs all preventative maintenance and the majority of corrective maintenance. If an issue arises that Finlay cannot address, Finlay subcontracts to a third-party vendor that can perform the work. No Yorkshire apparatus are currently under warranty. All maintenance activities performed excluding tire work and state inspections are tracked by Finlay. McCarthy Tire is used for tires and for semi-annual state inspections. These invoices and records are maintained in each apparatus's respective maintenance folder.
Monitoring	Yorkshire can compile information through requests of data from Finlay, and review of paper records maintained on site. A recurring review of key metrics is not performed, as review of records maintained by Yorkshire is performed as needed.

PROCESS MAPS

Buckhall VFD

Apparatus Maintenance Process



Note 1: VMS (Volunteer Management System) is a system used to create and manage the status of maintenance tickets.

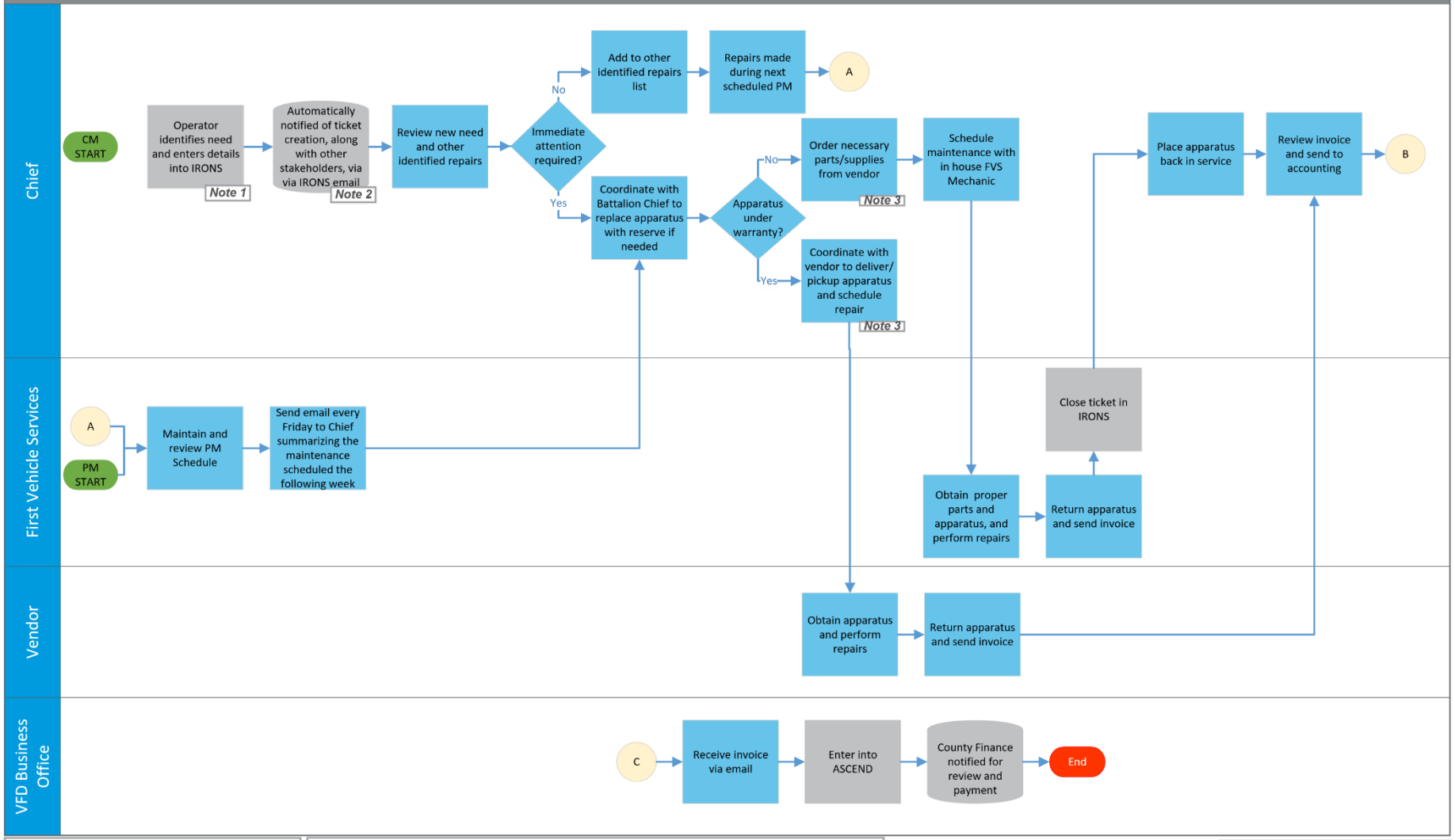
Note 2: Vendors include:
Finlay Fire – maintenance for most apparatus
Atlantic Emergency Solutions (AES) – manufacturer maintenance
Western Branch Diesel/Cummins – drivetrain work
Manassas Chevrolet – Small vehicle maintenance
McCarthy Tire – Tire supplier/annual inspections

Legend
Manual Step
Automated Step

PROCESS MAPS – CONTINUED

Dale City VFD

Apparatus Maintenance Process



Note 1: IRONS is a system used to create and manage the status of maintenance tickets.

Note 2: Stakeholders include the staff officers, station officer, mechanic, Chief, and FVS.

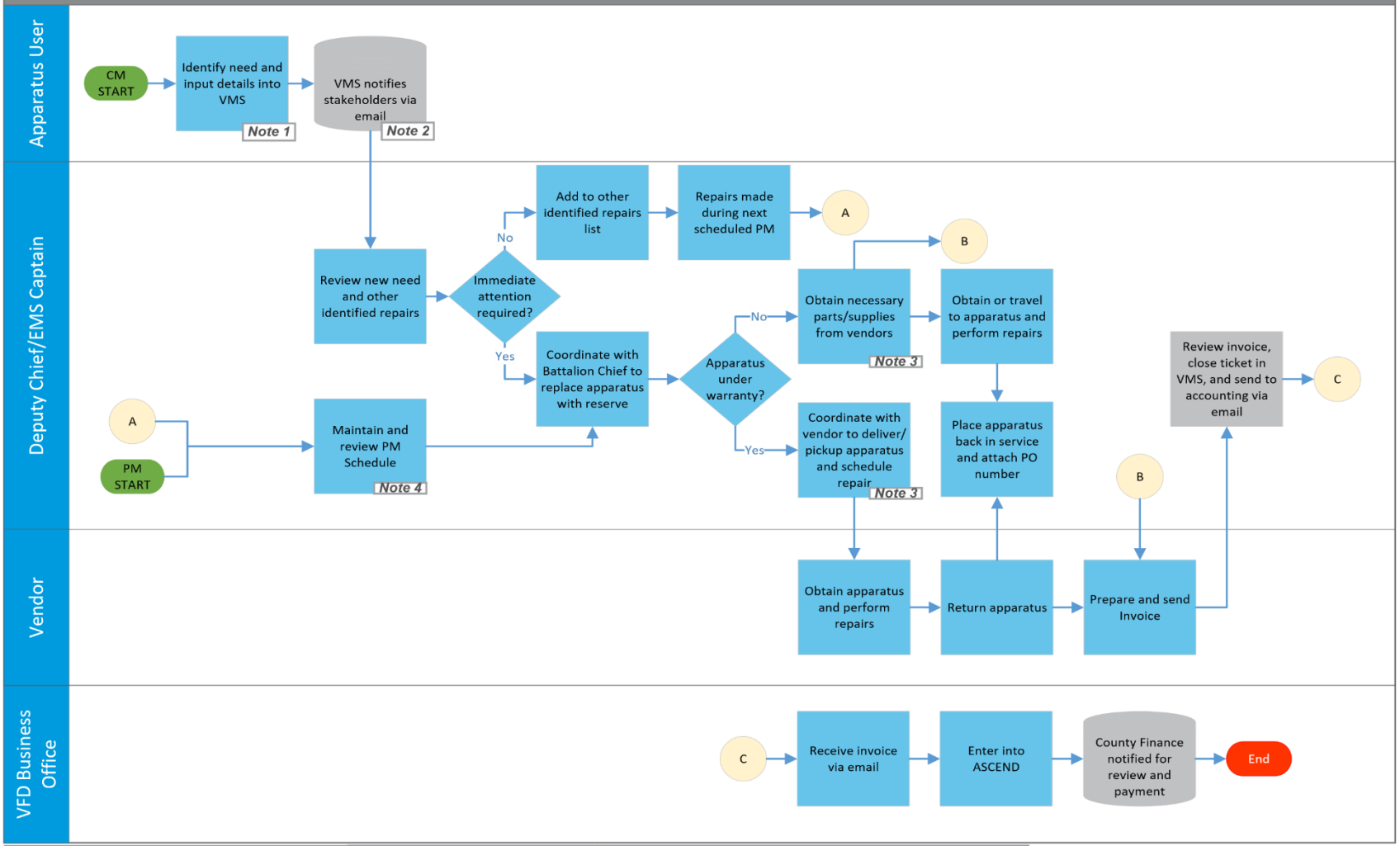
Note 3: Vendors include:
First Vehicle Services – In-house mechanic. They handle the process of subcontracting out to a 3rd party if necessary.
Rice Tire – Tire supplier
FESCO – Supplier of ambulance parts
Williams Emergency – Seagrave Manufacturer

Legend
Manual Step
Automated Step

PROCESS MAPS – CONTINUED

Dumfries Triangle VFD

Apparatus Maintenance Process



Note 1: VMS (Volunteer Management System) is a system used to create and manage the status of maintenance tickets.

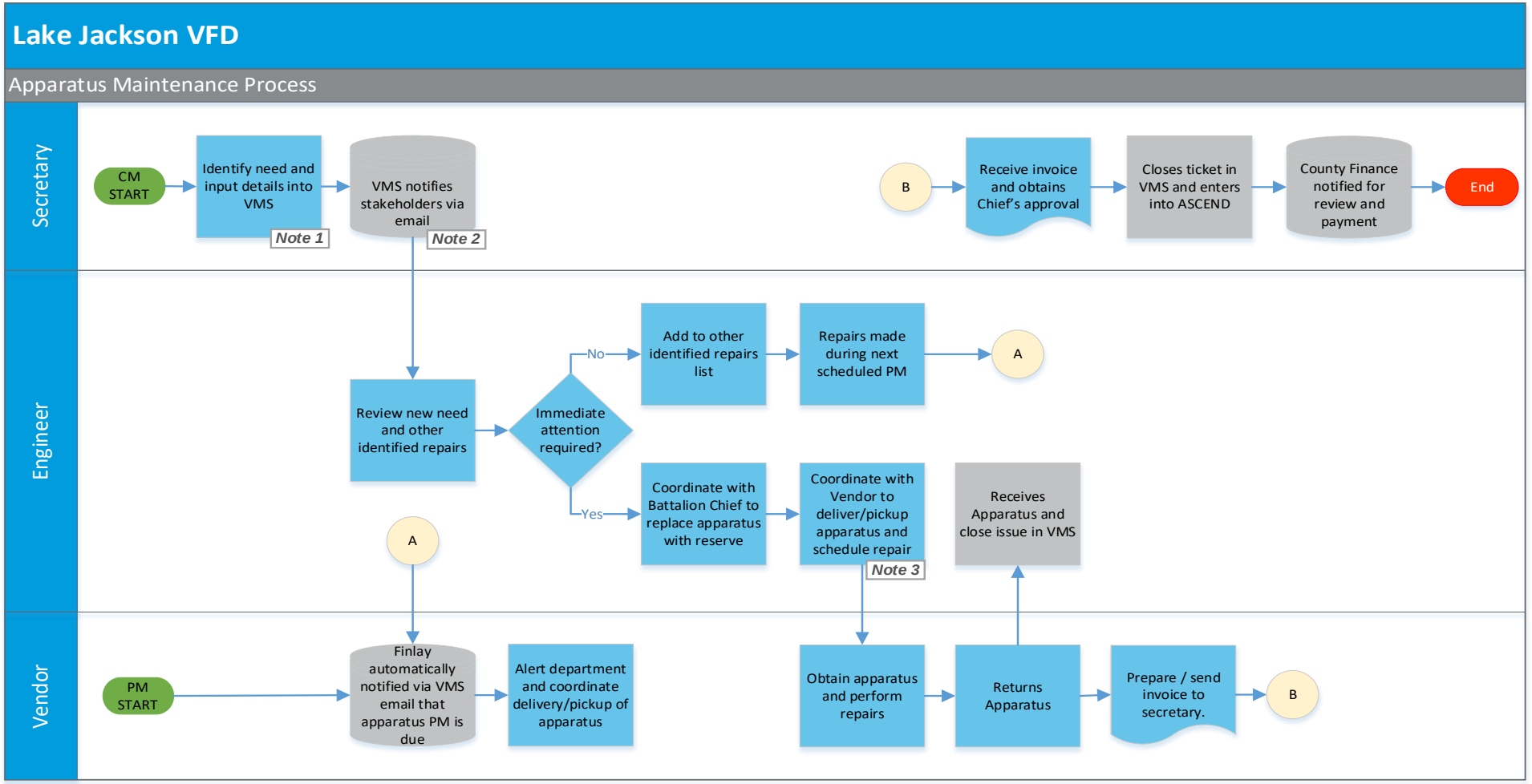
Note 2: Stakeholders include the station EMS Captain, Deputy Chief, President, Chief, and VP.

Note 3: Captain keeps a PM schedule for all apparatus. Any apparatus higher than a type 3 has a semi-annual PM schedule. All type 1,2, and 3 apparatus is maintained annually, which is triggered by each apparatus's annual inspection.

Note 4: Vendors include:
Matheny Motors – PO for E1 trucks
Northern Virginia Supply – Brake fluid
Alban Tire – Tire supplier
Wooddale Automotive – Small vehicles not under warranty
Arlington Armature – Radiators, alt starters, and other auto parts
EquipmentWorks – repair parts
FESCO – Ambulance work

Legend
Manual Step
Automated Step

PROCESS MAPS – CONTINUED



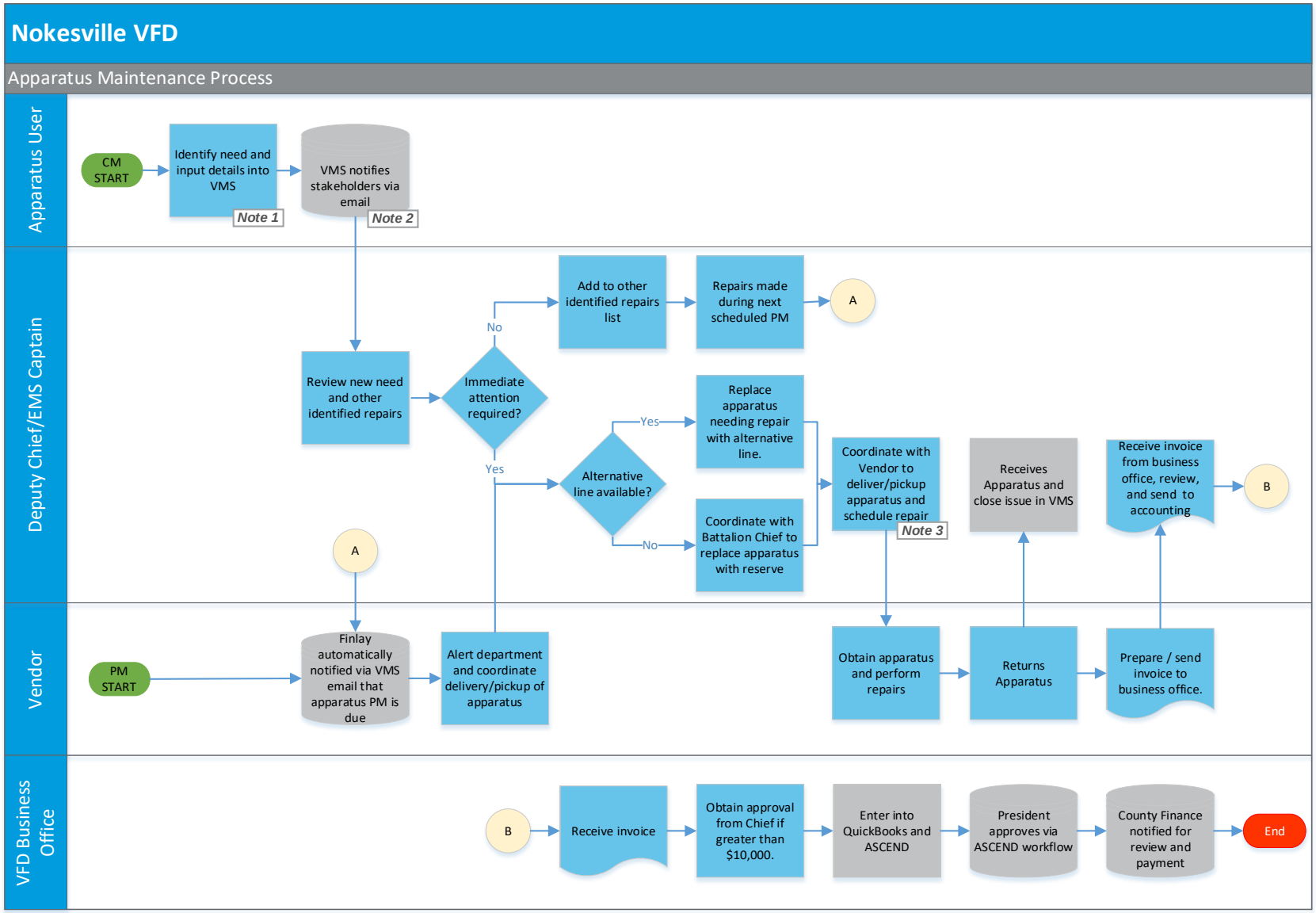
Note 1: VMS (Volunteer Management System) is a system used to create and manage the status of maintenance tickets.

Note 2: Stakeholders include the station President, Chief, VP and Finlay Fire.

Note 3: Vendors include:
Finlay Fire – maintenance for most apparatus. If a repair or service needs to be done that Finlay Fire cannot do in house, they handle subcontracting the work out to other vendors.
McCarthy Tire – Tire supplier

Legend
Manual Step
Automated Step

PROCESS MAPS – CONTINUED



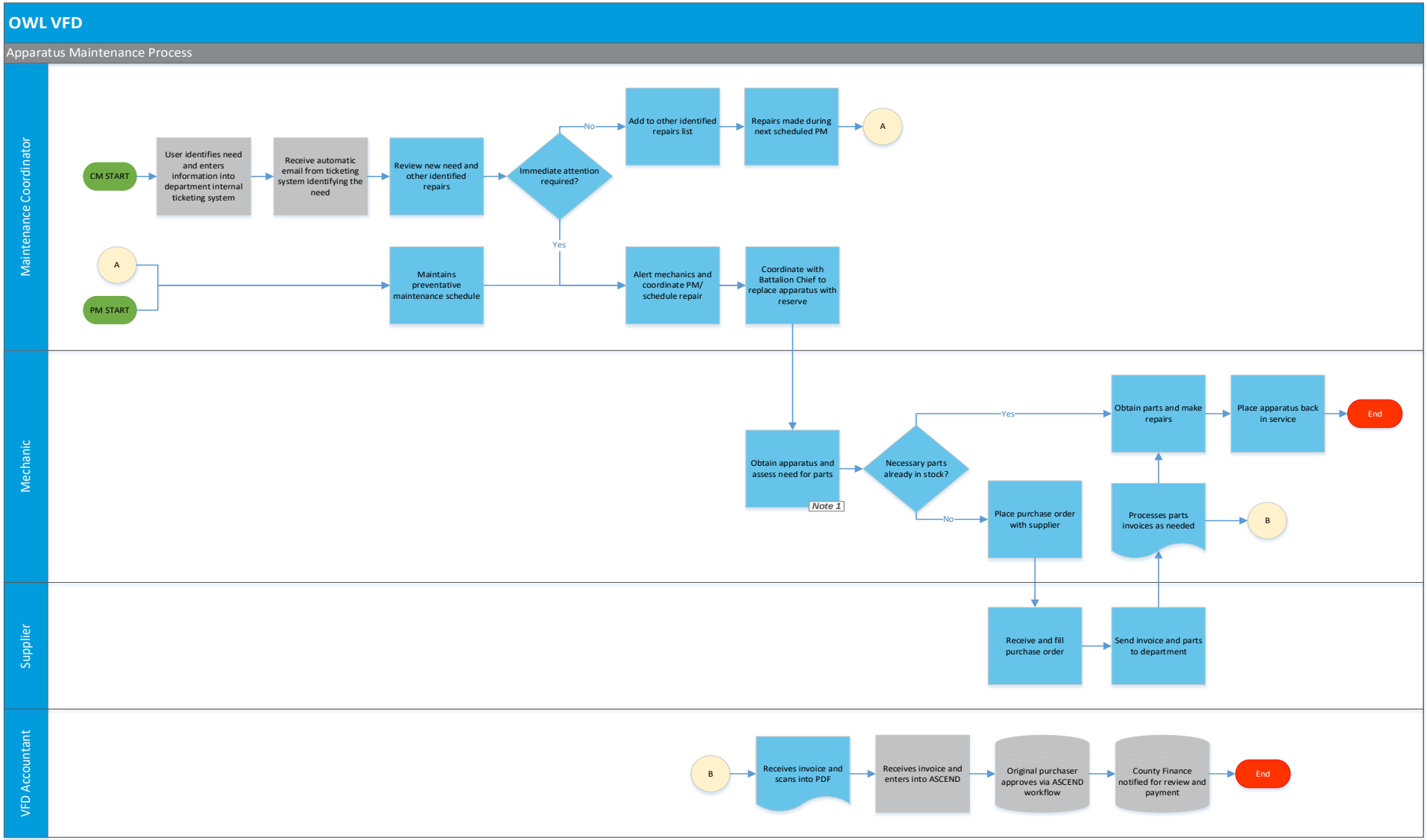
Note 1: VMS (Volunteer Management System) is a system used to create and manage the status of maintenance tickets.

Note 2: Stakeholders include the station EMS Captain, Deputy Chief, President, Chief, VP and Finlay Fire.

Note 3: Vendors include:
Finlay Fire – maintenance for most apparatus. If a repair or service needs to be done that Finlay Fire cannot do in house, they handle subcontracting the work out to other vendors.
FESCO – Ambulance work
McCarthy Tire – Tire supplier

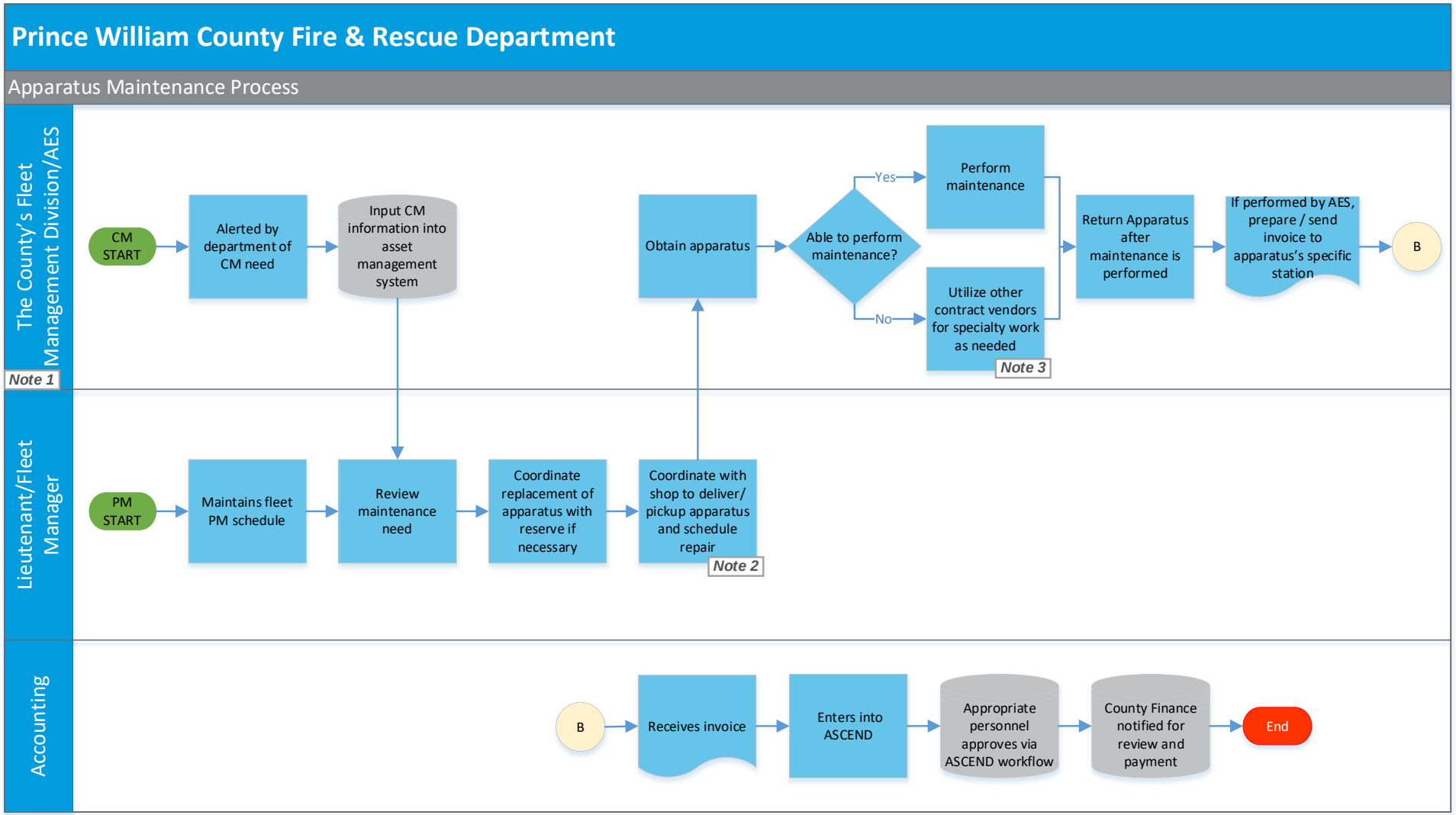
Legend
Manual Step
Automated Step

PROCESS MAPS – CONTINUED



Note 1: Most work is performed by the in-house mechanics. Engine, transmission, and suspension work is performed by vendors. Vendors include CSI, Finlay, Atlantic, and Cummins.

PROCESS MAPS – CONTINUED



Note 1: The County's Fleet Management Division is responsible for the majority of the preventative maintenance but AES maintains approximately 60 assets.

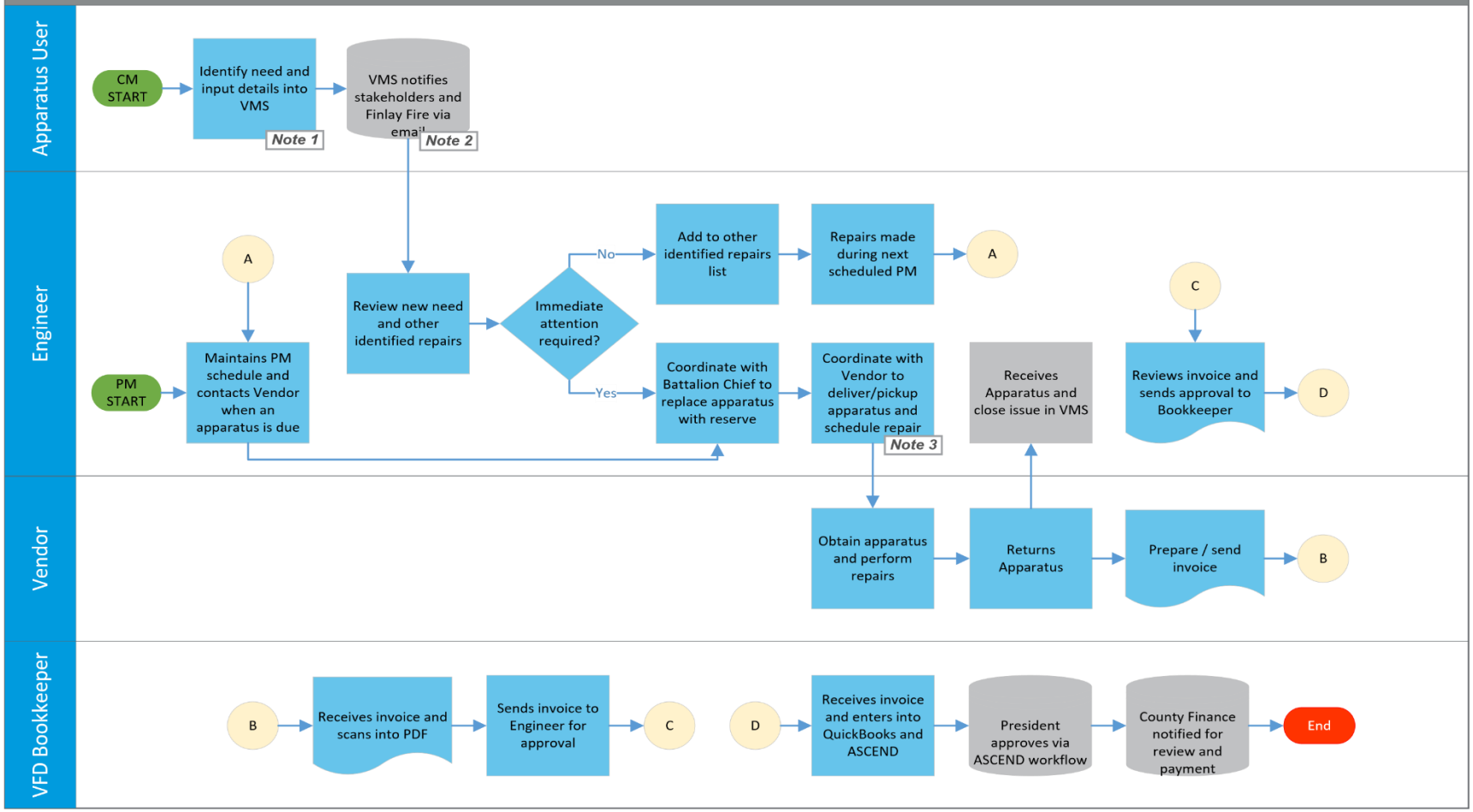
Note 2: Vendors include:
The County's Fleet Management Division – Preventative maintenance for most apparatus and corrective maintenance
AES – Preventative maintenance and corrective maintenance
McCarthy Tire – Tire supplier

Legend
Manual Step
Automated Step

PROCESS MAPS – CONTINUED

Stonewall Jackson VFD

Apparatus Maintenance Process



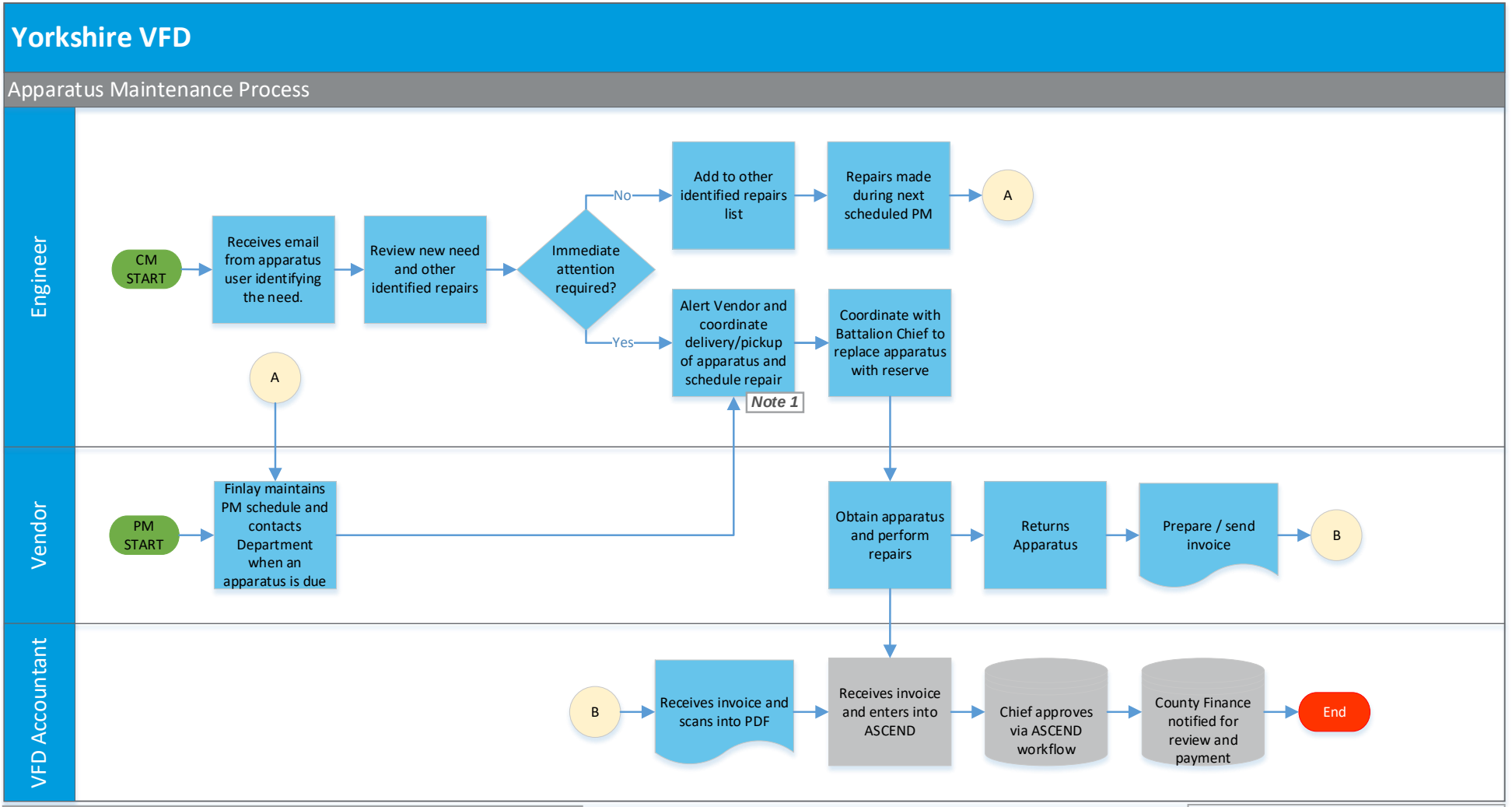
Note 1: VMS (Volunteer Management System) is a system used to create and manage the status of maintenance tickets.

Note 2: Stakeholders include the station Engineer, Chief, and President.

Note 3: Vendors include:
Finlay Fire – maintenance for most apparatus excluding warranty and proprietary manufacturer maintenance
Cowles Ford – Ford Explorer Police Interceptor (through Fairfax county contract)
Atlantic Emergency Solutions (AES) – Pierce warranty and proprietary work
Western Branch Diesel – drivetrain work
Cummins – Cummins brand drivetrain
Excellence Ambulance – Ambulance warranty work
McCarthy Tire – Tire supplier
Rice Tire – Goodyear tire supplier

Legend
Manual Step
Automated Step

PROCESS MAPS – CONTINUED



Note 1: Vendors include:
Finlay Fire – Maintenance for most apparatus
McCarthy Tire – Tire supplier
NAPPA – Small repairs parts

Legend
Manual Step
Automated Step

PRINCE WILLIAM COUNTY

APPENDIX A

Contract Record Retention Requirements

Finlay Fire

Section II: General Provisions - II.10 Examination of Records

The Contractor agrees that the County, or any duly authorized representative, shall, until the expiration of five (5) years after final payment hereunder, have access to and the right to examine and copy any directly pertinent books, documents, papers and records of the Contractor involving transactions related to this Contract.

Attachment A: Scope of Work - Repair Orders

All repair orders shall be per vehicle per repair visit and shall have the following data elements:

a. Vehicle description, including Unit number, VIN, Model Year, Make and Model, and Mileage;
b. Description of Complaint;
c. Description of Cause;
d. Description of Action; Taken to Repair;
e. Labor Charge Including Number of Hours and Hourly Rate;
f. Parts Charges;
g. Shop Supplies (if applicable); and
h. HazMat Disposals (if applicable).

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