
Case Number 1969.0

City of Somerville: Using Activity-Based Budgeting to Improve Performance in the Somerville Traffic Unit

"Why can't we increase enforcement so we can improve resident satisfaction and actual road safety? Why do we have trucks going through side streets of Union Square – they're probably coming from Cambridge to get to 93 and they're using our residential streets as their highway. It needs to end. How much is it going to cost us to protect our neighborhoods?" - Mayor Joseph Curtatone

Outside the tall windows of Somerville City Hall on a January day in 2007, the snow continued to fall. Snowplows crisscrossed the city, edging down narrow streets while residents flooded the 311 call center with complaints about walks not shoveled and ticketed or towed cars. Police cruisers scrambled to assist tow truck drivers and to respond to accidents. Inside, the Mayor chaired a meeting to discuss detailed operational and finance data of the Traffic Unit of the Somerville Police Department. The agenda of the day's meeting, which was part of the City's "SomerStat" performance management program, focused on improving current practices of the Traffic Unit, with an eye to more significant changes that could get built into the next fiscal year's budget.

Preparation of a budget for fiscal year 2008 (FY08) promised to be bruising. Reports from the Statehouse suggested that state aid would be cut once again this year. Meanwhile, the City's fixed costs continued to rise. In 2008, Somerville earned the least revenue per capita of any city in the Commonwealth larger than 30,000 residents. In its struggle to close an anticipated \$9 million budget gap, however, Somerville had one advantage. Compared to many cities, it had considerable information about cost, operations, and residents' concerns that it could use to weigh the tough decisions.

Soon after Mayor Curtatone's election as Mayor in 2004, he had implemented management systems that had made the mechanics of complex City operations more understandable. In the fall of 2004, he launched the SomerStat program, which he modeled on the successful "CitiStat" program in Baltimore, Maryland. He hired Stephanie Hirsch, a graduate of Harvard Business School, to set up and run the

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program. The SomerStat staff convened monthly meetings with all the City's biggest departments. At the meetings, they studied and discussed data from departmental operations in great depth.

In the SomerStat meeting that January day, the Mayor questioned the Traffic Unit Commander. As he talked, the Mayor pointed at slides from a PowerPoint presentation that held SomerStat data. The more he saw, the more the Mayor grew agitated. One slide showed results from a recent resident survey. Less than half of residents were satisfied with street maintenance, and barely 60 percent were satisfied with traffic enforcement. In Union Square, a bustling, semi-industrial neighborhood targeted for several major commercial and residential development projects, less than half of residents surveyed felt satisfied with traffic control. These results reiterated the opinions expressed in a near-constant flow of complaints at community meetings and in e-mails to the Mayor's Office about traffic volume and traffic control in the city. Residents expressed concern about the volume of cut-through traffic and the behavior of drivers, such as cars speeding and cars not yielding to pedestrians. As City decision-makers knew, resident opinion reflected the underlying, unique problems Somerville faced in handling traffic. Somerville was one of the most densely populated cities in the country, with significant cut-through car and truck traffic. Situated between Boston's northern and western suburbs and its downtown, the number of cut-through drivers on city streets was extraordinary. Approximately 65 percent of cars driving through the city at rush hour were non-resident commuters. At the same time, Somerville residents themselves were more likely than average to commute by walking or biking. Frustrated walkers were thus exposed to the bad behavior of overwhelming numbers of commuters who used narrow residential streets as their off ramps from Highway 93.

Background on Somerville and its Budget Challenges

Somerville, with a population of 77,478, was established as a town in 1842. The town was originally a residential and rural neighborhood of Boston's Charlestown neighborhood. In the late 1800s, some local leaders argued for annexation of Somerville to Boston, since most of Somerville lies within two or three miles of Boston City Hall and most Somerville residents worked in Boston. However, Somerville remained independent. Throughout the 1900s, immigrants and families from Boston moved into newly constructed developments of closely-set triple-decker and Philadelphia style multi-family houses.

Today, Somerville is the most densely populated city in New England and the fifth densest city in the country. Somerville's population is an eclectic mix of second and third generation Italians, Portuguese, and other ethnicities, with significant communities of recent Haitian and Brazilian immigrants. It also has a large artist community and a large population of students who attend Tufts, Harvard, MIT, and other local colleges. These groups are attracted to Somerville's relatively affordable housing.

Somerville shares a long border with Cambridge and is generally known as its more crowded, more working class, and, according to some, more lively neighbor. While the budget for Cambridge in FY07 was \$395.5 million for a population of 101,358, the budget for Somerville was \$153 million for its population of 77,478. While Cambridge earned 60 percent of its tax revenue from businesses and Boston earned 66 percent, Somerville received only 28 percent of its tax revenues from businesses. With little industry,

Somerville is a city of homes, with activity centering on small squares throughout the city, each with its own reputation, favorite restaurants, and well-known, long-operating small businesses like Gracco's Bowl-Haven in Davis Square or Little Vinny's on Broadway.

The City's weak commercial tax base meant Somerville could spend little per capita as compared to its peer cities. However, year after year of state aid cuts and falling local receipts had pummeled municipalities throughout the Commonwealth and pushed the already handicapped Somerville even further into the red. Between 2001 and 2007, Somerville's direct state aid allocation declined by 11 percent. State aid represented 41 percent of the City's revenue base in FY01, but only 30 percent in FY07. As a result, the City has had to rely more heavily on raising local revenues. Like all cities in the Commonwealth of Massachusetts, though, the City can only tax property according to the constraints established by "Proposition 2 ½", which restricts property tax increases to 2.5 percent of assessed property value. In addition to property tax receipts, the City relied on revenue from fees, fines, licenses, and permits.

The City's number one priority for sustainable revenue growth in coming years was to increase the commercial tax base. However, this strategy was not likely to produce revenue in the short-term. Even as revenue growth was limited, fixed costs and employee benefits continued to rise. In FY07, the City faced rising health insurance costs, pension contributions, bargained salary increases, and costs for rubbish disposal and snow removal. Another budget buster was the City's health plan for its employees, which was amongst the most generous in the Commonwealth. School spending was also increasing, and the Mayor wanted to invest in the city's school system.

The combination of limited revenue growth and increased costs created an environment in which Somerville had no choice but to scrutinize every penny in its budget. In this respect Somerville faced similar problems to middle-sized cities throughout the world: how to deliver basic services, (such as picking up trash, street lighting, roads, schools, police, fire, and utilities) on a very restricted budget. The City could not do everything, so it needed to prioritize its budget and pay attention to what it could achieve for each dollar spent.

Mayor Curtatone's Management Initiatives

Joseph Curtatone grew up on the City's historic Prospect Hill, a few blocks from City Hall, in a large Italian-American family. Prior to his election, the 37-year-old Curtatone coached high school football in his free time outside of his legal practice, and he brought a restless, competitive energy to each task of City administration.

Before his election as Mayor, Curtatone had served on the Board of Aldermen for eight years. As a member of the Board - whose chief authority was to approve the City's annual budget - the lack of information available to make budgetary decisions frustrated Curtatone. He asked: "How do we know where to cut? How do we increase our efficiency to continue to provide needed service with less funding? How can we generate revenue?"

Like most cities and municipalities, the City published a line-item fiscal year budget that listed all spending under such categories as salaries, overtime, and maintenance of equipment, but offered little information on what those bundled categories bought in terms of City service delivery. (See *Exhibit 1: Example of Line Item Budget, Department of Public Works*.) The deteriorating financial state of the City motivated Curtatone to look for ways to improve the amount and quality of management information available to City decision-makers.

As an Alderman, I found it very frustrating that you can't manage what you don't measure. That's not my statement, that's common sense in the budgeting world or the management world and it's a private sector tenet. As a member of the Board of Aldermen, your number one role is you're the watchdog of the City Treasurer.... If you want to give an analogy, you compare the city of Somerville to a corporation where the Mayor's the CEO, the Board of Aldermen is the board of directors, the stockholders and shareholders and customers are the people living here who depend on the services. So we're that check and balance. We've got to hold the CEO's feet to the fire. ...We received a budget, but there were no outputs and we had no clear performance goals and objectives in what we're trying to achieve and how the spending of certain money is justified against these goals and objectives.

After winning the election and while still mayor-elect, Curtatone had attended a training session for new mayors sponsored by the Institute of Politics at the Kennedy School of Government at Harvard University. Harvard Professor Linda Bilmes gave a presentation on a financial management technique called “activity-based costing (ABC)” that had been used to improve services while holding costs flat in Indianapolis. The Mayor believed that the “ABC” approach would complement the City’s SomerStat approach by providing decision-makers with an understanding of what different activities within departments cost the City. (See *Table 1 for a graphical overview of departments, programs and activities*.)

Budget Reform and the Introduction of Performance Budgeting

Somerville did not have the money to hire a large consulting firm that could develop and implement an ABC budget model. Looking for a solution to this problem, Mayor Curtatone asked Professor Bilmes whether some of the students from her “Introduction to Budgeting and Financial Management” class would be willing to volunteer their time to assist Somerville in developing an ABC budget. “This kind of project had never been done before,” said Bilmes, “so I was apprehensive about whether we could do it. I worried about the logistics of moving students, and the content of the work. But I was so impressed with the Mayor and his talented staff that I decided to give it a try.”¹

¹ An initial pilot had been completed in the spring and summer of 2004 with Mark Abrahams (consultant), John McGinn (then Finance Director) and Dan Newberger (Rappaport Fellow).

Curtatone visited Bilmes' class and asked the students for their help. Professor Bilmes expected that five or six students would take on the challenge. However, students reacted enthusiastically and 63 of the 97 students in her class chose to participate in the Somerville budget project. Throughout the fall of 2004, the students and SomerStat staff fanned out across all eighteen departments in the City. They met with each department to identify all of the department's functional areas—known as “programs” in the terminology of ABC budgeting—and they inventoried the “activities” that composed each program. In addition, they worked with officials in each department to develop preliminary outputs for each program and activity, and outcomes for each program. City officials participated in all aspects of the project, including providing feedback to Professor Bilmes for the students' term grades. (*See Exhibit 2: Example of Activities and Outputs of the Department of Public Works.*)

In the project's initial phase, the City was able, with the assistance of the student volunteers, to complete draft activity summaries for all eighteen of its municipal departments. In the spring of that year, a smaller team of students continued to work with the City on the process of tying performance objectives and costs to each program. By the time that the Board of Alderman had reviewed and approved the new FY2006 budget, the new format had already begun to improve the understanding of officials and residents alike about how tax dollars were being spent and how well City departments were doing in meeting their core responsibilities and in achieving their strategic objectives. Getting cost and performance data at the program level, however, whet decision-makers' appetites for even more detailed cost analysis. Subsequent students worked with the City's SomerStat unit to provide detailed cost analyses of specific operations within departments.

Preparing the Initial “Program-Based Budget”

The Mayor hoped to develop a complete activity-based costing budget, in which expenditures would be tracked to all of the specific activities carried out by each of the City's departments. However, given the amount of work that would be required to get to that level of detail, the Mayor decided that a good intermediate step would be to create a modified activity-based budget, called a “Program-Based Budget.” In this budget, spending would be tracked to the programs, or major functional areas, within each department, but not down to the individual activities within each program. Then the Mayor hoped to drill down to the activity level in areas of particular interest.

The purpose of the new “Program-Based Budget” was to help the City more precisely understand where money was being spent within each department. So, for example, instead of having a budget that simply listed the salaries and expenses for City libraries, the “Program-Based Budget” would allocate those expenditures into programs, such as the “Adult Literacy Program” and “Children's Program.” As a first step in making this transition, each department needed to identify the major programs in which it carried out its work. Then each department needed to allocate its expenditures to the different programs. For some kinds of direct expenditures (like the salary of the Director of the Adult Literacy Program), it was straightforward to allocate to the program. But for many types of indirect expenditures (like rent, custodial services,

administrative staff, IT), it was much more complicated to determine how much of the department's expenditures should be attributed to each program. The students assisted the Somerville Finance Department and SomerStat staff in completing the following steps:

Step 1: Inventorying Programs and Activities: For each department, student volunteers and/or Somerville staff members met with department heads and developed a list of the two to ten major programs of the department. Under each of these programs, the team inventoried major activities. For both programs and activities, the teams developed an "output" measure, which was a summary measure of the level of activity.

Step 2: Allocating Costs to Programs: The Finance Department generated lists of the personnel expenditures budgeted during the fiscal year to each department, as well as lists of "Ordinary Maintenance" costs, which were the non-personnel expenditures budgeted. The teams worked with the departments to allocate all of the budgeted staff time and Ordinary Maintenance resources. They were allocated to either a) one of the departments' program areas or b) a general "Administration" program, to which teams allocated some clerical and other overhead costs.

Step 3: Establishing Program Outcomes: One of the main benefits of identifying specific programs, activities and expenditures was that SomerStat staff could then set performance measures and goals for each department more effectively. For example, the Adult Literacy Program could set a target of helping ten percent of its adult students pass one of their GED subject tests. The teams worked with each department to develop one or two summary measures of the success of a program's activities—known as "outcome" measures. For departments that chiefly served the public, the teams reviewed results from a resident survey, which the City planned to administer every two years.

With all of these components in place, the teams and the SomerStat staff assembled the complete Program-Based Budget, with reports for each department that captured the information that the teams had developed over the course of the year. (See Exhibit 3: Example of Program Budget for Department of Public Works.)

ABC Budgeting in Action: The Traffic Unit

Having the new information increased the Mayor's and other decision-makers' desire to have even more detailed cost information to make decisions, particularly as worsening financial constraints made budgeting cycles very painful. Subsequent teams of City staff and students drilled down into operational and cost data within departments, programs and activities to answer questions posed by the Mayor and the Board of Aldermen.

In the winter of 2006-2007, the Mayor asked a Kennedy School team and SomerStat to focus their analysis on the Somerville Police Department's Traffic Unit, which had been assigned to deal with two distinct sources of resident frustration with local traffic patterns. These sources of rising neighborhood anger were : (a) increased passenger traffic from non-resident commuters driving through Somerville on

their way to somewhere else (“cut-through” traffic); and (b) commercial traffic such as trucks that were driving, often at unsafe speeds, through the city’s notoriously narrow streets. The challenge for the City was to determine how to improve the situation in the most cost-effective way possible.

The Mayor wanted to know whether it would be possible for the Traffic Unit to expand traffic enforcement *and* cover much of the cost of that expansion with increased revenue from citations. Some staff had suggested that the Traffic Unit could change its operations in ways that would improve enforcement and increase revenue. Motivated both by the urgency of resident complaints and the potential for expanding enforcement without significant added cost, the Mayor believed that the Kennedy School team could help the City develop a more precise estimate of the costs and implications of expanding enforcement. He expressed his hope that any expansion of Traffic Enforcement would “pay for itself” via increased citation revenue.

The Mayor asked HKS students to assist the City in preparing this analysis. To begin, the students interviewed the Traffic Unit’s commander, Lieutenant Paul Allen. Lieutenant Allen was an analytically-minded, thirty-year veteran of the force, who grew up in Somerville and had gone on to work in almost all divisions of the Somerville Police Department (“SPD”), finally finding himself best suited for the Traffic Unit. Lieutenant Allen shared the Mayor’s concerns about traffic volume and violations. He had long wanted to move the Traffic Unit to “smart enforcements,” which entailed targeting enforcement in problem areas. By working with the Crime Analysis Unit at the SPD, he had identified the most dangerous locations and the particular traffic violations that linked to accidents in each location. (*See Exhibit 4: Accident Locations.*) When piloted, Lieutenant Allen’s enforcement strategy achieved great success. After targeted enforcement, the number of accidents in Somerville decreased by 21% (from 935 to 736 accidents) between 2005 and 2006. Unfortunately, further expansion of the effort appeared to be limited due to lack of funding for enforcement officers.

Carrying out an In-Depth Cost Analysis

In order to answer the Mayor's questions on the Traffic Unit, the students needed to drill down from the Program-Based Budget into the specific traffic activities. Thus, they undertook the same three steps as had been done by the citywide team, but at a further level of detail:

Step 1: Inventorying Activities within the Traffic Unit Program: The students met with Lieutenant Allen and identified six distinct activities of the Traffic Unit:

1. Investigate Accidents
2. Manage Tow Companies
3. Traffic Enforcement (including ticket issuance and court prosecution of tickets)
4. Staff/Supervise Crossing Guard Posts
5. Process Data
6. Organize Special Events

Step 2: Allocating Costs: The students next needed to calculate the costs of these activities by determining how staff spent their time and departmental resources to carry out each of their activities. These costs included the labor costs of the police officers for each activity, as well as the costs of overhead, such as administrative costs and vehicle usage.

Lieutenant Allen outlined the Traffic Unit's structure (*See Exhibit 5: Duties of Traffic Unit Staff*), which allowed the students to allocate staff time to different activities based on a standard 40-hour workweek. However, Lieutenant Allen cautioned that though each officer had a general area of focus, there was some variability in day-to-day schedules. For example, if a major or fatal accident occurred, the investigation could require days of work.

Step 3: Establishing Activity Outcomes: The Mayor was most interested in enhancing traffic enforcement. Thus, the team focused additional effort on developing the cost, revenue, outputs, and outcomes for "Activity #3: Traffic Enforcement" and on understanding the costs and revenue associated with different types of traffic enforcement.

The students secured data from the State Registry of Motor Vehicles and from the Massachusetts Highway Department on traffic citation activity. This data showed revenue generated by ticket issuance. Using the information on how to allocate expenses together with the revenue data, the team created an overview of the activities within the Traffic Unit Program as shown in Exhibit 6.

Assignment Questions

The Mayor has charged you with determining how much it would cost to expand traffic enforcement *net* of any new revenue generated. In other words: if the City spends more money on traffic enforcement, how much of the cost of doing this is likely to be offset by revenues from additional citations that would be issued? In any government where resources are scarce, this is a critical budget trade-off.

Allocation of Costs to Traffic Enforcement and the Calculation of Net Cost

Begin by addressing the first issue: the *cost* of traffic enforcement. For an activity-based costing budget, you must determine the costs specifically allocable to “Activity #3: Traffic Enforcement.” In order to do so, you must consider *all six activities* that make up the Traffic Unit program, so as to determine what amount of the total program cost is attributable specifically to Traffic Enforcement. You must also consider *both* types of expenditures that are applicable to the activity, which in this instance are: (a) Personnel Expenditures, and (b) Non-Personnel (aka Ordinary Maintenance) Expenditures.

Trying to Answer the Question without ABC. Before using the ABC methodology, Lieutenant Allen attempted to assess the Traffic Enforcement activity using only the information available in his standard line-item budget (see *Exhibit 7 for a simplified version of the line-item budget for the Traffic Unit*). He noted that Officers Donovan, Fabrini, Halloran, Johnson and Kyle issued most of the citations in the City, so he added up their salaries, for a total of \$302,291. Lieutenant Allen realized that Sergeant Brown also issued citations, but because Sergeant Brown holds a superior rank, Lieutenant Allen did not include Sergeant Brown in his analysis. He also noted that one of the lines in the budget was for new, handheld computer equipment to print out citations. He added this cost of \$500 to the cost of the salaries. He did not add any costs for the vehicles used by the officers, since new vehicles were not budgeted for the upcoming fiscal year. He was surprised and concerned to see that his total cost of \$302,791 was well above last year’s citation revenue of \$150,000. He concluded that the Traffic Enforcement activity is operating at a significant deficit and must be reformed right away.

Question 1: What are the problems with Lieutenant Allen’s analysis using only a line-item budget? How can activity-based costing improve the accuracy of his analysis? Prepare for class discussion

Questions 1 (a) to 1(d) should be answered on the template provided.

Question 1(a): Allocation of Personnel Expenditures (Answer on Template)

Lieutenant Allen wants to try using ABC analysis to help answer this question more accurately. To do this, his first step is to figure out how much it costs to perform the traffic function now. **Exhibit 5** summarizes the results of interviews with each member of the Traffic Unit staff. It shows how staff members allocate their time among the different activities that make up the Traffic Unit program. **In the exhibit, the directly attributable time spent on Activity #3: Traffic Enforcement is highlighted in bold. Use this information to complete Part (a) of Template 1.** Assume that staff members work a 40-hour

workweek. For example, if a staff member spends 10 hours per week on the activity, then the allocation of time would be 25% (10 divided by 40). The budgeted salaries are drawn from the simplified line-item budget in Exhibit 7.

Question 1 (b): Allocation of Non-Personnel (Ordinary Maintenance) Expenditures (Answer on Template)

After allocating the staff's time and determining the Personnel Expenditures that are applicable to each activity, you now must allocate the Non-Personnel expenditures. These expenditures come from the line-item budget category called "Ordinary Maintenance", as shown in the simplified line-item budget in Exhibit 7. Based on the staff member interviews and operational performance, you have already allocated most of the Ordinary Maintenance Expenditures as shown in Part (b) of Template 1.

Selecting and Using a Cost Driver

The remaining Ordinary Maintenance Expenditures to be allocated are "Repairs – Vehicles" and "Motor Gas and Oil," and you have decided to use a "Cost Driver" methodology to allocate these expenditures. A cost driver is a unit of measure that is directly related to and directly influences a given expenditure. For example, the City must plow the roads on snowy days. The more it snows, the more the City must plow, and the higher the cost of the "plowing" activity. Therefore, a good cost driver might be "number of days requiring snowplowing" or "number of inches of snow."

Since "Repairs – Vehicles" and "Motor Gas and Oil" both directly involve vehicles, Lieutenant Allen believes that a cost driver that relates to vehicle usage would be appropriate. He is considering three alternative cost drivers, but he is unsure which to use, so he asks you for guidance. (He will use the same cost driver for both types of expenditures.) **Review the cost drivers below and recommend one for use in the allocation of "Repairs – Vehicles" and "Motor Gas and Oil." What are the pros and cons of each cost driver?**

- Miles driven per week
- Hours spent driving per week
- Hours spent with vehicle per week

After considering each driver, you decide to use *miles driven per week*. You have collected mileage sheets, linked them to staff and activities, and developed the following totals for each of the activities within the Traffic Unit program.

Using the data in the table below, complete Part (b) of Template 1

Activity	Miles Driven per Week	% of Total
Investigate Accidents	35	9.4%
Manage Tow Companies	2	0.5%
Traffic Enforcement	242	64.7%
Supervise Crossing Guards	30	8.0%
Data Analysis/Data Processing	-	0.0%
Respond to Special Projects and Emergencies	65	17.4%
Total	374	100.0%

Question 1(c): Calculation of the Total Cost of Activity #3: Traffic Enforcement

Now that Personnel Expenditures and Ordinary Maintenance Expenditures have been fully allocated, calculate the total cost of the Traffic Enforcement activity. **Using your results from Question 1(a) and Question 1(b),**

Question 1(d): Calculation of the Net Cost of Traffic Enforcement

You must now calculate the *revenue* that is generated from Traffic Enforcement from citations issued. You can then calculate *net cost* of the Traffic Enforcement activity (that is, the total cost of the activity less the citation revenue generated).

To analyze citation revenue generated, you are given detailed information on citations issued for a sample month of April 2007, (which represented one sample month in citation issuance). *For the full data, see Data Table 1: Citations Data (located in the accompanying Excel spreadsheet) and Exhibit 8.* The chart below presents information summarized from the raw data in Data Table 1. In the chart, "Average Revenue per Citation" is calculated as "Citation Revenue" divided by the "Number of Citations." (For simplicity, the sample data for the month of April 2007 have been annualized by multiplying all amounts by 12.) Note that "Citation Revenue" in the chart below includes only those citations that were payable (not warnings) and that were upheld in court (not dismissed). This treatment varies from the data in Exhibit 8, where "Citation Revenue" includes the total *assessed* value, even if a citation was a warning or was subsequently dismissed in court.

Using the data from the chart below and the information from the previous questions, calculate the current net cost of the Traffic Enforcement activity by completing Part(d) of Template 1. Does Traffic Enforcement currently generate a net surplus or deficit for the City?

Annualized Citations by Issuing Officer*

Officer Name	Number of Citations	Citation Revenue	Avg. Revenue per Citation
ALLEN	348	\$23,340	\$67.07
BROWN	564	\$14,520	\$25.74
DONOVAN	636	\$39,300	\$61.79
FABRINI	600	\$37,500	\$62.50
HALLORAN	540	\$24,420	\$45.22
JOHNSON	360	\$11,580	\$32.17
KYLE	372	\$4,680	\$12.58
TOTAL	3,420	\$155,340	\$45.42

*Note: In this table, 'Number of Citations' is the number of citations given by each officer in April multiplied by 12 to get an annualized number of citations. This includes all citations given by each officer in April, regardless of whether the citation was a warning or was later dismissed in court. 'Citation Revenue' in this table includes only revenue *actually received* by the city for April citations, so it does not include citations that were later dismissed in court.

2. Analysis of Expanding Traffic Enforcement

You now have all the background information and tools to respond to the Mayor's key question: how much would it cost to *expand* the Traffic Enforcement activity, *net* of any new revenue generated? The Mayor hopes that any expansion of Traffic Enforcement will "pay for itself" via increased citation revenue.

Questions 2(a) – (d): Analyze an Expansion Proposal

After further discussions with Lieutenant Allen and his staff, you have assembled the following details about a proposed expansion of Traffic Enforcement:

- Officer Halloran will increase his dedication to Traffic Enforcement from 10 hours per week to 30 hours per week. All other Personnel Expenditures will remain the same.
- Officer Halloran's new schedule will cause the "miles driven per week" cost driver to increase from 64.7% to 70%. All other Ordinary Maintenance Expenditures will remain the same.
- Officer Halloran will focus on issuing citations related to residents' two distinct concerns – 1) non-resident "cut-throughs" and 2) commercial truck speeding.
- By spending more time on Traffic Enforcement, Officer Halloran estimates that he will be able to increase the number of citations he issues from 45 per month to 75 per month.

- His “average revenue per citation” issued is expected to remain the same (\$45.22 / citation).

Using the information outlined above, complete Parts (a) through (d) of Template 2. (Note that only the cells highlighted in yellow need to be updated for this analysis.)

Question 2(e): Assess the Incremental Net Cost of the Proposed Expansion of Traffic Enforcement

Finally, you can use the information regarding the current Traffic Enforcement activity and the proposed expansion to assess the incremental net cost of the proposed expansion. **Complete Part (e) of Template 2 to calculate the incremental net cost.**

3. Recommendation

You are now asked to make a recommendation to the Mayor and the Board of Aldermen.

Question: Do you recommend that the City undertake the proposed Traffic Enforcement expansion plan? Why or why not?

In making your recommendation, consider the follow factors:

- Is the expansion expected to increase or reduce the net cost of Traffic Enforcement?
- Does the expansion meet the Mayor’s goal of “paying for itself”?
- What are the consequences of Officer Halloran increasing his time dedicated to Traffic Enforcement, with respect to all his other activities? Are these consequences accounted for in this analysis?
- What are the pros and cons of focusing the expansion on non-resident and commercial traffic violators instead of resident traffic violators? Consider both political ramifications and financial implications (drawing from the information found in Data Table #1: Citations Data).
- To what extent does the estimate of future citation revenues depend on factors that are difficult to predict, such as the behavior of individual officers, the difference between commercial and residential driving, and the willingness of officers to issue more payable citations (vs. “warnings”)?
- How accurate is our data; for example, do we expect the citations to vary more depending on the month and season? Is it correct to annualize monthly data? What concerns do you have about this method of analysis?
- How do citation patterns in Somerville compare to other nearby cities? (See Exhibit 9: Citations Issued by MA Cities.)

Table 1

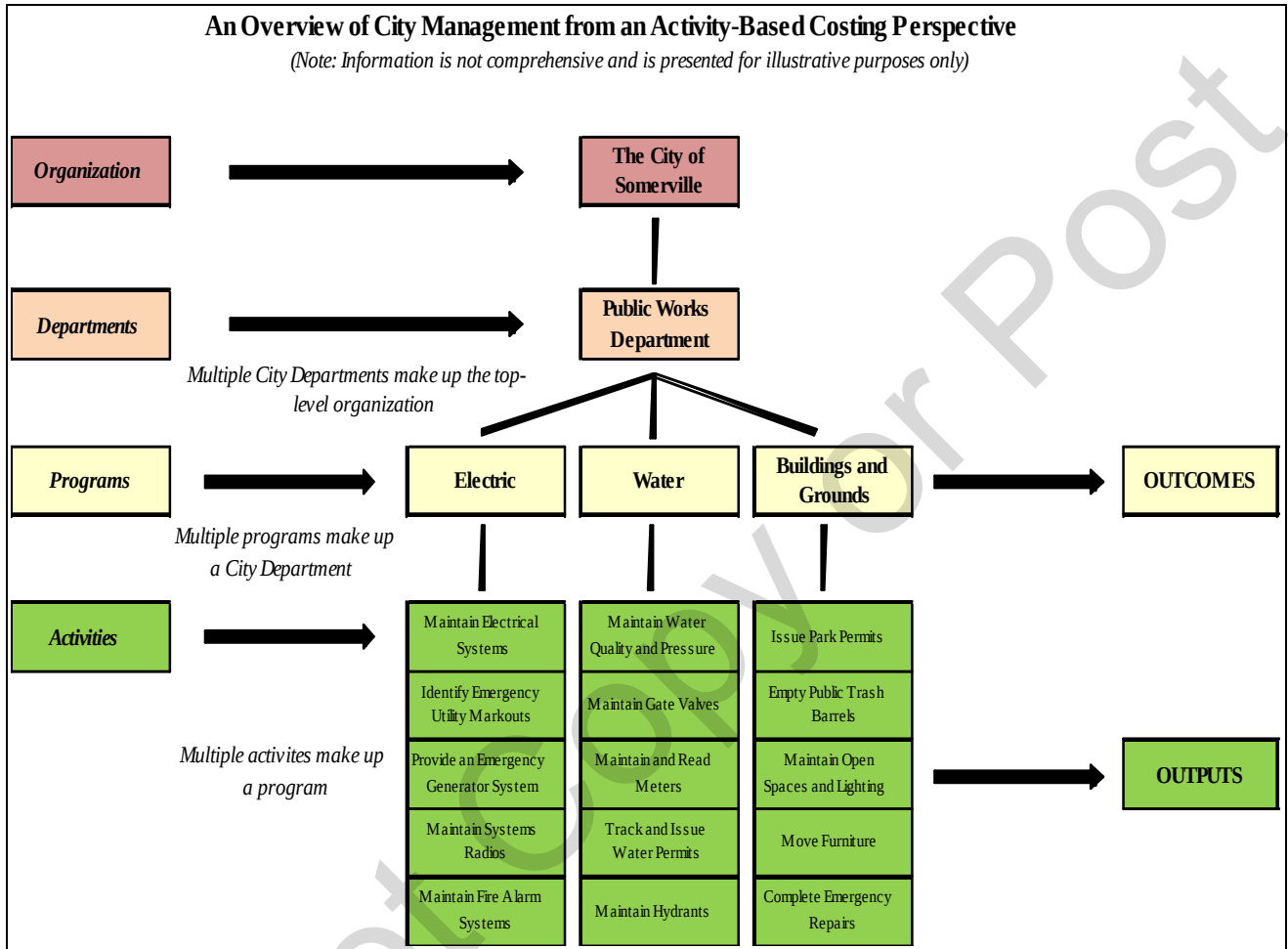


Exhibit 1

Example of Line Item Budget, Department of Public Works

DPW HIGHWAY
Org. 8005

Position	Name	Existing Rate	Base	TOTAL
HIGHWAY SUPT.	BUCKLEY, MICHAEL	1,336	69,760	69,760.08
TOTAL:			69,760	
HIGH'Y YARD FOREMAN	BARRY, THOMAS	1,070.88	4,283.52	61,697.15
	step 3 eff 7/28	1,113.60	53,675.52	
MOTOREQUIPRPMNFOREMAN	BROWNE, MICHAEL	1,039.19	16,211.36	58,788.00
long 3/19/96	step 3 eff 10/19	1,080.65	39,551.79	
WASTE COLL INSP	O'CONNELL, JOHN	1,079.36	56,342.59	60,014.96
WASTE COLL INSP	VACANT	983.00	51,312.60	53,549.96
WKFM1\SHMEO\TREE CLIMBER	WOOD, JAMES	805.19	42,030.92	44,976.88
long 4/27/87				
WKFM1\SHMEO\ CEMENT FINISHER	GORMAN, THOMAS	850.93	44,418.55	47,252.33
long 2/21/91				
WKFM1\SHMEO\PWL	MURPHY, BRIEN K	816.15	42,603.03	45,995.04
long 11/25/81				
WKFM1\SHMEO\PWL	STROSCIO, ANTHONY	782.52	28,327.22	43,629.89
	step 2 eff 3/13	800.93	12,814.88	
WKFM1\SHMEO\PWL	CORBIN, FRANK	782.52	28,327.22	43,629.89
	step 2 eff 3/13	800.93	12,814.88	
WKFM MOTOR EQUIPMENT RPMN	LOPEZ, DANIEL	874.11	45,628.54	48,156.83
MOTOREQUIPRPMN	THORNTON, RICHARD	834.11	43,540.54	45,992.03
MOTOREQUIPRPMN	PANTANELLA, ANTHONY	818.87	42,745.01	44,667.24
SHMEO\TREE CLIMBER\PWL	SALTMAN, LEONARD JR	725.17	30,602.17	39,748.30
	step 2 eff 4/21	737.93	7,379.30	
SHMEO\CEMENTFINISHER\PWL	CHIARAVALLOTTI, GINO	764.97	2,600.90	42,449.61
	step 2 eff 7/25	778.76	38,003.49	
SHMEO\CEMENTFINISHER\PWL	DIFRAIA, JAMES M	793.34	41,412.35	43,885.56
SHMEO\CEMENTFINISHER\PWL	ROCHE, CHARLES	793.34	41,412.35	43,885.56
SHMEO\PWL+10%	GRIFFIS, GEORGE	817.67	42,682.37	45,452.30
SHMEO\PWL+10%	BUNKER, DAVID	786.47	31,773.39	43,621.89
	step 2 eff 4/10	801.64	9,459.35	
SHMEO\PWL	VACANT (SALTMAN)	714.97	37,321.43	39,044.18
SHMEO\PWL	VENEZIA, JEFFREY	714.97	428.98	39,782.22
	step 2 eff 7/6	728.76	37,604.02	
SHMEO\PWL	VACANT (R. BARRY)	714.97	32,459.64	39,140.71
to be filled May 15, 2006	step 2 eff 5/15	728.76	4,955.57	
SHMEO\PWL	HALLORAN, EDWARD	743.34	38,802.35	41,179.56
SHMEO\PWL	HAMEL, JOSEPH	714.97	15,872.33	39,484.35
	step 2 eff 12/5	728.76	21,862.80	
SHMEO\PWL	JEFFRES, PHILLIP	735.52	38,394.14	40,656.34
SHMEO\PWL	BARBIERE, JEFFREY	714.97	16,015.33	39,481.60
	step 2 eff 12/6	728.76	21,717.05	
SHMEO\PWL	NADILE, SCOTT	714.97	16,015.33	39,481.60
	step 2 eff 12/6	728.76	21,717.05	
SHMEO\PWL	FUCILE, JASON	714.97	26,596.88	39,277.50
	step 2 eff 3/20	728.76	10,931.40	
SHMEO\PWL	ROSS, STEVEN	714.97	28,169.82	39,369.20
	step 2 eff 4/4	728.76	9,473.88	
MAINT. MECH.\PWL	PARK, WESLEY	738.66	38,558.05	42,076.28
WATCHMAN	RIDDLE, MARGARET	678.10	35,396.82	37,898.77
			1,262,246.73	1,334,265.73

Exhibit 2

Activities and Outputs for Public Works Program Budget

ORG 8000: DEPARTMENT OF PUBLIC WORKS

Buildings and Grounds		<i># of buildings, parks and open spaces maintained (Actual)</i>	101
<i>Activity:</i>	<i>Proposed Output Measure:</i>	<i>Source</i>	
Issue Park Permits	<i># of permits issued</i>	<i>Actual</i>	230
Supervise and Maintain Vendors under City Contract	<i># of vendor contracts managed</i>	<i>Average annual number</i>	12
Maintain Flag Poles and Banners	<i># of banners & flags maintained</i>	<i>Actual</i>	80
Empty Public Trash Barrels	<i># of barrels picked up</i>	<i>Actual</i>	260
Maintain Open Spaces and Lighting	<i># of open spaces</i>	<i>Close to actual</i>	69
Maintain City Buildings and Yards	<i># of buildings cleaned</i>	<i>Actual</i>	20
Complete Emergency Repairs	<i># of emergency repairs completed</i>	<i>Estimate</i>	1,000
Move Furniture	<i># of moves</i>	<i>Estimate</i>	156
Maintain Small Motor Equipment	<i># of motor repairs completed</i>	<i>Estimate</i>	300
School Custodial Services	<i># of schools cleaned and maintained</i>	<i>Actual</i>	12
Provide Snow Plowing, Sanding and Shoveling Services	<i># of locations plowed, sanded, or shoveled</i>	<i>Actual</i>	85
Electric		<i># of active residential, industrial, and commercial parcels (Estimate based on SPCD data)</i>	13,381
<i>Activity:</i>	<i>Proposed Output Measure:</i>	<i>Source</i>	
Manage Electrical Projects and Review Plans	<i># of electrical projects managed</i>	<i>Avg. 2 per week</i>	104
Maintain Electrical Systems	<i># of electrical repairs completed</i>	<i>Avg 40 per week</i>	2,180
Maintain Fire Alarm Systems	<i># of fire alarms repaired</i>	<i>Estimate based on records</i>	363
Identify Emergency Utility Markouts	<i># of requests by DigSAFE</i>	<i>Avg. 20 per week</i>	1,040
Provide an Emergency Generator System	<i># of incidents</i>	<i>Actual</i>	18
Maintain System Radios	<i># of radios repaired</i>	<i>Estimate</i>	150
Maintain Street Lighting	<i># of street lights repaired</i>	<i>Estimate</i>	1,000
Engineering Division		<i># of street miles overseen (Actual)</i>	90
<i>Activity:</i>	<i>Proposed Output Measure:</i>	<i>Source</i>	
Provide Customer Service Information	<i># of Customer Service Requests Processed</i>	<i>Estimate based on typical day</i>	3,000
Provide Project Design and Management	<i># of designs reviewed</i>	<i>Actual YTD</i>	11
Inspect Street Openings, Sewer Connections and Construction Sites	<i># of Street Opening Field Inspections Completed</i>	<i>Actual YTD</i>	750
Provide Private Utility Invoices and Billings	<i># of Monthly Private Utility Company Invoices Issued</i>	<i>Actual YTD</i>	4

Exhibit 2, continued

Issue Street Opening Permits	# of Street Opening Permits Issued	Actual YTD	1,200
Conduct Research	# of Requests For Survey & Line Processed	Actual YTD	68
Create Engineering and Technical Graphics	# of Drafting/Engineering Graphics Tasks Completed	Actual YTD	25
Highway (including Snow Removal)			# of street miles maintained (Actual)
			90
<u>Activity:</u>	<u>Proposed Output Measure:</u>	<u>Source</u>	
Maintain Trees	# of trees trimmed & stumps removed	Estimate based on records	602
Sweep Streets	Miles of public streets swept	Total public street miles	90
Repair Sidewalks	Yards of concrete used	Estimate based on bills	262
Provide Snow Services	# of tons of salt used	Estimate based on bills	6,253
Repair Potholes	# of potholes repaired	Estimate based on partial records	1,312
Remove Graffiti	# of items removed	Estimate based on service requests	82
Provide Curb Cuts	# of curbs cut	Estimate based on records	12
Provide After Hours/Emergency Service	# of emergencies responded to	Actual based on phone records	494
Provide Preventive Maintenance and Repairs	# of vehicles maintained	Actual	127
Pick-up Dead Animals	# of dead animals picked up	Estimate	152
Provide Reactive Maintenance and Repairs	# of reactive repairs	Estimate	425
Empty Public Trash Barrels	Tons of garbage removed	Estimate	180
Purchase Equipment for fleet	# of new equipment purchases for the fleet	Actual	14
Pick-Up Christmas Trees	# of trees picked up	Estimate	12,000
Sanitation			# of households and commercial units served (Estimate based on SPCD data)
			33,081
<u>Activity:</u>	<u>Proposed Output Measure:</u>	<u>Source</u>	
Separate Waste Items	# of items (or tonnage) separated	Estimate based on bills	1,635
Trash Collection	# of follow-ups responded to	Estimate based on per day average	6,500
Respond to Emergencies	# of emergencies responded to	Estimate	20
Sewer			# of sewer mains cleared (Actual based on records)
			1,766
<u>Activity:</u>	<u>Proposed Output Measure:</u>	<u>Source</u>	
Provide Sewer Customer Service	# of inquiries responded to	Estimate	75
Provide Markouts for DigSafe	# markouts made	Estimate based on records	1,200
Maintain and Repair Manholes	# of manholes repaired	Actual	20
Maintain Sewer Catch Basins	# basins cleaned and repaired	Estimate based on records	1,766

Exhibit 2, continued

Water		<i># of calls and emergencies responded to (Actual)</i>	10,660
<u>Activity:</u>	<u>Proposed Output Measure:</u>	<u>Source</u>	
Maintain Water Quality and Pressure	<i># of calls responded to</i>	<i>Estimate</i>	10,400
Provide Emergency Response	<i># of emergency calls needing immediate response</i>	<i>Actual</i>	260
Maintain Gate Valves	<i># of gate valves repaired</i>	<i>Actual</i>	20
Maintain Hydrants	<i># of hydrants repaired</i>	<i>Actual</i>	200
Maintain and Read Meters	<i># of meters read/replaced</i>	<i>Actual</i>	1,250
Track and Issue Water Permits	<i># of permits issued</i>	<i>Actual</i>	30
Replace and Repair Water Mains	<i># linear feet of water mains replaced</i>	<i>Estimate based on records</i>	10,979
Weights and Measures		<i># of items inspected or tested, **costs include all division administration (Estimate based on records)</i>	1,277
<u>Activity:</u>	<u>Proposed Output Measure:</u>	<u>Source</u>	
Maintain and Repair Equipment	<i># of equipment items maintained</i>	<i>Actual</i>	140
Provide Administration and Reporting	<i># hours per year spent on administrative tasks</i>	<i>Estimate based on daily average</i>	520
Conduct Inspections	<i># of inspections</i>	<i>Estimate based on records</i>	199
Test and Seal Devices	<i># of units inspected/tested</i>	<i>Estimate based on records</i>	1,078

Exhibit 3

Example of Complete Program of Department of Public Works

ORG 8000: DEPARTMENT OF PUBLIC WORKS			
PROGRAM COST AND ACTIVITIES			
PROGRAM: HIGHWAY - CITY STREET MAINTENANCE (INCLUDING SNOW REMOVAL)			
<i>Description: Provide street and sidewalk maintenance services to ensure clean, safe and satisfactory conditions.</i>			
PROGRAM COST CENTER SUMMARY			
	FY05 (Act.):	FY06 (Proj.):	FY07 (Proj.):
<u>Key Output:</u> # of street miles maintained (Actual)	90	90	90
<u>Program Cost</u>	\$1,594,901.90	\$1,691,465.00	\$1,874,225.60
<u>Cost per Output:</u>	\$17,721.13	\$18,794.05	\$20,824.72
<u>FTEs:</u>	26.00	26.50	27.50
<u>Outcome 1:</u> % of residents surveyed expressing an opinion who are satisfied with street cleaning (Resident satisfaction survey)		75%	
<u>Outcome 2:</u> % of residents surveyed expressing an opinion who are satisfied with snow removal (Resident satisfaction survey)		60%	
PROGRAM FY07 GOALS			
1. Reconstruct an additional 25 streets with an overlay and/or reconstruction. 2. Maintain 100 trees planted in FY06 and plant more than 100 new trees that are conducive to city conditions in response to requests from residents. 3. Increase efforts in tree pruning and planting and sidewalk upgrades. 4. Install 100 new decorative benches and barrels throughout the City as part of the Spring Beautification Program. 5. Continue to expand the in house sidewalk replacement program. 6. Continue to stump and remove trees as required in house program. 7. Continue to repair the excavation sites dug by the Water Department in lieu of private contractors. 8. Continue to work with Traffic and Parking Division to extend the street sweeping program schedule one month. All posted signs are in the process of being changed to reflect the new time period.			
PROGRAM ACTIVITIES AND OUTPUTS			
Provide Snow Services	FY05 (Act.):	FY06 (Bdgt.):	FY07 (Proj.):
	6,253	5,000	5,000
<i>Description: Provide plowing, sanding, and removal of snow to ensure safe passage for public safety, pedestrians, and emergency vehicles. Put out sand barrels for public use.</i>			
<i>Output: # of tons of salt used (Estimate based on bills)</i>			
Repair Sidewalks	FY05 (Act.):	FY06 (Bdgt.):	FY07 (Proj.):
	262	1,500	1,500
<i>Description: Respond to resident requests to repair uplifted and damaged sidewalk panels Repair excavations made by the Water department to restore sidewalk/streets to original condition.</i>			
<i>Output: Yards of concrete used (Estimate based on bills)</i>			
Repair Potholes	FY05 (Act.):	FY06 (Bdgt.):	FY07 (Proj.):
	1,312	1,400	1,000
<i>Description: Repair potholes in a timely manner.</i>			
<i>Output: # of potholes repaired (Estimate based on partial records)</i>			
Remove Graffiti	FY05 (Act.):	FY06 (Bdgt.):	FY07 (Proj.):
	82	500	300
<i>Description: Respond to residents, Aldermen and businesses requesting removal of graffiti.</i>			
<i>Output: # of incidences (Estimate based on service requests)</i>			

Exhibit 3, continued

ORG 8000: DEPARTMENT OF PUBLIC WORKS			
PROGRAM COST AND ACTIVITIES			
Sweep Streets	FY05 (Act.):	FY06 (Bdat.):	FY07 (Proj.):
	90	90	90
<i>Description: Provide street sweeping services to remove debris from streets and catch basin openings.</i>			
<i>Output: Miles of public streets swept (Total public street miles)</i>			
Empty Public Trash Barrels	FY05 (Act.):	FY06 (Bdat.):	FY07 (Proj.):
	180	200	200
<i>Description: Maintain the daily schedule for Citywide trash receptacle pickup in squares and along streets.</i>			
<i>Output: Tons of garbage removed (Estimate)</i>			
Provide Curb Cuts	FY05 (Act.):	FY06 (Bdat.):	FY07 (Proj.):
	12	40	25
<i>Description: Remove curbing for residents to allow off-street parking in a timely and professional manner.</i>			
<i>Output: # of curbs cut (Estimate based on records)</i>			
Maintain Trees	FY05 (Act.):	FY06 (Bdat.):	FY07 (Proj.):
	602	750	600
<i>Description: Respond to resident requests for trimming, removal, and general maintenance of public shade trees.</i>			
<i>Output: # of trees trimmed & stumps removed (Estimate based on records)</i>			
Pick-Up Christmas Trees	FY05 (Act.):	FY06 (Bdat.):	FY07 (Proj.):
	12,000	11,000	11,000
<i>Description: Pick-up Christmas trees, as requested by residents, to keep sidewalks and roadways clear and safe.</i>			
<i>Output: # of trees picked up (Estimate)</i>			
Pick-up Dead Animals	FY05 (Act.):	FY06 (Bdat.):	FY07 (Proj.):
	152	150	150
<i>Description: Respond immediately to requests to remove dead animals.</i>			
<i>Output: # of dead animals picked up (Estimate)</i>			

Exhibit 4

Accident Locations

2004 Citywide Pedestrian Accident Hotspots

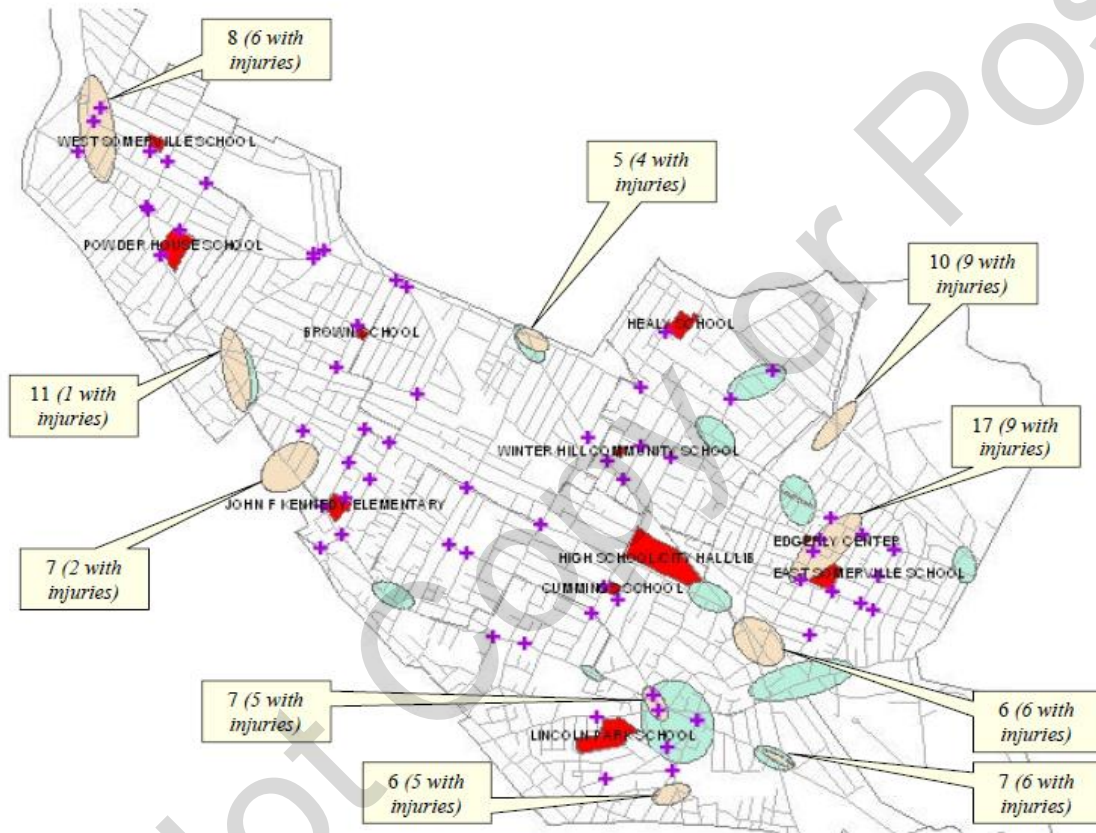


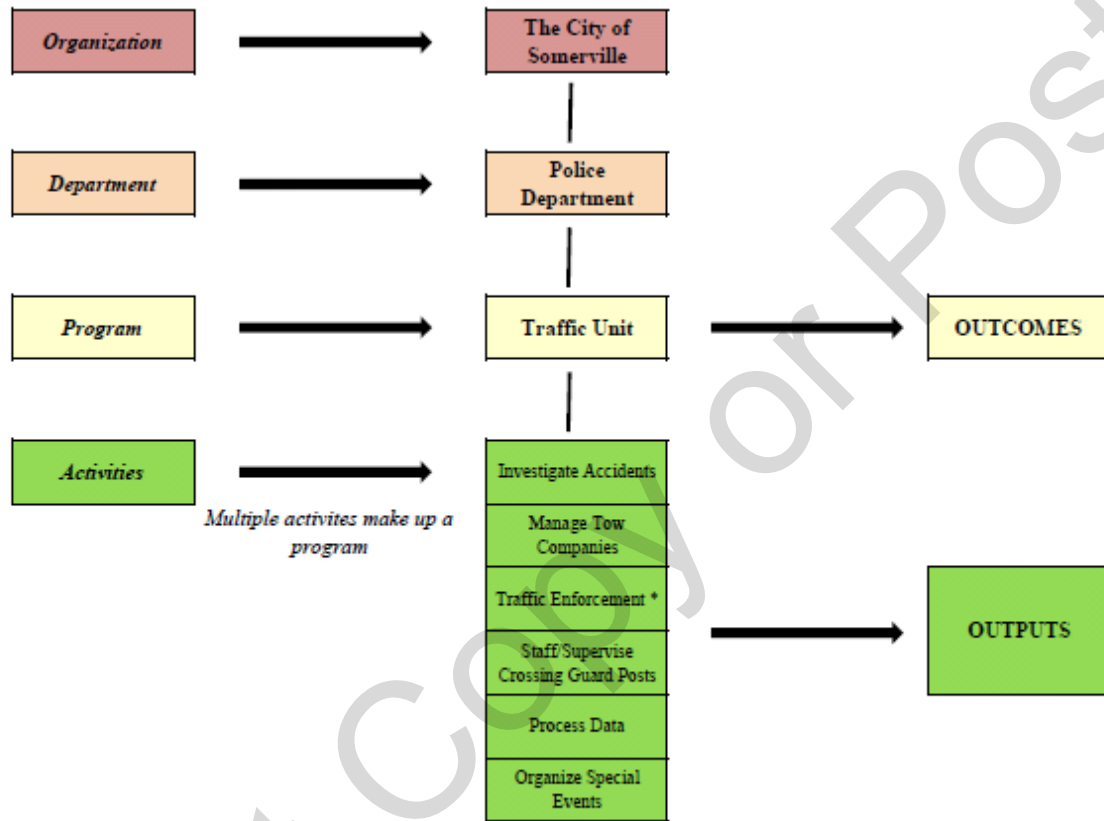
Exhibit 5

Duties of Traffic Unit Staff

Person	Duties
Lieutenant Allen	- In his role as commander of the Traffic Unit, Lieutenant Allen analyzes data, proposes new ordinances, set priorities, represents the Unit politically at a number of venues, oversees the performance of tow companies working for the City or for private companies, and occasionally works in the field on projects that need manpower, such as targeted enforcement campaigns. He reported that he spends 30% of his time supervising traffic enforcement or carrying out enforcement himself, especially of commercial traffic laws. - Lieutenant Allen spends 20 percent of his time overseeing tow companies. - Lieutenant Allen divides the remainder of his time approximately evenly supervising the other activities of the Unit. - In FY2007, Lieutenant Allen attended the prestigious FBI academy for 10 weeks, during which time Sergeant Brown assumed the Lieutenant's supervisory responsibilities.
Sergeant Brown	- In his role as the number two person in the Traffic Unit, Sergeant Brown supervises traffic officers and acts as the main Traffic Unit's representative to court on routine citations. On Mondays through Thursdays, Sergeant Brown spends approximately half of his time working on traffic enforcement and half of his time investigating accidents. Sergeant Brown spends Friday mornings in court to represent the City on any citation that is being appealed. - Sergeant Brown dedicates the rest of the day on Friday to accident investigations.
Officer Callahan	- In her role as the Bureau's clerk, Officer Callahan handles data coming into the Bureau, including data related to accidents, traffic citations, parking tickets, and covert speed monitors. She spends approximately 80 percent of her time on data processing. - Also, Officer Callahan manages all the financial dealings with the tow companies, which takes about 15 percent of her time. - When necessary, she works on special events. However, this work totals no more than two hours per week.
Officers Donovan, Fabrini, Halloran, Johnson, Kyle	These officers participate in targeted traffic enforcement projects, usually for two hours per day. They select locations based on data that indicate the location is accident-prone location or the site of speed violations. - These officers also process data (for example, reporting accidents and writing accident reports), which takes about three hours per day. - For approximately 14 hours every other week, they work on special events, such as escorting dignitaries or managing funerals. - Approximately eight hours per week, they cover the shifts of absent crossing guards.

Exhibit 6

An Overview of the Somerville Police Department's Traffic Unit Program



* Includes ticket issuance and court prosecution of tickets

Exhibit 7

Simplified Line-Item Budget of the Traffic Unit

PERSONNEL EXPENDITURES

<u>Name</u>	<u>Amount</u>
Allen	97,243
Brown	79,682
Callahan	63,832
Donovan	59,576
Fabrini	64,055
Halloran	56,830
Johnson	56,830
Kyle	65,000
TOTAL	543,048

ORDINARY MAINTENANCE

Repairs - Vehicles	12,000
Motor Gas and Oil	6,300
Repairs - Equipment	3,868
Computer Software	1,912
Training	4,500
Professional Services	4,000
Office Supplies	1,610
Other	440
TOTAL	34,630

GRAND TOTAL	577,678
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Exhibit 8

Pivot Table Results – Sample Citations Issued in April

Citations Issued by Officer and Citation Type			
Officer	Payable	Warning	Grand Total
Allen	24	5	29
Brown	25	22	47
Donovan	52	1	53
Fabrini	33	17	50
Halloran	42	3	45
Johnson	24	6	30
Kyle	19	12	31
Grand Total	219	66	285

Citations Issued by Type and Residence of Driver			
Driver Residence	Payable	Warning	Grand Total
OutsideSomerville	157	29	186
UnionProspectHill	29	28	57
WestSomerville	7	6	13
WinterHillTenHills	26	3	29
Grand Total	219	66	285

Citations Issued by Time of Day and Residence of Driver					
Time	Outside Somerville	Union Sq./ Prospect Hill	West Somerville	Winter Hill/ TenHills	Grand Total
12:00 AM	10	4		2	16
1:00 AM	11	2			13
2:00 AM	7	1		1	9
3:00 AM	1				1
6:00 AM		2		1	3
8:00 AM	6	3		3	12
9:00 AM	3	2	1		6
10:00 AM	12		3		15
11:00 AM	6	6		1	13
12:00 PM	2	13			15
1:00 PM	4		1	1	6
2:00 PM	3	4		1	8
3:00 PM	9	4	1	1	15
4:00 PM	10	5	1		16
5:00 PM	26	8		4	38
6:00 PM	19	1	4		24
7:00 PM	19		1	10	30
8:00 PM	7			1	8
9:00 PM	7		1	1	9
10:00 PM	18	2		2	22
11:00 PM	6				6
Grand Total	186	57	13	29	285

Exhibit 8, continued

Payable Citations by Officer and Court Finding			
Officer	Dismissed	Upheld	Grand Total
Allen	3	21	24
Brown	8	17	25
Donovan	6	46	52
Fabrini	8	25	33
Halloran	7	35	42
Johnson	7	17	24
Kyle	6	13	19
Grand Total	45	174	219

Citations by Type and Birth Year of Driver			
Birth Year	Payable	Warning	Grand Total
1926-1935		1	1
1936-1945	4	3	7
1946-1955	12	16	28
1956-1965	65	7	72
1966-1975	68	27	95
1976-1985	70	12	82
Grand Total	219	66	285

Citations by Type and Gender of Driver			
Gender	Payable	Warning	Grand Total
F	61	18	79
M	158	48	206
Grand Total	219	66	285

Citations and Revenue, Total and Per Day, by Officer				
Officer	Citations	Revenue*	Citations/Day	Rev/Citation
Allen	29	\$2,245	1.33	\$77
Brown	47	\$3,345	2.16	\$71
Donovan	53	\$3,405	2.44	\$64
Fabrini	50	\$3,930	2.30	\$79
Halloran	45	\$2,435	2.07	\$54
Johnson	30	\$1,335	1.38	\$45
Kyle	31	\$440	1.43	\$14
Grand Total	285	\$17,135	13.10	\$60

*Note that Revenue includes the total assessed value, even if a citation was a warning or was subsequently dismissed in court. This treatment differs from the chart in Question 1 (d), where Citation Revenue includes only those citations that were payable (not warnings) and that were upheld in court (not dismissed).

Exhibit 8, continued

Count of Drivers by # of Citations Issued to them in April	
# Citations Issued to License in April	# Drivers
1	115
2	48
3	11
4	4
7	2
Grand Total	180

Miles Over Speed Limit for Speeding Citations Issued, with Citation Type			
Miles Over	Payable	Warning	Grand Total
8		1	1
10	7	2	9
11	2		2
12	5		5
13	1	2	3
14	1		1
16	2		2
17	1		1
20	2	1	3
24	1		1
40	3		3
Grand Total	25	6	31

Exhibit 8, continued

Count Citations by Offense	
Offense	Count
ATTACHING PLATES	4
DISPLAY NUMBER PLATE	5
DISPLAY RED LIGHTS	1
DPW STATE HWAY REGS	2
DRINK OPEN CONTAINER	1
DRIVING TO ENDANGER	3
DWI ALCOHOL PROGRAM	1
DWI LIQUOR	1
EXCESS WEIGHT	5
FAIL TO KEEP RIGHT	1
FAIL TO RPT NAME/ADD	1
FAIL TO USE SAFETY	1
FAILURE TO STOP	64
ILLEGAL POSS CLASS B	1
ILLEGAL POSS CLASS D	1
IMPEDE EMERG VEHICLE	1
IMPROPER EQUIPMENT	5
IMPROPR EQUIPMENT NS	3
KEEP RIGHT NO VIEW	1
LANE VIOLATION	8
LEAVE SCENE PROP DAM	1
LICENSE RESTRICTION	1
LICENSE SUSPENDED	11
MINOR TRAFFIC	2
NO CHILD RESTRAINT	1
NO INSPECTION STCKER	12
NO LIABILITY POLICY	6
NO REG/LIC IN POSSES	9
NO TRANSPARENT WINDO	7
OPERATOR UNLICENSED	3
POSSESS CLS B/INTENT	1
REFUSE OBEY POLICE	4
RESTRICTED ROUTE	21
RMV/FED SAFETY REGS	1
RT OF WAY INTERSECTN	2
SEAT BELT VIOLATION	24
SPEED DRAG RACING	3
SPEEDING	31
THEFT/CONCEALMENT MV	1
UNREG/IMPROPER EQUIP	33
YIELD TO PEDESTRIAN	1
Grand Total	285

Exhibit 9

Citations Issued by MA Cities

Citations Issued by Residency of Driver (RMV Data)	Arlington	Brookline	Cambridge	Medford	Newton	Somerville
Population	42,389	57,107	101,355	55,765	83,829	77,478
% of Citations Issued to Residents	28%	14%	22%	28%	23%	29%

Citations by Type (RMV Data)	Arlington	Brookline	Cambridge	Medford	Newton	Somerville
% Warning	73.3%	49.3%	57.9%	80.3%	68.6%	23.6%
% Payable	19.0%	45.5%	33.4%	13.7%	27.9%	61.1%
% Criminal or Arrest Citations	6.0%	4.6%	7.4%	4.9%	2.1%	12.9%
% Citations with Accidents	1.6%	0.7%	1.3%	1.1%	1.4%	2.5%

Citations Issued by Residency of Driver (RMV Data)	Arlington	Brookline	Cambridge	Medford	Newton	Somerville
To Residents	743	2,061	2,276	1,244	2,804	2,479
Non Residents	1,773	12,592	7,582	2,919	8,866	5,722
Missing	155	193	269	227	543	255
Total	2,671	14,846	10,127	4,390	12,213	8,456
% to Residents	28%	14%	22%	28%	23%	29%

Citations by Type	Arlington	Brookline	Cambridge	Medford	Newton	Somerville
Total Criminal or Arrest Citations	606	1,338	1,774	1,097	801	1,422
Citations with Accidents	161	206	321	240	553	279
Payable	1,904	13,302	8,032	3,053	10,859	6,755
Estimated Warning Citations	7,346	14,410	13,904	17,941	26,715	2,606
Total	10,017	29,256	24,031	22,331	38,928	11,062
% Warning	73%	49%	58%	80%	69%	24%