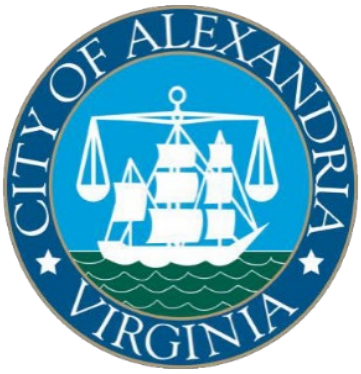
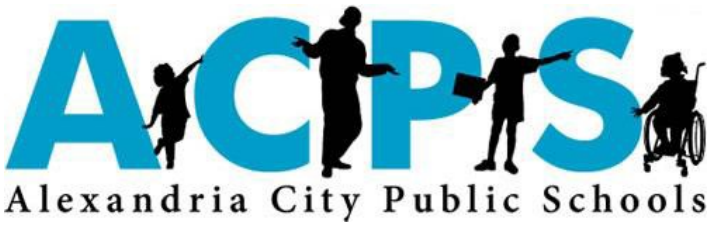
Report on an Assessment of

Fleet Maintenance Program Consolidation Feasibility

for





MERCURY ASSOCIATES, INC.

October 25, 2019

Mr. Jeff DuVal, Deputy Director
Department of Transportation and Environmental Services
City of Alexandria
2900 B Business Center Drive
Alexandria, VA 22314

Dear Mr. DuVal:

Mercury Associates, Inc. is pleased to submit this report on the results of our assessment of the feasibility of consolidating the the fleet maintenance programs of the City of Alexandria Fleet Services Division (FSD), formerly part of the Department of General Services, and Alexandria City Public Schools. We would like to thank the many officials and employees of both organizations for the assistance they provided to our project team in performing this assessment.

We appreciate being given the opportunity to provide services to the City and to ACPS, and hope that you will not hesitate to call on our firm in the future should the need for additional fleet management consulting assistance arise.

Very truly yours,

Paul T. Lauria
President

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INTRODUCTION

The objective of this component of our study is to assess the merits of consolidating all, or part of, the fleet maintenance activities of the City of Alexandria's (CoA) Fleet Services Division (FSD) and Alexandria City Public Schools' (ACPS) fleet maintenance unit, which currently falls under the Transportation Department's purview. This assessment is based on our findings regarding the soundness and consistency of fleet management activities in the many areas evaluated in Component 1 of this study, which assessed the maintenance and repair (M&R) practices of both FSD and Transportation independently, and our considerable experience working with hundreds of other similar fleet organizations across North America. This report assumes the reader has read the *Maintenance Practices* reports associated with these assessments, as well as the third component of this study, the *Fleet Replacement* report.

As noted and described in the other study components, the City government is comprised of many different agencies performing a wide range of functions and operations. CoA and ACPS owns and operates a highly diverse fleet including staff transportation vehicles, law enforcement vehicles, heavy-duty trucks, grounds maintenance equipment, snow removal equipment, school buses, and several other types of vehicles and equipment. The City's fleet is divided into several distinct subgroups, the largest of which is managed by FSD and constitutes the majority of the general government fleet.

ACPS Transportation and FSD operate independent shops to manage and maintain a combined 1,161 assets, which represent 1,927 VEU's[1]. Each fleet is described in greater detail within the corresponding *Maintenance Practices* reports. Viewed as a whole, the current FSD-managed portion of the fleet would represent over 85% of the total assets. However, a better perspective would be to consider the fleet in terms of VEUs, in which case FSD currently manages just over 71% of the combined fleet as the nature of any predominantly school bus fleet is to have a relatively high VEU to asset ratio. This is important to keep in mind when evaluating the potential benefits and challenges described later in the report.

It is important to note that the City's other fleet managing entities, and the corresponding portions of the fleet that these entities manage, are not included in the scope of this study. These include assets operated by the Alexandria Fire Department (AFD), the DASH transit system, motorcycles used by the Alexandria Police Department (APD), and small engine equipment (e.g. lawnmowers) utilized by Transportation & Environmental Services (T&ES) and the Department of Recreation, Parks & Cultural Activities (Recreation).

APPROACH

One objective in determining the appropriate organizational structure for Alexandria's fleet management is to determine what type of organizational structure will lead to the most

[1] The exact number of vehicles and pieces of equipment in CoA's and ACPS' fleet changes often as new vehicles are acquired and old ones are removed from service. This number represents the number of fleet assets managed as of November 2017. For an explanation on VEU's, see Maintenance Practices Report.

efficient and cost-effective fleet program for the City and school system as a whole. That said, it is important to keep in mind that fleet user (i.e., customers) service considerations should take precedence over cost reduction and other considerations because it is fleet user organizations' missions and associated business practices that dictate the need for fleet assets and fleet management services in the first place. Without fleet users there would be no need for fleet management organizations. Thus, the key objective in examining the organization of fleet management functions is to determine what type of structure will yield net improvements in service effectiveness. Fittingly, a "deeper dive" into cost analyses for fleet user organizations will often prove that the operating costs of these organizations will be driven down significantly when improvements in the effectiveness of fleet maintenance are achieved. This is due to a myriad of factors, but a key factor is the achievement of reduced downtime and a corresponding increase in vehicle availability, enabling the fleet user organization to operate more efficiently. For example, if a particular asset is unavailable, how does that impact personnel costs such as overtime, rental costs, and other opportunity costs?

The primary role of a centralized fleet organization should be to provide efficient and effective services to fleet users – not to regulate their behavior. Since user departments understand the requirements of their business much better than a central "fleet czar" ever could, they should drive decisions regarding the number and type of vehicles that they need to perform their missions completely. Accordingly, a central fleet management organization should provide its customers with consultative advice and technical expertise regarding fleet size and composition, influence their behavior through use of a service based (direct) cost charge-back system, and provide feedback on user decisions through management and exception reporting. Regulation, where it occurs, should come in the form of policy guidance and through the budget process where departments are required to justify their resource and spending requests.

Understanding Fleet Management Consolidation & Centralization

A clear best practice for fleet management programs, and a dominant trend over the past 20 years or so, is the consolidation of fleet management activities in a centralized service organization. Traditionally, it was believed that the effectiveness or responsiveness of a fleet management organization was highly correlated to its proximity to the fleet users it served. The result of this belief was the establishment or gradual evolution of multiple independent fleet management programs within an organization, each serving the purportedly unique needs of its own group of customers relying on its presumably specialized skills and knowledge. However, multiple fleet management "silos" are inherently inefficient in all but the largest fleet-owning organizations because they impede standardization of business systems and processes, lead to duplication of effort, and fail to leverage economies of scale.

Increasingly, however, it has come to be recognized that many, if not most, fleet user needs can be met more cost-effectively through a consolidated approach to fleet management. The trend in the fleet industry clearly is toward more rather than less consolidation of fleet management functions. The move toward consolidation can be traced to the increasing cost and complexity of fleet management and a simultaneous

increase in emphasis on governmental efficiency and cost control, and by extension, the need for accurate data. The rapidly increasing complexity of fleets (in areas such as automotive technology, alternative fuels, and vehicle telematics) and, by extension, of fleet management activities is creating significant economies of scale which often can be captured only through collective effort.

Fleet user organizations, while generally cognizant of the cost savings that a central fleet management program can achieve, are usually concerned that such a program will be overly bureaucratic, command rather than support oriented, and not adequately understanding of, or responsive to, their fleet-related needs. In the case of Transportation's school bus operations team, the latter is a particularly appropriate concern, as the nature of their role to the community inherently includes significant timing and coordination considerations to be successful, and in turn requires a high level of attention and focus from fleet maintenance staff on their assets in order to ensure their service is viable. However, such fears usually can be allayed by involving users in the guidance of the fleet program, using such mechanisms as a fleet advisory board, formal service level agreements, customer relationship management and satisfaction measurement processes, a transparent cost charge-back system, and objective performance measurement and reporting procedures.

These considerations were foremost in our project team's mind as we considered the pros and cons of consolidation fleet management programs in Alexandria.

METHODOLOGY

Maturity Ratings

In our review of existing fleet maintenance practices for each organization, we evaluated 30 distinct areas of fleet management, grouped into seven larger thematic functions, as to their conformance with industry best practices and to the strengths and weaknesses in each major area. We described in detail the present mode of operation and recommended actions that would improve the efficacy and/or cost efficiency of each. As part of that process, we assigned a *maturity score* to the present mode of operation for each business process. The maturity ratings are based on our extensive experience working with all manner of fleets and our knowledge of industry practices that are found in the highest-performing organizations with which we have worked. The ratings are shown in the following table:

Rating	Brief Description of Maturity Score
5 - Best in Class	The organization has an innovative, well-above-average ability to define, measure, monitor, manage, and perform the fleet management activity that clearly sets it apart from the typical fleet management organization.
4 - High Performing	The organization has comprehensive, well-defined, data-driven protocols and procedures for performing the activity and promoting continuous improvement in its execution.
3 - Competent	The organization has good knowledge of basic fleet management principles and techniques associated with the performance of the activity and applies it in a generally consistent manner.
2 - Basic	There is a limited understanding of the proper methods of, and generally inconsistent, performance of the activity across the organization.
1 - Reactive	The organization has a poor understanding of, and ad hoc approach to performing, the fleet management activity, or fails to perform it with any consistency, if at all.

Consolidation Benefit Ratings

Utilizing the information described above, our approach to this project involved assessing the relative strengths and weaknesses of the two fleet management organizations' current resources (e.g., staff, information systems, and facilities and equipment), capabilities (e.g., experience, technical expertise, and knowledge of industry best practices), and business practices, and the merits of overcoming any deficiencies identified through partial or total consolidation of its fleet management responsibilities and activities. Our intent was to determine where common fleet management practices would complement one another or have a negative effect on one or all of the parties as a result of consolidation. As such, we assigned a value to the degree of *benefit*, in terms of improving the maturity, and by implication the outcomes of these practices, that consolidation would produce. We developed separate ratings of such benefits for each fleet management organization. Thus, for example, consolidation could benefit the management of the ACPS fleet in several areas while not having an equivalent benefit for the fleet managed by FSD, and vice versa.

Consolidation Benefit Rating	Explanation
3 - High	Consolidation would facilitate substantial improvement(s) to current fleet management service delivery capabilities, practices, quality, and/or costs.
2 - Medium	Consolidation would facilitate moderate improvement(s).
1 - Low to none	Consolidation would facilitate limited improvement(s) or none at all.
0 - Adverse	Consolidation would adversely affect current services.

Cost and Resource Evaluation

While a rigorous benefit-cost or return on investment analysis was not included in this feasibility assessment, we also looked at each organization's current resources in terms of what, if any, investment would be necessary to address deficiencies and/or generate significant gains in current practices and considered whether all or part of these costs could be avoided through consolidation and/or resource sharing. To do so, we identified where resources are needed, estimated the necessary investment based on our experience where feasible, and determined whether each organization could offer value related to the resource.

Lastly, based on available data, we evaluated the impact a consolidated fleet maintenance team would have on cost by calculating key M&R cost benchmarks and comparing the results of each organization with a reasonable, consolidated organization. For this exercise, ACPS Transportation was divided into two organizations, with the fleet maintenance team moving into the new fleet maintenance organization, and those members involved administratively with fleet management remaining part of Transportation School Bus Operations (TSBO). The results of this exercise should not be viewed in terms of a proposed consolidation implementation plan, but rather as estimates based on the data and information readily available, which were then utilized to test if a consolidated organization is operationally viable, and if there is reason to believe economies of scale are achievable as a result of that consolidation.

FINDINGS

FLEET MAINTENANCE PRACTICE AND CONSOLIDATION IMPACT

Figure 1 below illustrates the rating for each fleet maintenance practice evaluated in Component 1, as well as provides a rating as to the impact a potential consolidation would provide to each organization's performance of the noted fleet management activity. For detailed observations on each organization's present mode of operation, as well as recommended action items, refer to the *Maintenance Practice* reports submitted under separate cover. We have also added ratings for both organizations' replacement management practices, based on the same scale described above, for which detailed analyses can be found in the *Replacement Plan*.

Figure 1
Fleet Management Practice Maturity & Consolidation Benefit Ratings

Asset Management	CoA FSD's Maturity	ACPS Trans. Maturity	Consolidation Benefit FSD	Consolidation Benefit ACPS
Replacement Planning and Management	3	2	1	3
1. In-House Asset Maintenance and Repair	**CoA FSD's Maturity**	**ACPS Trans. Maturity**	**Consolidation Benefit FSD**	**Consolidation Benefit ACPS**
1 Pre-/post-trip inspection and defect reporting	3	3	1	1
2 Preventive maintenance program design and execution	3	3	1	3
3 Work planning and scheduling	2	2	1	2
4 Vehicle defect reporting and Service Writing	3	2	1	3
5 Tech Job Assignment, Supervision and Efficiency Management	2	3	2	1
6 Quality assurance	2	2	2[2]	2[2]
7 Roadside assistance and asset recovery	3	3	1	1
8 Warranty, recall and campaign management	3	3	1	1
2. In-House M&R Parts Management	**CoA FSD's Maturity**	**ACPS Trans. Maturity**	**Consolidation Benefit FSD**	**Consolidation Benefit ACPS**
1 Supplier selection and contract establishment	3	3	1	1
2 Inventory and ad hoc parts procurement	2	3	1	1
3 Parts requisition and disbursement	2	2	2	3
4 Inventory management and control	3	2	1	3
3. Outsourced M&R Management	**CoA FSD's**	**ACPS Trans.**	**Consolidation Benefit FSD**	**Consolidation Benefit ACPS**

2 Integrating FMIS for this function would address ACPS' deficiencies in this area. It's possible that the work ethics exemplified by ACPS mechanics will influence FSD staff positively, but this must be accompanied by setting and enforcing work standards outlined in the FSD *Maintenance Practices* report.

	Maturity	Maturity		
1 Supplier selection, contract establishment and performance management	3	4	1	1
2 Service authorization and transaction management	3	3	1	1
4. Fleet Maintenance Resource Management	**CoA FSD's Maturity**	**ACPS Trans. Maturity**	**Consolidation Benefit FSD**	**Consolidation Benefit ACPS**
1 Organization structure and staffing levels	3	3	2	2
2 Employee Classification and Compensation	3	2	2	3
3 Employee training and professional development	1	2	1	1
4 Facility location, size, layout and utilization	4	1	2[3]	3
5 Facility maintenance and housekeeping	3	3	1	2
6 Safety management and regulatory compliance	2	2	1	2
5. Information Management	**CoA FSD's Maturity**	**ACPS Trans. Maturity**	**Consolidation Benefit FSD**	**Consolidation Benefit ACPS**
1 Management information system	3	1	1	3
2 Data capture and integrity and security management	3	1	1	3
3 Management analysis and reporting	3	1	1	3
4 Ad hoc Management Analysis and Reporting	4	1	1	3
6. Cost and Financial Management	**CoA FSD's Maturity**	**ACPS Trans. Maturity**	**Consolidation Benefit FSD**	**Consolidation Benefit ACPS**
1 Budgeting	3	1	1	3

3 Assumes implementation of a second shift where FSD moves PM and some light vehicle servicing to second shift; hence, utilization of the facility will improve.

2	Cost determination and charge-back rate development and allocation	1	1	3[4]	3
3	Cost and expenditure analysis and control	2	1	3[4]	3
7. Customer Service Management		**CoA FSD's Maturity**	**ACPS Trans. Maturity**	**Consolidation Benefit FSD**	**Consolidation Benefit ACPS**
1	Transaction-based communication	3	3	1	3
2	Customer satisfaction measurement	3	1[5]	1	2[5]
3	Customer relationship management	2	1	3[6]	3[6]

KEY CONSOLIDATION BENEFIT OPPORTUNITIES FOR ALEXANDRIA

As described above, one of the key considerations was to determine whether or not the consolidation of each organization's efforts could help to address deficiencies and/or improve current processes and situations for each organization. In addition to our assessment of each fleet management practice provided above, we felt it important to elaborate on those where consolidation would have the biggest impact. With this in mind, we considered the key challenges currently facing each organization, and developed feasible consolidation circumstances to consider the impact it would have on existing performance and/or efficiency of the various activities. In order to do so, we used our knowledge of existing operational requirements of each organization, and the resources at their disposal to meet these requirements. As equipment, tools and supplies are not an issue for either maintenance unit, our focus was on human, IT and facility resources.

The list below is not meant to be exhaustive of all of the benefits of consolidation, but to demonstrate key "wins" consolidation should produce.

Maintenance Facilities

A key issue for ACPS Transportation's maintenance unit is the fact that its maintenance facility is inadequate. As described in great detail of section 4.4 of Transportation's *Maintenance Practices Report*, there are not enough bays (failing to even provide one bay per mechanic); the bays are not large enough to accommodate the buses they are utilized to maintain; there is inadequate storage space; and the remainder of the space is

4 Assumes consolidation prompts a transition to 100% ISF, which is necessary to prevent cross-subsidizing agencies' fleet expenses.
5 While customer satisfaction was good to excellent among those interviewed, this rating is based on the lack of formal measurement within ACPS. Participating in FSD's existing measurement system, while imperfect, would improve this function.
6 Assumes consolidation prompts adoption of SLAs.

both not large enough and not arranged well to be conducive to a safe, efficient maintenance and repair environment. High performing maintenance facilities typically have 1.5 to 2 bays per mechanic, but to have less than one bay per mechanic is a severe hindrance to productivity.

While a comprehensive space needs assessment for a school bus maintenance facility was beyond the scope of work for this study, we did develop a high-level projection of maintenance facility space requirements to support the operation. Based on the current workload and a projection of near-term growth in the fleet[7], we have developed a rough order of magnitude size of a new fleet maintenance organization. The shop facility would include eight large M&R bays, which would accommodate the largest of ACPS' existing school buses with the understanding that larger buses would not be conducive to the operating environment within Alexandria, and two standard M&R bays. This facility would include the shop (i.e., maintenance bays), shop support areas (i.e., parts room, reference library, tool room, etc.), employee amenities (i.e., locker rooms, break room), and administrative areas (i.e., offices, workstations, conference room, etc.). This space is only for school bus maintenance staff and does not account for the space needs of the operations portion of the Transportation Department. In order to construct a new facility to meet the required needs, we estimate the cost of a new facility to be in the range of $4 to $5 million. The cost could be lower or higher depending on final design and construction materials. This does not include any site acquisition, site improvement or utility costs or any associated permitting or other construction fees. This also does not include any programming and design costs. These costs are provided for illustrative purposes only.

FSD's facility on the other hand, while imperfect, is for the most part well designed, adequately sized, and in good working condition. With a total of 16 bays, eight of which with some drive-through capability, there is enough space to accommodate the largest of buses within the ACPS fleet. Considering the two facilities share the same campus, and are adjacent to each other, any impact on ACPS Transportation's operations would certainly be surmountable. Moving school bus maintenance into the FSD facility is a reasonable potential solution and would help ACPS to avoid, or at minimum defer, significant facility costs.

The City would then have three ways forward to consider. The first would entail moving the entire fleet maintenance operation into the existing FSD space. While we believe there is sufficient space to do so, there would be some additional cost for minor renovations to reconfigure space and/or possibly acquiring a storage unit to facilitate the additional parts and supplies of the school bus maintenance team. However, these costs would be insignificant relative to the cost of a new school bus maintenance facility and be offset somewhat by the sale of unnecessary duplicate equipment. Additionally, the mechanic to bay ratio currently enjoyed by FSD becomes less ideal, however there are enough to enable *at least* a one to one ratio (16 bays to 14 dedicated mechanics under current organizational structures), and the use of a second shift, as discussed later in the report,

[7] At present, Transportation utilizes approximately six "wrench turning" FTE's via five full time mechanics and wrench turning from other staff members including the Lead Mechanic. At a minimum of 1.5 bays per mechanic, this would indicate a minimum of eight to nine bays.

could facilitate an even more conducive *effective* ratio. Lastly, while this arrangement would provide enough space for the near-term future, at some point, growth in both fleets would require additional maintenance facility space. While this is a fundamental challenge for all fleet owners who operate their own repair facilities, this arrangement will no doubt hasten the speed with which CoA will need to upgrade their space. That said, the design and location of the existing FSD facility is significantly more conducive to "add-on" building components than many facilities we visit.

Completely moving all fleet maintenance functions into the FSD facility will also provide other benefits. While a study of Transportation's school bus operations practices was not included in this study, it was clear from our visits that there was inadequate space. Moving the maintenance unit out of the building would free significant space such that renovations could allow for a more appropriate space for TSBO staff. From a maintenance staff perspective, the above arrangement would certainly necessitate other considerations with regards to work scheduling, but would prove beneficial for workload sharing, information exchange, cross training, etc.

The second way to proceed would be to continue to use the existing maintenance bays in the Transportation facility, but to reorganize staff location and bay assignments such that only vehicles of appropriate size are maintained in those bays. The advantage to this are the extended deferment of major facilities upgrade costs associated with fleet growth as the bay to mechanic ratio in total would be virtually optimized[8]. However, the coordination necessary from a parts management and equipment management perspective would be more difficult, and the potential gains associated with increased space for TSBO would not exist.

A third way forward, of course, is through some hybrid of the first two in an attempt to strike the best possible balance between the pros and cons of each.

Certainly, further study is required to develop a comprehensive facilities space needs assessment and implementation plan. The goal here is to illustrate that a) there is a significant issue with ACPS' existing maintenance facility (as described thoroughly in the *Maintenance Practice* report); b) to address this issue alone requires a significant investment by ACPS; and c) the option of addressing this issue via consolidation or shared resources is undoubtedly viable and provides large cost avoidance benefits.

Fleet Management Information Systems

Another key challenge for ACPS Transportation's fleet maintenance team is the lack of a dedicated fleet management information system (FMIS), which severely limits their ability to record information effectively, measure productivity, employ data-driven decision making, and identify opportunities for improvement in both efficacy and efficiency. A well deployed FMIS positively impacts every facet of fleet management and maintenance, including parts and inventory management, warranty and recall management, PM

8 This would create a ratio of 1.43 bays to 1 mechanic. Optimized facilities typically have at least 1.5 bays to 1 mechanic, and as much as 2 bays to 1 mechanic.

scheduling and performance, sublet vendor management, cost and expense control, and customer relationship management. It is essential to any modern fleet maintenance program, and a necessary tool for the continued, successful growth in ACPS' fleet and fleet management practices.

In order to obtain an effective FMIS independently for ACPS' needs, it could cost in the order of several hundred thousand dollars after licensing, necessary hardware upgrades, training, infrastructure improvements and other expenses. At minimum, we recommend ACPS work with FSD in an effort to "piggy-back" their existing system, thereby reducing acquisition costs. However, there would still be quite an investment of time and money for hardware and training in order to fully integrate the new system into work procedures and processes. Moreover, an additional effort by the supervisory and administrative staff would be necessary to develop the ability to manipulate the system sufficiently to extract valuable insight that can be gained from a properly deployed system.

While we have also provided FSD with several recommendations on how to better utilize this tool, the use of an FMIS is already integrated into their work processes. With a formal Management Analyst position already in place, a Division Chief who is dedicated to data-driven decision making and having already begun to utilize data to drive change within FSD, the adoption, integration and utilization of a FMIS by Transportation fleet maintenance staff will certainly happen more quickly and thoroughly, and create more value, by working closely with FSD staff.

Increased Service Hours

A significant potential benefit to the consolidation of fleet maintenance teams is the increased ability to incorporate a two-shift system. Both organizations clearly recognize that there is a need for extended service hours, as illustrated by their existing scheduling (both employ a four-day, 10-hour work day for mechanics). In this current system, there is significant demand placed on shop leadership to ensure proper staff coverage, which in both cases leads to extra work hours (overtime eligible or not) and blurred lines of responsibility amongst supervisors. Certainly, the combined quantity of qualified staff exists to accommodate a second shift, and economies created by that consolidation would ensure no loss of productivity of the primary shift.

Increased operational hours would help both organizations improve the amount and efficiency of the service they provide. We would expect improvements in turn times as assets that would otherwise be in queue can often be worked on during the second shift, and more convenient scheduling and reduced downtime associated with PM services. This creates less disruption to the operations of the fleet user, which is especially helpful with specialty equipment for which there are no, or very few, spares. This would undoubtedly lead to indirect cost savings for the fleet user's operation. Accordingly, several of FSD's current customers have expressed a desire to see service hours expanded.

For ACPS, Transportation's current operating circumstances make it virtually impossible to maximize the productivity of their mechanic staff. As described in detail in the

Maintenance Practice report, the school bus fleet does not have the optimal amount, and/or mix, of spare buses based on the current demand for bus service. As a result, mechanics must perform the bulk of their inspections, PM services and repairs between trips. This leads to the prudent practice of inspecting vehicles much more often than would otherwise be required in order to prevent unscheduled repairs. It also most likely leads to a rightful tendency to replace wear items early, so as to avoid potential safety concerns associated with not having the necessary access to the bus. These practices add cost to the maintenance of the fleet and limit the productivity of the school bus maintenance team. Utilizing two shifts would enable school bus inspections, PM services and some repairs to be performed at times when access to buses is significantly greater, facilitating both a more timely and efficient process, and increased bus availability to TSBO.

The two-shift system also leads to more availability to respond to unplanned work, including quick-fix repairs, accidents and breakdowns, reduces the current need for staff to remain on call for after-hours emergencies, and should reduce the need for overtime.

From FY 2015 to FY 2017, FSD and Transportation have paid a combined $239,720 in overtime, which does not include overtime for FSD weather emergencies. Understanding the bulk of this expense is paid to mechanics based on descriptions received from each organization, this represents less than $6,000 per year per mechanic, which is by no means an exorbitant amount. That said, while a second shift would most likely not eliminate overtime entirely, it is reasonable to expect some reduction in extra hours and paid overtime.

As alluded to above, the City currently employs special operations protocols for snow and other weather-related emergencies. In this system, FSD employees are required to work rotating 12-hour shifts to operate 24 hours per day, ensuring snow removal equipment can be attended to quickly so as to facilitate expeditious snow removal for road safety. Again, the cost for this is *not* included in the overtime costs noted above as these expenses are billed directly to a fund designated for this purpose. While we are unsure of the cost of these services, it is reasonable to assume it is significant, especially in recent years. There is also the indirect cost associated with having reduced staff during normal operating hours, which leads to reduced productivity. While a second shift would certainly not eliminate the need for special operations protocols, the increase in standard shop time would reduce the burden currently placed on both the City's budget and the staff themselves to respond and reorganize for these protocols, while reducing the impact on standard work routines and productivity.

Obviously, there will be challenges associated with instituting a second shift. First, the new fleet management organization (FMO) will need to determine the optimal hours of service for the needs of the fleet users. While for this study we have leaned toward a traditional night shift, the correct mix may lean more heavily on weekend operating hours, or some optimal mix of the two. Secondly, the FMO will need to determine the optimal staffing pattern with regards to mechanics, parts technicians, supervision, and other support staff. Typically, night-shift staff focus on PM and inspection, and quick-fix and urgent repairs. Lastly, all current staff members for both fleet maintenance teams

currently work day shifts during the traditional work week. Initially, the FMO will need to determine an appropriate system for fair distribution of these hours, whether it be redistributing current overtime allotments to differential pay or utilizing a rotating shift. With time, the FMO will be able to designate certain positions for a certain shift, thereby eliminating this issue.

Economies of Scale: Operating Cost Reduction & Staff Productivity

While an in-depth cost allocation and chargeback study was not included in the scope of this study, as part of our *Maintenance Practices* reports, we did evaluate the current cost management systems utilized by each organization, and as part of that evaluation, utilized available data to estimate current costs and compare those to industry benchmarks as a means of diagnosing potential issues within the maintenance practices of each organization. As described in section six of each of those reports, both organizations need improvement in terms of cost visibility and allocation stemming in large part to the chargeback system employed, or lack thereof, and the use of inaccurate (low) labor rates. Both organizations require improvements in terms of data-driven fleet management practices, and in the case of ACPS, there is virtually no data collection, as well as poor budget line delineation, making it extremely difficult to evaluate fleet management practices in terms of cost. Furthermore, as neither organization is required to carry expenses related to utilities or other facility fees such as rent or IT support, it is impossible to calculate the true *fully-loaded* cost of operation.

Utilizing our knowledge of both operations based on interviews, focus groups and our experience, we constructed a sample fleet management organization designed to account for the operational necessities of each organization, but tweaking reported time allocations to better apply staff expertise and reduce duplicity of effort. While carrying over all necessary costs, we evaluated the new organization to determine what impact, if any, the consolidation would have on staffing requirements, productivity and operating costs.

Figure 2
Staff Productivity

	Productivity Measurements	CoA FSD	ACPS Trans.	Consolidation
1	Total Full Time Equivalents (FTE)	18	9	26
2	“Wrench Turner” (WT) FTE	10.4	5.8	14.5
3	Reported direct labor hours (incl OT)	9841	1370[9]	N/A
4	Projected direct labor hours (w/o OT)	14496	6071	20,168
5	Optimized direct labor hours (w/o OT)	15585	N/A[10]	21,683

As Figure 2 above shows, similar or increased productivity could be achieved with fewer

9 We know inherently the reported direct labor hours are highly inaccurate based on our knowledge of the operation, which in turn inflates the associated labor rate. It is included to emphasize the importance of accurate data collection, and by extension, a well deployed FMIS.
10 Based on current conditions, we do not believe ACPS can reasonably achieve benchmark productivity.

FTEs via a consolidated fleet management organization. The hypothetical structure above utilizes one less FTE overall, and 1.7 less WT FTEs. This occurs via more efficient operating circumstances such as those described above, reduced duplicity of effort, and more focused job duties facilitated by effectively adding staff members to one whole organization. Incidentally, in this scenario, TSBO staff would "gain" an FTE, as staff members currently engaged in fleet management responsibilities would be *mostly* relieved of those duties.

With regards to impact on cost, Figure 3 below indicates operational economies could be achieved via consolidation.

Figure 3
Operating Costs

	Operating Cost Benchmarks	CoA FSD	ACPS Trans.	Consolidation
1	Total Annual M&R Cost per VEU	$2,026	$2,313	$1,999
2	Reported Productivity Labor Rate hourly	$147	$506[9]	N/A
3	Projected Productivity Labor Rate hourly	$97	$109	$96
4	Optimized Productivity Labor Rate hourly	$93	N/A[4]	$90
5	Asset Mgmt Markup (pr asset pr mo)	$14	$21	$13
6	Fuel Mgmt Markup (pr gal dispensed)	$0.09	+$0.08[11]	$0.08
7	Sublet Markup (per transaction)	13%	32%	17%
8	Parts Markup (per part)	39%	33%	35%

These calculations are based on current costs, and do not take into account achievable economies of scale associated with consolidated procurement efforts, such as parts, supplies, tools, equipment, etc., additional operational efficiency improvements that will most likely be realized based on the new organizational structure, nor the improvements each organization may reach on their own by instituting recommendations in the other reports. Even more impactfully, the use of a shared space as described above, would necessarily and significantly drive down the per hour/transaction fixed costs associated with utilizing the facility. As such, were the rates noted above fully loaded, the consolidation figures would show a more dramatic decrease.

While the figures in these tables should not be viewed as the results of a comprehensive operating chargeback rate study, taken together it does serve the purpose of evaluating whether or not economies of scale may exist in terms of productivity and cost efficiency. In addition to enabling significant cost avoidance to ACPS, we can state with some level of confidence that consolidation should lead to cost reduction for both organizations' fleets.

11 This figure represents the markup Transportation should charge based on its efforts to provide fuel for ACPS fleet users. As FSD provides fuel to ACPS, this figure is added to the FSD markup, such that the effective markup would be $0.17 to ACPS fleet users.

IMPEDIMENTS, CONCERNS AND KEY CONSIDERATIONS

There are several items that must be addressed in advance of moving forward with consolidating the fleet maintenance teams into one organization.

Resistance to Change and Service Level Agreements

For one, there is long-standing organizational culture where the two entities have operated separate fleet operations for some time, and as such, both skepticism and resistance to change will be a natural reaction for many involved. This can be addressed through clear communication, inclusive planning efforts, and a well-developed implementation plan that includes the development and vetting of service level agreements (SLAs) between the new FMO and fleet user departments, which now would include ACPS TSBO as its own stand-alone fleet user, and of course ACPS' other current fleet user departments. Similarly, SLAs can be used to assure FSD's fleet customers that consolidation efforts will not negatively impact their fleet management and fleet maintenance needs.

A key aspect for ACPS Transportation, and indeed the City as a whole, which must be agreed to and included in the SLA, is the commitment to keep in place a dedicated school bus technician team with the experience, expertise and focus necessary to accommodate the operational needs of TSBO. This includes having the appropriate quantity of staff on hand during the necessary operating hours to quickly and appropriately respond to TSBO's needs, as is currently the case. While fleet right sizing and operational efficiencies will significantly alleviate the current demands of the school bus fleet on maintenance staff, they will not eliminate the need for dedicated and focused technicians oriented around TSBO's schedule.

Additional Fleet Management Organizations

Secondly, consideration should be made for other existing fleet managing organizations. As referenced in the introduction, while FSD represents a mostly centralized fleet management organization for the City, there are several others. It is logical to consider which, if any, of those organizations would also benefit from consolidation; and, if further consolidation is feasible, the potential impact these organizations would have on workload, workforce and workspace. AFD, for example, has its own space in the same building with FSD, and could have excess or insufficient space and staff capacities that would impact the best scenario for all involved.

FSD Technician Productivity Improvement

Perhaps the most important impediment to immediate (relatively speaking) consolidation between FSD and ACPS Transportation maintenance programs is the current lack of production by *most* FSD technicians as described in section 1.5 of the *Maintenance Practices* report. Inherently, there is at least some risk of negative cultural diffusion. As such, it is important that FSD shows strong improvement in this area prior to a formal consolidation. In other circumstances, this issue may have deterred our recommendation

for consolidation at all, however we have reason to believe this issue will be overcome. For one, we are aware that FSD has already begun to implement policy and performance measurement changes based on our recommendations in the *Maintenance Practices* report. Furthermore, our interviews with both customers and staff members of FSD consistently expressed noticeable improvement in the quality and timeliness of the M&R services since the arrival of the current Division Chief approximately three years ago, and we are aware of parts management practices that were implemented prior to the commencement of our study that have produced measurable results. As such, we are confident that these improvements will be made, and accordingly, consolidation is a reasonable next step upon the improvement of measured technician productivity approximating the provided projected direct labor hours.

Cost Allocation and Recovery

Lastly, but no less importantly, the current cost allocation practices of both organizations fail to assign cost recovery appropriately, as described in detail in the *Maintenance Practices* reports. This impedes cost visibility for fleet users, the fleet management teams, and City and ACPS leadership. As such, the current systems result in cross-subsidies between departments and also fail to incentivize fleet users to manage the costs they create by making consumption decisions in accordance with their operating needs, and by managing the behaviors of their drivers and operators accordingly. At the same time, there is currently no burden on FSD or ACPS Transportation to justify rates and mark-ups to its fleet customers, which should be the driving force behind efficiency and the quality assurance of its services.

Even without consolidation, the benefit of setting up fleet organizations as an Internal Service Fund (ISF), whether formally or effectively, is essential to properly manage and control costs for the fleet, provide optimized fleet services, and implement strategic change where and when it is necessary. As such, we have made this recommendation for both organizations independently. In the case of a consolidated fleet management organization, the need for this system is all the more pressing as it is the only way to truly avoid cross-subsidization, ensure fleet user satisfaction, and measure the efficacy of the consolidation. As such, this system will need to be implemented in advance of the consolidation, whether formally or as a “shadow” system, so that fleet user organizations can budget appropriately, and become accustomed to the new system.

CONCLUSION

We commend the City government and Public Schools system of Alexandria for recognizing the challenges of managing and maintaining a large and diverse fleet and welcoming the opportunity to make changes to the fleet program.

In this study, we have identified many action items to improve the levels of service, increase accountability, and reduce overall fleet costs. Implementation of these actions will present challenges, but they must be addressed in order to transform the fleet program into a “best in class” organization. Some changes will require reengineering of past practices (e.g., ACPS will have to implement the use of an FMIS) while others will

not be quite as intrusive (e.g., increasing and formalizing staff training programs).

We are confident that if the City and ACPS act on the recommendations provided in these reports and given adequate resources and support from leadership, that both fleet maintenance operations can be successful in increasing service levels and lowering total fleet costs.

Returning to the central issues involved in assessing the feasibility of consolidating fleet management activities in Alexandria, the two key questions we believe need to be answered are the following. Would consolidation improve fleet management service levels for fleet user organizations? And would consolidation enable Alexandria to leverage economies of scale to lower fleet and fleet management costs? We believe the answer to both questions is *Yes*. Centralizing fleet management in the City would improve service levels through the expansion of service availability, and significantly more efficient operational circumstances; and likely lower fleet-related costs via economies of scale associated with the efficient deployment of staff and the utilization of shared resources, as described above. It could also enable significant cost avoidance associated with facilities and IT costs for ACPS. Furthermore, the improved service levels associated with the consolidated fleet will equate to lower fleet downtime, which in turn will lower the operating costs of fleet user organizations, and potentially facilitate a reduction in fleet size associated with a reduced need for spares.

However, at this time there are several barriers in place that would impede the total consolidation of the FSD and ACPS fleet management programs. All of these obstacles are surmountable, thus leading us to recommend a *phased* approach to consolidation. In this way, the two organizations can avoid pitfalls, and avoid the risk of potentially lowering the quality of service each organization receives, but still realize the improvements consolidation will create. To that end, our recommendations below predominantly represent efforts that should be completed *before* consolidation is formalized, and while many of the activities can take place simultaneously, we have ordered them with some eye towards chronology.

In summary, there are many service quality, cost benefits and cost avoidance opportunities that can be achieved through the integration of FSD and ACPS Transportation fleet services. There are also several obstacles that must be navigated in order for that integration to be successful. A key first step is ensuring that the “foundational” business policies, procedures, and practices of both fleet management programs be compatible before attempting large-scale consolidation efforts.

RECOMMENDATIONS

M&R and Replacement Practices Recommendations

The first step in ensuring a successful consolidation is to begin to address opportunities for improvement as outlined in other reports within this study. Doing so will not only improve efficacy and efficiency of fleet management practices for both FSD and ACPS Transportation individually but will also position both organizations for a successful transition. There is no need to delay while consolidation and other larger improvement opportunities are considered by leadership. Key recommendations from these studies include:

1. Create or improve cost allocation and chargeback methods to ensure cost visibility, thereby optimizing the effectiveness and efficiency of fleet resources
2. Implement or expand the use of FMIS to incorporate KPIs into technician performance measurement, reporting and decision making
3. Develop and implement SLAs collaboratively with fleet user organizations
4. Optimize fleet size, composition and life cycle replacement parameters through empirical analyses
5. Implement a replacement plan, which includes determining the best financing method for fleet assets and using cashflow projections to establish or adjust replacement chargeback rates to reduce overall spending requirements

Fleet Centralization Expansion

Determine the feasibility, challenges and benefits of expanding consolidation to include each of the City's other fleet managing entities into one central fleet management organization. Decide which and to what extent each organization's fleet management staff, and their corresponding fleet assets, will be included in the new FMO, and integrate accordingly into consolidation planning and implementation activities.

Conduct Fleet Maintenance Facility Needs Assessment and Implementation Plan

Perform a comprehensive fleet maintenance facility space needs assessment that includes consideration of all asset types, parts inventory, equipment needs, staffing requirements, etc. for all fleet managing units that will be integrated into the new fleet management organization. Determine necessary and optimal renovations, space reorganization, and/or additional resources. Develop a plan to assign space accordingly, accounting for relocation efforts.

Establish New Fleet Management Organizational Structure

Starting with FSD's existing structure, consolidate ACPS Transportation's fleet maintenance team, along with appropriate fleet management staff from other consolidated fleet management entities, into the new fleet management organization. In ACPS' case, the transition should include assurances that the current school bus maintenance technicians will continue to devote most if not all of their time to school bus

fleet maintenance and repair. In order to ensure appropriate resources and operational considerations are dedicated to TSBO, include the following in the new organizational structure:

1. Formally define a school bus maintenance unit within the organization, incorporating job descriptions and responsibilities that correlate to an SLA with TSBO
2. Change the title of the ACPS Transportation Lead Mechanic to Fleet Services Supervisor, School Bus Maintenance

Make the same considerations for other consolidated organizations as appropriate.

Establish New Fleet Management Organization as an Internal Service Fund

Establish the new FMO as an internal service fund that finances *ALL* of its costs using a cost-chargeback system. Include the following elements:

1. Fixed monthly rates to recover asset fixed costs including:
    a. Capital cost recovery and replacement surcharges as described in the *Replacement Plan* report
    b. Asset Management Fees associated with administering the fleet, providing specialized technical assistance, telematics, etc.
2. Transaction-based charges to recover asset variable costs including:
    a. In-house M&R utilizing fully loaded labor rates
    b. Parts including markup to accurately reflect the time needed to procure and manage parts inventory
    c. Sublet M&R including markup to accurately reflect the time needed to arrange and manage such services
    d. Fuel with appropriate markups to accurately reflect the cost of managing the City's fuel supply, including procuring the fuel, managing delivery, monitoring fuel levels, maintaining the fuel sites, issuing fuel cards, etc.

Again, the principal reason for using a cost-charge-back system is to manage and control fleet assets and fleet management costs by making these costs visible and comprehensible to both the providers (fleet management organizations) and their consumers (fleet user agencies) of fleet resources. In the context of the recommended consolidation of fleet management activities, a properly designed and used cost charge-back system will ensure the equitable distribution of the new FMO's costs to ACPS fleet user departments and FSD's existing customers. Moreover, we have seen fleet management organizations reduce service delivery costs by as much as 25 percent as a result of implementing this system.

Determine and Implement Optimal Shift Configuration

Via a collaborative effort with key fleet user organizations and stakeholders, determine what feasible shift configuration would create the greatest benefit for the City and ACPS as a whole. While we have outlined the benefits of a second shift above, the new fleet

management organization will have to determine:

1. Optimal operating hours that balance the operational needs of fleet users
2. The types of services that will be made available during "odd" hour shifts (e.g. PM of all assets, or only certain types of assets, inspections, major repairs, etc.)
3. What appropriation of mechanic, parts, supervisory and support staff is necessary to fulfill the operational needs of the additional shift(s)
4. How to properly manage potential changes in the existing schedules of current staff
5. KPIs and outcomes used to measure the success and impact of the new shift configuration

The inclusion of other fleet managing entities may enable and/or necessitate even more than two shifts, or impact what the optimal configuration is in other ways.

Develop and Execute a *Fleet Management Consolidation and Improvement* Plan

The day-to-day demands of managing the City's and Public Schools' fleet will not be suspended simply because a decision is made to consolidate their fleet management organizations. This simple fact makes even small doses of business process reengineering difficult for most organizations, and neither the City nor ACPS has much of a "bench" in its two fleet management organizations. Accordingly, it is important to develop a detailed plan for implementing the recommendations presented above, and to follow the plan closely.

In order to create an effective plan, we recommend that each improvement initiative addressed in the plan include the following:

1. A formal problem and goal statement
2. A high-level description of the anticipated outcome of the improvement
3. A discussion of the rationale for the improvement
4. An action plan that identifies:
    a. Anticipated benchmark accomplishments and/or deliverables
    b. Tasks to be performed
    c. Estimated resource requirements (internal time commitments and/or out-of-pocket costs for professional services)
    d. Timelines and milestones
    e. Responsibility assignments

ADDITIONAL CONSOLIDATION OPPORTUNITIES

Conduct Motor Pool Utilization and Consolidation Study

While motor pool management was not included in the scope of our study, we feel compelled to comment on a potential improvement opportunity. During interviews aimed at collecting feedback regarding the quality of fleet management services fleet users receive, we could not help but observe that many of the fleet users for both FSD and

ACPS utilize their assets as internal departmental motor pools for staff transportation, with no special equipment requirements to perform job related functions (beyond varying passenger/cargo capacity needs). And of course, FSD operates a city-wide motor pool available to any City staff member to perform related job duties. Consolidation of these various pools would:

1. Most likely lead to economies of scale that would allow a reduction in total pool assets, thereby eliminating associated capital costs
2. Increase utilization by expanding availability to additional personnel
3. Reduced costs for those divisions/departments who no longer need to retain their own fleet as they will only pay for what they consume; overhead and operational costs associated with vehicle ownership and M&R would be eliminated
4. Improved asset availability as users would always have access to at least the same number of vehicles forfeited, regardless of repair needs, accidents, etc. (as opposed to “department-owned” assets in which case vehicle service and repair needs lead to a reduction of available vehicles)
5. Additional labor capacity for divisions/departments currently operating internal pools as existing administrative staff’s workload associated with motor pool management is reduced or eliminated
6. Improved motor pool management practices associated with dedicated fleet management professionals and resources focused on motor pool optimization