VEHICLE MAINTENANCE: A REGIONAL BENCHMARKING INITIATIVE

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The Capitol Region Council of Governments
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- INTRODUCTION -

Executive Summary

Building on the success of its Snow and Ice Removal and Control Study, the Capitol Region Council of Governments (CRCOG) commissioned a second regional benchmarking investigation, this time examining local **vehicle maintenance operations**. Much like its predecessor, this exercise was created with several complementary goals in mind: to give town officials a framework for evaluating competing approaches to the provision of "bread and butter" municipal services; to encourage analyses by department heads to challenge their own "status quos"; and to spur inter-town dialogue and perhaps more ambitiously, create a regional forum for the open exchange of related information and expertise.

The results of this study published here: (1) broadly characterize the region's "typical" vehicle maintenance operation; (2) quantifies the resources allocated by each community in support of related services (e.g. staffing, rolling stock, parts inventories, budgeted dollars, etc.); (3) identifies the policies and procedures that govern day-to-day operations and resulting efficiency levels (e.g. replacement and preventative maintenance schedules, standardization programs, professional certification incentives, etc.); (4) highlights options that may warrant further investigation as possible cost-saving and efficiency-enhancing measures; (5) delineates the limitations of the study and offers questions that could spur future performance measurement analyses; and (6) prescribes a series of "next steps" that may help to identify best practices and facilitate the adoption of more regionalized solutions.

Methodology

All forty-one members of CRCOG's Purchasing Council were invited to participate in the agency's vehicle maintenance operations exercise in the summer of 2002. In total, some twenty-two communities submitted responses to the questionnaire (See Appendix A), reflecting their scope of operations for the fiscal year ending June 30, 2002 (the last completed accounting cycle at the time the study was initiated).

Respondents were asked to: specify the staffing, parts, equipment and financial resources that support their vehicle maintenance activities; generate a detailed inventory of their community's entire rolling-stock, including all registered and unregistered vehicles and equipment; and provide basic information about the scope of their operations as well as

the various financial and technology-based systems that ultimately direct their decision-making processes.

Participating communities were later invited to a benchmarking forum to review the data collected and to help CRCOG staff clarify outlying responses in order to ensure "apples-to-apples" comparisons across communities. Preliminary trends were also presented and those in attendance were called upon to provide ideas for related topics that should be addressed in the final report in an effort to make the study more comprehensive in scope. Based on the feedback received, a set of clarification questions was sent out to all participants (See Appendix B) and any updates submitted have been indicated.

Finally, interviews, site visits and literature searches were conducted to help round out the information generated by the survey.

Study Limitations and Additional Considerations

The exercise described above was crafted as a necessary first step towards facilitating meaningful inter-town comparisons and discussions on the topic of fleet maintenance. Unlike snow and ice control—a direct service provided to the public under its watchful eye—vehicle maintenance's "internal service center" status keeps it below the public's radar screen, often leaving it vulnerable to budget-cutting (given its considerable size) and a lower priority on the strategic planning and professional development fronts. Accordingly, while it is hoped that this study will help to raise the profile of an important public works function, it should be realized that the results of the project represent but one layer of possible analysis.

For example, while a great deal of input data was collected, true performance indicators/measures designed to assess the effectiveness of each town's operations (in terms of vehicle availability, breakdown and repeat repair rates, the breadth of PM programs, as well as general shop efficiencies), fell outside the scope of this investigation. An entirely separate project would be needed to address such issues.

Lastly, given the nearly two-year span between the time this project was initiated and the production of this final report, it is possible that some of the information presented is now somewhat outdated.

-STUDY RESULTS SUMMARY-

Broadly, the results of the survey reveal a wide range of resources, responsibilities, policies and procedures that collectively shape individual municipal vehicle maintenance operations across our region. While a comprehensive matrix is provided at the back of this report (Appendix C) detailing the specifics of each participant's survey response, select information has been highlighted below to establish the landscape of current practices and to potentially flesh out opportunities for future efficiency enhancements.

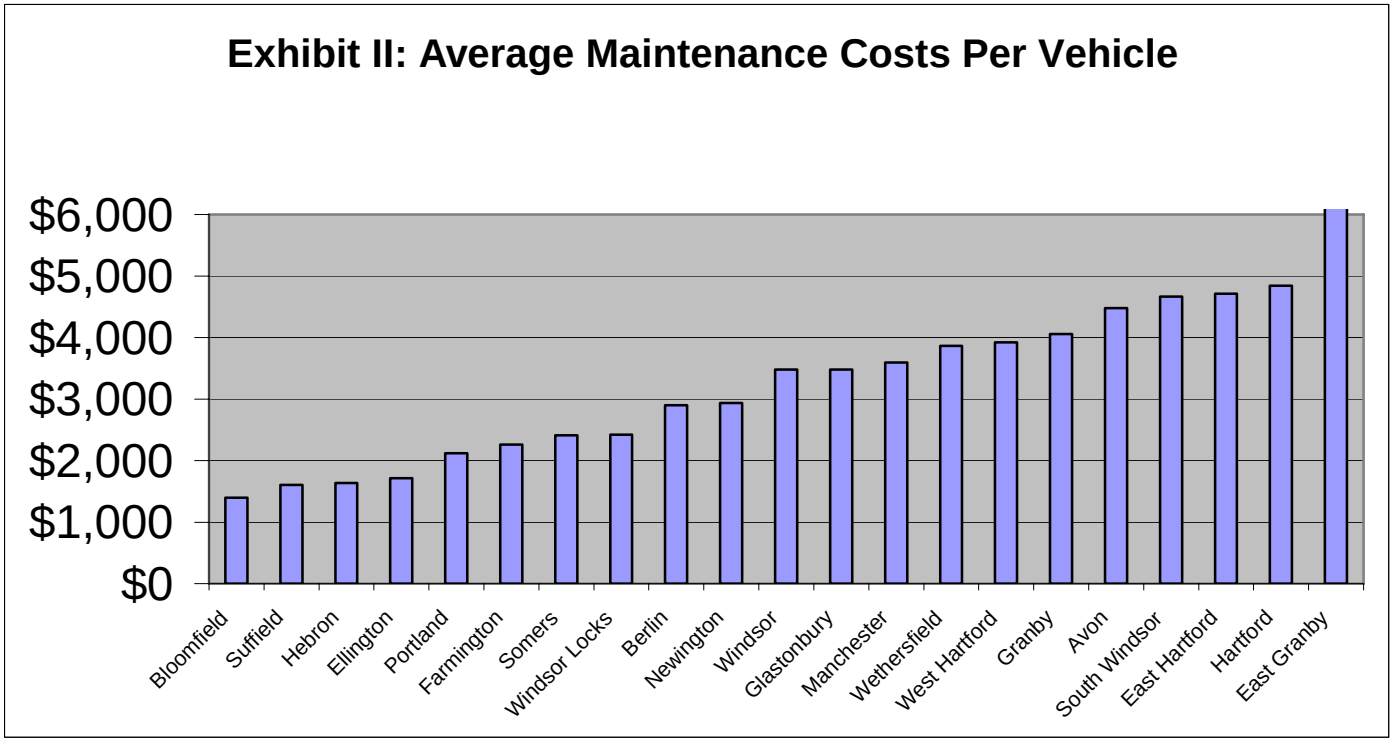
Note too that to initiate comparisons across "like" communities, the participants have been divided into three separate clusters based on the number of on- and off-road vehicles maintained by the municipality. Cluster #1 includes communities with less than 50 vehicles, Cluster #2 represents communities with between 50 and 200 vehicles and Cluster #3 includes those towns responsible for more than 200 vehicles. Exhibit I below provides a snapshot of how the towns measure up, based on the most basic data elements considered in the study, namely fleet size, staff size and related workload ratios, annual budgeted dollars, average vehicle maintenance costs and the value of parts inventories.[1]

[1] Annual budget figures include: salaries, fringe benefits, contractual services, parts/supplies/materials, school bus maintenance and capital outlays of less than $10,000. The figures do not include: replacement vehicles, capital improvements, school bus purchases, fuel or utilities. The number of on- and off- road vehicles includes: automobiles, light trucks, heavy trucks, utility vehicles (e.g. vans), specialty vehicles (e.g. sky workers), off-the-road construction equipment (e.g. bulldozers), on-the-road construction equipment (e.g. front-end loaders), fire apparatus, passenger vans/buses, motorcycles, etc.). It does not include any components, like sanders or plows or any small pieces of equipment, such as lawn mowers, weedwackers or snow blowers.

EXHIBIT I: CLUSTERED HIGHLIGHTS

City/Town	Total number of on- and off-road vehicles maintained by the municipality	Total number of mechanics and working foremen on staff	Ratio of mechanics and working foreman to vehicles	Annual Vehicle Maint. Budget	Average Maintenance Cost per Vehicle	What is the approximate cost/value of your current parts inventory?
East Granby	14	2	7:1	$275,000	$19,643	$3,000
Windsor Locks	28	3	9:1	$67,850	$2,423	$12,000
Somers	32	1	32:1	$77,075	$2,409	$10,000
Suffield	40	1	40:1	$64,200	$1,605	$3,000
Hebron	45	1	45:1	$73,600	$1,636	$14,000
Ellington	46	2	23:1	$78,900	$1,715	$10,000 - $15,000
Granby	46	2	23:1	$186,512	$4,055	$5,000
Windsor	90	3	30:1	$313,130	$3,479	$40,000 - $50,000
Farmington	93	2	47:1	$210,000	$2,258	$20,000
South Windsor	99	3	33:1	$462,000	$4,667	$74,000
Portland	100	2	50:1	$212,000	$2,120	$5,500
Avon	100	3	33:1	$448,000	$4,480	$15,000
Wethersfield	170	6	28:1	$657,000	$3,865	$115,000
Berlin	178	5	36:1	$515,780	$2,898	$4,500
Newington	190	5	38:1	$557,223	$2,933	$13,000
East Hartford	236	10	24:1	$1,111,728	$4,711	$25,000
Bloomfield	250	5	50:1	$350,000	$1,400	$100,000
West Hartford	330	6	55:1	$1,295,000	$3,924	$130,000
Manchester	341	10	34.1	$1,225,768	$3,595	$100,000
Glastonbury	347	8	43:1	$1,207,462	$3,480	$113,712
Hartford	741	25	30:1	$3,588,800	$4,843	$160,000
		TOTALS:	**710.00**	**$12,977,028**	**$82,137**	**$972,712**
		AVERAGE:	**33.81**	**$617,953.72**	**$3,911.27**	**$46,319.62**

At first blush, it becomes readily apparent that in each of the three clusters, towns with the same or very similar fleet sizes reported significantly different staffing, inventory and general budget resources, as



well as per vehicle maintenance costs. In fact, Exhibit II above graphs in ascending order annual average maintenance costs per vehicle, with towns from all three clusters appearing at the low, midpoint and high ends of the range.

And the differences don't stop there. Here's an overview of the state of vehicle maintenance operations in the region:

- ***Staffing Ratios:*** The ratio of vehicles to mechanics and working foremen varies greatly across communities, from as little as 7:1 to a high of 55:1. The region's average stands at 34:1. This mean figure is fairly consistent with the findings of a study conducted in Washington D.C. in the 1980's which offered the following operating guidelines:
  - 1-50 for autos and light trucks
  - 1-40 for heavy trucks
  - 1-30 for heavy equipment
  - 1-120 for mowers and rollers[2]

[2] Source: David N. Ammons, Municipal Benchmarks, Assessing Local Performance and Establishing Community Standards (Thousand Oaks, CA: SAGE Publications, Inc., 1996), p. 261

Questions naturally arise when comparing communities within the same cluster that appear to have significantly different workloads. A delicate balancing act needs to be maintained to ensure that a mechanic's time is not being spread too thin, which could lead to accidents and premature failures, or too low, which might imply shop inefficiencies and an excess of downtime.

•***Scope of Services****:* In general, most municipal fleet operations perform engine, exhaust and emergency equipment work in-house, and have mechanics on staff with recognized certifications/expertise in support of brake, engine, transmission and electrical repairs/maintenance. Painting and glass replacements are usually farmed out to specialty shops, and might be appropriate targets for new cooperative bids.

•**Software *Management Tools:*** Nearly half of all respondents do not have a PC-based inventory system. Of those who do, no one system appears to dominate the market. Those in use across the region include: Dossier, Quest Maintenance, Computerized Fleet Analysis, VHB Equipment Program, RTA, Fleet Controller, and DSPI Fleet Maintenance.

In addition, the field is evenly split on the repair order-processing front. Half of the participants handle these activities manually, while those with fleet maintenance software packages typically have an integrated work order module.

•***Inventory Control:*** The level of inventory stocked at any one time does not directly correlate back to the size of the town's fleet operation. While a baseline of critical parts are typically stocked for daily use, some departments subscribe to "just in time" replenishment philosophies, often re-ordering when they are down to the last one. Others operate from the standpoint that more is better—and a broad spectrum of parts and supplies are kept on hand at all times to ensure, for example, that middle-of-the-night repairs on snowplows can be made to minimize equipment downtime. In terms of costs, the value of current parts inventories ranged from as little as $3,000 to more than $100,000. This area too might be ripe for cooperative bidding activity.

•***Vehicle Replacement Schedules/Policies:*** Most communities operate <u>without</u> a formal replacement policy. Only Bloomfield, Hartford, Newington, Somers, South Windsor and West Hartford indicated their reliance on a pre-established schedule for various vehicle types. And even within this small sub-group, standards vary markedly. For example, take the ubiquitous Ford Crown Victoria Police Cruiser. Replacements for this vehicle are scheduled anywhere from 18 months to 8 years and/or 60,000 to 90,000 miles.

In terms of adding alternative fuel vehicles to local fleets, the shift from traditional gasoline-powered engines has been slow at best. At the time the survey was first distributed, only four communities had natural gas or hybrid vehicles on site. And only two others reported plans to purchase such vehicles during the next two-year period.

•***Vehicle Financing Strategies:*** Nearly all (19 of 22) of the participating communities finance the purchase of their on- and off-road vehicles, at least in part, through capital improvement budgets. Departmental operating budgets, street division budgets and special equipment funds were also cited as leveragable sources.

Charge back approaches to capture specific using department costs vary greatly across the respondent pool, as some communities charge back for parts, labor and fuel, others only charge back for one or two of these cost categories, and others do not charge back at all.

On a related front, less than a third of the towns dip into specific department funds to replace a vehicle that is involved in a major accident or fire and results in a total loss to the town. Greater reliance on operating department subsidies might encourage employees to be more careful, and therefore lower accident incidence rates. Currently, the bulk of the monies are derived from special vehicle insurance reserve funds.

•***Cooperative Purchasing Options:*** An overwhelming majority of respondents participate in cooperative bidding efforts for the purchase of vehicles; fewer rely on co-ops to stock parts. State and CRPC bids were cited most often, though other local and out-of state options may warrant more widespread consideration (e.g. inter-town piggybacking arrangements, the Greater Boston Police Council, Plymouth County Commissioners, U.S. General Services Administration (GSA), U.S. Communities Government Purchasing Alliance, etc.).

•***Insurance:*** Most communities pay between $500 and $1,000 as their insurance deductible per vehicle, regardless of the insurer of choice.

•***Professional Development:*** Both National Institute for Automotive Service Excellence (ASE) and Emergency Vehicle Technician certifications are generally <u>not</u> required nor recognized with monetary bonuses. Only East Hartford, Farmington and Somers require ASE certification; Bloomfield, Portland and South Windsor incent their employees to attain these designations with monetary bonuses ($175 per ASE certification in South Windsor and an additional $.10 per hour for each specialized

training certification earned, up to a maximum of $.30 per hour in Bloomfield, pursuant to the town's union agreement).

Next Steps: Measuring Performance?

As stated in the introductory section, this project purposefully limited its focus to measurable inputs. Yet while such data can be used to fuel follow-up discussions and analyses and to explore alternative approaches employed within the region, it stops short of measuring the operating efficiencies of each fleet division. Instead, textbook performance indicators in this area that look at service outcomes to measure efficiencies could be visited as a next step, as long as the supporting statistics are already/can be readily collected by participants. Consider the following examples in play elsewhere in the public sector:

Vehicle Availability Rates: Tucson, Arizona strives to have 90% of its fleet available at all times, and in Coral Gables, actual availability rates have been measured at 95%.[3] In Charlotte, North Carolina, the City has a goal of completing 77% of its scheduled and unscheduled maintenance work within one day and 87% within 3 workdays. Both benchmarks have been exceeded, as the City reported actual rates of 85.6% and 93.4% respectively. [4] Knowing the percent of your fleet that is deadlined for repair at any one time is an obvious first step here.

Repeat Repair Rates: This indicator measures the extent to which repairs are done correctly the first time. A possible target of having less than 3% of all vehicles returned for rework could be established and monitored.

General Shop Efficiencies: This catchall category might include: testing the effectiveness of mechanics (are jobs performed within engineered time standards? is it taking a mechanic too long to do a routine oil change?); assessing internal controls to monitor outsourced work (are invoiced charges correct? has the warranty been extended appropriately?); and evaluating preventative maintenance practices to ensure that staff is not unnecessarily tied up on engine overhauls, for example, or that vehicles are not experiencing premature failures.

According to a recent Automotive Fleet article that detailed the results of the ninth annual fleet passenger car maintenance study conducted by GE Fleet Services, approximately 68% of all maintenance costs are driven by preventative maintenance and wear items like tires and brakes.[5]

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[3] Ammons, p. 262
[4] Ibid.
[5] Source: "Fleet Car Maintenance Expenses Were Flat in 2003," Automotive Fleet (March 2004), p.25

Armed with that kind of local data, departments could target their cost control strategies appropriately.

Conclusion

In addition to designing a true performance measurement exercise that deals with one or more of the elements detailed above, future options include:

1) Exploring new regional and sub-regional procurement opportunities for parts (e.g. via a regional store), large pieces of equipment (e.g. rollers) or fuel card systems.
2) Coordinating a web-based communication network for the exchange of information.
3) Hosting periodic user group forums to explore common areas of interest and to brainstorm regional solutions to local problems.
4) Initiating a third benchmarking project focusing on another public works activity entirely.

Input from both the participants of previous studies and the members of CRCOG's Municipal Services Committee, the group that provides work plan direction to the Municipal Services Program, is our next step.