Report On

Fleet Management Best Practices Assessment

For The

Town of Exeter

DRAFT

November 11, 2009

MERCURY ASSOCIATES, INC.

TABLE OF CONTENTS

Executive Summary 1
INTRODUCTION 5
BACKGROUND 7
ORGANIZATION, STAFFING, AND GENERAL MANAGEMENT 13
FINANCIAL MANAGEMENT 22
VEHICLE REPLACEMENT AND FUNDING 27
FLEET SIZE AND COMPOSITION 36
FLEET MAINTENANCE 38
PARTS INVENTORY AND SUPPLY 45
FACILITIES AND SHOP EQUIPMENT 48
FLEET MANAGEMENT INFORMATION SYSTEM 51
BUSINESS PLANNING AND PERFORMANCE MEASURES 53
APPENDIX 57
Vehicles Due For Replacement 58
Light Vehicle Replacement Guidelines 60
Medium and Heavy Truck Replacement Guidelines 61

Report on Fleet Management Best Practices Assessment For The Town of Exeter

Executive Summary

Mercury Associates is pleased to present this report on fleet management best practices to the Town of Exeter. Effective fleet management is of critical importance to Exeter. Quite simply, the work of the Town could not be done without its fleet. In addition to supporting normal municipal operations such as police, fire, street maintenance and parks, Exeter's fleet must be readily available to respond to emergencies such as water leaks and clearing snow from roads after storms.

The good news is that during our review we found that the Public Works Department does a very good job of maintaining the fleet and keeping it ready for service. As this is the primary mission of the staff involved with fleet maintenance activities, they should be commended for their hard work that makes this accomplishment a reality. We have offered several observations and recommendations around the margins of fleet maintenance that will help the organization to do an even better job in the future.

Most of the improvement opportunities in Exeter are in fleet management not fleet maintenance. Opportunities can be grouped into the following areas:

- **Organization.** The Town's fleet program is largely decentralized. This is an unusual approach for a small municipality; even more so since it is not followed for other important internal support services such as finance, human resources, and information technology. In our experience, a centralized structure works best for fleet management where one organization is given the responsibility to manage (with appropriate user input) and maintain the fleet. With the current fractionalized approach, no organization is accountable for proper management of the fleet. In our opinion the Town will not be able to optimize its fleet program until this program is centralized under Public Works, which is the most suitable organization to take on this mission.
- **Record Keeping.** There is a distinct lack of information and data available regarding the Town's fleet operations. Much important information that is normally tracked is not in Exeter. The data that does exist is fragmented. Consequently, we had to piece together, from multiple sources, even fundamental information such as how many units are in the fleet and how much the Town budgets each year for maintenance and fuel. We are believers in the old adage "what cannot be measured cannot be managed". The Town must make the collection and reporting of quality management information, including implementation of a fleet management information system, an integral part of its plans to optimize the fleet program.

- ***Financial Management***. While Public Works provides maintenance and repair services for all departments with the exception of Fire, the cost of these services is not billed back to users on a full cost reimbursement basis – which is a clear industry best practice. To facilitate this, many municipalities have established an Internal Service Fund (ISF) for their fleet programs. The idea behind an ISF is to improve the management of a government activity by accumulating and isolating costs, and having the total cost of operations charged back to service consumers. This yields improved cost recognition and control by sending clear price signals and providing incentives for better consumer behavior and decisions (much like with an Enterprise Fund such as the Town's Water Fund). It is important to note that while it is preferable to do so, the Town need not establish an ISF in order to gain the improvements that centralized and improved financial management practices will bring to the fleet program.

- ***Asset Management*** – The Town has generally done a good job in the past replacing its fleet on time and in accordance with industry best practices, although a backlog in replacement funding requirements has begun to accumulate. While some elected official across the country are tempted to eliminate vehicle replacement funding during a recession, those in Exeter understand that there are consequences to allowing a fleet to age including higher maintenance and repairs costs, more demand for mechanic labor, more frequent breakdowns, and decreased fleet availability. The Town uses a variety of financing techniques to acquire its fleet including cash, savings, and debt. We prefer savings (i.e. a reserve fund) and debt (e.g. loans, leases, bonds) because these forms of financing spread costs of fixed assets over their useful lives. We recommend that the Town debt finance most vehicles and pieces of fleet equipment because this will have a beneficial fiscal impact and enable more vehicles to be replaced in 2010 for the limited funds that are available. This will enable the Town to drive the age of the fleet down to around 6 years overall for primary assets which will produce an average replacement cycle of 12 years.

  In terms of the size and composition of the fleet, we found the Town has done a good job insuring that staff have the right tools to perform their jobs. Departments we interviewed reported that they had the correct vehicles available to them and annual usage levels are generally appropriate.

Recommendations that are included in the body of this report have been listed below in sequential order for easy reference. Please note that the narrative preceding recommendations will need to be read to develop a full understanding of why a

recommendation was made and the impact of implementing the proposed course of action.

Recommendations

1. *Consider expanding the role of Public Works beyond fleet maintenance to asset management activities such as replacement planning, development of purchase specifications, and fleet utilization monitoring.*
2. *Centralize all fleet maintenance activities under Public Works including maintenance and repair of fire trucks and other fire operated vehicles.*
3. *Add a full-time experienced mechanic to Public Works to replace the current part-time mechanic helper (Option 2 as described in this section of the report).*
4. *Revisit shop staffing requirements and the feasibility of performing all fire fleet maintenance in-house in a year or two (Option 3 as described in this section of the report).*
5. *Consider establishing the fleet function as an Internal Service Fund.*
6. *Centralize fleet related costs under the ISF or at least within Public Works.*
7. *Discontinue the practice of having consumers pay parts and vendor service bills directly.*
8. *Develop fully burdened service-based cost charge-back rates for all of the various services that a centralized fleet function under Public Works provides.*
9. *Develop a comprehensive, documented operating cost charge-back rate model. This model should be developed in Microsoft Excel® or a similar electronic spreadsheet program.*
10. *Develop and implement a policy and procedure for updating rates annually and for estimating annual charges by fleet user agency for agency budget preparation services.*
11. *Revise the CRF Vehicle Replacement Plan, developed by Public Works, to include all vehicles and pieces of fleet equipment owned by the Town irrespective of assigned department or funding source.*
12. *Adopt lease-to-own or other appropriate debt financing method as the primary means to fund acquisition of vehicles and fleet equipment.*
13. *Provide sufficient funding to maintain an average fleet age of six years, which corresponds to an average fleet replacement cycle of 12 years.*

14. *Adopt the point system recommended in this report to help set priorities for replacing vehicles.*
15. *Establish a committee to review fleet utilization and types of vehicles purchased each year to insure that the size and composition of the Town's fleet is appropriate.FMS should develop detailed service level agreements with each major customer group.*
16. *Public Works should improve its documentation of key workload statistics including the number of work orders processed and productive mechanic labor hours.*
17. *Public Works should scale back its operational checks of police patrol cars from three times per week to once per week.*
18. *The Town should offer to perform maintenance and repair work for outside agencies*
19. *Public Works should develop a formal structured skills assessment and training program for mechanics. A minimum of 20 hours of technical training should be provided to each staff person each year.*
20. *Public Works should establish a perpetual inventory for its fleet parts stock. More formalized parts management procedures and internal controls should be put in place.*
21. *Public Works should purchase all parts and charge them back to customers as they are used.*
22. *Public Works should track key parts statistics such as costs by department and costs by vendor.*
23. *Public Works should develop formal pricing agreements with key parts suppliers.*
24. *Public Works should explore the availability of additional and feasibility of using State of New Hampshire contracts for automotive parts as it currently does with tires.*
25. Public Works should consider converting space adjacent to the shop office into an additional work bay.
26. *The Town should budget $15,000 for the various upgrades to the shop noted in this report.*
27. *The Town should make acquisition of a fleet management information system its highest priority for the fleet program.*
28. *Public Works should develop an annual business plan and fleet report that details goals and significant initiatives, and provides concise information on the costs and performance of the Town's fleet program.*
29. *Public Works should develop a system of key performance measures.*

Report on Fleet Management Best Practices Assessment For The Town of Exeter

INTRODUCTION

*This report presents Mercury Associates Inc. (hereaf*ter MAI) findings and recommendations on fleet management best practices for the Town of Exeter. The scope of our review focused on the following activities:

- An assessment of fleet maintenance operations including an analysis of workflow, staffing levels, PM programs, training, facilities and tools, and systems.
- An assessment of other fleet management activities including replacement planning, fuel, internal service fund management and charge-back rate methods.
- Development of a report documenting our findings and recommendations.

The primary study methodologies we employed in conducting this project were as follows:

- **Written Information Request.** We begin all program evaluation projects by providing the client with a detailed checklist specifying the types of *documentary material* (e.g., organization charts, policy and procedure statements, etc.) and *quantitative data* (e.g., work order and parts transaction data, vehicle meter readings, revolving fund revenues and expenditures, etc.) we would like to review in evaluating fleet management practices and costs.

- **Site Visits and Interviews.** Our project team made three separate trips to Exeter to view fleet facilities, interview mechanics, assesses maintenance practices, review information systems, and observe fleet operations in action. We also conducted interviews with management of Public Works and with other fleet program stakeholders including Finance and primary fleet user groups.

- **Performance Measurement and Benchmarking.** Data availability permitting, we employ quantitative performance measurement techniques in every best management practices review we conduct, interpreting the resulting performance statistics using suitable internal and industry benchmarks. In addition to serving as a valuable diagnostic tool that helps us home in on potential problem areas and avoid devoting unnecessary time and attention to areas in which current practices are strong, performance measurement adds objectivity and consistency to our evaluation, and hence, credibility to our findings and conclusions. For this project we analyzed available financial and performance data for the Exeter fleet. Where data was not available, we developed benchmarks based on interviews, observations, and on our years of experience in the industry.

- **Business Process Mapping and Gap Analysis.** The other key method we used to evaluate fleet management practices and identify opportunities to improve quality and lower costs was process mapping and gap analysis. This involves ascertaining 1) if and how specific management and operating processes are formally *defined*; 2) the soundness of their *design* – e.g., their logic, thoroughness, compliance with applicable regulations, responsibility and authority for execution, and so forth; 3) their *consistency* with industry best practices; and 4) the nature of their actual *execution*, which is a function of how they are communicated (e.g., through a policy and procedure manual) and how employees are held accountable for following them.

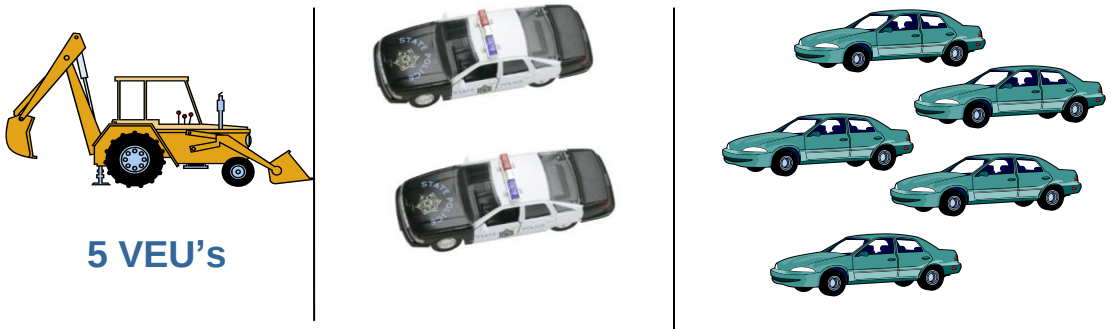
  We gained these insights primarily from the review of documentary material such as policy and procedure statements and the conduct of interviews and focus group sessions with employees of the fleet management, fleet user, and associated support organizations. In order to ensure that we covered each functional area of vehicle and business management thoroughly, we employed a detailed, 60-page *Process and Practice Review Checklist* that allows us to gauge the soundness of current practices in each area of endeavor. This typically is the most labor-intensive, but also the most revealing, aspect of any fleet management program review or efficiency study.

- **Vehicle Statistical Reference System.** In evaluating key aspects of a fleet services organization, we use an analytical technique based on the Vehicle Statistical Referencing System (VSRS), which was introduced several decades ago by the U.S. Air Force. This technique allows us to compare statistics from diverse fleets by converting vehicle and equipment types to their equivalent in terms of the level of effort required to maintain a standard passenger sedan - which is used as a baseline and given a value of 1.0 Vehicle Equivalent Units (VEUs). By statistically reducing a fleet to its equivalent in terms of sedans, we can make reasonable, standards-based comparisons with the fleet operations of other organizations that have very different compositions.

  A fleet of one hundred patrol cars[1], which are rated at 2.5 VEU's each, constitutes a fleet of 250 VEU's. The number of mechanics/technicians required to maintain this fleet is more than a fleet of 100 sedans, but far less than a fleet of 100 dump trucks. The following graphic illustrates how this technique works:

[1]VEU values are based on our work with hundreds of fleets across North America.

Figure 1: Relative VEU's



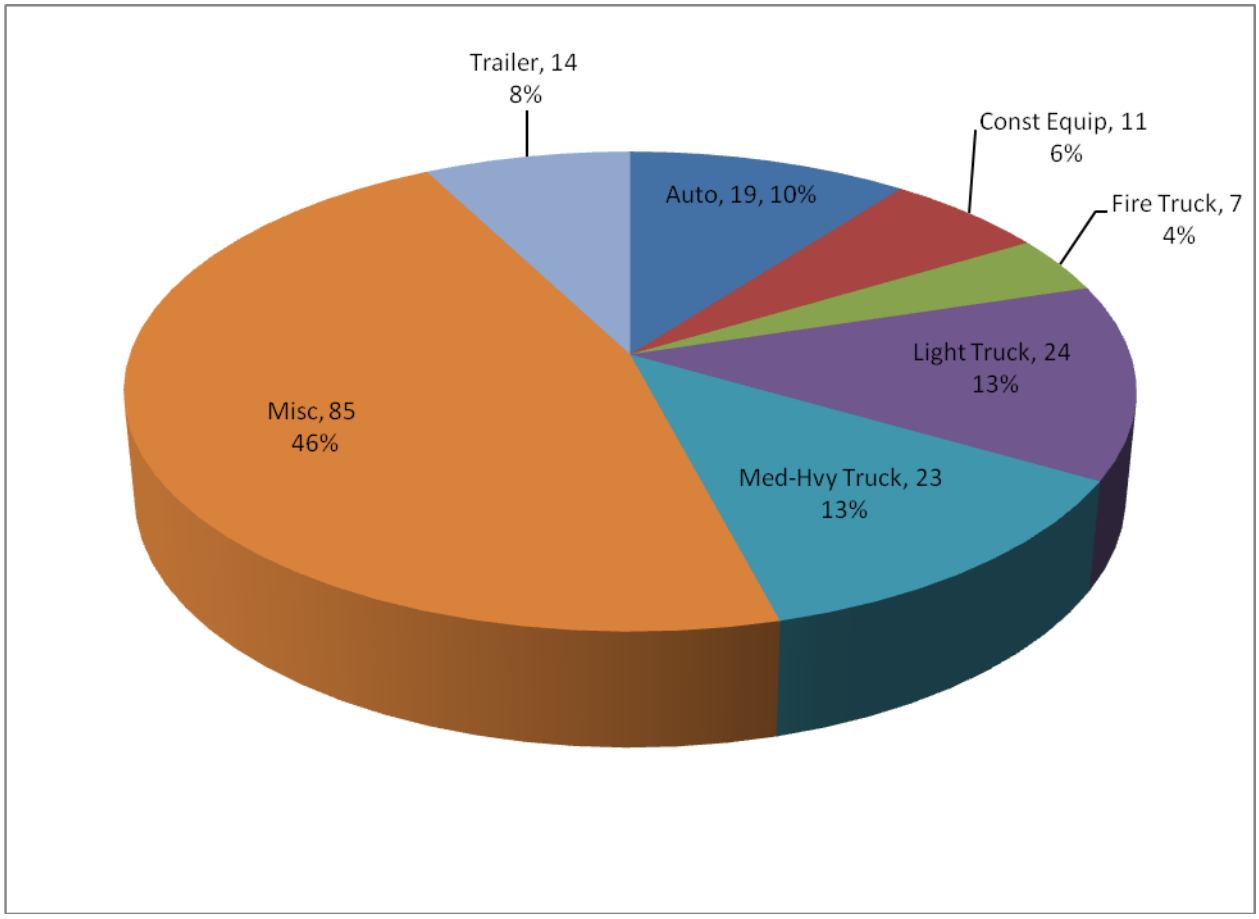
Over the years MAI has come to recognize the value of the VSRS. These VEU assignments help to identify many fleet-related issues, including staffing levels and cost competitiveness. Many of the comparative calculations, conclusions and recommendations found in this document can be traced back to the VSRS.

We would like to express our sincere appreciation to Town staff for the professionalism and courtesy that they extended to us during this study. We hope that the recommendations contained in this report will be useful to employees involved with fleet operations as they seek to continually improve service levels and cost performance.

BACKGROUND

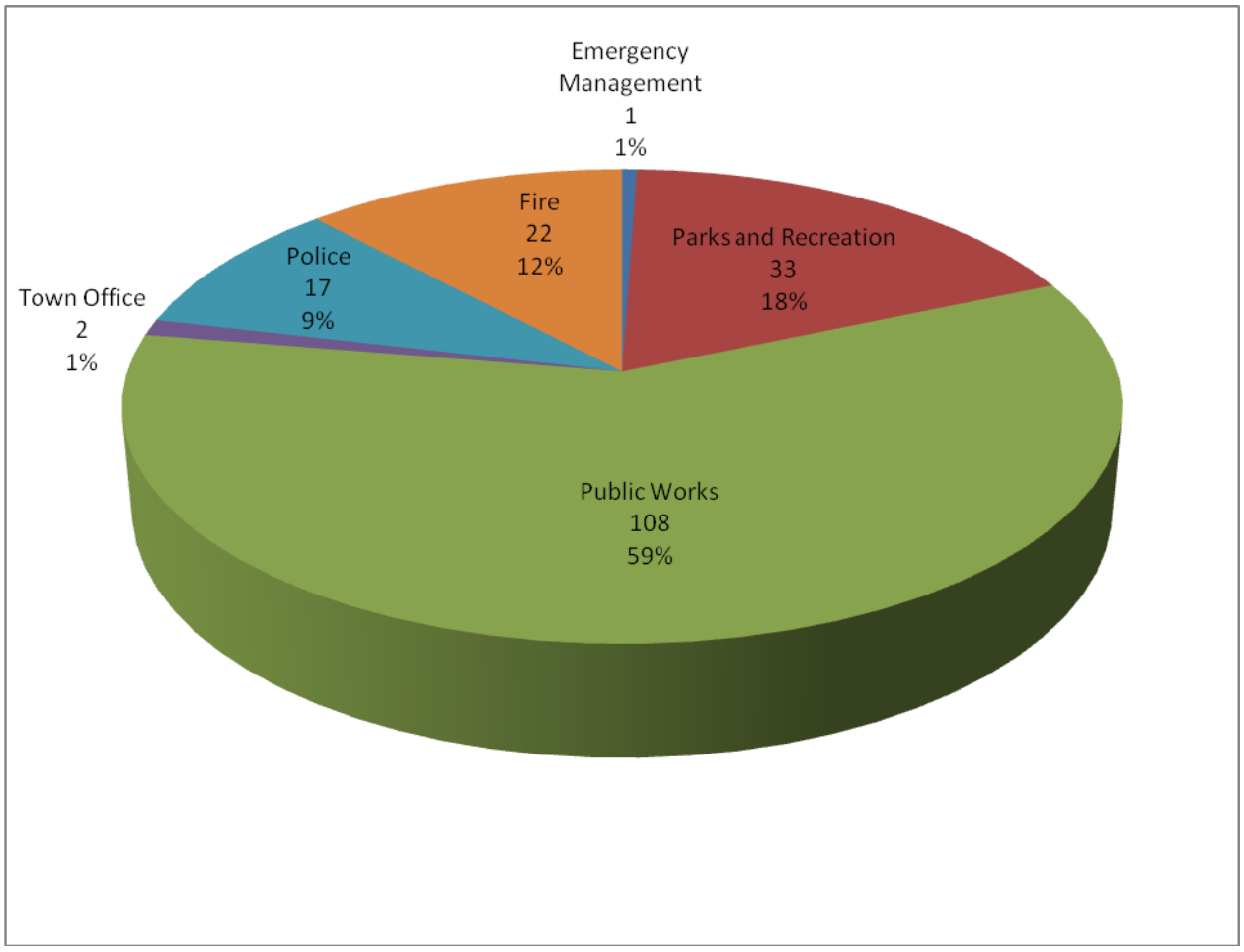
The Town of Exeter owns a diverse fleet with 180 vehicles, pieces of motorized equipment, and auxiliary units. The chart on the following page provides an overview of the vehicles by major type in the Town's fleet.

Figure 2: Exeter Fleet by Equipment Type



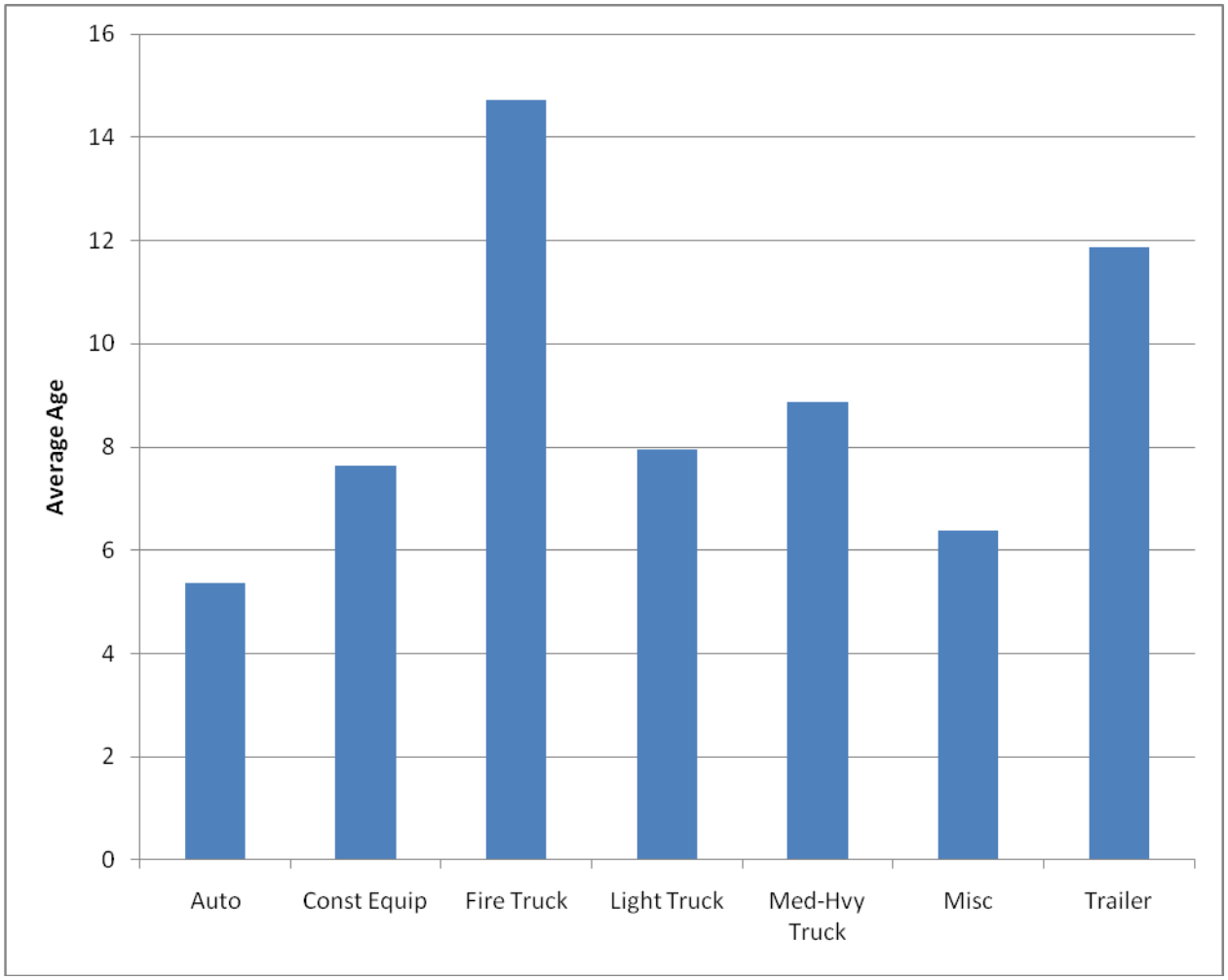
The next table shows a summary of the fleet distribution by department:

Figure 3: Exeter Fleet by Department



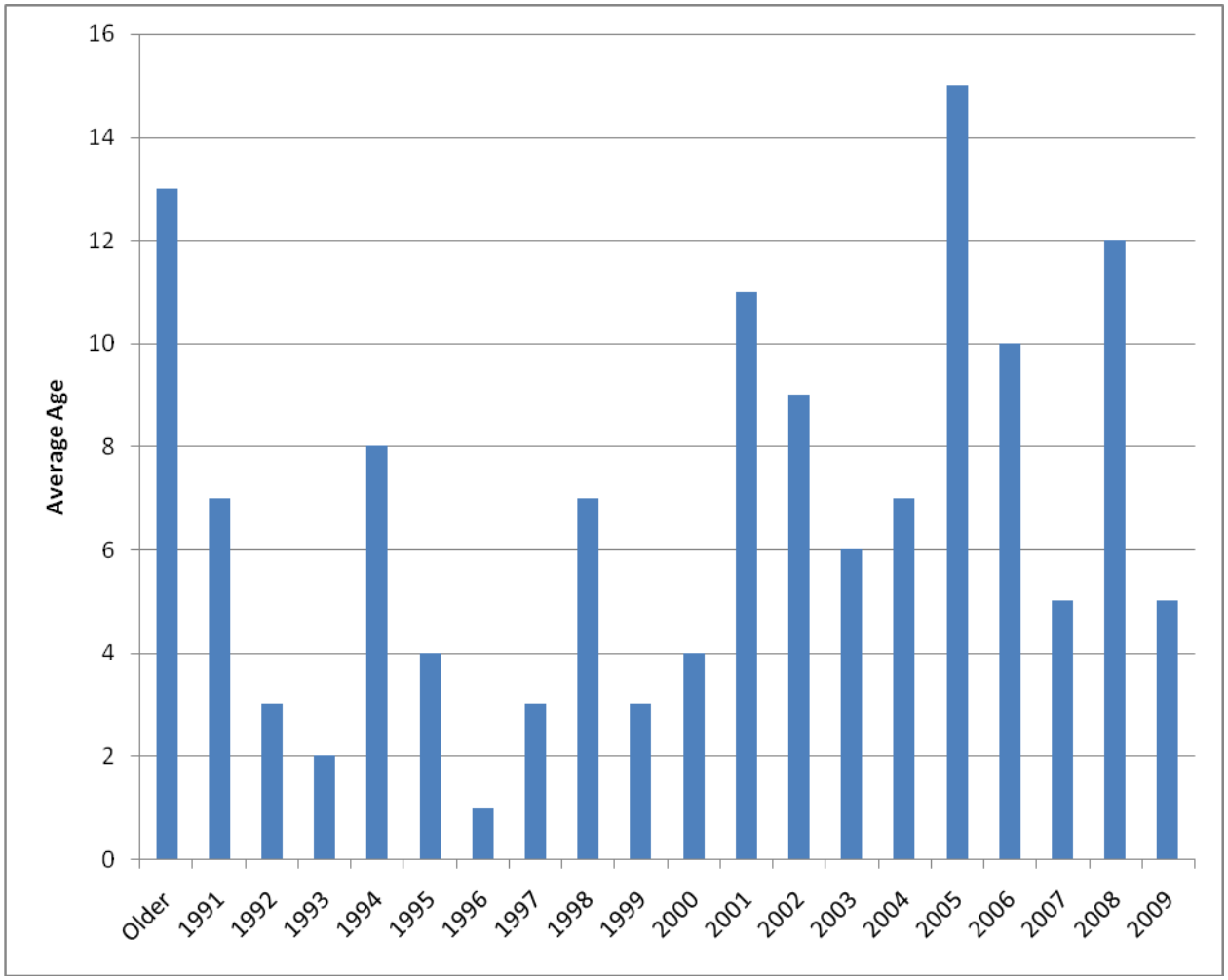
The chart below shows the average age of major types of equipment in the Exeter fleet.

Figure 4: Average Fleet Age



Since the imputed replacement cycle for a fleet is double the average age, some types of assets in the Town's fleet are growing quite old. Even if miscellaneous equipment, trailers, and fire trucks are excluded, the average age of primary assets (i.e. cars, trucks, and construction equipment) is 7.5 years when it should be closer to 6 years. The next chart shows a distribution of vehicles and equipment by model year.

Figure 5: Model Year Distribution



As can be seen, there have been pronounced peaks and valleys from year-to-year in replacing vehicles and fleet equipment. For instance, twice as many vehicles were acquired in 2008 than in 2007 or 2009. While some volatility is inherent in fleet replacement, the Town would be better served developing a more planned approach to replacing fleet assets.

*** *** *** *** *** ***

Motor vehicles and equipment are vital to the day-to-day operations and service-delivery activities of Exeter. In fact, the Town could not function without them. Notwithstanding their importance, our experience is that fleet management activities

usually do not receive a lot of attention from high-level decision makers in government jurisdictions (or many private companies, for that matter). Inattention to fleet-related issues results from, to a large degree, the fact that few individuals appreciate the diversity and complexity of activities encompassed by the expression "fleet management." We refer to this, only partially tongue in cheek, as the "everyone-is-a-fleet manager syndrome". Since most individuals are experienced in the acquisition, operation, maintenance, and replacement of motor vehicles – i.e., their personal cars – the idea that acquiring, operating, maintaining, and replacing several hundred (or even several thousand) motor vehicles is a particularly intricate or demanding undertaking is often difficult to grasp. In the minds of many people, in other words, fleet management is just not that complicated an endeavor.

In reality, however, few functions involve as many business disciplines as does fleet management. Activities included in this function range from managing the depreciation of millions of dollars worth of assets to diagnosing an electrical problem in a diesel engine control module. Thus, this study is important not only because it constitutes an opportunity to develop a strategic plan designed to optimize the performance of Exeter's fleet, but also because it will serve to illuminate a subject to which most decision makers in Exeter usually do not devote much thought: the contributions of fleet management to the delivery of public services, and the challenges associated with performing these activities well.

In the following sections of this report we assess the fits and gaps between current fleet management processes and industry best management practices and make recommendations for improving the Exeter's fleet management program. Because we focus on improvement opportunities the reader should not interpret a negative tone to our report. We found staff working in the fleet area to be professional, hardworking, and motivated to provide Exeter with efficient services.

ORGANIZATION, STAFFING, AND GENERAL MANAGEMENT

Summary of Industry Best Practices

A dominant trend over the past twenty-five years is the consolidation of fleet management functions into one centralized service organization. Traditionally, it was believed that the effectiveness or responsiveness of a fleet management organization is highly correlated to its proximity to the fleet users it serves. The result of this belief was the creation of numerous independent fleet management programs within an organization, each serving the purported unique needs of its own group of customers relying on its presumably specialized skills and knowledge. Increasingly, however, 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 in the industry can be traced to the increasing cost and complexity of fleet management endeavors and a simultaneous increase in emphasis on efficiency—particularly in the face of competition from providers of fleet management services. During this period, developments in such areas as computerization, personnel management and professional development, risk management, regulation of environmental protection and occupational safety and health, and automotive technology have changed the definition of "effective" fleet management, making it prohibitively expensive for many independent fleet management organizations to keep up. In short, the complexity of fleet management today produces significant economies of scale that often can be captured only through collective effort.

Thus, the key objective in examining the mission and organization of fleet management functions is to determine what type of structure will yield net improvements in service effectiveness and/or cost control for the Town as a whole, always keeping in mind that fleet customer service considerations should take precedence over cost reduction and other considerations because it is customer needs that dictate the need for fleet management endeavors in the first place.

The performance of any fleet maintenance program also is affected by the number of personnel who are employed to deliver services and the manner in which they are organized and deployed to accomplish their mission. Organizational structures should reflect reasonable spans of control and channels of communication which are consistent with formally defined authority and responsibilities. Staffing levels should be consistent with the amount of workload and effort required to produce desired services in a productive, efficient, and effective manner.

The responsibilities, or lines of business, handled by most fleet organizations fall into the following major categories:

- √ Asset Management, Administrative, and Information
- √ Vehicle Specification and Acquisition
- √ Fuel Management
- √ Maintenance
- √ Vehicle Disposal
- √ Pool vehicle provision and/or administration

Current Program Status

- Exeter's fleet management program is overseen by the Public Works Department. The Fleet Maintenance Section (hereafter FMS) is an organizational unit of the Maintenance Division (which is responsible for facilities as well as fleet). This is a typical organizational alignment for a municipal fleet management program.
- In terms of mission and scope of authority, Public Works functions primarily as a central provider of fleet maintenance and fuel services to Exeter departments (although FMS provides no maintenance services to the Fire Department). FMS' responsibilities for fleet management and administration are limited. As a result, activities such as vehicle replacement planning, specification development and analysis of fleet size are substantially decentralized.
- In many respects Exeter's fleet program is among the most decentralized that we have seen for a municipality of its size. Public Works is not "in charge" of the Town's fleet. Rather, each department manages its own fleet, tracks its assets, advocates for vehicles to be replaced each year, pays its own parts and service vendor bills (sometimes sent directly to them by suppliers and sometimes forwarded by FMS), and holds their own titles and registrations. Due to their current role, Public Works doesn't even know for sure how many vehicles and pieces of equipment are in the fleet or how much money the Town spends each year on maintenance, repairs, and fuel.
- Exeter would benefit from a more centralized and coordinated approach to fleet management. Such an approach would centralize fleet management and fleet maintenance (including maintenance of fire apparatus) under Public Works, provide for improved cost accounting, better data collection, and enhanced management reporting and performance measurement (these issues are discussed later in this report). Improved clarity of organization and mission will drive improvements in fleet management. It will also enable line departments to devote more time to their core mission activities rather than to fleet management.

- Development of a centralized support fleet management program would enable the Town to leverage core competencies, capture economies of scale, reduce duplication of effort, and link related functions (such as fleet replacement planning to fleet maintenance). Centralization of all feet activities within Exeter will enable a holistic approach to this business, provide for the development of consistent policies and practices, and foster improvements through a more systematic approach to management of the Town's fleet assets.

- This not to say that user departments should have no role in decisions relating to vehicles and equipment. Far from it - engaged users are an important component of good fleet management. Furthermore, it is also important to note that the primary role of a centralized fleet organization is 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 "car czar" ever could, they should drive decisions regarding the number and type of vehicles that they need to complete their mission activities. The fleet organization should provide its customers with consultative advice 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.

- FMS has 2.75 full-time equivalent personnel. The staff includes two permanent employees (both are mechanics, with one functioning as a shop lead) and a part-time (30 hours per week) mechanic helper position.
- The Maintenance Superintendent, who manages the Maintenance Division, supports FMS and focuses on budget issues, customer relations, priority setting, fleet administrative issues, fleet management data collection and reporting, and special projects. Public Works also provides some clerical and administrative support such as payroll, purchase order processing, budget reporting, and data input.
- The Mechanics are both journeyman level tradesmen. Both are capable of working on many types of equipment, but they also appropriately specialize in areas of particular expertise.
- One Mechanic (Jeff Beck) functions as the shop lead and performs support activities such as shop scheduling, coordinating with vendors and managing parts purchasing and stores. Approximately 25% of this position's time is devoted to administrative activities.

- The part-time position functions as mechanic helper performing semi-skilled mechanical work and preventive maintenance activities under the direction of a Mechanic. This position was approved in 2003 and staff turnover has been a problem (there have been four incumbents in six years). The position has become a stepping stone to permanent full-time employment in Public Works.
- The Fire Department also has an employee who does some work on vehicles. This employee, a firefighter who has mechanical experience only completes minor repairs such as replacing light bulbs. The majority of repairs on fire trucks and support vehicles are outsourced to vendors (including oil changes, safety inspections, and other routine maintenance activities). Fire Department records show that this position spent a total of 96 overtime hours on maintenance and repair activities in 2008 and 145 through October this fiscal year. Much of this time is reportedly for transporting vehicles to and from vendors. Regular time is not tracked by activity but the estimate we were provided is 5-percent (104 hours per year) of the employee's time.
- We use the VSRS described earlier in this report to benchmark mechanic staffing levels. The 183 vehicles and pieces of equipment in the Exeter fleet represent 332 Vehicle Equivalent Units (VEUs) – in other words the mixed fleet is equivalent to 332 sedans. Note that Public Works is responsible for 259 VEUs and Fire for 73. The following table presents a summary of our VEU analysis:

Table 1: VEUs by Equipment Type

Equipment Type	VEUs Per Unit
Administrative Sedans	1
Emergency Sedans (Police/Fire)	2.5
Pickups/Vans	1.5
Medium/Heavy Trucks	4
Medium/Heavy Trucks with Special Equip	6
Construction Equipment	6
Fire Trucks	10
Misc. Equipment (trailers, generators, etc)	.5

Our experience is that one VEU is equal to 10 to 15 labor hours per year (depending on fleet age and operating environment) and mechanics generally can be expected to produce 1,456 hours (70% of 2,080 annual payroll hours) of wrench turning time each year (not including overtime hours). Consequently, each technician can be assigned from 97 to 146 VEU's (1,456 divided by 15 equals 97). However, in a small

shop mechanics often can't meet this benchmark for reasons discussed in a later section of this report. Consequently, we have estimated productive hours at 1,300 per year per FTE mechanic.

The labor demand calculation and positions required are shown in the table below:

Table 2: Labor Demand Analysis - DPW

Labor Component	Hours	FTE Positions
Required staff for 259 VEU's at 15 hours per VEU	3,878	3.0
Available direct hours at 1,300 hours per year and 2.5 positions[2]	3,250	2.5
Capacity excess / (shortage)	(628)	(0.5)

Table 3: Labor Demand Analysis - Fire

Labor Component	Hours	FTE Positions
Required staff for 73 VEU's at 15 hours per VEU	1,095	0.8
Available direct hours[3]	100	0.1
Capacity excess / (shortage)	(995)	(0.7)

- As can be seen, our analysis shows that Public Works is under staffed by .5 mechanic positions. Note that this analysis includes consideration of the administrative duties necessary to run a shop. That is, Public Works needs three mechanics dedicated to production and 25-percent of a mechanic to handle administrative duties (parts, vendor coordination, record keeping, etc). Coincidently, the margin between the productive labor demand (i.e. wrench turning) and available supply is equal to making the current part-time mechanic position permanent full-time.

[2] Public Works has 1 dedicated mechanic, a mechanic that devotes 25% of his time to administrative activities (therefore .75 FTE), and a 30 hour per week part-time mechanic (.75 FTE).
[3] Fire has a staff person who devotes an undetermined amount of time to fleet maintenance (We have estimated this time commitment at 0.25 a FTE position.

- We have calculated the labor demand for Fire at .8 FTE mechanic. While Fire does not track the time its staff works on fire trucks, minimal time is reportedly spent. Rather, Fire meets its labor demand by outsourcing most repairs to vendors.
- From an analytical perspective the total gap between mechanics needed and mechanics on staff in Exeter is just over 1 (1.3) FTE positions across all departments. This represents a capacity shortage of just under 1,700 labor hours per year, or 45% below what Public Works would need to meet the current demand for mechanic labor if it were maintaining all vehicles in the fleet.
- The staffing requirement for mechanics is greatly impacted by the productivity of staff. Our standard for productivity is 1,456 billable (i.e. productive) hours per year per mechanic, which represents 70-percent of 2,080 annual payroll hours. It is important to note that this benchmark applies to line mechanics in a normal production environment. Neither Public Works nor Fire tracks mechanic time so it is unclear what level of productive hours is actually produced.
- Most small shop operations are not able to meet production benchmarks because of the lack of dedicated support positions (such as parts technicians, service writers, administrative clerks, etc.). In a small shop, such as Exeter Public Works, mechanics must wear several hats and often are pulled away from repair operations to attend to other matters. This is why we have lowered our production estimate for Exeter to 1,300 per mechanic per year.
- Another area that impacts the need for mechanics is the type and amount of work that is outsourced to local vendors. Most municipal shops routinely outsource services that require special training or tools (such as emissions systems checks, body work, and front-end alignments), services that would tie up a mechanic and a work bay for extended time periods (such as rebuilding engines and transmissions), and overflow services during periods of peak workload. Our benchmark for outsourcing is 10 to 15-percent of total maintenance and repair costs.

  Public Works tries to perform as much work in-house as possible in order to save money. Most large repairs are sent to vendors particularly if a service warranty can be obtained to guarantee the work. Public Works recognizes that rebuilding major components such as transmissions in house is inefficient. Moreover, while there are car and light-truck dealerships located in the vicinity of Exeter, this is not the case for heavy trucks and construction equipment. This equipment must be sent to vendors in Portsmouth or Boston for vendor repair. This requires two to four hours roundtrip for at least two employees and two vehicles and inhibits the use of vendors.

  The Fire Department takes a different approach and outsources most work on their fleet. Curiously, Fire has never used Public Works as a vendor – not even for cars and light trucks. Instead, Exeter has two fleet maintenance operations that are

completely separate, isolated from each other, with no capture of synergies whatsoever.

- In our view the Town would benefit by consolidating fleet maintenance under Public Works. This would lower vendor costs, capture economies of scale, improve record keeping, and enable the Fire Department to focus on its core mission activities. It is unusual for a municipality these days to have separate general repair and fire maintenance operations. Most cities and towns long ago realized that separate fleet operations caused inefficiencies, duplication of effort, and ultimately higher costs.

  We sometimes hear the argument that fire trucks are different because they are specialized pieces of emergency response equipment. Consequently, only dedicated and certified fire mechanics can maintain these units. In our experience this overstates the case. In the first place, fire trucks have very similar components (e.g. drive train, chassis, wheels and tires) to other trucks in the Town's fleet. Public Works mechanics are as capable of doing a brake job on a fire truck as they are a dump truck. Highly specialized components, such as water pumps and aerial ladders, can continue to be sent to vendors. Secondly, Public Works already maintains emergency vehicles for the Police Department and so is familiar with emergency lighting and other electronics on fire trucks and ambulances. Thirdly, the Fire Department has many support vehicles (e.g. cars, pickups, trailers, bucket truck) that are nearly identical to other vehicles in the Town's fleet already maintained by Public Works.

- The Town has a few options moving forward. At a minimum we recommend that the current part-time mechanic helper position be made permanent full-time. This replaced with a full-time journeyman level mechanic. This action would provide Public Works with an increase in staffing of .25 positions, which is needed to meet the current demand for fleet maintenance labor.

- A second option (the one we recommend that Exeter pursue at this time) would be to replace the current part-time mechanic helper position with a full-time journeyman level mechanic. While this provides the same marginal staffing increase as in Option 1, production capacity will increase to a greater level because the new hire would be an experienced mechanic and more adept and diagnosing and solving repair problems. This would enable Public Works to take on some maintenance of fire vehicles (support vehicles and small repairs on apparatus) (assuming that the current practice of outsourcing large repairs is kept in place). If this is the course selected then we recommend the mechanic that will be hired have experience with fire equipment and ideally have an EVT (emergency vehicle technician) certification. If the town receives no applications form certified mechanics, then it should hire a mechanic on the condition that he or she obtains certification within one year and

provide the requisite training that will enable this (we estimate the training cost to be $7,500 inclusive of travel costs).

- A third option is for fleet maintenance activities to be consolidated and most work to be done in-house at the Public Works shop. If this is the course chosen then Public Works would need to retain its current part-time mechanic helper as well as add an experienced mechanic. This would enable most of the vendor costs currently incurred by the Fire Department to be eliminated.

  Since the Fire Department cannot tell us for sure how many in-house labor hours it has historically devoted to fleet maintenance activities, it is difficult to be entirely confident what the labor demand will be under a consolidated operation. Consequently, the least risky approach for the Town under both Options 2 and 3 would be to hire an experienced EVT mechanic, then consolidate operations under Public Works, keep the current outsourcing model for the fire fleet in place and gradually decrease outsourcing as the long-term labor demand becomes clear. Assuming that operations under Option 2 are successful, the Town could pursue Option 3 at a later date once the long-term labor demand is clear.

- The cost of our recommend approach (Option 2) would be $63,264, an increase of $42,232 over the salary and employee benefit cost of the current part-time mechanic helper position. If fire vehicles are maintained in-house, then the part-time position would need to be retained at an additional annual cost of $20,932. Offsets would include decreased overtime in the Fire Department under both Options 2 and 3 ($3,631 in 2008 and $5,484 through October in 2009) and decreased vendor costs for fire, which total around $40,000 per year (not all vendor costs could be avoided as some of the technical activities would certainly continue to be outsourced). We estimate that vendor costs could be reduced by $15,000 per year under Option 2 and $35,000 per year under Option 3.

  There would be indirect cost savings for the fire department as well. Firstly, the department would gain regular time hours that are currently devoted to fleet maintenance activities. We estimate these hours at 100 per year which would be saved under both Options 2 and 3. The Fire Department will also gain time that it currently spends transporting vehicles to and from vendors – particularly significant when these vendors are in the Boston area. There are costs involved with transporting vehicles as well – particularly gasoline. We estimate vendor transport hours at 160 per year (40 trips per year x 2 hours average per round trip x 2 employees each trip). We estimate that 60 of these hours will be saved by taking vehicles to Public Works rather than to vendors under Option 2 and 120 hours under Option 3.

  The table below presents a summary of our recommendations:

Table 4: Organization Model Options

	Option	Why Needed	Costs	Benefits
1	Make current PT mechanic helper FT. (DPW would have no responsibility for fire vehicles under this option)	To meet current labor demand for DPW, Police, and Parks fleets	$17,000	Faster repair turnaround time, improved fleet availability, more time for fleet administration
2	Replace current PT mechanic helper with FT journey level mechanic	To meet current labor demand, start maintaining fire support vehicles, and start coordinating vendor repairs on fire trucks.	$42,232 (net direct cost of $22k)	Benefits above plus eliminate fire OT costs related to fleet ($5,000), enable redirection of regular time hours now spent by fire on fleet, reduce fire vendor costs by $15,000 per year, greatly reduce vendor transport time and costs.
3	Add FT journey level mechanic and keep PT mechanic helper	Full consolidation and in-house repair of all Town vehicles	$63,264 (net direct cost of 23k)	Benefits above plus reduce fire vendor costs by an additional $20,000; nearly eliminate vendor transport time and costs.

- Exeter has well developed policies and procedures governing the use of Town vehicles, replacement of vehicles, safety, etc.

Recommendations

1. *Consider expanding the role of Public Works beyond fleet maintenance to asset management activities such as replacement planning, development of purchase specifications, and fleet utilization monitoring.*
2. *Centralize all fleet maintenance activities under Public Works including maintenance and repair of fire trucks and other fire operated vehicles.*
3. *Add a full-time experienced mechanic to Public Works to replace the current part-time mechanic helper (Option 2 as described in this section of the report).*

4. *Revisit shop staffing requirements and the feasibility of performing all fire fleet maintenance in-house in a year or two (Option 3 as described in this section of the report).*

FINANCIAL MANAGEMENT

Summary of Industry Best Practices

An industry best practice is for the fleet organization to operate as an Internal Service Fund (ISF). These types of funds are used by state and local governments to account for the funding of goods and services provided by one department or agency to other departments or agencies, and to other government jurisdictions, on a cost-reimbursement basis. The use of Internal Service Funds has the following advantages:

- The ability to identify and accumulate the total cost of a support activity, including the depreciation of capital assets;
- Facilitates costing and pricing of support services;
- Allows for the accumulation of funds for equipment replacement (when the funding of vehicles and equipment is the responsibility of the centralized fleet organization); and
- Allows for the allocation of General Fund overhead costs to the Internal Service Funds for redistribution to the benefiting programs.

The design and management of ISF and charge-back systems should comply with the guidelines of the Federal Office of Management and Budget (OMB) *Circular A-87*. *OMB A-87* establishes principles and standards for determining costs for federal awards carried out through grants, cost reimbursement contracts, and other agreements with state and local governments. The purpose of *OMB A-87* is to provide a uniform approach for determining "allowable" costs for which the federal government will compensate such entities. To the extent that the Town receives any federal funding, either directly or on a pass-through basis, the guidelines of *OMB A-87* should be followed – at least for calculating the fleet service costs that are charged to federally subsidized programs. Even where no federal funding is involved, many organizations have adopted *OMB A-87* guidelines as the de facto standard for the design of charge-back systems and the management of internal service funds.

Basic principles articulated in this circular require that charge-back-funded organizations (they need not be classified as internal service funds) operate on a break-even basis; recover only allowable costs from federally funded customer organizations; make adjustments for under and over recovery of costs (preferably through adjustments to future billing rates); bill all users at the same rate for similar services; utilize billing units which represent services provided or benefits received; and not improperly utilize

revenues generated by one type of service to finance the delivery of another type of service (e.g., capital charge-back rate revenue does not subsidize operating costs).

A properly designed charge-back system improves the consumption and provision of fleet resources by 1) illustrating linkages between the behavior of vehicle users and the costs of the vehicles and related services they consume; and 2) encouraging fleet users to hold fleet management organizations accountable for the quality and costs of the goods and services the latter provide. Such systems also promote equitable treatment of fleet users. Since users pay only for the resources they consume, there is no cross-subsidization of fleet costs under a properly designed and implemented charge-back system. One of the implications of this benefit is that fee-supported departments and programs pay the full cost of the fleet resources they consume and do not receive any subsidies from the general fund.

In a properly designed charge-back system rates should differentiate among the goods and services provided insofar as the costs of their provision are significantly different. The rates should be developed empirically based on the fleet organization's actual costs of providing the various services such as maintenance and repair, fuel, parts, and sublet services.

Current Program Status

- The Town's budget[4] for fleet related costs in 2009 is $656,000. The major cost lines for the 2008-10 budgets are shown in the table below:

Table 5: Fleet Budget

Cost	2008	2009	2010
Maintenance and Repair[5]	$ 210,790.00	$ 211,255.00	$ 229,430.00
Fuel[6]	$ 138,400.00	$ 196,869.00	$ 150,630.00
Insurance[7]	$ 32,675.00	$ 31,625.00	$ 28,105.00
Capital[8]	$ 422,793.00	$ 216,364.00	$ 213,353.00
Totals	$ 804,658.00	$ 656,113.00	$ 621,518.00

[4] Note that labor is not included in these figures.
[5] Budget line items 4136, 4210, 4311, 4320, 4349, and 4623.
[6] Budget line items 6260 and 6261.
[7] Budget line items 5212,
[8] Purchases and lease payments only, does not include depreciation of existing assets.

The budget for fleet is holding fairly steady, with the exception of capital costs. As discussed in the next section of this report, capital costs tend to ebb and flow year-over-year as vehicles come due for replacement.

Table 6: 2009 Fleet Budget by Major Department

Organization	M&R	Fuel	Capital	Total
DPW	$ 128,100	$ 76,780	$ 105,823	$ 310,703
Fire	$ 55,805	$ 23,778	$ 80,732	$ 160,315
Police	$ 13,500	$ 82,416	$ 27,800	$ 123,716

- A few items of note in the manner that the Town budgets for fleet related costs:
  - ✓ Capital costs are generally part of the Town's CIP, which provides a six year projection of costs (an excellent practice). Supplemental to the CIP is a vehicle replacement reserve fund that the Town intends to create as funding becomes available, which is another excellent practice. However, police vehicle costs are neither in the CIP nor the replacement fund. Rather, they are in the operating budget. This inconsistency should be rectified so that all Town vehicles are budgeted in the same manner.
  - ✓ Line Item 4320 (Vehicle Maintenance) is used by all departments except for Water and Sever. These two departments use line item 4320 (Equipment Maintenance). This inconsistency should be rectified.
  - ✓ Tire costs are budgeted separately, presumably to provide clarity to this cost item. Once the Town has acquired fleet management information system software and has ready access to management information tire costs should be folded into line item 4320.
  - ✓ Labor is not included in the budget figures. We estimate labor costs at around $200,000 per year.
- The Town's financial management structure and processes for fleet do not follow industry best practices. As previously mentioned, Public Works does not charge labor costs back to any customer group. Parts and vendor services costs are paid directly by consumers, which is better than having Public Works provide these for free, but un-necessarily decentralizes fleet related finances and contributes to the lack of available management information.
- The one area where the Town does follow industry best practices is fuel. Consumption is tracked by department and costs are charged back through an automated management information system. Even though most departments have

a budget line item for fuel, Public Works knows what the total Town cost of fuel is because they are responsible for this program. . The remaining fleet cost line items need to be managed in a similar fashion – centralized into a single budget, tracked with a computer system, and charged back to consumers.

- The Town should act as though the fleet program is an Internal Service Fund, even if an ISF is not actually established. The Town can harness the power of an ISF as a management tool to enhance efficiencies by improving cost recognition and control. Since the financial objective of an ISF is to recover the complete cost of operations (including overhead) without profit or loss, adopting ISF principles will include setting rates for various fleet services – which is difficult under the current decentralized financial structure.
- As previously mentioned, service-based rates and transaction-based charges are clear industry best practices and an excellent management tool (which is what a cost charge-back system fundamentally is for lowering fleet related costs. The Town should develop a rate methodology that has the following goals:
  - ✓ Recover all direct and indirect costs associated with providing fleet services;
  - ✓ Comply with federal costing standards as detailed in OMB Circular A-87;
  - ✓ Avoid cross-subsidization among service activities, vehicles types, and rate payers;
  - ✓ Treat all rate payers equitably;
  - ✓ Promote cost recognition by sending clear price signals to vehicle users thus providing incentive for the proper operation and care of valuable State assets;
  - ✓ Produce rates that are intuitive and easily comparable to private sector alternatives; and
  - ✓ Provide transparency by developing a rates and rate model that are clear and well documented.

  We recommend that following rate structure:

  - ✓ **Fleet Management** – Monthly charge per asset in service. The costs allocated to this cost pool include relate to the activities associated with the acquisition, specification, inventory and disposal of fleet vehicles including.: direct and indirect salaries and fringe benefit costs of all personnel involved in the fleet management function and associated operating expenses.
  - ✓ **Vehicle Maintenance and Repair** – Regular and overtime hourly rates for maintenance labor covering the provision of maintenance and repair activities

by Public Works for vehicles in the Town's fleet and those owned by outside customers. The total costs allocated to this cost pool include all direct and indirect salary and fringe benefit costs of trades workers and appropriate maintenance, management and administration personnel; direct and indirect operating expenses; and other, indirect costs.

- ✓ **Parts Procurement and Supply** – Percentage markup on repair costs to cover administrative costs related to the procurement and supply of ad-hoc and contract parts purchases for Town vehicles. The total costs allocated to this cost pool include all costs associated with the contracting with parts vendors, procuring parts, managing the parts room, maintaining parts inventories, paying vendors, charges associated with the storage space for inventory, and all other direct and indirect costs of parts procurement and supply.
- ✓ **Commercial Repair Management** – Percentage markup for the administration of commercial repairs of fleet vehicles. The total costs allocated to this cost pool include: the full costs of contracting with vendors, administering repairs, transporting vehicles, processing vendor invoices, billing users, and managing accounts receivable.
- ✓ **Fuel Procurement and Supply** - The procurement of fuel for Town vehicles and equipment. The total costs allocated to this cost pool include the direct and indirect costs of developing fuel contracts, issuing fuel cards or keys, paying invoices, and all other direct and indirect costs associated with purchasing fuel.
- ✓ **Vehicle Replacement Fee** – Costs associated with ownership of vehicles (i.e. capital costs including depreciation, lease charges, or replacement reserve fund allocations. Charges should be based on the purchase price of a vehicle, plus any upfitting costs, minus projected residual value at time of sale.

- Note that all rates developed should reflect the total cost for providing fleet products and services. That is, they should be fully burdened and include indirect costs and appropriate overhead (such as Public Works Administration and Finance). While calculating rates was beyond the scope of our study, we would expect them to fall within normal parameters ($65 per hour for labor, 25% markup on parts, 10% markup on vendor services, $.03 cents per gallon for fuel, and $20 per asset per month management fee). While the Town can start with these rates, Public Works should calculate its own rates based on actual costs and activity volumes.

Recommendations

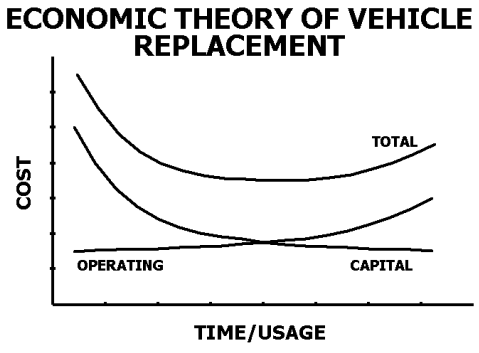
5. Consider establishing the fleet function as an Internal Service Fund.

6. *Centralize fleet related costs under the ISF or at least within Public Works.*
7. *Discontinue the practice of having consumers pay parts and vendor service bills directly.*
8. *Develop fully burdened service-based cost charge-back rates for all of the various services that a centralized fleet function under Public Works provides.*
9. *Develop a comprehensive, documented operating cost charge-back rate model. This model should be developed in Microsoft Excel® or a similar electronic spreadsheet program and include the following elements at a minimum:*
   - ✓ *Rate base which identifies (by budget line item or object code, where appropriate) all direct and indirect FMS costs to be recovered through charge-back rates in the fiscal year for which rates are computed.*
   - ✓ *Rate structure which identifies the specific services for which rates are to be calculated.*
   - ✓ *Cost allocation which is a method of allocating all of the costs included in the rate base to one or more cost buckets or pools corresponding to the rate structure; and*
   - ✓ *Rate calculation which is a method of computing the unit cost of, or charge-back rate for, each service.*
10. *Develop and implement a policy and procedure for updating rates annually and for estimating annual charges by fleet user agency for agency budget preparation services.*

VEHICLE REPLACEMENT AND FUNDING

Summary of Industry Best Practices

Timely replacement of fleet assets is important for controlling vehicle availability, safety, reliability, and efficiency. The economic theory of vehicle replacement holds that vehicles should be replaced when the sum of ownership and operating costs is at its lowest historical point. The chart at right, which shows three cost curves, illustrates this concept. The capital cost curve shows the decreasing cost over time of a fleet asset as it ages and depreciates. The operating cost curve illustrates the increasing maintenance, repair, and fuel costs for the same asset over its life cycle. The total cost curve



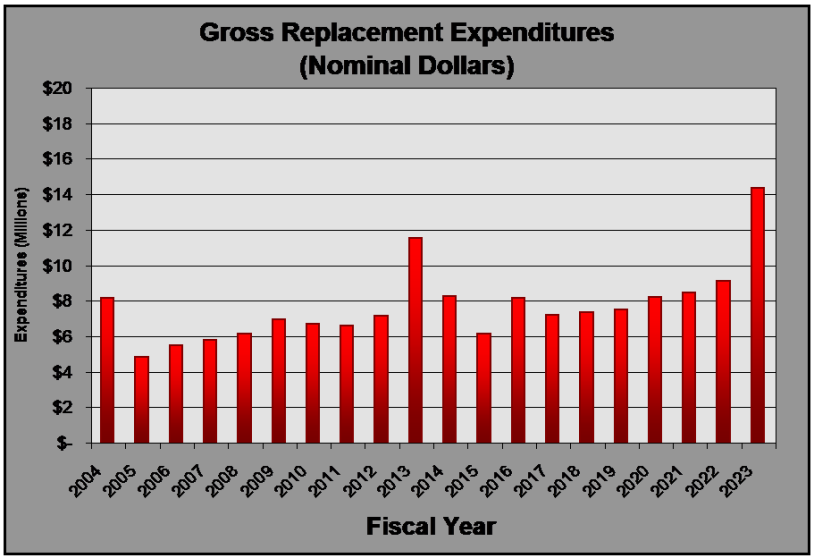
combines the two. The optimal point at which to replace this asset from an economic perspective is when the "total cost" curve is at its lowest. That is, when the combined cost of owning and operating the unit is at a minimum, just before it begins to increase.

As illustrated, the bottom of the "total cost" curve is relatively flat. This means in practical terms that there is not a single best time to replace a unit. Rather, a period of time exists during which the combination of capital and operating costs are at their lowest and delaying the replacement of the unit will not have a material impact on the total annual costs for that unit. For example, for the typical light-duty vehicle, this flat section usually represents from five to seven years or from 80,000 to 100,000 miles.

The total cost curve is different for every unit. This variability is caused by differences in the design and engineering of different types of units, the effects of differences in operating environments, the quality of care the unit receives, and other factors. As a result, it becomes impractical to apply this model without utilizing class average replacement criteria or estimates, which will accurately reflect the best replacement time for most of the units in that particular class of vehicle or equipment.

Even the best replacement planning efforts will not succeed if the appropriate funding to renew the fleet is not available. It is important for decision makers in Exeter to recognize that a dollar of fleet replacement funding deferred is not a dollar saved. Fleet assets do wear out. Over time they not only become more unreliable, but more costly and unsafe to operate. Decisions to defer replacement for a particular unit or type of unit beyond its planned service life will impact the average maintenance and repair costs for those units. It will also affect the manner in which the unit is utilized due to its actual or perceived drop in reliability. Significant deferment, in our experience, also leads to an overall increase in the size of the fleet due to the need, real or not, to have spare vehicles available. The ultimate need to replace the unit in question is not eliminated; it is only pushed to another year.

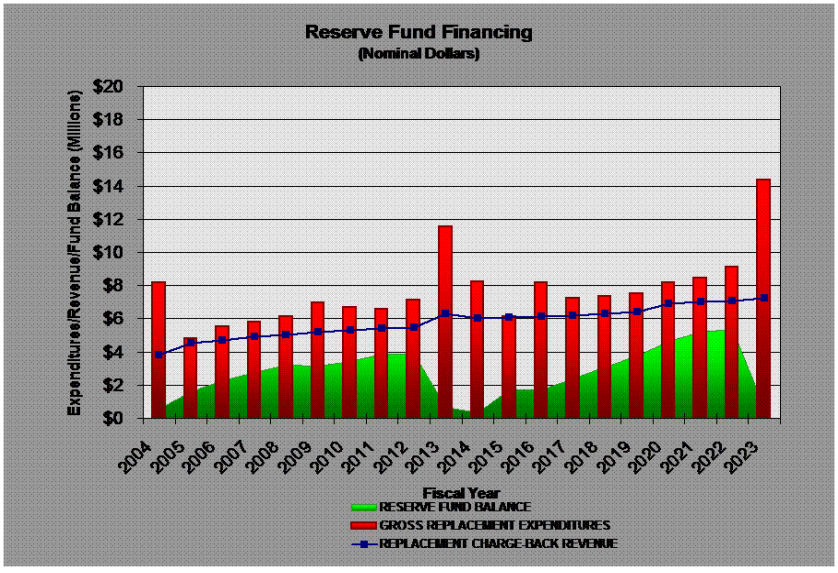
There are three basic financing alternatives available to the Town for funding replacement of fleet assets: cash, savings, and debt (including leasing). The graph at right illustrates a 20-year replacement plan for a county government fleet of about 3,000 vehicles and pieces of equipment and the funding requirements associated with financing all of the purchases in the plan with ad hoc appropriations of cash. As can be seen, a major drawback of cash financing is that it makes fleet replacement funding requirements volatile and unpredictable because the long-term replacement spending requirements of most fleets are inherently and unavoidably lumpy. This is due to the simple fact that different types of vehicles and equipment have different life expectancies and come due for replacement in such a way that spending needs fluctuate from year to year.



As can be seen in the above graph, there are some pronounced peaks and valleys in future spending needs that any organization would have difficulty accommodating. For example, projected replacement costs are about 45 percent higher in 2009 than in 2005 and nearly double between 2011 and 2013.

Most organizations have difficulty dealing with fluctuations in fleet replacement spending needs because the amount of funds they can devote to the purchase of vehicles each year generally does not fluctuate. In fact, while the number of fleet assets that need to be replaced may "zig" upward (say, by 45 percent) in a given year, government revenue in that year may not only not increase by a corresponding percentage, but may actually "zag" downward. When this happens, some fleet replacement purchases must be deferred and a backlog of replacement spending needs begins to accumulate.

Fleet replacement financing approaches such as a reserve fund and lease purchasing allow an organization to spread the capital cost of each vehicle over its useful life. This makes fleet replacement funding requirements smooth and predictable and reduces the likelihood that critical replacement purchases will be deferred and that a backlog of replacement spending needs will develop.



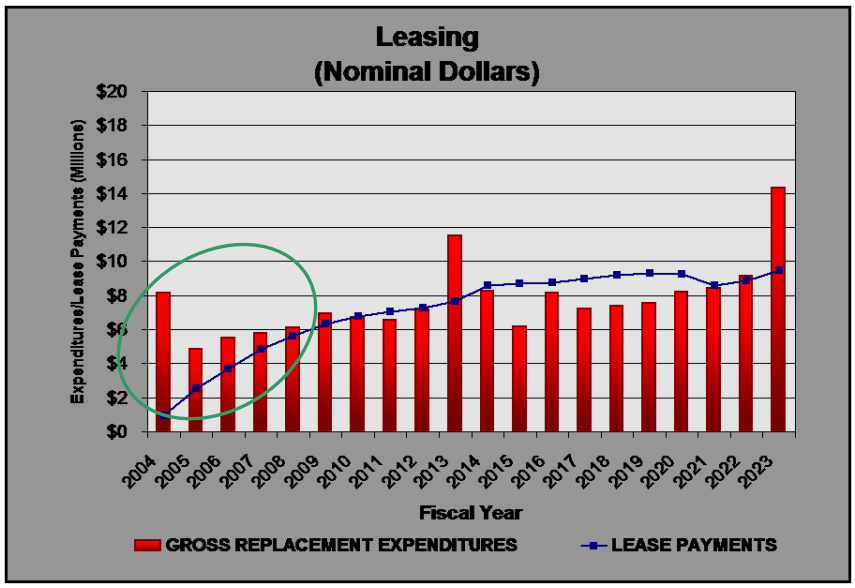
The graph at right shows the long-term funding requirements associated with financing the replacement costs of the 3,000-vehicle fleet above with a sinking fund and charge-back system. Although replacement spending requirements are identical to

those shown in the earlier graph, funding requirements (represented by the charge-back revenue line) are not at all volatile.

One of the challenges of managing a reserve fund properly is calculating charge-back rates so that the reserve fund balance does not get too big or too small. Many government jurisdictions with which we have worked in this area have built up unnecessarily large fund balances due to improper rate setting and/or an incomplete understanding of how a reserve fund should operate. In many such cases the reserve fund gets depleted by political decision makers who are looking for sources of "extra" cash during tight budget times.

Like a reserve fund, lease purchasing makes replacement funding requirements smooth and predictable by spreading the capital cost of each vehicle in the fleet over its useful life. This approach also is attractive to many cities, counties, and states that use it because it eliminates the need to manage a replacement fund balance (which can be susceptible to raiding in an economic downturn), and because making the switch from cash financing or a sinking fund to debt financing can produce very large budget savings in the near term.

The graph at right shows the funding requirements associated with financing the replacement of our sample 3,000-unit fleet using lease-purchase financing. Under this approach, the purchase of every vehicle and piece of equipment in the fleet would be financed over a period of seven years, slightly less than the weighted average life expectancy (i.e., replacement cycle goal) of the various types of assets in this particular fleet.



As in the two previous exhibits, the bars represent projected annual replacement spending requirements. The line in this graph illustrates projected lease payments and, consequently, the fleet's replacement funding requirements. Although the volatility of

future spending needs has not changed, funding requirements are now smooth and predictable.

Equally, if not more, important, however, are the significant budget savings associated with changing replacement financing approaches. The area of the graph that is circled shows how a switch from cash financing to leasing can significantly reduce fleet replacement funding requirements in the short term, creating very sizable, albeit temporary, budgetary windfalls. These budget savings result from the fact that cash financing requires paying for vehicles upfront before they are used, whereas lease purchasing permits an organization to pay for its vehicles and equipment incrementally over the course of assets' useful lives.

The last step in an effective fleet replacement program is a short-term replacement decision making process that identifies and prioritizes when to replace individual vehicles and pieces of equipment. Although replacement guidelines usually trigger an assessment of the need to replace a particular vehicle, some assets will need to replaced earlier than expected (for instance, due to unusual wear and tear or recurring mechanical problems) and some units will be cost effective to operate well beyond the age or usage threshold suggested by replacement guidelines. Consequently, fleet management organizations need to include a number of factors beyond age and accumulated usage in the process of identifying the specific units most deserving of replacement in any given year. These factors include historical repair costs, type of use (such as severe duty, mission critical or back-up), reliability, and an assessment of a candidate unit's current condition.

Many organizations have developed a point system that mixes the factors listed above into a quantitative process of assigning replacement priorities. This has the advantage of taking most of the politics out of the replacement decision-making process because all stakeholders (including budget staff and fleet users) understand the factors being considered and have bought into the process. We have included a sample point system in the Appendix to this strategic plan.

Current Program Status

- The Town has developed elements of a good structure for its fleet replacement program including replacement cycle guidelines, multiple year fleet replacement budget forecast, a reserve fund, and use of debt financing for high cost vehicles such as fire trucks. As with other area of fleet management, a somewhat decentralized approach to fleet replacement hinders optimization of this important functional area.

- A key issue for this study is the question of when Town vehicles should be replaced and how purchases should be paid for. We address these issues below.
- The Town has established replacement cycle guidelines in its fixed asset policy. Cycles generally follow industry best practices. Police patrol cars are replaced at 100,000 miles and Fire Trucks at 20 years. These are standard replacement cycles for municipalities and have been proven to minimize life-cycle costs. Many other types of vehicles are replaced after 10 years of service, which is reasonable given the size of the Town.
- The management of the replacement of the Town's fleet assets is decentralized, with each department basically fending for itself when it comes to preparing and justifying requests for replacement funding. It has been our experience that such an approach can result in significant inequities in the distribution of limited replacement funds. Such funding imbalances can result in the overall cost of the Town's fleet being higher than necessary as "poorer" agencies are forced to keep vehicles in service longer than is economical.
- Historically, Exeter has used annual appropriations of cash as the main funding method to replace most vehicles and equipment. In our experience, ad hoc appropriations are the least effective means of financing fleet capital costs, and, *without exception*, every government jurisdiction with which we have worked over the last 20 years that uses this approach has an old fleet. The reasons for this are many, but two in particular bear mentioning. Under a cash financing approach, which involves paying 100 percent of the cost of acquiring a replacement vehicle in the year in which it is acquired, the marginal cost of replacement will *always* be more than the marginal cost of maintaining and repairing the vehicle for one more year. Consequently, vehicles tend to be kept in service until their diminishing reliability and availability become intolerable. Under a pay-as-you-go financing approach such as a reserve fund or lease-purchase program, in contrast, differences between the marginal cost of repair and replacing a vehicle are much less pronounced, which reduces the temptation to continually defer replacement to "save" money.

  Secondly, the enterprise-wide costs of replacing a fleet of vehicles is inherently volatile from year to year as the optimal replacement dates of the many different assets in the fleet with different purchase prices and life expectancies converge in given years in unpredictable fashion. It is not unusual over the course of, say, 10 years for gross annual fleet replacement costs to vary by as much as 300 percent. Attempting to finance such costs with cash appropriations is virtually impossible. No matter how flush with cash they might be, most organizations are simply never going to budget, say, $200,000 for fleet replacement purchases one year and $1 million the next. Over time static funding levels in the face of volatile spending needs

inevitably result in the replacement of many vehicles being deferred and a large backlog of spending needs accumulating.

- Exeter has recognized this issue and has in the past used debt to finance high-cost assets such as fire trucks, street sweepers, and front-end loaders. Given the state of the economy and resulting budget pressures, we believe that the Town should adopt debt financing as its primary method of financing replacement of fleet assets. We will discuss this more later in this section of the report.
- The overall average age the Town's fleet is a bit past an optimal level. Based on detailed fleet inventory data furnished to us, the average age of all assets in the fleet is 13 years. This equates to an average replacement cycle of 26 years. Removing trailers, miscellaneous equipment, and fire trucks from the calculation produces an average fleet age of 8 years. Since most of the vehicles in the Town's fleet have a stated replacement cycle of 10 years, which is reasonable in our view, we would expect the average age of the fleet to be less if Exeter were adhering to its guidelines.
- The Town has recently developed a vehicle reserve fund to finance the future replacement of fleet assets assigned to Public Works. A multiple year replacement plan was developed. This plan is excellent. We rarely see such plans and when we do they are not done with the rigor and thoroughness of the one prepared by Public Works. Unfortunately, no funding has been identified to implement the plan. Funding to replace Police vehicles is included in the operating budget. Replacement of other vehicles is presented by departments as part of the budget each year.
- The Town should take a more holistic and strategic view of fleet replacement funding needs by developing a consolidated fleet replacement plan covering all vehicles regardless of assigned department or funding source.
- We have calculated the replacement value of the Town's fleet at $9.3 million. This would be the cost if the Town had to replace all of its primary fleet assets[9] (i.e. sedans, police cars, pickups, trucks, fire apparatus, and construction equipment) tomorrow. Based on the average of the Town's adopted replacement cycles – which we found to be reasonable - the fleet would turnover on average every 10.4 years[10]. At this rate of turnover, the Town should be acquiring an average of $894,000 worth of equipment each year. In practice, this level has only been reached in the past in years where a fire truck has been replaced.

[9] Not including 95 auxiliary and miscellaneous equipment for which we were not provided pricing. These items would likely have acquisition prices of a few thousand dollars or less on average. However, the total could add materially to the value of the Town's fleet.

[10] Of course some vehicles (such as patrol cars) would be replaced more frequently and others (such as fire trucks) would not. However, for planning purposes the overall average is 10.4 years.

- Averages are fine to illustrate a point, but are not particularly helpful in preparing a budget. Therefore, we have developed a projection of vehicles that are due are overdue for replacement covering all departments for the next ten years. The results are shown below:

Table 7: Projected 5 Year Replacement Costs

(In Millions of Dollars)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
$ 2.99	$ 0.76	$ 0.65	$ 0.85	$ 0.15	$ 0.13	$ 0.76	$ 1.52	$ 1.06	0.39

- As can be seen, a considerable backlog of replacement funding needs has developed. While this is in large part due to budget pressures caused by the economic downturn, less than optimal replacement planning practices are also to blame.
- 29 vehicles are due or overdue for replacement. This represents one-third of the fleet rather than the expected 10-percent if the Town were adhering to its fleet replacement criteria.
- Even if the Town had unlimited funding available next year we would not recommend that 29 units be replaced. This would be logistically difficult and the ripple effect would cause a large spike in funding requirements in future years. Rather, the Town needs to defer replacement of some vehicles and reduce the backlog in funding requirements over a number of years. After all, it took several years for the backlog to develop and it is reasonable to expect that it will take several years to recover.
- Once a consolidated replacement plan has been developed (based on the model that Public Works has) a committee of Town staff should work together to recommend the highest priority vehicles to replace next year and in subsequent years in a manner that ultimately results in the “smoothest” and less volatile annual replacement costs.
- While calculating annual debt service amounts need to finance vehicle purchases was beyond the scope of our project we estimate that the Town would have to appropriate around $500,000 to acquire the 29 vehicles overdue for replacement next year. In other words, the Town could acquire $3 million worth of vehicles for $500,000. Again, we do not recommend that all overage vehicles be replaced in one year. However, it is clear that financing vehicles rather than paying cash is a much more budget friendly, and therefore, feasible approach for the Town.

- If the Town decides to finance purchase of vehicles in the future, we recommend that finance terms match vehicle life-cycles as closely as possible. Consequently, if an ambulance is going to be kept in service for six years the Town should amortize the loan for the same period. Note that most banks and commercial finance companies will not loan money for longer than 10 years. Accordingly, loans for fire trucks and other long-life vehicles will need to be shorter than their life-cycle. We were told that in the past fire trucks have been acquired over a five year payment schedule. We do not recommend this because the higher payments detract from the Town's ability to replace other vehicles.
- Optimizing vehicle replacement practices is important because failure to do so would ultimately result in the total direct cost of ownership of the Town's fleet being higher than necessary. Maintenance and repair costs would be higher and used vehicle residual values would be lower than would be the case under an effective replacement program.
- Ineffective replacement practices and an aging fleet would also confront the Town with many indirect costs as well. Foremost among these would be reductions in employee efficiency, productivity, and safety as vehicle availability, reliability, and performance diminish.
- Finally, ineffective replacement practices would seriously impede any efforts to improve the sustainability of the Town's fleet and impacts on the environment. No organization can reduce the carbon footprint of its fleet substantially if it is not willing to devote funds to replacing older, less fuel-efficient, and more polluting vehicles with newer, more efficient, and cleaner ones.
- The Town's current procedures for identifying the actual units to be replaced each year are, for the most part, informal. We believe that a more formalized process for making these selections would be of benefit. We have provided a recommended point system for guiding fleet replacement selections in the Appendix.

Recommendations

11. *Revise the CRF Vehicle Replacement Plan, developed by Public Works, to include all vehicles and pieces of fleet equipment owned by the Town irrespective of assigned department or funding source.*
12. *Adopt lease-to-own or other appropriate debt financing method as the primary means to fund acquisition of vehicles and fleet equipment.*
13. *Provide sufficient funding to maintain an average fleet age of six years, which corresponds to an average fleet replacement cycle of 12 years.*
14. *Adopt the point system recommended in this report to help set priorities for replacing vehicles.*

FLEET SIZE AND COMPOSITION

Summary of Industry Best Practices

Since a fleet user's need for a vehicle or piece of equipment can diminish over time, justifying the initial acquisition and assignment of a vehicle does not ensure that a fleet of vehicles will remain properly sized, composed, and utilized. Fleet management organizations should be responsible for developing and reporting to fleet users information on the utilization of fleet assets and on opportunities to share such assets. They usually are uniquely positioned to do so by their need to maintain up-to-date records on fleet size and composition, their responsibilities to acquire, fuel, maintain, and dispose of vehicles, and their operation of central fleet management information systems.

Defining a fleet management organization's responsibilities in this area is a delicate task, however, since it is difficult to maintain good customer relations when acting both as a provider of fleet assets and services and a controller or regulator of the use of such resources. One way to address this issue is to have the fleet organization function in a consultive role to customers and to a higher-level decision maker, such as a budget manager, to whom user agencies are responsible for justifying retention of underutilized vehicles.

Fleet utilization levels, expressed in terms of average annual miles driven or hours used for particular classes of vehicles, can provide an indication as to whether or not assignment justification and utilization monitoring processes are effective in controlling fleet utilization. It is important to realize, however, that such measures do not always provide a complete and accurate picture of the need for a vehicle or piece of equipment. Other considerations such as frequency of use (i.e. time away from base), cargo carrying requirements, emergency responsibilities, and special equipment needs must be added to the analysis.

Shared use motor pools provide a fiscally responsible means to provide vehicles and equipment to users that have only an occasional need for a vehicle or piece of equipment. As such, a motor pool can reduce the number of vehicles that an organization has to purchase and to maintain.

Current Program Status

- It appears that the Town generally has the right number of vehicles and pieces of equipment in its fleet. Vehicles are readily shared across departments and interviews indicate that staff believe they have the equipment they need to do their jobs.

- An initial high level review of fleet use reveals good utilization levels, as shown in the table below:

Table 8: Annual Use for Common Vehicle Types

Vehicle Type	Average Annual Use
Cars	17,000
Pickups	8,200
Trucks	3,300

- For a Town the size of Exeter this is very good utilization. Note that the average for cars is driven up by police patrol vehicles. Also, since trucks tend to stay on job sites their average use is understandably lower than for other vehicle types.
- We did notice a fair degree of variability in use among vehicles. The Town should adopt a process to review the need for units that fall below certain thresholds. We recommend 5,000 miles for cars and pickups and 2,000 miles for trucks.
- The types of vehicles in the Town's fleet are typical of other municipalities we have worked with. We did not observe any obvious superfluous or extravagant vehicles. To insure vehicles are appropriate for their intended use going forward, the Town should form a fleet replacement committee comprised of program stakeholders. Such a committee makes vehicle selection decisions more transparent and inclusive by requiring end users to justify vehicle types to committee members. This process makes end users better define their business needs and brings peer pressure to bear. This same committee should also review fleet utilization each year.
- The Town has a few general use sedans in service. These vehicles are reassigned police patrol cars that have been painted, had minor repairs completed, and placed back in service. The advantage of this practice is that these vehicles have been nearly fully depreciated and so capital costs are low. However, the vehicles have more than 100,000 miles of hard police use, which in our experience is equal to 200,000 miles of normal use. Some staff are understandable reluctant to drive such a vehicle on all but the shortest trips. This is particularly true for the pool car at the Town office. A pool car that nobody will use is not serving its purpose. When the budget situation improves the Town should consider purchasing an appropriate pool car for the Town office. We recommend a late model (three year old) lease return vehicle purchased from a local dealer. This vehicle should be replaced on on a short

cycle (no more than three years) to keep the vehicle in good shape for office use. Sale proceeds should be used to partially offset the next vehicle purchase. Such a strategy cost the Town around $200 per month in depreciation costs which is much lower than leasing a new car.

15. *Establish a committee to review fleet utilization and types of vehicles purchased each year to insure that the size and composition f the Town's fleet is appropriate.*

FLEET MAINTENANCE

Summary of Industry Best Practices

All vehicles and other pieces of motorized equipment require maintenance and repair during their life. Since a fleet service organization's primary mission is to maximize the availability of vehicles so that its customers can productively do their jobs, the focus of maintenance management for such organizations needs to be in developing practices that minimize unscheduled incidents of repair and that return vehicles requiring repair to service in as little time as possible.

The performance of any fleet maintenance program is also affected by the number of personnel who are employed to deliver services and the manner in which they are organized and deployed to accomplish their mission. Organization structures should reflect reasonable spans of control and channels of communication which are consistent with formally defined authority and responsibilities. Staffing levels should be consistent with the amount of effort required to produce desired services in a productive, efficient, and effective manner. Work orders should be used to document all maintenance and repair services provided to a vehicle. Procedures also are needed to monitor the progress and, where necessary, to expedite the completion of work. These include protocols for passing work from one shift to the next, from one technician or shop to another, and from an in-house garage to a vendor. Procedures also are needed for following up on repairs whose completion by a mechanic or vendor is excessively slow and on parts whose delivery is overdue.

The service writer or other individual opening a work order should estimate the time and services required to complete a work order, by reference to appropriate flat-rate manuals or in-house time and task standards, to estimate the cost of the repair. Work authorization procedures should ensure that appropriate controls are in place over the services and costs provided by a vendor. Such controls are particularly important as vehicles approach their planned replacement dates. In order to ensure the cost-effective utilization of in-house maintenance resources and to minimize maintenance and repair turn-around time and downtime, processes should be in place for scheduling work into a shop in advance and for performing minor repairs while the driver/operator waits. Service hours and scheduling processes should be flexible enough to

accommodate vehicle users' work schedules, but also should seek to maintain a steady flow of work to mechanics and avoid peaks and valleys associated with unplanned service demands.

Procedures should be in place to distribute work to mechanics so as to promote high levels of mechanic productivity, efficiency, and effectiveness and to minimize repair turn-around time; and to assign the work to a specific mechanic based on an assessment of mechanics' availability and skills. Additionally, priority systems are often used to identify vehicles that are to be moved ahead in the repair queue based on their importance to the organization. Vendors may be relied upon to perform fleet maintenance and repair services for a variety of reasons, including managing in-house work backlogs; avoiding costly investments in facility construction, tooling, training, and staffing; to meet low volumes of service demand in remote areas or for specialty repairs; and to achieve a degree of flexibility (e.g., in terms of locations, hours of service, etc.) in the provision of services that is not possible with civil service system constraints and sizable investments in fixed fleet maintenance infrastructure. The cost-effective use of vendors requires, however, that procedures be followed for 1) determining the comparative cost effectiveness of performing a service in house or using a vendor; 2) managing and controlling vendor performance relative to individual service orders and ongoing service levels (in the case of contract providers of services); and 3) capturing all relevant information on vendor-performed services so as to maintain a complete record of vehicle maintenance history and costs and provide for timely user billing via a charge-back system.

Repair quality assurance procedures are used to ensure that requested services are performed properly. When repairs are not completed correctly, the vehicles are often returned resulting in "comeback" repairs. When they occur comebacks are costly and annoying, so they need to be tracked and followed up on. It is important that comebacks be identified and handled properly for several reasons:

- In all likelihood, the vehicle user is not pleased that the vehicle has had to be returned to the shop;
- The comeback may have occurred because the initial defect report failed to clearly describe the problem. If this is the situation, a review of the original service request with the service writer and/or operator may be in order;
- The mechanic may have improperly diagnosed and/or performed the repair and therefore, some retraining may be needed; and
- The parts used may have been defective and some follow-up with the supplier may be needed.

One of the best strategies in managing comebacks is avoiding them all together. This usually involves some form of post-repair review process. Quality checks can range from simple road-tests, to quality checklists, and to complete observation of the repair. No matter what procedure is used, good quality programs are integral to insuring customer satisfaction. It is impossible for maintenance managers to be all places at all times and, therefore, to assess the appropriateness of maintenance activity and performance solely on the basis of subjective judgment, first-hand observation, and second-hand information. The development and analysis of management information enables managers, supervisors, and trades workers to develop insights into aspects of their performance and opportunities for improvement therein that might otherwise not even be detected. Accurate, complete, detailed, and timely collection of maintenance activity and cost data through work orders is the foundation on which maintenance performance measurement and improvement processes rest.

The centerpiece of any vehicle maintenance program is its preventative maintenance (PM) program. Without clear and specific involvement of everyone in the organization to focus its attention on its PM program, the operation will not be as successful as required. A good PM program drives the cost of fleet operations down and promotes efficiencies throughout the organization. A good PM program minimizes breakdowns and unscheduled maintenance subsequently allowing the vehicle to remain in service as much as possible and therefore maximizing the availability of vehicles to its customers.

PM services should be scheduled on the customer's timetable. Often this is after normal working hours or at times when the vehicle may be idle for a period of time. The PM program should also incorporate multiple echelons of progressive services. That is to say that tasks particular to a specific type of PM be included in each subsequent PM. For instance PM A tasks are incorporated into PM B tasks. PM B tasks are incorporated into PM C tasks.

PM intervals should be based on certain "triggers" that meet manufacturers' recommendations or standards. In most cases this is some interval of time or some interval of usage; preferably both. When one or more of the triggers is met the need to schedule the PM becomes the focus of the operation. Without documentation of meeting stated or recommended PM intervals manufacturers may deny warranty if made aware that the vehicle or piece of equipment is not being properly maintained.

Current Program Status

- We found Public Works' maintenance practices to be good and generally in compliance with industry best practices. Staff are dedicated, professional, and knowledgeable. Customer groups we interviewed gave the shop high marks for the

quality of work performed. Some customers did note that repair turnaround can be slow particularly during periods of peak workload.

- Data from Public Works' Access database shows the following the following workload statistics:

Table 9: DPW Shop Workload Statistics

Year	Count of Work Orders	Labor Hrs	Hrs/WO
2002	176	829	4.7
2003	317	1,246	3.9
2004	344	1,486	4.3
2005	350	1,598	4.6
2006	306	1,309	4.3
2007	254	636	2.5
2008	229	215	0.9
Averages	282	1,045	3.6

Record keeping has clearly been incomplete. As previously discussed, with 2.75 positions the shop should be producing more than 3,000 hours of productive hours per year. Also, based on our experience the number of word orders should exceed 600 given the size and composition of the fleet. Never-the-less, the average number of hours per work order falls within our benchmark range of 3 to 5, which indicates an efficient level of productivity.

- Workflow procedures consist of the following:
  - ✓ Vehicles enter the shop from three sources. Customers may call with a mechanical problem and schedule a visit to the shop, vehicles also drive in unannounced and are dropped off, and vehicles are delivered for scheduled PM service. Work is not presently coded in a manner that would enable statistics to be tracked on the frequency of scheduled versus unscheduled work.
  - ✓ Scheduled repairs most often emanate from daily vehicle inspection reports that are completed by vehicle drivers (an excellent practice that the Town should be commended for). These reports are routed through the maintenance superintendent who prioritizes work for the mechanics. Other scheduled work comes from daily discussions with the Police Department.
  - ✓ Preventive maintenance services are also scheduled. Reports are produced from the department's Access database and are based on the last service

completed and projected mileage from transactions entered into the fuel system.

- ✓ Jobs are assigned to mechanics based on availability and considering skill sets. Jobs may be assigned during the production meeting that is held each morning.
- ✓ Mechanics diagnose repair problems and the decision to outsource is normally made at this point. Job completion costs and timeframes are nor estimated and communicated to customers.
- ✓ Mechanics proceed with repairs and generally will stay with a job through competition.
- ✓ Paper work order forms are used to record services, labor times, and parts used.
- ✓ Mechanics pull their own parts from the stockroom or tire storage container. The transaction is noted on the work order. For non-stock parts, one of the full-time mechanics will source materials, complete required paperwork, and order the parts.
- ✓ When a mechanic finishes a job he completes entry of time and notes on the work order form, which is forwarded to the Maintenance Superintendent for review. Customers are called to notify them that repairs are complete, which is a good practice.
- ✓ Data from work orders is input to the Access database by Public Works office staff.
- ✓ Invoices for parts or outside vendor services are forwarded to the appropriate department for payment.

- Public Works needs to improve its documentation of maintenance activities and transaction statistics through the implementation of an automated fleet maintenance system (this is discussed more detail in a later section of this report).
- The PM program appropriately incorporates multiple echelons of progressive services and intervals generally follow manufacturer recommendations. Both use and time are appropriately used as PM service triggers. The standard PM cycle is 3 months or 3,000 miles (300 hours for off-road equipment) whichever comes first. Given annual use of vehicles this is an appropriate PM cycle.
- Stickers are placed on the windshields of vehicles as a reminder to operators when the next PM service is due. Shop staff report that most drivers/operators are conscientious about scheduling PMs before they are overdue. A report is run each week from the Access database to catch any overdue vehicles.

- Public Works should track PM compliance as one of its key performance measures. Monthly reports should be run to track the percentage of services that are completed on time, with 95% as a minimum target
- Quick fix services are appropriately available to customers for simple repairs and PM services. Customers are also provided with a day certain/time certain appointment foe scheduled services, which is an excellent practice.
- Public Works appropriately provides field service for vehicles that are difficult to move to the shop and for on-road breakdowns.
- When mechanics are called back to work after-hours, they are paid a minimum of hours and time and half rates. This is a fairly standard practice in the industry.
- Mechanics are paid an annual $500 tool allowance. The Town provides large tools and diagnostic equipment. The main electronic scan tool was purchased in 2006 and the software is out-of-date. As a consequence, trouble codes cannot be read from the systems of many vehicles. A new tool should be acquired, which will cost around $2,500.
- Minor warranty repairs are completed in-house in order to expedite the repair process while large jobs are sent to vendors. Public Works should pursue certification by manufacturers as a certified warranty repair shop in order to reduce repair turnaround times and maximize cost reimbursement.
- Patrol cars are brought to the shop three times each week for a quick check by a mechanic. This practice was instituted many years ago when Public Works first became responsible for maintaining police vehicles. The idea was to catch small emerging problems before they turned into expensive repairs. While this was likely a good idea at the time, it seems to us to be over-kill now that Public Works has instituted good maintenance practices for patrol cars. Scaling back to once per week would save a few labor hours that could be re-directed to other priorities.
- Public Works does not perform any work for outside agencies, even though the organization sells fuel to both the Housing Authority and School Districts. The Town should approach these agencies and offer to perform maintenance and repair work on a cost reimbursement basis. Other agencies should also be approached, such as the State of New Hampshire and Rockingham County. While the amount of outside work would likely not be great, revenue generated would help to spread the Town's overhead costs over a larger base thus benefiting all customers.
- Training for mechanics has been minimal in recent years. Consequently, mechanics are not keeping up with technological changes to equipment. The Town's fleet represents assets worth millions of dollars. It is not an unreasonable expectation that all mechanical staff receive some technical training each year. We recommend

a minimum standard of two courses totaling at least 20 hours of technical or fleet related administrative training each and every year. The training budget should be set at $1,000 per employee.

Recommendations

16. *Public Works should improve its documentation of key workload statistics including the number of work orders processed and productive mechanic labor hours.*
17. *Public Works should scale back its operational checks of police patrol cars from three times per week to once per week.*
18. *The Town should offer to perform maintenance and repair work for outside agencies*
19. *Public Works should develop a formal structured skills assessment and training program for mechanics. A minimum of 20 hours of technical training should be provided to each staff person each year.*

PARTS INVENTORY AND SUPPLY

Summary of Industry Best Practices

The cost effective and timely provision of high quality repair parts and supplies to maintenance workers is a key element in the overall provision of fleet maintenance services. The organization and staffing of the parts supply function, the procurement of parts, parts inventory management, warehousing, and inventory control each have a large effect on the overall success of this functional area, and a corresponding effect on the efficiency and cost effectiveness of fleet maintenance services. The optimal organization and staffing of the parts supply function varies considerably with the size and complexity of the maintenance operation, and decisions regarding procurement and inventory investment. Adequate staffing in terms of the number of employees and the tasks assigned is a critical success factor, as is designing a parts organization that is suitable in scope of responsibility to the scope of the maintenance operation as a whole. Well-designed contracts and blanket purchase agreements enable an organization to reduce administrative effort and time delays associated with procuring parts; to monitor and control parts purchases; to simplify payment for such purchases; and to secure discounts associated with buying from particular suppliers in volume. In short, they can reduce both the direct and indirect costs of buying parts and other fleet maintenance-related commodities. Procedures for establishing, monitoring, renewing, and circumventing contracts should be designed to maximize vendor performance, minimize administrative effort, and maintain a maintenance organization's flexibility to procure a part by other means when contract suppliers cannot satisfactorily meet its needs. Individual purchase orders typically are used to procure parts that are not carried in inventory or available from a local supplier under a contract or blanket purchase agreement. While they offer maximum flexibility in sourcing parts, their employment usually is limited to the purchase of infrequently used specialty parts due to the administrative effort, cost and time delays involved in their issuance and the inability to capture volume discounts through piecemeal buying.

The identification of the types of parts required to support maintenance and repair activities involves analyzing various attributes and indicators of parts needs, including the types, quantities, and timing of parts usage; parts and parts supplier performance; and parts accessibility and waiting tolerances. Determining proper inventory size and composition requires developing an understanding of several interrelated factors, including cost trade-offs between volume and individual purchases of specific commodities; trade-offs between inventory carrying and parts delivery costs; and trade-offs between parts availability and delivery times and waiting tolerances of particular fleet users and vehicle and equipment types. It also requires identifying inventory items that have become obsolete due to changes in fleet composition and no longer should be replenished. Key measures of performance in this area include inventory turns (the

ratio of the value of stock items issued per year to the average value of parts carried in inventory), parts order fill rates (the percentage of requests that can be filled immediately), and order fill times (the average amount of time required to fill an order).

Inventory control involves the tracking and physical control of parts from the point of receipt through consumption. This process is important for controlling theft of, and damage to, inventory items, and has a direct effect on the cost of carrying the parts inventory. Control of physical access, and the methods employed to replenish and disperse these items ensure that their consumption is accounted for properly. Effective parts supply processes allow mechanics to focus on the activity for which they are hired, maintaining and repairing vehicles, by putting parts in their hands with a minimum of disruption to maintenance activities. This reduces repair turn-around time and costs and increases mechanic productivity, efficiency, and effectiveness.

Current Program Status

- Public works has relatively small inventory of parts in a 16' wide by 30' long room connected to the shop. The stock is well organized and appropriately limited to fast moving maintenance items or parts that are difficult to obtain quickly.
- There is also a storage container outside and adjacent to the shop that is used to store tires. Most tires in stock are for police patrol cars.
- Annual inventory counts are not performed, so Public Works could not tells us precisely the number and value of parts in inventory. Public Works estimates the value of the parts inventory at $25,000 to $30,000 with an additional $15,000 to $20,000 in tires.
- One of the reasons that inventory counts are not done is that the majority of items in the stock and tire rooms have already been charged out to customer organizations. This is done when items are purchased. Some stock may sit on the shelf for a number of years before an item is actually placed on a vehicle. A replacement part then is ordered and direct charged to the department that has the vehicle.
- Since fleet users actually pay the invoices for parts, Public Works does not track the annual spend for the Town. Parts costs are charged to the same budget line item as vendor services (4320-vehicle maintenance for most departments and 4311-equipment maintenance for Water and Sewer). While Public Works does have a budget line inventory for stock, this is used for consumables (such as fasteners, rags and cleaner) and not for inventory. As discussed below under financial management, Public Works should purchase all parts and charge them to customer departments as they are used (in the same manner that it currently handles fuel).

- From a best practices and internal controls perspective Public Works needs to establish a perpetual inventory for the shop. Under current practice, there is little control over as much as $50,000 worth of stock. Therefore, Public Works cannot assure that stock is being managed appropriately and safeguarded against misuse.
- Controlling an inventory properly involves the establishment of appropriate procedures for purchasing, tracking, and issuing stock. A computer software parts management program is a pre-requisite for this, particularly in a situation such as in Exeter where a dedicated parts management clerk is not available (nor required given the volume of activity). Such software includes imbedded procedures and business rules based on industry best practices and internal controls. The fleet management system previously recommended under the maintenance section of this report and the specific software packages identified later includes complete inventory control modules.
- Items that cost more than $250 require three written quotes Items more than $500 require a purchase order. The shop initiates PO paperwork and the department that "owns" the vehicle approves and process them.
- There are no contracts in place for parts. Rather, the shop has "gentlemen's" agreements with a few firms who have become key suppliers. The two biggest key supplier are Sanel Auto Parts (projected $20,000 2009) and McFarland Ford (projected $12,000 for 2009).
- Public Works reports that they receive favorable pricing from vendors (dealer net) and the shop normally calls around to check pricing. However, vendors are appropriately selected on a combination of price, parts quality, parts availability, and vendor service. Best practice would be for Public Works to establish formal price and service agreements with vendors. The process of competitively bidding often produces lower pricing and/or better terms.
- A local vendor visits the shop once per month and restocks oil filters and fasteners (nuts and bolts) as required. This is a good practice for a small parts room that does not have a full-time parts clerk.
- Tires are generally purchased off an existing State of New Hampshire contract with Goodyear and very favorable pricing. Public Works should explore the availability of state contracts for other types of automotive supplies.
- Retread tires are appropriately used for trucks to save money. Fire des not use retreads but should reconsider this policy as savings can be as much as 50-percent (note that retread tires should not be used on steering axles).
- Snow tires are mounted on most Town vehicles each Fall to provide improved traction when it snows. This is a common practice in many areas of the country.

- A common measure of parts program efficiency is inventory turnover rate. Our standard for inventory turns is three times on a value basis. Data was not available for us to make this calculation for Public Works.
- Parts are normally delivered by vendors to the shop. Public Works insists that invoices always accompany the part, which is an industry best practice. A mechanic will sign the invoice, which indicates the part has been received. The Maintenance Superintendent reviews all invoices and adds the correct accounting code (budget line item and department). Transactions relating to Public Works are then processed through the Town's financial system by front office staff or forwarded to the appropriate department for processing by their staff.
- Most suppliers have accounts separately with the largest users in the Town (i.e. Public Works, Police, Parks, and Fire). Vendors send monthly invoices directly to each department. After invoices have been matched to the statement, Finance is asked to process payment. Since there are multiple departments receiving statements, it appears that there is an opportunity to reduce accounts payable workload by centralizing the parts management process.
- No regular reports detailing parts activities are produced. Such reports should include inventory levels and values, parts movement statistics (e.g. stock outs and dead stock), transactions by vendor, costs vs. budget, and performance against targets and goals.

Recommendations

20. Public Works should establish a perpetual inventory for its fleet parts stock. More formalized parts management procedures and internal controls should be put in place.

21. Public Works should purchase all parts and charge them back to customers as they are used.

22. Public Works should track key parts statistics such as costs by department and costs by vendor.

23. Public Works should develop formal pricing agreements with key parts suppliers.

24. Public Works should explore the availability of additional and feasibility of using Sate of New Hampshire contracts for automotive parts as it currently does with tires.

FACILITIES AND SHOP EQUIPMENT

Summary of Industry Best Practices

Adequately sized, suitably configured, correctly equipped, and appropriately positioned facilities are a significant contributor to efficient and effective fleet maintenance programs. Conversely, no amount of effort can fully overcome facilities that are outgrown, disorganized, lacking in equipment, and/or in the wrong place.

The quality, size and configuration of fleet facilities must match the work to be done. Some basic tenets of good fleet facility design include:

- Staging areas for maintenance candidates or *deadline* vehicles that are collocated with, or adjacent to, the maintenance facilities.
- Staging areas for *ready* vehicles that are collocated with, or adjacent to, the maintenance facilities.
- Ceiling height within the facilities must allow certain crucial maintenance procedures.
- Illumination must be very good.
- Machining, welding, fabricating, painting, and/or body work areas may be necessary, and so-positioned that they are distant from related maintenance operations.
- Maintenance bays must be sized properly and have an adequate number of bays for fleet size and composition. At least 1 to 1.5 bays per technician per shift is recommended.
- Circulation within the shop area must be adequate.
- Parts rooms must be properly located, sized, and configured for efficient receipt and dispensing of parts.

Current Program Status

- The vehicle maintenance shop is part of the Public Works yard located at 13 Newfields Road. The shop is located in the middle of the main building in the yard with vehicle storage/work areas for other Public Works divisions on either side.
- The shop consists of two work bays with an office off the left bay and the parts room to the right. The total area of the work bays is 40’ wide by 60’ long. However, because work benches, shop equipment, and storage cabinets line the walls the operational size of the work area is closer to 30’ by 50’ or 15’ by 50’ for each of the two work bays.
- The standard for efficient repair operations is 1.5 work bays per mechanic. This maximizes productivity and efficiency by allowing mechanics to continue working

when a vehicle is waiting for parts, customer repair approval, quality assurance inspection, etc. With three mechanics, there should be six work bays instead of the available two. As a result, staff must work on vehicles outside the shop, and frequently must stop working to move vehicles around – thus detracting from productive maintenance operations.

- Besides a deficit in the number of bays, existing work spaces are too small to efficiently accommodate the Town's largest equipment such as the sewer truck or dump trucks with plow blades attached. The industry standard for a truck/heavy equipment bay size is 55" long by 25" wide, substantially larger than the Town's shop.
- Additional bay space is readily available on either side of the shop where equipment is currently stored and parked at night. While this is generally an appropriate use for under roof space, it is not as high a priority as providing adequate room for mechanics to work. Public Works should consider converting space adjacent to the shop office into an additional work bay. This will be especially important if the shop takes on responsibility for fire vehicle maintenance.
- Lighting in the shop is marginal and could be greatly improved by having the floor coated with a reflecting light colored sealant. We estimate the cost for this at $5,000. High quality portable low angle lights (two for each side of the shop) would also improve lighting. These could be acquired for around $1,000.
- There are two vehicle lifts – one in each bay. Lifting capacity is adequate at 15,000 and 12,000 pounds.
- The shop has a fluid distribution system and air lines driven by an adequately sized compressor.
- Shop areas are well organized and clean.
- Shop equipment is adequate. The engine diagnostic scan tool was purchased in 2006 and needs to be updated. We estimate that this would cost $3,000.
- Minimal cost would be involved in converting a parking bay to shop space. The main cost would be extending fluid and air distribution systems. We estimate this cost at $5,000. A vehicle lift is not recommended as flat floor space is preferable for fire truck maintenance.

Recommendations

25. Public Works should consider converting space adjacent to the shop office into an additional work bay.

26. *The Town should budget $15,000 for the various upgrades to the shop noted in this report.*

FLEET MANAGEMENT INFORMATION SYSTEM

Summary of Industry Best Practices

In all fleet operations, a tremendous amount of information is recorded and compiled in the normal course of procuring, operating, and maintaining the vehicles and equipment used in the operation. Prior to 1980, fleet information was kept primarily in a hard-copy format, on documents that were manually recorded, compiled, and filed.

Modern fleet management information systems (FMIS) can extract key data elements by equipment type, user department, or functional area, and can easily track performance and cost in a number of ways. Key data elements can be instantly compiled, sorted, and summarized to produce information on activities and performance that simply was not available in the past. Real-time access to vehicle repair histories and inventory records enables fleet management organizations to plan, direct, and control service delivery activities with a degree of precision and efficiency never before possible. At the same time, increased levels of accountability and benchmarking against other organizations have all increased pressure on fleet management organizations to develop and use management information to facilitate improvements and demonstrate proficiency in all areas of performance. Information systems that are *specifically designed for fleet management* have become one of the most important tools for delivering fleet management and maintenance services cost effectively. Some of the advantages of implementing such a solution, including the following:

- Dispersed fleet operations work with standardized data definitions, data input fields, and data reports
- Information can be communicated using industry standard fleet terminology, data fields, performance measures, reports, etc.
- Statistical history enables comparisons over time (longitudinal statistical reports), and across organizational divisions
- Managers and supervisors can more speedily identify problems and unearth answers to management questions
- Query programs enable flexibility for selecting and extracting data and reporting in different formats and from different statistical perspectives

One of the leading trends in the industry is that fleet management organizations are providing their customers with information stored in their information systems through read-only reports that are accessed through secure Internet and Intranet web pages.

This reporting capability allows fleet customers to manage their own vehicles and equipment by looking at reports that show utilization, fuel consumption, billing records, and inventory details. Such reports also improve customer relations by providing transparency and a feeling on the part of customers that the fleet organization is ready and willing to provide complete information on fleet operations.

In today's data intense environment it is critical to consolidate vehicle fleet data and have the ability to track and report this information. Utilizing an information system that is designed specifically for fleet management makes this task much easier for fleet managers. There are two main ways to begin the process, hire a fleet management company who will provide an information system or purchase an off-the-shelf fleet management information system. There are pros and cons to each method as explained in the maintenance and repair section of this report.

Current Program Status

- Public Works does not have a fleet management information system in place. Most information is tracked manually on paper forms or not tracked at all. Public Works has taken some steps to move beyond manual data collection by developing a Microsoft Access database to track preventive maintenance schedules. This database is also designed to keep track of basic work order information for all repairs (such as work order dates, number of labor hours, and basic description of repairs). However, data entry has been inconsistent, primarily because the information contained in the system has never been used for anything beyond tracking PMs. This is a symptom of the system not being easy to use and lacking in functionality.
- The Fire Department has no fleet system at all. In-house and vendor repair records are kept on paper forms.
- Record keeping for fleet activities is very poor. Data on fleet operations is either not kept or is scatter among various systems and organizations. Town staff had difficulty responding to our request for information regarding fleet operations, not due to any lack of cooperation but simply because data is not readily available. Basic information about the fleet, such as the number of assets by type, maintenance and repair costs, annual utilization, and standard performance statistics are not tracked. Some data is kept by Public Works, some by finance, and some by user departments. This silo approach hinders effectiveness as important management information is not available to any group of decision makers to guide their actions.
- Detailed maintenance and repair records are kept on paper forms in file folders in the Public Works office. As such, they are inaccessible to shop personnel - not only because they are physically located in a separate building but because actionable

information is nearly impossible to extract from paper records. Simple questions such as "How much did we spend maintaining this truck last year?", and "Didn't we replace this same part two years ago?" are not easily answered.

- The Town's efforts to optimize its fleet operations hinges on the acquisition of dedicated fleet management information system. In our opinion, acquisition of such a system is the most important short-term initiative that the Town can pursue. It Appropriate systems for a municipality the size of Exeter include CollectiveFleet by Collective Data, Roadbase by Chevin, and CFAWin by Computer Fleet Analysis. Any of these systems can be acquired for around $15,000 including basic implementation.
- The Town has acquired a good automated fuel management system which is used to provide secure access to fuel and to gather data on fueling transactions and vehicle mileages.

Recommendations

27. The Town should make acquisition of a fleet management information system its highest priority for the fleet program.

BUSINESS PLANNING AND PERFORMANCE MEASURES

Summary of Industry Best Practices

Performance measurement is part of a strategic (that is, planned and forward looking) approach to business management. Organizations that do not have a strategic management approach find themselves always a step behind. Because they lack strategic focus, they are always scrambling to react to the latest crisis and surprise. Constantly having to react to unknown and unplanned situations is time consuming and inefficient—and ultimately places an organization in an uncompetitive position.

The process of setting goals and measuring progress toward these goals is essentially strategic in nature. It is not very helpful, after all, to have a plan and not have any way to know whether the plan is being followed and producing the desired results. Performance measurement provides the essential feedback required to keep a strategic effort on track. Performance measurement allows an organization to:

- √ Reduce reliance on subjective judgment and speculation;
- √ Track performance against standards and benchmarks;
- √ Focus on areas of the organization that require improvement; and
- √ Track trends over time.

Implementation of a system of meaningful key performance indicators is also an important initiative for improving communication with customers and demonstrating the value of the services that the fleet management organization provides. Organizations need to take care that they limit the number of measures being tracked to a manageable list. Reporting of key measures of success, and progress towards meeting them, should extend from within a fleet management organization to its customers and to decision makers in the larger organization. They should also be communicated to internal users of fleet vehicles via the use of graphics tracking trends over time.

Now, more than ever, fleet organizations feel pressure to demonstrate their accomplishments using objective and quantifiable measures. The technological advances made available by computerized FMIS have provided fleet managers the capability of capturing and reporting on key measures of performance and therefore managing fleets in ways never seen before. Fleet organizations are now able to collect and analyze hundreds of thousands of data elements to determine such things as fleet availability, maintenance effectiveness, and a myriad of other performance statistics.

Performance measurement and benchmarking have become the most important tools to a fleet manager. They provide an objective look at the fleet organization and provide valuable information to justify fleet replacement spending and other fleet related decisions.

Benchmarking is important because it can take the politics and personalities out of fleet management decision making; it can help an organization detect areas of weak performance and where improvements are needed; it helps an organization measure goals and objectives; and it tracks changes or trends in performance over time.

It is important to note that it is difficult to compare fleet organizations with other peer organizations. The industry lacks standardized ways to quantify performance. Therefore, comparisons to other organizations can be compromised if the type of data collected is different and calculation methods are dissimilar. For these reasons and others, a measure of an organization's effectiveness should not be based solely on external comparisons. Possibly the most important benchmarks are measures of internal performance over time. Calculating these in a consistent manner provide a more accurate indication of the effectiveness of the fleet organization. These trends reveal whether performance is improving, remaining constant, or declining.

Current Program Status

- Public Works does not have either a strategic plan or a business plan. Fleet related strategies and goals are mostly informal.

- Public Works does not track any measures of performance.

Recommendations

28. *Public Works should develop an annual business plan and fleet report that details goals and significant initiatives, and provides concise information on the costs and performance of the Town's fleet program.*
29. *Public Works should develop a system of key performance measures as outlined below:*

Table 10: Recommended Fleet Performance Measures

Performance Measure	Description	Target
Average Fleet Age	The age and accumulated use of a fleet has a great impact on cost and service level performance indicators. As such, Relative fleet age should be tracked over time in parallel to key performance measures In order to track trends and to document the impact of lower or higher capital spending levels	One-half of the avg. stated fleet replacement cycle-normally 3.5 to 5 years for a typical municipal fleet
Fleet Availability Rate	This is one of the key measures of success in a fleet management program; the degree to which the fleet service provider is able to ensure the regular availability of fleet units to their user departments. Availability rates should be highest for mission critical fleet units	95% for the entire fleet and 85% to 98% for various types of vehicles
PM Program Compliance Rate	This measures the number of PM's performed before the date scheduled. A low compliance rate indicates that PM's are not being performed regularly. A high PM compliance rate is a basic building block for an effective maintenance and repair program.	95% on-time
Scheduled Repair Rate	Measures the portion of all repairs identified and conducted in a controlled, planned manner. The combined purpose of the PM program, operator inspections, and service writing is to identify and take care of problems in a planned, scheduled manner so they do not result in unscheduled and costly breakdowns	50 to 66%
Comeback Rate	This measures the percentage of time a customer returns a vehicle or piece of equipment back to the shop for the same problem within a specified period of time. It is a measure of service quality that reflects the accuracy of service writing and diagnostic activities as well as repair quality	1%

APPENDIX

Vehicles Due For Replacement

Vehicle No.	Class Description	Department	2010	2011	2012
1	Sedan, Intermediate 4Door	Public Works		$ 22,587	
3	Pickup, 1/2-ton 4x2	Public Works		$ 34,296	
4	Pickup, 1/2-ton 4x2	Public Works		$ 34,296	
5	Pickup, 1/2-ton 4x2	Public Works			$ 35,151
6	Van, 1/2-ton 4x2	Public Works	$ 32,831		
12	Van, 3/4-ton 4x2	Public Works			$ 43,165
13	Pickup, Compact 4x2	Public Works	$ 27,638		
14	Pickup, 1/2-ton 4x2	Public Works	$ 32,969		
15	SUV, Compact 4x4	Town Office			$ 30,002
16	Pickup, Compact 4x2	Public Works	$ 27,638		
17	Sedan, Full Size 4Door	Public Works	$ 45,633		
19	Van, 1-ton Hi-Cube 12' 4x2	Public Works	$ 45,118		
21	Enclosed Trailer/Control	Public Works	$ 5,025		
29	Flatbed 1-ton Dump 4x2	Public Works		$ 46,453	
30	Dump, HD, 5-7 Yard	Public Works	$ 128,995		
31	Dump, HD, 5-7 Yard	Public Works	$ 128,995		
32	Flatbed 1-ton Dump 4x2	Public Works			$ 47,495
47	Snow Blower H-D	Public Works		$ 17,533	
48	Sweeper, HD, W/VAC	Public Works			$260,146
51	Sedan, Full Size 4Door	Town Office	$ 45,295		
52	Dump, 1-ton 4x4	Public Works		$ 54,569	
53	Backhoe Loader	Public Works			$137,507
54	Sedan, Full Size 4Door	Public Works			$ 48,412
56	Trackless, Utility, HD 4x4	Public Works	$ 112,787		
57	Trackless, Utility, HD 4x4	Public Works	$ 112,787		
58	Trackless, Utility, HD 4x4	Public Works	$ 112,787		
61	Snow Blower H-D	Public Works	$ 16,690		
64	Chipper	Public Works	$ 27,135		
67	Vactor, HD, Sewer Combo	Public Works	$ 223,265		
81	Van	Parks and Recreation	$ 26,130		
82	Pickup, 3/4-ton, 4x4	Parks and Recreation	$ 30,150		

84	Dump, 1-ton 4x4	Parks and Recreation		$ 54,168	
85	Sedan, Full Size 4Door	Parks and Recreation	$ 45,295		
86	Pump, HD, 4"	Public Works	$ 10,050		
200	Welder/Generator	Public Works	$ 10,552		
1969634	Sedan	Police	$ 24,301		
G00294	Sedan	Police		$ 25,155	
G00481	Ambulance	Police		$223,610	
G00525	SUV	Fire	$ 37,613		
G01185	Pickup 3/4 ton, 4X4	Fire	$ 58,053		
G01211	Sedan	Police		$ 25,155	
G01213	Sedan	Police	$ 24,422		
G03323	Sedan	Police			$ 25,909
G10485	Ambulance	Fire		$225,824	
G12648	Fire Truck	Fire	$ 769,538		
G14783	SUV	Fire	$ 37,520		
G15281	Fire Truck	Fire	$ 769,538		
G18218	Sedan	Fire			$ 25,909
GO1212	Sedan	Police	$ 24,301		
			$ 2,993,051	$ 763,646	$ 653,696

Light Vehicle Replacement Guidelines

Factor	Points
Age	One point for each year of chronological age, based on in-service date.
Miles/Hours	One point for each 10,000 miles of use.
Type of Service	1, 3, or 5 points are assigned based on the type of service that vehicle receives. For instance, a police patrol car would be given a 5 because it is in severe duty service. In contrast, an administrative sedan would be given a 1.
Reliability	Points are assigned as 1, 3, or 5 depending on the frequency that a vehicle is in the shop for repair. A five would be assigned to a vehicle that is in the shop two or more times per month on average, while a 1 be assigned to a vehicle in the shop an average of once every three months or less.
M&R Costs	1 to 5 points are assigned based on total life M&R costs (not including repair of accident damage). A 5 is assigned to a vehicle with life M&R costs equal or greater to the vehicle's original purchase price, while a 1 is given to a vehicle with life M&R costs equal to 20% or less of its original purchase cost.
Condition	This category takes into consideration body condition, rust, interior condition, accident history, anticipated repairs, etc. A scale of 1 to 5 points is used with 5 being poor condition.

Point Ranges

Under 18 points	Condition I	Excellent
18 to 22 points	Condition II	Good
23 to 27 points	Condition III	Qualifies for replacement
28 points and above	Condition IV	Needs immediate consideration

Medium and Heavy Truck Replacement Guidelines

Factor	Points
Age	One point for each year of chronological age, based on in-service date.
Miles/Hours	One point for each 10,000 miles or 750 hours of use.
Type of Service	1, 3, or 5 points are assigned based on the type of service that truck had during most of its life. For instance, a dump truck that has been used in an off-road environment (such as a landfill) would be given a 5 because it is in severe duty service. In contrast, a truck used for in-town delivery service would be given a 1.
Reliability	Points are assigned as 1, 3, or 5 depending on the frequency that a truck is in the shop for repair. A five would be assigned to a vehicle that is in the shop three or more times per month on average, while a 1 be assigned to a vehicle in the shop an average of once every two months or less.
M&R Costs	1 to 5 points are assigned based on total life M&R costs (not including repair of accident damage). A 5 is assigned to a vehicle with life M&R costs equal or greater to the vehicle's original purchase price, while a 1 is given to a vehicle with life M&R costs equal to 20% or less of its original purchase cost.
Condition	This category takes into consideration body condition, rust, interior condition, accident history, anticipated repairs, etc. A scale of 1 to 5 points is used with 5 being poor condition.

Point Ranges

Under 20 points	Condition I	Excellent
20 to 23 points	Condition II	Good
24 to 30 points	Condition III	Qualifies for replacement
31 points and above	Condition IV	Needs immediate consideration