Development and Implementation of a Management Reform Plan for the District of Columbia

FIRE AND EMERGENCY MEDICAL SERVICES DEPARTMENT

Task 2
Identification of Management Reform / Improvement Projects

November 1, 1997

CONTENTS

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EXECUTIVE SUMMARY

This report summarizes recommendations from the second of three tasks to develop a management reform plan for the D.C. Fire and Emergency Medical Service Department.

Purpose

The first report, Task 1, dealt with Problem Identification. This report, Task 2, presents a series of management reforms and improvement projects that address virtually all of the problems identified in Task 1.

Highlights of the recommended management reforms across all areas of the Fire and EMS Department are discussed below. Some management reforms require coordination with other departments, and these are flagged, especially the procurement, personnel, and MIS issues.

Wherever possible, "quick fixes" were identified.

Implementation of these recommendations will significantly speed up response times for advanced life support; put a safer fleet of fire vehicles on the street, with fewer companies having to go out of service; increase firefighter safety; improve the indecent conditions for workers in the department; provide better planning and management information, to make the department more efficient; provide a higher level of rescue, hazardous materials and counter-terrorism service; and reduce fire losses.

Approach

The suggested improvement projects here all stem from the analysis of problems in Task 1. In formulating the improvement projects, recommendations from past consultant reports and internal department studies were considered. Discussions were held with the department leadership and representatives of employee organizations. Most of the suggestions, however, came from the experts on the project staff, who drew on experience in fire and EMS departments in which they had worked, practices in other

departments, the literature, and ideas developed specifically for the District of Columbia as a result of its particular problems. Some discussions were also held with other city departments. It is anticipated that the ideas here, which had to be drawn together in a three week period, will be refined as discussions are held in Task 3, and in formulating the overall plans for the Fire and EMS Department, and its relationships with other departments.

The criteria used to choose and prioritize projects focused on end output measures: actions likely to reduce fires, fire losses and casualties; reduce firefighter casualties; increase response times; improve community relations; improve employee morale; improve efficiency and productivity; treat emergency medical victims with high quality medical care; and other measures noted in the text.

There was good consensus in the identification of the problems in the Department in Task 1. There are many potential solutions, and less likely to be consensus on them.

Synergism and Cross Department Linkages

The plans in one area of the Fire and EMS Department are linked to those in another. If recommendations are accepted in one area and not in another, care must be taken that the whole still makes sense. We have tried to indicate some of the linkages. If some areas are not improved immediately, contingency plans may have to be developed other than what has been described. For example, if a new supply distribution system is not started immediately, other measures need to be taken to keep the fire stations and ambulances supplied. If the two stations recommended to be moved are not moved, then the stations need more attention to their long range repairs. If inadequate numbers of firefighter breathing apparatus with personal automatic alarms built in are not purchased immediately, then a different plan is needed for purchasing and using personal alarm systems; and so forth.

Some of the “management improvement projects” have several sub-pieces. To avoid having hundreds of separate projects, we grouped small projects together. Some of the groupings contain recommendations of different priority levels. If money is not available to fund an entire management improvement project, consideration should be given to funding the most critical parts of it, rather than totally rejecting it. The

discussion of individual projects addresses the importance of the needs within each project.

Key Management Improvement Projects

All recommended improvement projects were categorized as to priority. Below are listed the projects thought to be of highest priority. The priority scale was:

1 – Critical/Highly Urgent
2 – Urgent
3 – Important
4 – Desirable

A series of quick fixes of varying priorities is shown below, then a summary of the most important projects, and finally a complete listing.

Immediate Improvement Opportunities ("Quick Fixes")

In the course of doing the study, a number of suggested improvements were identified that could be made immediately or within a few months, at little or no cost, or within existing budget plans. These are not the most critical actions needed, but rather those that can be easily undertaken.

Office of the Fire Chief

1. Revamp the organization chart (increase efficiency, better balance management workloads and spans of control.
2. Provide the Fire Chief with more flexibility by changing the constraints on approval of rules and regulations by the City Council
3. Increase accountability
4. Fill the vacant attorney advisor position
5. Revamp the PIO function

Fire Prevention

1. Reform overall prevention management, budgeting, and performance measurement
2. Provide for updating of codes
3. Establish evening hour inspection program for places of public assembly
4. Establish a juvenile firesetter counseling program
5. Train line firefighters to preserve arson evidence

EMS

1. Contract for oxygen supplies
2. Increase accountability for ambulance crews (e.g. for drop off times at hospitals)
3. Motivate engines crews to respond faster to priority EMS calls

Firefighting

1. Provide supplies to improve fire station maintenance
2. Relocate two truck companies to Anacostia

Special Operations

1. Strengthen the administration of the Special Operations Section and add two new functions, and reassign inland water rescue
2. Reassign inflatable rubber boats and responsibilities for inland water rescue to the fireboat crew.
3. Establish minimum standards for assignment to special units.

Training

1. Train all department members in awareness and interfacing with special operations events.

Communications

1. Change 9-1-1 answering phrase to "District of Columbia 9-1-1, Operator ###, what is your emergency?" instead of "Police Emergency, Operator ###."
2. Clean up communications center
3. Change overtime handling to home unit (for all overtime)
4. Repair roadway leading to Communications Center
5. Schedule more staff meetings between director and operations personnel
6. Reconfigure fire/EMS dispatch area to place calltakers, dispatchers, and supervisors in closer proximity

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Highlights of Recommendations

Below is a summary of the most important recommendations. A complete list of these suggested improvement projects and their priority rating may be found at the end of this Executive Summary.

Office of the Fire Chief

Several critical additions are needed to help run the department. Several critical procedural and budget roadblocks need to be moved.

- Revise the organization chart to elevate prevention, provide better balance of workload among the senior staff, provide better support and attention to EMS services, and better support for the Chief.
- Fill the vacant attorney position in Judicial Affairs.
- Remove City Council constraints on changes to Rules and Regulations book.

- Improve public outreach through the media by increasing the PIO capability through training or additional talent.
- Increase accountability at all levels
- Reorganize the budget; create divisional budgets that allow each manager to manage his or her resources.
- Provide four positions for accounting and budgeting, to help end the roadblocks that have affected the entire department.
- Revamp procurement with a new purchase planning process, including an inventory management system and supporting technology (bar codes, databases.)
- In short run, detail a procurement manager from the central procurement office, or let GSA assist in procurement for 90 days; in long run, hire procurement officer or arrange a "permanent" detail from central procurement.

Prevention

D.C. has a 60 percent higher fire death rate, and a very high number of calls for service per capita. The most leverage on reducing human and property losses comes from investing in prevention, but there has not been anywhere near adequate attention to prevention in the past. The following reforms are needed:

- Elevate the Prevention Bureau to division status. Pay more attention to monitoring its performance quantitatively, in terms of fire incidence, deaths, injuries and dollar lost rates per capita; percent of children and elderly reached; percent of buildings inspected; juvenile fire setting recidivism; arson clearance rates; response times for plans reviews and inspection requests.
- Develop a systematic, proactive public education program. Add two public educators, and money for prevention materials, Start a community-based public education program in the highest risk areas of the city.
- Enhance the capacity of the inspection sections so it can get closer to meeting inspection frequency targets. This will require a) providing better MIS and clerical support to increase inspection productivity; b) adding four inspectors;

c) getting more inspections undertaken by the line companies (three per week instead of three per month) d) redeploying two inspectors from their plans review functions; e) redeploying seven inspectors from inspecting schools (or getting funds to pay for that court-imposed function.)

- Replace two of the three plans reviewers with fire protection engineers–there are none at present–to provide technical capability to review the complex fire safety systems in new buildings, and to speed service to the building community.
- Start a juvenile firesetter counseling program, with one person dedicated to the counseling function.
- Follow the U.S. Attorney's recommendations and past consultant recommendations to train and arm fire and arson investigators as peace officers, since the required assistance from the police to provide the function is not likely to be forthcoming. Accept ATF's offer to temporarily assist the department in arson investigations as the arson unit metamorphoses.

Emergency Medical Services

The principal problems in Emergency Medical Services are the long response times for Advanced Life Support service, which are due to a combination of extraordinarily high demand per capita from the citizens of the District, and shortage of ambulance units that leads to high unit utilization rates, and long drop off times at the hospital, and shortages when needed at certain times of day. There also is a major cultural clash between the EMS personnel and the firefighters, exacerbated by lack of personnel being held accountable.

A major redesign is recommended for the Emergency Medical Service system. Key features are as follows:

- Reorganize emergency medical services, to be headed by an EMS system director who would be responsible for the logistics, positioning and all non-medical issues; the medical director would be responsible for all medical issues, including medical training of firefighters and EMS personnel; quality

assurance; medical protocols; and medical triage used by the dispatchers. Having both functions in one person does not work..

- Evolve engine companies to become paramedic engines, with dual-role cross-trained personnel, at least one per unit; this will get an advanced life support provider on scene in half the time it takes today. This will require changing rules to allow one paramedic to start treatment before an ambulance with two more arrives.

- Attempt to reduce demand for emergency medical services by using the "Omega" protocol to screen out non-emergency calls, and refer them to other points in the health care system. Increase public education on both preventing injuries and appropriate use of the Emergency Medical System. (Montreal reduced their per capita rates by 20 percent). Diversion to other services would also be allowed by the units arriving on scene.

- Increase the number of rapid response ALS units by two, and add fifteen ambulances, to be divided between ALS and BLS transport. Use variable staffing to cost effectively deal with sharp peaks at certain hours. Also use dynamic repositioning ("System Status Utilization Model") to reposition units hour by hour if necessary, rather than having EMS units return to base after each call.

- The supply of EMS units will be helped by improvements to the overall department supply system, but also by adding a mobile resupply unit to meet ambulances at hospitals or elsewhere.

- The EMS service should use dynamic redeployment of EMS units, hour by hour, to the most appropriate locations.

- Management of EMS personnel needs to hold people accountable in the same way that firefighters are asked to be held accountable. In particular, monitoring is needed of drop times at hospitals, and explanations sought for extraordinarily high averages that exist today.

- EMS senior managers need to be reassessed as to whether they have capability to handle the proposed new type of EMS delivery system, which requires much more active EMS management overseeing accurate collection of information and allocation of units throughout the day. A potential hurdle is

in the difficulty in adjusting to varying numbers of units on the street at different hours of the day, to have an efficient system.

- The two cultures issues needs to be resolved after obtaining more broadly based inputs from the various stakeholders, and undertaking a detailed cost analysis incorporating the recommendations for improving EMS service in this report versus other ways to staff and organize them. All of the other EMS recommendations here can be implemented regardless of these outcomes here.

Firefighting

The Firefighting Division has been making due with a fleet of vehicles that are old, in poor condition, and in desperate need of replacement. Firefighters are jeopardized by the poor condition of some of the ladder trucks in particular. There are no spare ladder trucks and for most intents and purposes, virtually no spare engines. The highest priority is to prevent holes in service caused by not having vehicles, and to accelerate the replacement schedule for fire apparatus and for key firefighting equipment.

An accelerated capital purchase program is needed to not only replace the ladders that are in dangerous condition for use for first-line vehicles, and the many engines suffering reliability problems, but also to develop at least one spare for every eight vehicles so that companies are not taken out of service altogether as they must be today when a vehicle is down.

The response times to fires and overall firefighting performance are satisfactory. However, there is need for a full station location and deployment study to consider the best way to fill some holes in coverage in some wards, and to determine whether the overall use of apparatus and personnel is reasonably efficient. While some short-term recommendations for relocating two ladder companies and moving two stations were made, such moves would preferably be done in light of an overall systems review not feasible during the present fast-tracked study.

Two particular questions that arose were the adequacy of ladder staffing (currently at four personnel) and the need for restoration of battalion chiefs' aides or other ways to efficiently use the Incident Command System in the early stages of structural fires. There are several alternatives to consider.

Further use of mutual aid with surrounding jurisdictions should be considered.

Special Operations

Special Operations is a collection of advanced services being provided under the leadership of the Operations Division. These services include technical rescues of various types, hazardous materials incidents, fireboat, metro and rail operations, and counter-terrorism.

Special Operations needs to have its equipment and apparatus significantly upgraded including three new rescue units, a new hazmat unit, hazmat support unit, collapse support unit, a floodlight unit, and a 4x4 truck and trailer to haul inflatable rubber boats.

The management capacity of special operations needs to be significantly upgraded, with the addition of captains to oversee hazardous materials and technical rescue operations, and the expansion of the role of the EMS captain for terrorism and special events, and the addition of a lieutenant to assist the battalion chief in program development and planning for this highly specialized area.

Improved training and special operations is needed for all members of the department and for some special skills of the specialist unit. There is potentially high leverage in saving lives and reducing property damage from a wide range of hazardous materials incidents, building collapses, terrorist incidents, and other disasters that they consider likely to happen over the next five years. A modest investment in preparations for these unexpected but likely-to-occur events will save the city millions, and reduce liability.

Training

The training academy is literally a junkyard. There are inadequate training facilities, training equipment, training staff to provide/maintain the increasingly demanding and increasing range of training required by dual role firefighters and by the EMS personnel. Needed are:

- Centralization of all department training.
- Construction of a safe, modern, live burn facility.
- Expanded classroom space.
- Repair of training equipment and provision of equipment to make up for that which was “borrowed”.
- Addition of 3 training positions to guide curriculum development, do some of the training done now by detailed employees, and reduce overtime from detailed operations personnel.
- Development of and wider use of training for supervision to increase accountability and consistency, as well as improve leadership.
- Removal of underground storage tanks, as required by EPA, before fines start.
- Clearing up the junkyard of vehicles, repair the concrete, remove the old training tower (in the National Airport Flight Path.)

Communications

The emergency communications systems is not adequate in certain geographic areas of the city, in many large buildings, and in some Metro tunnels. Key components of the current system are in disrepair. The CAD system is badly out of date. In addition, communication center staff performance needs a sharp improvement.

All of the following are critically important projects:

- Improve selection and training protocols for communication center staff.
- Resolve the open decision on whether or not to consolidate the communication system with police system (we recommend not.)
- Gain FCC approval of right to use radio frequencies for the planned new 800 MHz system—the keystone of improvements.
- Start building the new radio system and its key subsystems ASAP.
- As a stop gap measure while the new system is being built, make emergency repairs to the five station alerting system and the Metro tunnel radio system.

- Get the RFP out for a new Computer Assisted Dispatch System, and replace the current system ASAP.
- Develop automatic vehicle location system.

Services

The Fire and EMS Department has suffered greatly over the last decade from lack of adequate support for the infrastructure of the Department, and the wide range of services needed to support Fire and EMS Operations. It has been the classic "robbing Peter to pay Paul" scenario. Positions are temporarily detailed from operations, and filled in with overtime. There has been a great under-investment in modern technology needed to support the complex, and lifesaving services provided by the department.

Needed are the following:

Management Information Systems – A department wide local area network, standardization of software packages and investment in computer hardware (including 350 PCs).

The existing staff, other than the MIS director, does not have the skills to develop the department-wide MIS systems needed. After evaluation of skills and detail, it is likely that two of the currently detailed personnel will be replaced by computer systems professionals, and three other positions would be upgraded, returning those positions to Operations.

Personnel – The DC Central Personnel Office is not adequately serving the needs of the Fire Department. It is recommended that a personnel unit be developed for the Department, with autonomy from CPO to the limit that can be arranged, with transfer of personnel functions and recordkeeping. The current position descriptions are outdated, there is difficulty in getting them recast and new ones added, personnel records are not well organized or available, and are not secure. The personnel director, three specialists and clerical support are needed to establish the new office, with a decrease in the Central Personnel Office staff currently providing these services. There will be a net addition of positions to the city, because key personnel services are simply not being provided today to FEMS.

Property and Supply – As discussed in Task 1, the property and supply system is somewhere between non-existing and a shambles.

- It is necessary to reorganize and train the supply staff.
- Create a proper warehouse and stockpiling supplies.
- Develop a computerized inventory management process.
- Purchase and maintain an adequate supply distribution system (two trucks and two vans).

Research and Development – There is little R&D or planning taking place, and that relatively new position needs to get very active in helping plan the future of the department, especially in light of the recommendations from this report.

A major responsibility under "R&D" is facilities maintenance. A major facilities renovation and building program is needed to remedy the dismal conditions in the fire stations, build a new training center, and organize for long term maintenance of facilities so they do not ever again get to their current condition.

Professional Standards – This area includes safety. There are major deficiencies in the safety program of the department today. Needed are the following:

- Replace or repair all defective firefighter protective equipment and breathing apparatus. These should be immediate testing of all SCBA cylinders, and the purchase of new breathing apparatus that includes personnel alarm systems that are "in line" with the regulator so that they are automatically on whenever the breathing apparatus is used.
- There is need to revamp the organization procedures and staffing of the safety functions in the Department. There should be at least one officer on duty per shift to rapidly go to scenes of fires and other major incidents, as opposed to one person who often is called in from off duty today.

Fleet Maintenance – As discussed in the Task 1 report, the current status of the vehicle fleet – the engines and ladder trucks – is in extremely poor condition, with no reserves.

The fleet maintenance function needs to be dramatically improved, or a significant portion of it done under contract by private contractors. We recommend the hybrid system where some of the specialized work is contracted out, and the more routine work done in house, in keeping with the skills of existing personnel and the difficulty in it revamping the mechanics positions in the near term.

There needs to be a fleet maintenance inventory system developed, with ability to track the status of vehicles and the cost of repairing them.

More preventive maintenance is needed (and that has been started).

Other Issues

The improvement plans discussed in this report require coordination with a number of other departments, as was discussed in the Task 1 report. In particular:

Police – Regardless of whether the arson unit receives police powers, there needs to be better coordination with the police in investigating arsons.

Schools – The Fire Department has taken on the unusual role of inspecting schools for non-fire problems. They need to be reimbursed for this and trained if that role is to continue, because it is distracting from investigating buildings for compliance with the fire code.

Department of Public Works – Repairs and removal of underground storage tanks can be done less expensively using private contractors than the DPW quoted. DPW should re-examine its "bids" or the Fire Department should be released from being required to use them.

Procurement – A final resolution is needed on how independent the fire department can be with its emergency spending authorization for $500,000. This is critical for getting repairs to emergency vehicles done quickly.

Health Services – There needs to be coordination with Health Services on the proposed triaging of EMS calls and referral of more citizens to alternatives other than an emergency transport to the hospital. There also is need to release the Fire and EMS Department from the constraint for using one paramedic to start emergency actions.

U.S. Attorney's Office – Recommendations for improving the arson unit are generally following those made by the U.S. Attorney, but that office should be involved in the final plans for giving arson investigators peace officer powers.

Consumer Regulatory Affairs – The recommended hiring of fire protection engineers needs to be coordinated with the counterpart plan reviewers in the building department. The plans for dealing with the large gap in annual building inspections need to be discussed with the CRA.

City Council – Council needs to consider giving the Fire Chief more authority for changes in the Rules and Regulations Manual.

Central Personnel Office – Coordination is needed for reassigning personnel functions from the Central Office to the Fire Department.

Budget –The largest issue or impediment facing the Fire and EMS Department is the need to restore both capital budget and personnel budget funds to allow the Department to provide the needed level of emergency services to the citizens, or the citizens need to understand the higher level of risk to which they are exposed. Some of the recommended increases in personnel in this report would be offset by decreases in overtime, as needed support functions are currently filled by temporarily assigning people from one duty, usually operations to a support function that has been cut or never staffed.

Congress – The Oversight Committee for the District needs to understand the many major problems identified in Task 1, and that there are significant problems in providing emergency fire and EMS services to protect the government of the United States as well as the citizens of the District.

Conclusion

The effects of implementing the recommendations here would be to significantly reduce risks of dying in a fire, significantly improve response times for emergency medical service and hence reduce the severity of emergency medical problems, significantly increase firefighter safety and improve their working conditions, and improve the reliability of emergency services. The District also would be in better condition for handling major special events and preparing to counter terrorism.

Summary of Management Improvement Projects

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
Office of the Chief						
1. Reorganize the Department	3	Span of control Efficient grouping of functions	Management Efficiency	$206-331	Immediate	Immediate
2. Reduce constraints on Rules and Regulations Book	2	Chief does not have flexibility	Management Efficiency	Nil	Immediate	Immediate
3. Improve accountability and discipline	2	Lack of discipline hurts morale and productivity	Morale, productivity	Nil	Immediate	Immediate
4. Revamp PIO function	1	Lack of adequate information to media	Public knowledge, employee morale	Nil	Within 30 days	Immediate
5. Revamp the Procurement Process	1	Procurement slowness affects emergency repairs, supplies, morale	Sharp improvement in procurement; reduce time for repairs; increase accountability.	(Covered in other functions)	3 months	3 months
6. Obtain key procurement expertise	1	Inefficient procurement; lack of expertise	Same as above	$70	3 months	4 months
7. Fill vacant Attorney Advisor position	2	Lack of legal advice	Reduced liability exposure	(Already budgeted)	3 months	4 months+

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
8. Improve Budget system, add four budget staff	2	Lack of budgetary control	Better management of resources at division level and overall	$160	6-12 months	12 months
Prevention						
1. Reform overall prevention management, budgeting	3	Prevention has not been given enough attention; D.C. has a high fire death rate.	Reduce fire deaths and losses	$40 (one-time) $28	3-12 months	Immediate
2. Increase public fire safety staff and outreach; start community-based program	1	Same as above	Same	$152	One year	One year
3. Train prevention staff.	2	Lack of staff capability	Increase staff competence	$18	3-12 months	6 months
4. Increase number of building inspections	2	Too few inspections being done	Increase safety of buildings	$249	3-36 months	3 months+
5. Update codes	4	Confusion to builders	Reduce confusion	$1	Annual	12 months+
6. Start evening hours inspections	1	High occupancy businesses operating at night are not inspected.	Reduce risk to people attending night spots	Nil	Immediate	Immediate

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
7. Add engineering competence for plans reviews	2	Complex fire protection systems not properly reviewed	Reduce risk of public in new buildings	$106	3-36 months	1 year+
8. Purchase vehicles for inspectors	2	Inspectors lose productivity using public transportation	Productivity; more inspections	$368	3-36 months	3 months+
9. Give Arson Investigators police powers and training	1	Low arson clearance rate	Higher arson clearance rate	$9+	3-12 months	12 months+
10. Establish juvenile firesetter counseling program	1	High juvenile arson	Nip problem in bud	$45	1-12 months	12 months+
11. Train line firefighters to preserve arson evidence	2	Evidence sometimes ruined	Higher arson clearance rate	–	6 months	6 months+
12. Improve communication of arson section	3	Low investigator productivity	Higher productivity, safety	– (covered elsewhere)	12 months	12 months
13. Develop school improvement to free investigator	2	Inspector time lost	More buildings inspected	–	12 months	12 months

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
EMS						
1. Reduce call volume through call-triaging and public education	1	D.C. has exceptionally high EMS calls per capita	Lower demand, fewer ambulances needed, lower costs	$67 (one-time) $162 (recurring)	1 year	1 year+
2. Place more EMS units in service, and use peak local staffing, system status management and paramedic engines	1	D.C. has exceptionally high ALS response times	Speed responses, save lives	$1131 (one-time) 7000 (recurring)	6 months - 3 years	6 months+
3. Improve EMS dispatch, including automatic vehicle location	1	High EMS call rate per capita, high response times	Locate EMS vehicles, dispatch closest vehicles, speed response; do better job triaging critical EMS calls	$353 (one-time)	6 months	6 months+

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
4. Reorganize EMS and its management	2	Lack of time for medical director; need for different type of EMS system management; clash of fire and EMS cultures	Free Medical Director to assure patient treatment quality; manage system more efficiently.	$93 (recurring) $13 (one-time) Note: The net change in costs for different alternative organiza-tions remains to be done.	6 months (leadership reorg.) 1-3 years (reorg., depending on choice made)	6 months+
5. Make EMS promotional process competitive	3	Poor EMS morale; loss of good employees;	Better synergism; better morale; lower turnover	$26	3 months	Immediate upon announcement
6. Better integrate EMS documentation, quality assurance and training	2	Lack of adequate QA for patients	Better field supervision, faster hospital drop times, fewer errors	$496	4 months	4 months+
7. Improve EMS supply system using mobile supply unit	4	EMS units waste time hunting for critical supplies across the city.	Less wasted time of EMS units; contributes to lower response time	$133	3 months	3 months+

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
Firefighting						
1. Develop accelerated fire apparatus and equipment replacement schedule	1	Holes in service due to broken down vehicles; danger to firefighters and citizens from faulty ladder trucks, missing or broken equipment	Safety to firefighters. Consistent availability of emergency service in all wards. More effective firefighting.	$5272 (this year; half that the next two years	1 year	1 year+
2. Provide supplies for station maintenance	2	Lack of supplies for basic human dignity and cleanliness.	Improve cleanliness and morale	$257	30 days	30 days
3. Redeploy 2 units, move 2 stations. Undertake full station location and deployment study	2	Lack of confidence that current use of resources is most efficient.	Improve cost-effectiveness, response times, and possibly safety	$3350	1-2 years	2 years+
4. Evaluate implementation of fuller mutual aid	3	Improve efficiency	Improve efficiency use of area-wide resources	Nil	3-6 months	6 months+
5. Reevaluate standard response to structure fires	3	Questions on the efficiency of the current response policy	Potential improvement in efficiency	(Included with cost of item 3 above)		

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
Special Operations						
1. Purchase and repair apparatus and equipment needed for Special Operations	1	Inadequate apparatus, equipment, and personal protective outfits for resources and hazmat situations	More effectively and safety handle resources and hazmat incidents.	$2,100 (one-time) $320 in follow-on years	12 months	12 months+
2. Strengthen administration of special operations functions; add responsibility for special operations and counter-terrorism; add paramedic to special operations company	2	Lack of water safety training for rescue company; problem of getting paramedic to treacherous places where people are injured; lack of adequate coordination with government security agencies.	Increased safety for citizens, visitors, and workers; increased firefighter safety; better coordination of special events, terrorist threats	Nil	3-12 months	3-12 months
3. Provide staffing needed to administer and conduct Special Operations	2	Lack of adequate leadership positions for critical new functions	Appropriate staffing to plan for Technical Rescues, lead operations and reduce liability exposure	$197	2-6 months	6 months
4. Train all members of Department in Special Operations awareness and interfacing	1	First-in unit at rescue or hazmat incidents are likely to be the non-specialized units.	Improved safety of public and firefighters at hazmat and rescue incidents.	Nil	6-24 months	6-24 months

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
Training						
1. Rebuild and Improve the Training Facility	1 (for live burn facility and UST removal, repairs; rest is Priority 2)	Lack of live-burn training facility; current facility lacks room, is a junkyard literally.	Safer, more comprehensive training leading to more competent, safer provision of services	$7100 ($2825 of which is Priority 1)	2-24 months	12 months+
2. Reorganize Training Division; make staff permanent FTEs.	2	Lack of central training; duplication of courses in fire and EMS; lack of officer development	Eliminate duplication; \encourage department-wide treatment of Fire & EMS; improve leadership capacity	$70	12 months	12 months
3. Restore Training Division Staffing	3	Lack of adequate training staff; use of too many temporary duty personnel.	Reduce overtime by filling FTEs. Stronger training program	$110	6-12 months	6-12 months
4. Provide Adequate training equipment and apparatus	2	Training equipment is “stolen” by crews short in the field; need for training to prepare crews for real world.	Better training, increase firefighter safety, higher productivity	$100	12-18 months	18 months

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
5. Revise training curricula	2	Lack of adequate officer training; lack of tie to safety information	Better leadership, reduced accidents	29	6-12 months	12 months
6. Upgrade Training MIS	3	Lack of access of instructors to MIS	Better Training Record-keeping	(Costs under MIS department-wide improvement)		
Communications						
1. Resolve whether communications center is to be consolidated	1	Can't proceed with improving communications until resolved	Remove roadblock to improving communications	Nil	90 days	90 days
2. Improve selection and training of Communications Center Staff	2	Too many anecdotes of problems in handling calls	More efficient response to callers; proper emergency actions taken	Nil	3-9 months	9 months
3. Replace and upgrade radio system and its subsystem	1	Critical problem in communicating with emergency units in the field, and with local jurisdictions	More efficient emergency operations, greater safety to emergency personnel	$60 (major capital cost already budgeted)	4 months	1 year
4. Make emergency repairs to Fire/EMS station alerting system	1	Vocalarm system is partially broken.	Reduce tying up radio channels with acknowledgment traffic	$50	6 months	6 months

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
5. Make emergency repairs to Metro tunnel radio system	1	Can't communicate in Metro tunnels	Have critical communications working in case of a Metro disaster or fire.	$50 (?)	6 months	6 months
6. Replace and update the computer assisted dispatch system	1	CAD unreliable; not year 2000 compatible; barrier to dispatch efficiency.	Faster, more reliable dispatching, with better management information – for operating the Department	$4000	3-18 months	18 months
7. Develop Fire/EMS Automatic Vehicle Location System	2	Covered in EMS Chapter. Might be extended to fire apparatus, over time				
8. Obtain Mobile Data Terminal system	2	(Develop as part of new communications system.)				
Management Information Systems						
1. Develop Department-wide LAN (Local Area Network).	2	Various elements of department cannot share software, information on line	More consistent management, better control of resources, more productivity	$1938 (one-time) $93 (recurring)	6 months	6 months+
2. Standardize software	3	Lack of compatible software makes sharing information more difficult; stops employees from suing various systems they don't know.	Ease of maintenance; increased office productivity; decreased training cots.	$100-200 (one-time)	12 months	12 months

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
3. Automatic clerical and MIS function currently done manually across the Department	2	Much inefficiency from manually processing paperwork; use of carbon paper; archaic filing.	Improve office efficiency, better management information, less duplication of data entry	$1700 (one-time)	1 – 6 months	6 months+
4. Modernize the information system hardware (especially PCs).	2	Outdated computers cannot use modern office and specialized MIS systems.	Able to use new software; increased productivity.	$1900	1-6 months	6 months+
5. Increase staff capability to handle MIS	1	Existing MIS staff lacks skills to upgrade the Department's MIS	If no staff capacity, can't modernize or do the other needed improvements.	250	1-6 months	6 months+
Services						
1. Develop a personnel unit	3	Inadequate service from Central Office of Personnel	Accessible but protected records; prompt development of accurate position descriptions; prompt filling of positions; provision of personnel services to employees in an accurate, timely fashion.	$22 (one-time) $333 (recurring)	3-9 months.	9 months+

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
2. Reorganize and train supply staff	3	The supply function has been woefully inadequate – shortages of emergency equipment, and personal gear, etc., abound.	Develop a proper supply function. Keep lack of supplies from affecting emergency services,	$20	1-6 months	6 months+
3. Create a proper warehouse for stockpiling supplies	1	Current warehouse is vermin-infested, inadequate in size, inadequate in receiving and shipping capability	A proper warehouse facilitates distribution of supplies, prevents losses from theft and rodents, improves productivity.	$179	1-6 months	6 months+
4. Develop inventory management process	1	Can't track supplies today	Manage inventory, avoid waste, avoid shortages	$92	1-6 months	6 months+
5. Develop adequate supply distribution system	2	Current delivery vans are too small, too unreliable	Better supply delivery to firehouses	$130 (one-time)	1-6 months	6 months
6. Develop Property Management System	3	No real tracking of property once it enters the department.	Improve accountability of property; reduce waste; efficiently dispose of old property.	$108 (recurring) $42 (capital)	1-6 months	6 months+

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
7. A major facilities renovation and building program is needed	1	The state of many fire stations is abysmal – leaking, no heating, poor lighting, poor handling of exhaust fumes; broken concrete aprons with holes, etc. also, the apparatus maintenance shop is in poor condition, with inadequate repair equipment; inadequate facilities for females.	Improved health and safety of employees; decent working conditions; compliance with OSHA regulations. Better morale, better productivity. Reduce hazard to citizens. Provide decent facilities for female field personnel.	Roofs $1100 (operating) Concrete repair $131 (operating) Station interiors $1200 (operating) Renovations $5400 (capital, including mainten-ance shop -$1000) (Some projects are higher priority than others within these costs)	5 years; emergency repairs ASAP	6 months+
8. Institute underground storage tank removal	1	EPA requires all tanks be removed by end of 1998	Comply with EPA	$400-1000	1 year	1 year
9. Revive planning process in the Department	3	No planning leads to no long-term vision for improvement; coping with changes is ad hoc.	Long-range improvement in cost-effectiveness, fewer crises.	$60	6 months	3 years+
10. Replace or repair all defective firefighter protective equipment	1	Firefighter safety is in jeopardy from dangerous gear	Increase safety of firefighters	$1530 (capital) 50 (operating)	2-12 momths	12 months+

Project	Priority	Problem Addressed	Benefits	Costs (000)	Period of Implementation	When Results Realized
11. Revamp organizational staffing of safety function; add physical fitness equipment	1	Only one safety officer for 4 shifts; too slow to arrive. Too little attention to safety planning; too little attention to physical fitness.	Improve firefighter safety and health, reduce injuries, lost time.	$253 $75 (one-time)	3-12 months	12 months
12. Revamp the fleet maintenance program for fire and heavy apparatus	1	Poor maintenance of fire vehicles	Less vehicle downtime, safer vehicles	Much can be done within existing budget; need $50j-100 in higher salaries for mechanics and training.	1 year	1 year
13. Revamp the passenger vehicle maintenace program	4	Poor maintenace of passenger vehicles	Less vehicle downtime, free mechanics time for specialized apparatus	$115	1 year	1 year

CHAPTER 1—INTRODUCTION

In September 1997, an intensive 90-day study was started of the D.C. Fire and Emergency Medical Services Department. The Task 1 report, completed October 7, identified a wide range of problems that need to be addressed.

This report discusses management reforms and improvement packages that address the problems identified in the Task 1 report. The prime emphasis is on identifying changes needed to improve quality of service to the citizens, visitors, and workers in the District, and to improve safety and decent working conditions for the firefighters and paramedics. The Task 3 report will develop an integrated management plan for the next three years.

The overall organization of this report generally follows that of the Task 1 report.

To keep the number of management reform packages manageable, we have grouped similar types of solutions to a variety of problems. Thus, one management reform addresses the need to improve fire department facilities, though some improvements (e.g., certain stations, the Training Academy) are much higher priority than others (e.g., other stations.)

Most of the reform packages presented here give specific recommendations. Some require more detailed analysis than could be done within the short period allotted for Task 2. For the latter, a description of what needs to be done is treated as an improvement package. The main examples of this are a comprehensive station location analysis, and review of the last station location analysis, and costing the alternatives for EMS organization.

The format followed here in presenting each reform or improvement is that specified in the RFP. The following elements are included for each reform:

- Identification of Issue or Problem
- Suggested Improvement Project

- Description of Costs and Benefits
- Analysis of the Capacity for Change
- Determine Priority Status

Where appropriate, a tentative workplan is included at the end of each improvement project. These will be integrated and revised as necessary in Task 3.

CHAPTER 2 – OFFICE OF THE FIRE CHIEF

This chapter discusses improvements in services that currently report directly to the Fire Chief, including those of the Chief Financial Officer, EEO, ADA compliance, judicial affairs, and public information. We also address overall organizational and management issues, except for MIS, which cuts across the department, is addressed under Chapter 9.

General Organization and Management

Management Improvement Project 1: Reorganize the Fire and EMS Department – "Quick Fix"

Identification of Issue

The main problems faced by the department are not caused by the organizational structure. However, the current organization gives high visibility to some minor functions and low visibility and attention to some major ones. It also tends to underplay the EMS role. It puts far too much responsibility under the Assistant Chief for Operations and too little under Services. A better balance of duties is needed. Many details of the organization changes in various functions are discussed in the appropriate later chapters.

Suggested Improvement Project

There are several organizational alternatives to consider. The major suggested changes are as follows:

- Elevating the Fire Marshal/Prevention to status of a division, reporting to the Chief
- Moving the training and communications under Services, or split out in a new Technical Services deputy or assistant chief.

- Regrouping support functions (e.g., safety with training; all maintenance functions; all administrative functions).
- Reducing the number of separate functions reporting to the Chief
- Giving the Chief just two line individuals reporting directly to him; an executive assistant and the PIO.

The proposed reorganization is illustrated in a chart on the next page that includes the recommended changes made throughout this report. This reorganization adjusts the DCFEMS span of control and responsibilities more equally, flattens top management by elevating some divisions higher in the chain of command, such as fire prevention. The proposed reorganization limits the bureau or command functions reporting to the Fire chief to five, which is very manageable. This reorganization also provides for an executive assistant for the Fire Chief which allows for better management of the Office of the Fire Chief, facilitates projects and assignments for the entire department.

This proposed reorganization shifts more responsibility toward Support Operations. It is necessary to add a Deputy Fire Chief for maintenance to balance the different functions reporting through the Assistant Fire Chief for Support Operations.

To centralize the Administrative functions of finance, and judicial affairs as well as incorporate the recommendations for adding a personnel unit and improved management information system (Chapter 9) an Administrative Services Director is needed.

The proposed organization chart is one of several options that can be workable and effective. Another option for example, would be to increase the bureau/commands reporting to the Fire Chief from the five illustrated to six. The Training and Safety Deputy Fire Chief could become Technical Operations Deputy and can report directly to the Fire Chief (see diagram in Chapter 7). Support Operations would be smaller and the additional Deputy Fire Chief for Maintenance could then be omitted.

For org chart.

For the same cost as six commands a division such as Fire and EMS Communications can be moved to Technical Operations, and/or Management Information Systems could be left in its present position in Support Operations. The planning unit proposed under training and safety operations could also be shifted as deemed most effective.

Costs and Benefits

Cost – The costs will be relatively low, and mainly involve supervision changes, just moving offices of a few people; most functions would stay where they are, but report differently.

Cost of adjusting the organization with five command/bureaus reporting to the Fire Chief:

Job Title	Grade	Annual Salary	+ 33% (Benefits)
Battalion Chief	1	$57,946	$77,068
Deputy Fire Chief	1	68,033	90,444
Administrative Director	DS14 Step 5	61,898	82,324
Secretary for Director	DS9	27,018	35,934
Clerical support for DFC	DS7	22,285	29,639
Office furniture/supplies			16,000
Total			**$331,409**

The cost of the option with six commands/bureaus reporting directly to the Fire Chief. This option does not require an additional Deputy Fire Chief, but increases the Chief's span of control.

Job Title	Grade	Annual Salary	+ 33% (Benefits)
Battalion Chief	1	$57,946	$77,068
Administrative Director	DS14 Step 5	61,898	82,324
Secretary for Director	DS9	27,018	35,934
Clerical support for DFC	DS7	22,285	29,639
Office furniture/supplies			11,000
Total			**$206,326**

Benefit – The benefit is more high level attention to key functions, more recognition of the EMS role, and more equitable distribution of responsibilities across senior staff, hopefully increasing their productivity.

Capacity for Change

The proposed change and modification to it should be discussed with the Chief and Assistant Chiefs to get their views, and any reasons for not making the changes, to get buy-in. The divisions reassigned away from the Firefighting Division may be resistive because of the dominate fire culture, but Fire Prevention, Training, and Communications will be better served and will have a greater impact on the Department and citizens.

Priority Status - Level 3 (Important)

Management Improvement Project 2: Provide the Fire Chief with More Flexibility by Changing the Constraints on Approval of Rules and Regulations by the City Council – "Quick Fix"

Identification of Issue

The Chief currently cannot run the department in the same way that other chiefs can because every change in the rules and regulations manual requires City Council approval.

Suggested Improvement Project

This should be changed to give the Chief freedom to make most changes. A prudent chief will have employee participation of his key staff and often committees in making major changes, and will run them by the Council. But every change need not be approved.

Cost and Benefits

No cost, but requires buy-in and a change by the City Council.

Priority Status: Level 2 (Urgent)

Work Plan

Management Improvement Project 3: Improve Accountability and Discipline Throughout the Department – "Quick Fix"

Identification of Issue

An issue that emerged repeatedly from interviews at most levels of the organization and among firefighters, officers, emergency medical services personnel, and employee representatives, was the perceived lack of accountability within the organization, and perceived unfairness in holding people accountable for the same behaviors. On an outward level, this lack of discipline is demonstrated by the poor adherence to uniform regulations. Less visible but more serious effects of this lack of adherence to rules and procedures include fireground safety, training, and personnel discipline.

Emergency officers were faulted for failing to enforce rules and regulations with their personnel. Battalion Chiefs were cited for failing to hold their station-level officers accountable for their personnel's actions.

Particular areas about which concerns were raised included discipline for driving accidents, dress codes, attendance, punctuality, insubordination, etc.

Suggested Improvement Project

Management should initiate a "back to basics" policy whereby rules and regulations are strictly enforced. The problem is not lack of rules but rather their enforcement. Battalion chiefs should be held accountable for personnel in their Battalion and they should supervise station officers to properly enforce the rules. Random inspections and audits could be performed by top management both as a means of demonstrating commitment to the program and as a means of measuring its success. Officers should be held accountable for the personnel under their command.

The Chief and Assistant Chiefs must get across to Battalion Chiefs, and they to company officers and other supervisors, that they are expected to conform to the rules themselves, and are expected to enforce them. Officers may be disciplined for not disciplining their subordinates.

New leadership training courses (discussed in Chapter 7 – Training) should include sections on accountability.

Capacity for Change

In theory, virtually everyone wants this. The problem will come in its interpretation, and when someone's own ox gets gored.

Costs and Benefits

Costs – None.

Benefits – A sharper image to the public; reduction in grievances and perceptions of unfairness; higher morale coming from a more disciplined, better looking organization. Reduction in accidents. Increased effectiveness and efficiency.

Priority Status: Level 2 (Urgent)

Work Plan

ASAP, already started. Needs to be reinforced.

DPM/EEO/OPM Functions

No recommendations other than to fund the diversity training. Providers are under contract but not funded. ***("Quick Fix.")***

Public Information Office

Management Improvement 4: Revamp the PIO Function – "Quick Fix"

Identification of Issue

The PIO needs to take a more proactive role in dealing with the media on positive achievements and in clarifying incorrect negative stories. (As one recent example, *The Washington Post* misreported much in their articles on the Task 1 report on this project, and exaggerated the real problems that did not need exaggeration.)

Suggested Improvement Project

The PIO should be someone with strong ability to deal with the media. Either further training or augmentation of the office with talent from within the department or a civilian from the army of talented public information people in this area should be considered. ***("Quick Fix")***

Costs and Benefits

Costs – No cost.

Benefits – Better representation of the Department and better information for the public.

Priority Status: Level 4 (Desirable)

Work Plan

Do ASAP.

Management Improvement Project #5: Revamp the Procurement Process with a "Purchase Planning Process"

Identification of Issue

The procurement function is central to the efficient operation of the Fire and Emergency Medical Services Department. The successful procurement of goods and services would help to ensure the firefighting department is prepared and equipped to effectively and safely serve the citizenry and visitors to the District of Columbia.

A recent study of D.C. Government Procurement cited key issues contributing to a process in "crisis." The reported findings included:

- No effective planning process
- Unclear and ambiguous roles and responsibilities throughout the procurement cycle.
- No accountability of the players (Agency Heads, Program Managers, Contracting

  Manager, Financial Managers, Suppliers) in the process
- No clearly defined, documented, and understood procurement process"[1]

In the Fire and EMS Department, there is confusion about the procurement process, especially the new emergency powers of the Chief. These are critical repairs.

[1] Pegasus-Langford Project Team, Organizational and Program Assessment for the District of Columbia Procurement Function, October 14, 1997

Suggested Improvement Project

Institute a purchase planning process that integrates inventory, property and supply monitoring systems to give managers a system to forecast purchasing needs. Managers will work with procurement and property managers to establish levels where purchase requests are "triggered." This system should factor in the lead time it takes to procure the item from suppliers. At FEMS, an on-line system with procurement, inventory and field managers would increase communication and accountability by clearly identifying where the breakdowns occur in maintaining appropriate levels of supplies and equipment.

Develop pilot program using Procurement Cards to reduce the large volume of small purchases and decrease turnaround time for purchase requests.

Costs and Benefits

Costs for use of procurement cards is based on negotiation with vendors of major credit companies (e.g., Visa, American Express, and MasterCard). Cost drivers include number of cardholders and total purchase volume. There are several vendors providing procurement services to governments including purchasing/procurement cards.

Procurement cards reduce costs and give procurement staff ability to concentrate on higher-value purchases. These cards also provide an automatic history of purchasing information useful in management reporting, forecasting of budgets. The most beneficial aspect of using these cards is reducing cycle time from order to receipt – providing the ability of staff to purchase goods and services as needs occur. The use of procurement cards can help to improve the relationships the District has with suppliers who will benefit from faster payments and reduced administrative costs from the elimination of billing and collection activities. Management of the use of these cards will require the development of policies and procedures, including:

- Level of documentation to be maintained (i.e., packing slips)

- Reconciliation process
- Monthly statement approval process
- Use restrictions (industries – i.e., restaurants, entertainment, etc.)

Capacity for Change

The development of a purchase planning process will require dedication of department leadership to provide the infrastructure to support this effort. The successful implementation of a purchase planning process would require the existence of an inventory management system that accurately and easily reflects levels of suppliers and property (discussed later). Armed with this information, procurement and field managers could work together to establish realistic lead times necessary to replenish goods and ensure maintenance of minimum levels. The supporting technology (bar code systems, inventory tracking databases) and their costs and benefits will be covered in other areas of this report.

The concept of using procurement cards has been under discussion for some time in the District. FEMS managers have also already researched using procurement cards. The development of policies and procedures to effectively manage use of this purchase vehicle is a vital prerequisite to FEMS use of these cards. The departmental financial management should identify vendors (including lending institutions with established relationships).

Priority Status – Level 1 (Critical/Highly Urgent)

Work Plan

Within 3 months:	Develop policies and identify number of users
Within 4 months:	Identify vendor for procurement card
Within 6 months:	Negotiate fees with potential card issuers

Management Improvement Project 6: Obtain Key Procurement Expertise

Identification of Issue

The current staff workload eliminates the possibility of providing real value-added activities such as monitoring spending levels in blanket purchase orders. Gaining contracting authority was well received and is seen by the Department as necessary for successful management of their purchasing activities. But with the new authority came new responsibilities and increased workload without real direction in the form of an experienced contracts manager or training for current staff. The workload problems are exacerbated by a lack of supporting technology (i.e., WAN, E-mail, electronic forms) which would reduce the vast amount of time procurement staff spend moving paper and making telephone calls at different stages of the purchasing process.

A key problem we have identified is the need for additional staff. This is not just a case to support "throwing another body" into the office to combat workload. The current staff of three FTEs was already tasked with all small purchasing activity before contracting authority was given to FEMS on August 29, 1997. Additionally, the Supervisory Contract Specialist has property officer responsibilities. No authorization (or funding) for a Procurement Officer position exists. An opportunity exists in having the newly acquired Procurement Officer and the present procurement team work together and learn from each other to begin to turn things around quickly.

Suggested Improvement Project

There are two alternatives to gain the necessary senior procurement leadership and expertise.

In the short term: Temporary detail of procurement manager from CPO (Central Procurement Office) to provide contract management experience to process new $500,000 authority for FEMS.

Or assign temporary management of contracting authority to GSA for a period of 90 –120 days, to give the department depth of experience to manage this new authority. The precedent was established by the MPD financial management leadership, who

temporarily outsourced contract management to the GSA to allow staff time to eliminate backlog of actions working their way through the system.

In the longer term: hire a Procurement Officer for FEMS with strong contract management, small purchase, and excellent communication skills – preferably with prior experience in military organizations. Staff at every level of the department made it clear that there was a need to hire an experienced contracts professional that could lead the procurement team in their new responsibilities. However, there is no existing authority or funding for this position.

The new expert, if not existing staff, needs to clarify whether the Department can spend its $500,000 new authority for emergency repairs, etc. There is confusion and an impact on morale from all the confusion and appearance of low expertise of the reality of not being able to clear logjams on critical purchases and repairs.

Costs and Benefits

Costs – For detailing employees, there are no additional costs to the District, as the employee costs are already exist and are planned for.

In the short term, the alternative to use GSA would incur procurement management costs based on a lump sum payment, or payments by contract to GSA, based on time estimation to process contracts. Costs would depend on types of contracts processed and volume.

In the long run, the cost of hiring a Procurement Officer is as follows:
Direct Costs – Competitive salary, benefits and infrastructure (Office, Technology) GS 13 or 14 plus 33 percent benefit costs.

GS 13 – $46,421 – $59,822
GS 14 – $54,858 – $70,698

Indirect Costs – Administrative process to develop this position, acquire authority and funding, identify candidates, interview and select candidate, physical space and technology.

Benefits – Fills void in contracts management leadership and provides new insights to develop process improvements in FEMS, reduce major roadblocks to delivery of emergency services, increasing safety of employee through purchasing protective equipment and fixing their facilities.

Capacity for Change

The process of detailing employees is seen as a "band-aid" approach to resolving staffing shortages. However, there are many benefits of bringing in detailed staff instead of going through the process of creating new positions, securing funding, and finding viable candidates. District employees bring institutional knowledge, probable past agency experience, possible established working relationships with current staff, and central procurement operation experience valuable in developing local agency process improvements.

Temporary management of procurement activities may be seen as a threat to maintaining authority or current staff and may have a negative impact on already damaged morale.

The department cannot simply hire a procurement officer as there is no authority for the FTE. The Chief has identified the procurement process as a priority to improve operations department-wide; his support will be crucial to working through the process to create this position.

Priority Status – Level 1 (Highly Urgent/Critical)

Work Plan

ASAP: Action Steps

	Establish contact with GSA
Within 1 month:	GSA temporarily begins management of contracts
	Work with OCFO Mission Support and "The Authority"
	to identify qualified candidates to lead this function
Within 3 months:	Hire (or Detail) Procurement Officer
	Training for current FTEs in contract management
Within 4-6 months:	GSA returns process, in phases, to staff

Office of Judicial Affairs

Management Improvement Project 7: Fill the Vacant Attorney Advisor Position – "Quick Fix"

Identification of Issue

The Department leadership must have the benefit of legal counsel in establishing department and employee relation policies and direction. The Attorney Advisor position (the Office of Judicial Affairs) is vacant; this position has been advertised and open since April 16, 1997.

The position as advertised requires only one year of specialized experience, court order compliance monitoring, facilitation experience, and District of Columbia bar certification. The salary, which starts at $54,858, is competitive and even slightly higher than sample Federal positions open for attorneys with one-year experience – the Federal range was GS 11 – GS 13 where the range is $38,000 – $71,017. There is some justification for the higher level of salary with the kinds of responsibilities required of the proposed Attorney Advisor. However, there should be some consideration given to increasing the amount of experience required, to ensure the candidates are equipped with the level of experience and expertise necessary to contribute to the development of policies that will best serve the Department.

Suggested Improvement Project

Seek out new resources to recruit candidates to fill the Attorney Advisor vacancy.

If recruiting continues to be unsatisfactory, consider the alternative of working with Corporation Counsel to develop liaison with DCFEMS or detail an attorney to assist DCFEMS in judicial affairs.

Cost and Benefits

Costs – Already in budget; no incremental cost. Salary for the Attorney Advisor:

Attorney Advisor	Starting Range	Mid-Range	Ending Range
Salary	$54,858	$61,898	$70,598

Benefits – The Advisor will provide counsel on matters of controversial or confidential nature that may result in court intervention including EEO matters, grievances, affirmative action, sexual harassment, union negotiations. Advisor will ensure department compliance with new and pending legislation. These are all necessary steps to make a more proactive department.

Capacity for Change

The Department has already committed resources to the idea, the only thing left to accomplish is to find a viable candidate or some other resource (detail) to meet this need.

Priority Status: Level 2 (Urgent)

Work Plan

Do within three months.

Office of the Chief Financial Advisor

This key function includes budgeting and procurement, both of which are major problem areas.

Management Improvement Project 8: Improve the Departmental Budgetary System, and Create Divisional Budget

Identification of Issue

A better budgeting system is needed. Each area in the department needs to have a budget for its personnel, equipment, maintenance, and overtime. The budget for an area can be an earmarked part of another unit's budget; however, managers need information on their total budget and an understanding of the costs associated with different functions. A lack of confidence was expressed in many parts of the Department with respect to the quality of the budgeting process.

The current staffing is totally inadequate to establish and maintain a viable budgetary function. Currently there is one Budget Analyst (DS-11), within the Fire and Emergency Medical Services Department. The position reports to the Chief Financial Officer. In addition to budget responsibilities, the position also has position control responsibilities and performs personnel services analysis (i.e. tracking overtime and detailed personnel).

Suggested Improvement Project

As a minimum, an additional four positions need to be established and filled. These would include:

1. Budget Analyst, DS-12
2. Accountant, DS-12
3. Accounts Payable Technician, DS-9
4. Administrative Assistant, DS-7

Costs and Benefits

Costs –

Quantity	Job Title	Grade	Annual Base	Total with Benefits (33%)
1	Budget Analyst	DS-12	$39,045	$51,930
1	Accountant	DS-12	$39,045	$51,930
1	Accounts Payable Technician	DS-9	$27,018	$35,930
1	Administrative Assistant	DS-7	$22,285	$29,640
Total				**$169,430**

Benefits – The addition of the recommended staff would establish the needed infrastructure for a viable budgeting function within the department. Current conditions are an impediment to smooth operation within each of the departments sections. Each manager needs an accurate operating budget and timely expenditure feedback. The ability to track this information is an essential ingredient of management and directly related an effective versus ineffective manager.

Capacity for Change

The department Chief Financial Officer is aware of the process problem. He believes the recommended additional staff will provide the necessary resources to accomplish the mission.

Priority Status: Level 2 (Urgent)

Work Plan

Within 3 months:	– Establish position description and start recruiting
Within 6 months:	– Hire one of key positions (budget analyst or accountant)
Within 12 months:	– Hire all positions

Office of the Administrator

No recommendations at this time. The issues brought up in Task 1 have been addressed under other headings.

Community Relations

The major recommendations here are to institute a stronger PIO function, to explain the actions of the department to the community, and to institute a community-based fire prevention program, as will be discussed in the next chapter (Public Education part of Prevention).

CHAPTER 3 – FIRE PREVENTION

This chapter addresses management reforms and improvement projects for all fire prevention functions.

Management and Administration of Division

Prevention Project 1: Reform Overall Prevention Management, Budgeting, and Performance Measurement – "Quick Fix"

Identification of Issue

D.C. has a fire death rate 60 percent above the national average. The prevention staff is undersized for the job. D.C. has a higher "client difficulty" than the national average because of the larger percent of families at or below the poverty line. Part of the building stock – Federal buildings – is not under the DCFEMS control.

There are many proven prevention programs not being implemented. Most fire victims are dead or dying before the fire service arrives. The resources needed for making a major difference in prevention are much less than adding one engine company to suppression forces. THIS IS A HIGH LEVERAGE OPPORTUNITY.

Suggested Improvement Project

The high D.C. fire death rate is affected by many factors, none more than the prevention program. To make inroads on reducing the fire death rate requires a stronger fire prevention effort and includes the following elements:

1. A strong, targeted public fire safety education program with two new public educators added, plus materials.
2. Inspections of all priority structures falling under code, on an annual basis.
3. Increasing the expertise available for review of fire protection plans for new buildings.
4. Encouragement of developers to sprinkler buildings

5. Establishment of a juvenile firesetter program.
6. A strong arson prevention and control program with police powers and training for arson investigation
7. High level management attention to prevention
8. Strong media relations to allow placement of PSAs, stories featuring prevention, and prevention input into stories
9. Elevated recognition for prevention "heroes."
10. Tracking and evaluation of the prevention program.

Items 1-6 are detailed as separate improvement projects, below. This Prevention Project 1 addresses the overall management of prevention, and items 7-10 above.

To improve the management of prevention, we recommend the following steps:

A. Remove the Fire Prevention Bureau from the Operations Division, and give it Division Status, reporting to the Fire Chief directly. (The level of the Fire Marshal position does not necessarily have to change.) Give Fire Prevention its own budget, including prevention materials, vehicles, etc.

B. Direct the Fire Chief to monitor prevention plans and results monthly, and to distribute results throughout the department and to the media.

Direct the Fire Chief to develop an estimate of the total cost of fire to D.C. It is probably 5-10 times direct losses. Methodology exists for making at least rough estimates. This is important for getting the public's (and congressional) attention to the magnitude of the problem.[1]

C. Strengthen the Public Information Officer function to include placement of PSAs, stories featuring prevention and prevention input to stories.

[1] See "Total Cost of Fire in Canada," TriData Report to the National Research Council of Canada for the latest methodology.

D. Start a dialog with community groups as to their knowledge of fire prevention (and other Fire and EMS services). (See public education section below for more details.)

E. Elevate recognition for prevention "heroes." Present awards for prevention achievements. Attempt to get D.C. recognized as an NFPA "Champion" in prevention education.

F. Regularly track prevention results with quantitative measures such as: fire incidence, deaths, injuries and dollar loss by occupancy type and ward; inspection outreach; plans review "response times"; arson clearance rates; and other performance measures.

G. There is a lack of a minimum acceptable level of clerical support in prevention. There is only one clerical position (not including the receptionist) to perform all of the normal administrative duties associated with a division of 59 personnel, including data entry needs. This lack of personnel causes fire inspection and fire investigation personnel to spend over 20 percent of their time not performing operational duties, e.g., fire inspection, fire investigations. A clerical position should be added to the Prevention Division.

H. A complete local area network (LAN) system should be developed for the Division utilizing state of the art Pentium computers (at work stations) previously noted in this section. These work stations should have the following features: inter and intra (to other regulatory inspection agencies), E-mail, FAX, document scanning, database (Paradox) and word processing. Computers at the Investigation Section should be modem- equipped for communication capability to Fire Prevention Division. After the Investigation Section receives certification as a criminal justice agency, it should have computer access to MPDC, FBI, NCIC (National Crime Information Computer), and the WALES (Washington Area Law Enforcement System), as well as access to motor vehicle, and tax/land records databases.

Costs and Benefits

Costs – Most of the above management steps should be handled within the existing budget. The exceptions are a once-in-ten-year study of total costs, which should cost about $40K (or could be done as part of the implementation phase of this project); and one clerical position @ $21K + 33% = $28K. The other out-of-pocket costs for improving prevention are described in the management reforms below.

Benefits – Better management and tracking of the prevention functions that have the most leverage over reducing fire casualties and losses going into the future.

Capacity for Change

No problems (except perhaps for lack of an in-house analyst to do the total-cost-of-fire study.)

Priority Status – Level 3 (Important)

Candidate for "Quick Fix"

Work Plan

Immediate and ongoing:
Monitor prevention plans
Develop community dialog
Recognize prevention achievements by staff

Within three months:
Change the fire prevention organization chart to be part of a larger fire department organization realignment. Give prevention its own budget starting with beginning of the fiscal year.

Within one year:
Track prevention performance measures: at least quarterly presentation of results. Data exists to start at once.

Public Safety Education

Prevention Project 2: Increase Public Fire Safety Education; Start Community-based Prevention Program

Identification of Issue

There is no systematic, proactive fire safety education program; the fire death rate per capita is 60 percent above the national average. Impediments are a) only one public fire educator full-time, b) lack of visibility or emphasis on prevention.

Suggested Improvement Project

A. Increase number of public fire educators from 1 to 3. If there are no people within the department with high interest, special talent, or appropriate background (e.g., school teacher, human relations), hire civilians.

B. Develop a targeted public education outreach program, based on the Department's NFIRS data. Focus on highest causes in residential occupancies. Determine whether the magnitude or nature of the fire problem varies by ward; if so tailor program to ward. Reach close to 100 percent of schoolchildren several times during their elementary school career (e.g., in K, 3rd, 5th grades. Consider fire prevention materials available from many sources.

C. Get each shift of each fire company to "adopt" 1-2 schools in their first-due area. Visit each school at least once per year (could do inspections and run a public education assembly on same visit).

D. Obtain prevention materials for use in schools. (Solicit free materials, donations for purchasing materials; buy the rest.)

E. Develop a community-based public fire education program for highest risk areas. See Baltimore for an example.[2] The basic steps are to identify the areas, run focus groups of citizens living in the areas to identify how they get their information, and what sources they trust; then run a door-to-door campaign using members of the community and the fire department. (This approach has been successful in many cities; we are instructors in it.) The focus groups can be run with in-house talent or with professional focus group facilitators.

F. Give school children an annual homework assignment to have their family count and test their detectors, and report the results to school. This yields key data overnight, at virtually zero cost and little preparation time.

Cost and Benefits

Costs –

Two civilian public fire educators @ $35K	$91K (including 33% benefits)
Prevention materials budget increase	$10K
Consultant to design and run 3 focus groups (one with neighborhood leaders, two with citizens of the neighborhood).	$9K
Detectors for highest risk homes 2000 @$9	$18K
Batteries if not donated for 5000 homes @$3 per battery	$15K
Total	$152K

Benefits – Reach 100 percent of schoolchildren with fire safety information, a significant fraction of elderly, and others. Increase use and maintenance of detectors in highest risk areas. Reduce death rate by at least 10 percent. If one death per year was

[2] The step-by-step process was documented in a project that started at TriData, and was ultimately published as "Community-Based Fire Safety Education Handbook," Rossomando & Associates, Washington, D.C. Also distributed by the National Association of State Fire Marshals.

saved (let alone a reduction in injuries and fire damage), "savings" is $2M, over a ten-fold return on the investment (in crude cost-benefit terms.[3]

Capacity for Change

No problem other than, perhaps, a need to encourage truck and engine companies to participate. The very busiest companies areas might be excused, though their visits could be scheduled for daytime hours with the lowest probability of calls.

Priority Status – Level 1 (Most urgent/critical)

Work Plan

See steps A-F above. Accomplish within one year.

Prevention Project 2: Develop Training Program for Prevention Division Staff – "Quick Fix"

Identification of Issue

The lack of a formal training program in the Fire Prevention Division reduces staff capability.

Suggested Improvement Project

Schedule Prevention Division staff for the following annual training:

A. *Inspectors* – Fire Academy Training and University of Maryland Fire Rescue Training Institute "Short Course for Fire Inspectors."
B. *Investigators* – Maryland/District of Columbia International Association of Arson Investigators, and Maryland Arson Investigators Annual Seminars.

Develop mandatory prevention staff training in-house at least on a monthly basis. The curriculum for inspection should be an ongoing review of the District of Columbia

[3] A life is valued at $2M in many cost benefit studies.

Fire Code and its references and the fire-related sections of Building Officials Code of America (BOCA) building code. The investigators should review NFPA #921 guidelines for fire investigation.

Division training sessions should be videotaped for playback to shift personnel absent at the actual session. The training should be coordinated with the Training Division so employee records are updated are maintained at the department level.

Costs and Benefits

Costs – VCR recording equipment - VCR camera and associated equipment = $ 1,000, Seminar/conference costs (58 personnel @ $300 each) $17,400

Total $18,400

Benefit – More competent inspectors and investigators, with reduced liability because of standardized training.

Capacity for Change

No problem foreseen other than need to schedule them.

Priority Status : Level 2 (Urgent)

Work Plan

Video equipment may take a year to procure. Seminars and training should be planned a year ahead.

Code Enforcement/Fire Inspections

Prevention Project 4: Increase Number of Building Inspections

At least three-quarters of the buildings in D.C. are not inspected annually as they should be. [4] The main impediment is too few inspectors for the workload, rather than inefficiencies of the inspectors. The extra loading (and publicity) coming from having to inspect schools for physical repair unrelated to fire safety, as a result of a court order, deepened the inspection deficit. The busyness of the line companies makes it more difficult to get them to take on much of the burden.

Suggested Improvement Project:

To increase inspection hours, use a threefold approach of a) increasing inspection efficiency through EMS, b) getting line fire companies to do more inspections, and c) adding four inspectors.

Personnel assigned to the Fire Prevention Division currently conduct in excess of 25,000 inspections annually. These include approximately 9,000 existing building maintenance inspections (done to ensure that code required fire protection requirements are in place and function). However, to ensure that the most important 3000 buildings are inspected annually and one-third of the rest each year, each company (engine & ladder) must, on a regular basis, perform an inspection of the less complex occupancies other single-family homes (which cannot be inspected except on a voluntary basis) in their first-due response area.

At the present time, seven inspectors are assigned to court mandated semi-annual public school inspections (20 percent of available divisional personnel). Normally only two inspectors are assigned to conduct annual school fire safety inspections. This diversion of inspectional hours away from other occupancies will have an immediate and long term adverse affect on fire safety compliance. It is recommended that since the Superior Court Judge overseeing the court order on school fire code deficiencies has determined that the majority of public schools are presently code compliant (as evidenced by the opening of public schools for the current school year), the seven temporarily assigned divisional inspection personnel can now be placed back in their normal duty assignment conducting inspections in other occupancies, and inspections for compliance

[4] See District of Columbia Fire Code Section F-107.1) and Article 18, District of Columbia Fire Department. (See Appendix 1.)

with the pending EPA underground tank rules and regulations. The combined inspectional activities of full time fire prevention division personnel and the fire station inspection program will greatly enhance the department's inspection capability.

Table 3-1. Investigation Shortfall and Solution

Buildings	Total Buildings in D.C.	342,475
	Single-family	-239,449
	Federal	-4,026
	Inspectable buildings	99,000

Inspection Capabilities		
27 current inspectors	16,649	(current # of buildings inspected.)
8 supervisors	2,464	(potential from supervision)
7 returned from schools	4,312	(potential from current 7 inspectors assigned to schools by Court)
2 reassigned from plans review	1,232	
44 inspectors total	24,657	(minimum workload expected from existing personnel)
Firefighting companies	7,488	(48 cos. @ 3 per wk x 52 wks.)
Hire 4 new inspectors	2,464	
Net Efficiency Increase	400	
Total Inspection Capability	35,000	

Inspections needed per year	
-- Occupancies that must be inspected annually (schools, hospitals, nursing homes, department stores, high-rises, etc.)	3,000
-- 1/3 x 96,000 (inspect other buildings once every three years)	32,000
	35,000

If this is not done, then the DCFEMS budget needs to be increased further to pay for the shortfall of inspections, or the goals for inspections and public safety need to be reduced.

It is further recommended that after one year, the effectiveness of the new combined inspectional program be re-evaluated to determine if an acceptable number of

occupancies are being inspected annually. If not, more inspectors may have to be added, or inspection frequency goals revised downward.

The goal for an inspector's administrative time in the office should be less than one hour per day. The will increase time for the delivery of inspection services in the field. It will allow more quality time for analyzing structures for code compliance, and a higher number of inspections completed. To meet this goal will require the infusion of new computer hardware and software to streamline the Division's administrative support capabilities, e.g., office machines, computer support, and in both the near- and long-term.

The Fire Department, in association with the District of Columbia Department of Regulatory Affairs, should establish a computerized system which the public can use (via the telephone) to schedule an inspection and obtain the status, e.g. (pending, approved,) on a real time basis. Such systems are presently in use in other jurisdictions, and have proven to be cost effective. This item is desirable, but less pressing than the above needs. All computers should be configured on a "Local Area Network" (LAN) within the Prevention Division to enable E-mail, etc.

Costs and Benefits

Costs – Equipment needed:

A. Laser printer 2 @ $600 = $1,200

B. Photocopy machines (2 @ $1000 = $2,000

Note: Two printers and copiers are required as office operations are on two separate floors.

C. Pentium computers, 200 MMX (5) @ $2200 = $11,000

For the areas listed below:

1. Public service counter
2. Geographical Inspection section
3. Technical Inspection Station
4. Investigations

5. Inspections

Automated inspection program software $ 5,000

Hand-held mini computers for field inspection data entry 40 @ $ 1,500 = $60,000

(for 36 inspectors, 4 Sergeants)

One time hardware cost $79,200

Four entry level inspectors @ $32K plus 33 % benefits = $170,000

Currently there are 46 firefighter/inspector positions with average salary level of $37,625 (3 year step) or a total of $1.7 million. Adding "pro-pay" of 10 percent to professionalize the inspector would cost an additional $170,000. However, setting this as a precedent could cost more, if other skills had to have a similar adjustment.

Benefits – The prime benefit is going from inspecting less than 20 percent of all occupancies to inspecting 35 percent (over 3,000 annually and the rest at least once every three years). Inspections reduce property losses and increase life safety; no one can quantify the estimated reduction in a credible manner with the current state of the art.

Capacity for Change

In most cities there is reluctance on the part of line companies to do inspections but they do them. It requires leadership from the Battalion Chiefs. It also requires providing the companies with easy to fill out inspection forms, and providing company officers with in-service training on the basics of an inspection.

Also, the present selection process for technical inspector assignments to the Fire Investigations and/or technical section is not conducive to recruitment and selection of the best qualified candidates to fill these positions. The present promotional process is based on length of Fire Department service and the numerical test score. Fire department management cannot use other criteria to evaluate candidates, such as engineering degrees or prior law enforcement experience.

It will be desirable to amend the selection process to allow more comprehensive selection criteria to be factored in as a part of assignment. It is recommended that these positions be a lateral assignment where a firefighter is assigned as a Fire Inspector or Fire Investigator at the entry level. Promotions beyond the entry level (of firefighter), e.g., sergeant, lieutenant, would follow the present Fire Department promotional process.

Further, consideration should be given to providing a "pro-pay" differential salary increase (10 percent) for technical assignment. It would no longer be a promotion; a bonus for "Specialty Skill" would be provided. If this is considered, it is also necessary to consider similar salary differential for skills in all other areas of the department, as a matter of equity. This would require a change in the negotiated contract, or a sidebar agreement between the Fire Department and the union.

Another "capacity" problem is that the Fire Inspectors (and Fire Investigators) currently are not certified to the National Professional Qualification Standard's "NFPA #1031 and #1033" (Fire Inspector, Fire Investigator).

The Fire Department should adopt these standards, and immediately evaluate all assigned personnel as to their compliance with them. For those that qualify, initiate the certification application to the appropriate certification body. Those who cannot qualify should be given a prescribed time to achieve certification. Certification should be a required prerequisite to pro-pay. The standards and appropriate certifications should be coordinated within the Training Division, which will become a National Certifying Academy. The added cost for doing this is minor; the certification application fee for all existing divisional operational personnel would be 54 applications @ $25.00, or a total of $1,350.

As part of the change, revise monthly divisional activity reports to reflect the following elements:

- Fire inspections completed versus number targeted, by inspector and by line company
- Total time from date of request to initial inspection (broken down by type of inspection), in order that average response time is measured for each type of inspection. Note that only some inspections are requested; this measure is not needed for the bulk of inspections, which are prescribed.

Priority Status: Level - 2 (Urgent)

Work Plan

Within 3 months:	– Set new inspection goals for line companies – Develop inspection training for line officers – Purchase MIS hardware
Within 6 months:	– Start new inspection management performance measurement – Integrate MIS into a LAN – Start more intensive company inspection program – Hire 4 new inspectors
Within 12 months:	– Evaluate first 6 months of revised inspection program. Iterate staffing or revise goals, as necessary. – Negotiate “pro-pay” for inspection – Start certification of inspectors
Within 36 months:	– Certify all inspectors

Prevention Project 5: Provide for Updating of Codes – "Quick Fix"

Identification of Issue

The District of Columbia Fire Code has no provision for adoption of the latest edition of a nationally recognized fire code. Builders/developers are sometimes confused over which codes are in effect, and what they have to comply with.

Suggested Improvement Project

Amend the D.C. fire code to automatically reference the latest edition of applicable codes and standards which are referenced in the Fire Code, e.g., "National Fire Protection Association Standards" (NFPA) and the Building Official Code of America (BOCA) fire code.

Cost and Benefits

Cost – Annually revised NFPA Code membership is $450. Revised code books for inspection field use (e.g., Life Safety Code #101) at $550; total = $1,000.

Benefit – Less confusion for developers and inspectors, and a more up to date code, which increases fire safety.

Capacity for Change

The Financial Control Board must approve the legislative request, and the City Council must approve the enabling legislation.

Priority Status - Level 4 (Desirable)

This can be a "quick fix."

Work Plan

Can be started immediately by submitting code amendment.

Prevention Project 6: Establish Evening Hour Inspection Program for Places of Public Assembly – "Quick Fix"

Identification of Issue

Lack of a regular evening hour inspection program for places of public assembly and alcohol beverage control occupancies, which have greater potential for high loss of life fires due to occupancy load and nature of activities in the business.

Suggested Improvement Project

Immediately establish a program to regularly inspect, without announcement, public assembly and ABC occupancies. Some fire inspectors should be assigned to work a regular evening shift, possibly 7:00 p.m. to 3:00 a.m., to provide coverage when such occupancies are approaching their maximum occupancy limits (posted capacity). This will help ensure that high-risk loss of life occupancies are code compliant with regard to such critical fire protection features as fire exit doors and sprinkler systems. Divide the city in half for coverage, and use two two-person platoons.

Costs and Benefits

Costs – N/A - Use existing personnel.

Benefits – Reduction in risk in high risk public assembly occupancies. Prevent D.C. from having a New York City Happyland-type nightclub disaster.

Capacity for Change

Reallocation of existing personnel to unaccustomed night shifts is likely to draw resistance.

Priority Status: Level - 1 (Most Urgent, Critical)

This is a candidate for "quick fix" which can be implemented within the department.

Work Plan

Within 1 month:	Plan for reassignment
Within 2 months:	Make assignments
Within 6 months:	Rotate inspectors assigned to evening or replace with the proposed new hires.

Plans Review

Prevention Project 7: Add Engineering Competence to Plans Review

Identification of Issue

D.C. needs enhanced engineering competence for reviewing new building plans that contain complex fire protection systems. Such fire protection systems should be encouraged as the best investment for long-term fire safety, but they need to be properly designed and maintained.

Suggested Improvement Project

Two new civilian positions of Fire Protection Engineer (college graduates with technical degrees) should be created for the Fire Prevention Division to perform complex building and fire protection system reviews. The engineers could be assisted by one of the three presently assigned fire inspectors, who would perform basic reviews that do not need engineering expertise. The other two Fire Inspector positions presently assigned should be re-allocated to the inspection section.

Consumer and Regulatory Affairs Department officials and the Fire Marshal should meet to re-establish clear roles and responsibilities for each entity with respect to the review of plans. Improved ongoing dialogue should be established between the Fire Department and the CRA Department. Personnel should be carefully selected for long

term tenure at the Section. They should receive formal classroom training to augment their on-the-job training.

Costs and Benefits

Cost – Two fire protection engineer positions @ $40,000 + 33% = $106,000. One might be more senior than the other, with this as an average.

Benefits – This will increase the quality of engineering reviews, and their timeliness. An engineer generally is more efficient and will require a smaller number of supplemental reviews before approval. The time to review a plan should decrease, and the number of revisions required from builders should decrease, both of which are sources of complaints today. Some reviews might increase in duration due to the greater knowledge of the engineers knowing what to look for, and finding more problems, but that is in the best interest of the public.

Capacity for Change

The Personnel Office will have to develop a new job classification and recruit engineers for the first time. Based on past problems in developing PDs, delays can be expected.

Priority Level: 3 (Important)

Work Plan

Within 3 months:	Start collecting better performance data on time to review plans, and the complaints and number of reviews per plan, as a baseline. Continue at least annually.
Within 6 months:	Develop Position Descriptions
Within 12 months:	Recruit and start up at least one engineer
Within 36 months:	Recruit and start up second engineer

Prevention Project 8: Purchase Vehicles for Inspectors and Investigators

Identification of Issue

Most fire inspectors and other prevention staff are forced to use public transportation. There are only 15 vehicles for 50 people. Public transportation is often not practicable or timely; therefore, private vehicles are routinely used by prevention staff to conduct official fire department business, causing potential personnel and government liability exposure.

Suggested Improvement Project

Purchase a larger inspection and prevention vehicle fleet, as is done by most other cities.

An analysis should be done to determine the minimum number of government owned vehicles necessary to provide transportation for conducting Prevention Division business. The vehicles should be procured through the Fire Department or other government agencies. As a last resort, consider using surplus city or U.S. government vehicles, until such time as new or newer vehicles can be allocated. The vehicles should be equipped for full emergency response capability so they can be used as needed by the Fire Department at time of major disasters, terrorism events, etc.

Cost and Benefits

Cost – The cost for an estimated 20 additional automobiles @ $18,000 each, is $368,000. Phasing this in over three years would require $123,000 per year added to the capital budget, plus some increase in operating expenses for vehicle maintenance and fuel. This estimate includes emergency response equipment, i.e., siren, lights, radio.

Benefit – The benefit is increased efficiency and safety for the inspectors, increasing the number of inspections per day, and reducing the number of inspectors needed. It also allows inspections to continue in bad weather, when bus service is disrupted.

Capacity for Change

No barriers foreseen. Inspectors would have to have drivers licenses, but not their own (private) vehicles.

Priority Status: Level 2 (Urgent)

Work Plan

Phase in over three years; replace fleet as needed.

Fire and Arson Investigation

Prevention Project 9: Increase Effectiveness of Arson Investigation by Giving Arson Investigators Police Powers and Training and Improving Support Services, and Making Changes in Management.

Identification of Issue

The fire/arson investigation unit is not adequately addressing the city's arson investigation needs, as evidenced by the low arson case closure rate of 10 percent. The present hand-off once the fire investigators determine that a fire is incendiary to the Metropolitan Police Department takes over the criminal investigation, including identification, location, arrest, and prosecution of arson offenders, which has not been satisfactory over at least the past five years. Recommendations made by a TriData/USFA consultant study of D.C.'s arson unit dating back five years need to be addressed.

Suggested Improvement Project

The United States Attorney for the District of Columbia has formally requested that an "Arson Investigation Unit" be established in the District of Columbia Fire Department and that the appropriate laws be enacted to grant police powers to investigators. We concur. The U.S. Attorney has also requested that the Metropolitan Police Department provide the necessary law enforcement training to Fire Department personnel as soon as possible.

1. It is strongly recommended that the Fire Investigation Section of the Fire Department be granted complete law enforcement authority, including the power of arrest, for the limited and express purpose of the investigation of fire-related crimes, including arson fires, and that the Metropolitan Police Department Homicide Division continue to be the lead agency only on fire-related deaths.

2. All present and future fire department personnel, before assignment to the fire investigation section, should receive a complete background investigation, including a criminal history check and psychological screening criteria based on the law enforcement profession.

3. The Fire Investigators need police training. Apparently an agreement has already been concluded with the Police Department to do this at the police academy.

4. During the period of transition to law enforcement agency status, the fire department should utilize the investigative and forensic services of the U.S. Treasury's Bureau of Alcohol, Tobacco and Firearms (ATF), which has committed itself to assist the Fire Department. Implementation of a joint DCFEMS/ATF Task Force to investigate fires in the District of Columbia will provide the following:

    - On-scene fire cause and origin assistance, as needed, by ATF certified fire investigators
    - Arson investigation training for fire department fire investigators
    - Direct forensic laboratory support (accellerant analysis)
    - Direct criminal analyst support (fraud motive and link analysis)

Even after training, ATF resources should continue to be tapped as feasible. To establish this support, there needs to be a Memorandum of Agreement (MOA) between the District of Columbia Fire Department and the Bureau of Alcohol, Tobacco, and Firearms (BATF). BATF has advised that it would commit up to 12 fire investigators during the transition period, and step down the resource commitment as the Fire Investigation Section's law enforcement proficiency is increased. The Bureau of Alcohol, Tobacco and Firearms has indicated that it fully supports police power

authorization for fire investigation personnel who have passed the necessary police background investigation and received the necessary training.

4. Improve Fire Investigation Section management and case management by doing the following:
    - The Section Supervisor position should be a long term assignment to provide continuity of command. In the past there has been too much turnover in this position.
    - The supervisor should be housed at the Fire Investigation Section Office at Engine Company 24. The supervisor needs to be present to provide basic personnel supervision and case management.
    - All investigation section operating procedures need to be memorialized in a Standard Operating Procedure book. This is essential to provide a guide for existing and newly assigned personnel.
    - An improved, category-based reporting system needs to be implemented. This will provide comprehensive, well-written case investigation reports.
    - An arson profiling system should be utilized. This database will provide readily available data such as M.O., sociological, and geographical information to help identify suspects in arson cases.
    - Investigations generally should follow the guidelines set forth in NFPA #921 - Fire Investigations Guidelines, 1995 Edition, including but not limited to the following:
        - Photographing all fire scenes
        - Sketching all fire scenes
        - Collection and preservation of evidence
        - Secure evidence and proper chain of custody. A physically secure evidence holding area large enough to hold appliances needs to be established. It should have a monitored alarm system and it should be equipped with explosion proof lights and exhaust. Engine Company 28 can monitor the alarm.
    - An Arson Incident Management System (AIMS) needs to be utilized to track patterns of arson and potential arson targets, e.g., vacant structures.

- An investigative case prioritization system needs to be utilized to determine what cases have the most solvability, based on a set of proven criteria such as the "Aurora System."
- The response criteria for fire investigation callout needs to be re-evaluated. The present criteria requires investigators to be called out on any fire with an estimated fire loss of $10,000. This is causing unnecessary investigative responses, and impacts negatively on case follow-up.
- The Investigations Section authorized staffing level is not being maintained for extended time periods. This is causing strains on section personnel and section productivity.
- Compliance with the extended sick leave provision of Vice Technician (temporary technician) for slots vacated over 60 days should be required.

The USFA Arson Technical Management Report to the District of Columbia, in 1992, made many of the above same recommendations.

Costs and Benefits

Cost – The following equipment will need to be purchased for 10 investigators, with one spare for each.

Handguns	11 @ $400	=	$4,400
Handcuffs	11 @ $25	=	$ 275
Bullet Proof Vests	11 @ $200	=	$2,200
Shield/Badges	11 @ $40	=	$ 440
Evidence Storage Box	1 @ $2,000	=	$2,000
		Total	$9,315

The cost of software and time to implement remains to be estimated.

Benefits – The benefit is increased chances for successful investigation, leading to a higher arson clearance rate, fewer arsons, and increased safety for investigators (relative to their going unarmed).

Capacity for Change

Greatly desired change long overdue.

Priority Status: Level 1 (Most Urgent/Critical)

Work Plan

Within 3 months:

- Have all investigators that pass background and psychological screening checks start investigator training at police powers
- Start investigator training at police academy
- Get agreements in writing from ATF and police

Within 6 months:	– Procure investigator equipment, to be available upon completion of their training
Within 12 months:	– All investigators who satisfactorily complete police academy training be given police powers

Prevention Project 10: Establish a Juvenile Firesetter Counseling Program – "Quick Fix"

Identification of Issue

There needs to be a Juvenile Firesetter program established for the city. While the District of Columbia's juvenile firesetting problem has not been adequately quantified (it should be), it is known to be serious, especially in economically depressed and low-income areas.

Suggested Improvement Project

Modern fire prevention approaches include the establishment of a formal Juvenile Firesetter Counseling program. To the Department's credit, this gap has been recognized and assistance has recently been obtained from the U.S. Fire Administration to organize a Juvenile Firesetter counseling workshop in the Fall, involving members of various city departments. References of juveniles to the programs must come from social agencies, health agencies, and schools as well as from parents and public safety. A Juvenile Firesetter Program is a critical element in reducing both intentionally set fires by juveniles and fires set by "curious kids." A FTE in prevention should be added to coordinate and develop this program.

Costs and Benefits

Cost – Employee salary $33,930 + benefits = $45,000

Benefit – A juvenile firesetter program is a critical element in reducing both intentionally set fires by juveniles and fires set by "curious kids." Such programs have proven to dramatically reduce recidivism among juvenile firesetters. It is important to nip juvenile firesetting in the bud as it has been shown to be a precursor to life as a professional criminal. Many serial killers have histories of starting as juvenile firesetters.

Capacity for Change

This program should report through Fire Prevention Public Safety Education unit and work closely with fire investigators and the Juvenile Court System. The position could be uniformed or civilian.

To do this requires approval of the following agencies:

1. Corporation Council Office - legal review
2. Metropolitan Police department - training of personnel
3. City Council - legislative approval
4. Financial Control Board - concept approval
5. Bureau of Alcohol, Tobacco, and Firearms - investigative and training support.

Priority Status: Level 1 (Most Urgent/Critical)

Work Plan

Within 1 month	– Hold U.S. Fire Administration workshop
Within 3 months	– Establish plan for formal counseling program
Within 6 months	– Implement plan
Within 12 months	– Hire/select juvenile fire counselor/coordinator

Prevention Project 11: Train Line Firefighters to Preserve Arson Evidence – "Quick Fix"

Identification of Issue

Lack of arson scene preservation hampers evidence collection.

Suggested Improvement Project

All recruit firefighters should receive the U.S. Fire Administration Arson Awareness Training Course prior to graduation from the D.C. Fire Academy. Continuing education on arson scene preservation should be made a prescribed component of fire station training.

Cost and Benefits

Cost – No cost; public domain training course

Benefit – Fewer cases with evidence destroyed or mishandled.

Capacity for Change

Training burden for line companies is high, but this can be fit in. Not much to learn.

Work Plan

Ease in over a 3 month period.

Priority Status: Level 2 (Urgent)

This can be a "quick fix," with training delivered at in-service training by the Training Division.

Prevention Project 12: Improve Communications of Arson Investigation Section

Identification of Issue

The Fire Investigation Section is currently located at Engine Company 24. Their telephone communications consist of one line. It is essential for investigation units to have immediate and secure direct communications with fire and police dispatch, as well as with other agencies which are normally relied upon, e.g., fire prevention division, laboratory resources, and so forth. The investigators are also handicapped with inadequate radio equipment, as they share the channels used by fire operations. Information obtained during our interviews with investigators reveal that portable radios quite frequently fail in buildings and in other areas of the city. This condition compromises confidentiality that frequently is essential. Lack of confidentiality can create a dangerous situation should the investigator require assistance.

Improvement Project

As part of the revised communications system, allocate secure radio channel for Investigation Section radios, or install scramblers on present radios.

Cost and Benefits

Cost – Two radios with scramble capability are needed at a cost of $3,000 = $6,000.

Benefits – The benefit is increased safety to investigators and more efficient investigation.

Capacity for Change

Incorporate in overall communications reform project.

Priority Status: Level 3 (Important)

Prevention Project 13: Develop School Improvements That Will Free Inspectors.

Identification of Issue

The Superior Court-ordered school inspection program is having a negative impact on the fire inspection program by removing seven inspectors from their normal duties.

Suggested Improvement Project

The Fire Department should develop an "overview of code compliance" for the court in all public schools that reflects the present compliance status as evidenced by the court's recent authorization to open the District of Columbia public schools for occupancy. A component of the overview should be a prioritized listing of capital improvement projects (long term) over a five-year period necessary not only to keep the schools compliant with maintenance-type life safety items, e.g. exit doors, sprinklers, but to provide schools with the latest in fire protection construction features, such as smoke barrier doors, smoke evacuation systems, and exit stairway enclosures. It should detail the department's future school compliance program to include monthly walk through inspections by first-due fire company personnel, and appropriate follow up as necessary by fire prevention division personnel.

Cost and Benefits

Costs – Existing personnel/reallocation, and Capital Improvement of Schools (School Boards (C.I.P.).

Benefits – Help disengage from the court-ordered program.

Capacity for Change

The inspectors are not trained for inspecting the schools.

Priority Level Status: 2 (Urgent)

Work Plan

Should be coordinated and in place before the next school term.

CHAPTER 4 – EMERGENCY MEDICAL SERVICES

This chapter provides initial ideas for improving EMS services; the full, integrated solution requires a more extensive analyses beyond the three weeks available for Task 2. After a discussion of goals, we present alternatives for solving various problems, and recommended EMS management reforms or improvement

Analytical Framework for EMS Recommendations – In attempting to solve the problems identified in Task I (*Problem Identification*), it is crucial to lay out *a priori* assumptions about the kind of service to be delivered. This means defining an operating "philosophy" for an EMS system. This is a critical task because the philosophy of the system serves as a reference point for the decisions made in conducting this analysis and that will need to be made in choosing among options for how to structure and implement a new EMS system. In other words, in opting for one recommendation or another, it is frequently necessary to return to the basic premise of the EMS system for guidance.

The starting point of all analyses used to derive recommendations in this section was the question, "What is best for the patient?" Simply put, the recommendations contained herein are designed to create an EMS system focused on the needs of the patient and the safety of the firefighters and EMS personnel themselves. The second criterion is how to provide the desired level of service most effectively.

There are a number of models of EMS delivery. All of them have an operating philosophy that falls somewhere on a continuum from a public safety model to a public health model.

EMS systems that tend toward the public health model consider themselves more closely integrated with the system of delivering medical care than systems that have a public safety focus, which perceive of themselves as responding to emergencies. There is an important distinction here—the public safety model views EMS incidents as isolated, singular events, whereas the public health model views EMS incidents as clusters of repetitive problems occurring within an a given community.

A recent federal government-sponsored effort to define the future of EMS systems indicated that the:

> EMS [system] of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. … EMS will serve as the public emergency medical safety net. … This health care mission [will be] accomplished utilizing principles of public health *and* public safety systems.[1]

A Caveat About Cost-Benefit Analysis – Cost-benefit analysis of EMS projects is fraught with problems. Measurement error, the difficulties of assigning a dollar value to intangible benefits (or intangible costs), and the problem of valuation of a human life combine to make cost-benefit analysis of EMS programs especially difficult. One could make the argument that any program or project that costs less than $2.8 million would have a positive cost-benefit ratio if it resulted in saving one life.[2] Using this line of reasoning for an EMS system that saves a number of lives each year, the costs of virtually any project could be justified on a cost-benefit basis. This report does not attempt to conduct a strict cost-benefit analysis of the recommended projects for this reason. Instead, where costs or benefits are intangible, they are listed by perceived cost or benefit.

EMS Master Plan – There has never been a master plan written for EMS delivery in the District of Columbia. The present form of the system has evolved piecemeal—frequently in an attempt to fill a void. For instance, the predecessor to the EMS Bureau (EMSB), the Emergency Ambulance Division, was created when the Firefighting Division (FFD) expressed a desire to cease having its firefighters provide ambulance service. The growth in the call volume is widely believed to be linked to an inability of the primary care system to meet the health care needs of District residents, and not just a growth in true emergency calls.

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[1] National Highway Traffic Safety Administration. 1996b. Emergency Medical Services Agenda for the Future. Washington, DC: National Highway Traffic Safety Administration.

[2] The U.S. Department of Transportation (DOT) official estimate of the worth of a life in 1993 was $2.6 million. After adjusting for inflation, that number was slightly more than $2.8 million in 1996 (the last year for which the calculation could be made using the U.S. Bureau of Labor Statistic's Consumer Price Index). The DOT estimate is made using a measure of "willingness-to-pay" to avoid death, rather than the method formerly employed by economists, years of potential life lost (YPLL), which measured the opportunity cost of a person's foregone contributions to society , based on actuarial assumptions about the YPLL. The DOT estimate does <u>not</u> take into account intangibles such as human suffering or lost volunteer or in-kind contributions to society.

Without a master plan, the EMSB is left to wander, responding on an *ad hoc* basis to whatever crisis is foremost on the minds of policy makers and the public. In interviews, EMSB personnel express a need for leadership, vision, and focus for the EMS system. The absence of this system-wide vision has created a patchwork of decisions and operating practices that hampers real progress in identifying and solving system problems.

Accordingly, before introducing the specific improvement projects we recommend that the D.C. Fire and EMS Department undertake, we introduce a vision for how the EMS system in the District should function. This vision is not "pie-in-the-sky." The components of the system we are about to outline are in use in various EMS systems throughout the country. They work. They ensure that the patients receive high-quality care delivered in a systematic and efficient fashion.

It is important to state, from the outset, that *this vision is sculpted specifically for the District of Columbia*. We do not suggest that the District's EMS system should look like that of any other city (or county) in the country, because no other city or county has the unique history, topography, demography, commutation, tax base, or incidence of illness and injury of the District. In short, we are not trying to make the D.C. EMS system into another Montgomery County Fire Department or Albuquerque Ambulance Service. Rather, we are advocating that the problems which currently vex the EMS system be recognized as being interdependent, and that therefore their solutions be viewed equally comprehensively.

A Vision for EMS Delivery in the District of Columbia – *While at work in his office on 16th Street, Frank Harrington begins to experience chest pain. He picks up his phone and dials 9-1-1. At the D.C. Public Safety Communications Center, an emergency line rings and Harrington's address and phone number pop up on a computer display. A trained emergency medical dispatcher asks what the problem is, and Harrington answers "I'm having chest pain."*

Using a mouse, the dispatcher clicks on "chest pain" to initiate a medical dialogue designed to elicit the critical information needed to pinpoint the exact nature of the emergency. While this is happening, the address and telephone number are being automatically electronically confirmed by the dispatch computer. Within seconds, the

computer-assisted dispatch program is assessing the physical location of every available EMS-capable vehicle in the District. By the time the dispatcher has gathered enough information to make an initial assessment of the problem, the computer has located the closest available EMS resource that is equipped to handle Harrington's chest pain.

The closest unit turns out to be a fire engine with a paramedic onboard. The dispatcher notifies the fire engine and an ALS ambulance of the emergency. The fire engine arrives within four minutes. The paramedic on the fire engine begins advanced life support care consisting of assessment of Harrington's condition, administering oxygen, initiation of intravenous therapy, and monitoring of Harrington's heart rhythm. The ALS ambulance arrives several minutes later with its complement of two paramedics. The paramedic from the fire engine gives a report to the paramedics as they all continue the needed care. Harrington is administered nitroglycerin and morphine, and his vital signs begin to improve.

Harrington is placed on a stretcher and into the ambulance. The ambulance departs as the fire engine (and its paramedic) return to the fire station to await their next call. At the hospital, the EMS personnel turn Harrington over to the care of the emergency department personnel while the lead paramedic gives the nurse a report on Harrington's condition. After completing the patient transfer, her partner and the driver from the mobile EMS supply unit prepare the medic unit for service. After giving the report to the nurse, the lead paramedic plugs her pen-based computer into a printer port and prints out a copy of her patient documentation for the hospital. Information from the call is electronically transmitted to the EMS quality assurance office and the EMS billing vendor. The crew presses a button on their radio console which sends an electronic message to the computer-aided dispatch system that each unit is ready for service. Total elapsed time: 45 minutes.

Such excellent emergency medical service could be provided in the District of Columbia. For it to happen, however, considerable change must occur. The EMS system in Washington, D.C. will need to become integrated, patient-centered, and medically oriented. The system will need to capitalize on the resources that are present and substantially augment those that are lacking. Most importantly, there will need to be an organizational commitment to providing high-performance EMS that is currently lacking.

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Grouping Problems and Solutions

It is necessary to group the results from Task I (*Problem Identification*) into key problem areas. This is because there are improvement projects that can address several of the identified problems simultaneously. The number of problems facing the FEMSD seems great, the means of fixing the EMS system can be distilled into six broad solutions: reduce call volume, improve resource allocation, increase control and operation of EMS system resources, realign the management structure, provide integrated quality control, and improve the morale of EMS personnel. A number of problems (such as poor morale) derive from other, over-arching problems (such as pay parity). Hence solving the determinant (upstream) problems will likely solve the dependent (downstream) problems.

The single most serious problem plaguing the delivery of EMS in the District is intolerably slow response times to the most critical calls, advanced life support (those classified as "Delta" and "Charlie"). The 90th percentile response times for critical calls exceed 20 minutes–far in excess of the national standard of achieving a 8:59 or shorter response time on 90 percent of the critical calls. Response times to less-than-critical calls ("Bravo" and "Alpha" categories) are even worse. The slow response times are caused by the combinations of high volume of calls and insufficient units to handle them

Reduction of response times can be accomplished in a number of ways:

1. ***Decrease call processing times***–By reducing the amount of time that it takes to navigate through the Medical Priority Dispatch (MPD) interrogation procedure and to select and assign units for a given call, response times can be lowered. To do this requires dispatch center personnel to become more proficient interrogators with increased familiarity with the MPD protocol. There also is potential for time savings through better computer-assisted dispatch (CAD) systems that tie in automatic number identification/automatic location identification (ANI/ALI), MPD, automatic vehicle location (AVL), and better algorithms for computing the closest appropriate EMS unit to recommend.

2. ***Increase the number of EMS delivery units–***Increasing the number of EMS resources means they will be distributed more widely, and that a unit is likely to be available for service thus increasing the probability of reaching a given

patient in a shorter period of time. This becomes especially important for critical calls, although the concept applies equally to non-critical calls.

3. ***Decrease unit-hour utilization–***Lower unit-hour utilization (UHU) rates–less busy units–yield shorter response times.[3] With lower UHUs comes increased unit availability. When more units are available, a critical backlog of calls is less likely to develop. Decreasing UHU can be accomplished in a number of ways, one of which is reducing the heavy workload by reducing demand.

4. ***Drive faster–*** Driving faster to calls. This can be done with control of traffic lights (e.g. a Logicom-type system). As not simply by speeding, which is highly dangerous. Traffic light controls for as wide an area as would be needed are expensive, but might be considered in selected areas.

These are not mutually exclusive methods, and all should be incorporated into a comprehensive effort to reduce response times.

EMS Improvement Project 1: Reduction of EMS Call Volumes Through Call-Triaging and Public Education.

Identification of Issue

As noted in the Task I report transporting EMS units have a UHU of 0.566. This denotes an extremely high work load–units are responding on a call an average of once every 1.77 hours, or approximately seven times in a 12-hour shift. This needs to be brought more in line with the national standard of five calls in a 12-hour shift (or a UHU of 0.420). There are only two principal means by which this can be accomplished:

Increase the number of unit-hours the system produces–This can be done by increasing the number of units placed into service in the system or by increasing the number of hours that each unit works. The latter option is the less feasible option for two reasons. First, there are not enough EMS vehicles to keep as many in service as would be necessary to reduce UHU just by increasing the number of hours each works. Second, there is real concern in the medical community about the efficiency of emergency

medical personnel subjected to extremely long working hours. Decreased skills and efficacy have been noted throughout the medical literature on the subject of work schedule tolerance of medical personnel. In fact, this issue was the driving force behind legislation in New York State which limits the number of hours that a hospital resident physician may work. There is no less concern regarding the ability of EMS personnel to deliver high-quality medical care after prolonged periods on duty. This means that increasing the number of units on duty at any given time is really the only viable option to increase the number of unit-hours produced.

Decrease the Call Volume–Although not an easy thing to do, this is an important component of UHU reduction. There are two main ways that call volume reduction may be accomplished. First, develop alternatives to EMS usage. This would entail making the health care system more accessible to the public. One of the main reasons that people call an ambulance in the District (as well as elsewhere in the country) is that they have nowhere else to turn for medical assistance. The District of Columbia has one of the highest per capita rates of under- and uninsured residents. Compounding this problem is the relative inaccessibility of primary care in the District. People know that if they call 9-1-1 for medical assistance, it will arrive (eventually) in the form of an ambulance. To many, EMS represents a sure way to get needed medical attention. Lacking viable alternatives to using EMS, the public will continue to use it as it presently does. Second, there needs to be strong, proactive public education about the proper use of the EMS system. The FEMSD has undertaken the federally sponsored EMS public education program, *Make the Right Call*, but is has not been well supported through assignment of a full-time public educator.

Suggested Improvement Project

The most critical improvement task is the reduction of call volume—both on a system-wide basis and on an individual unit basis. If no other change were made, this alone would have the most substantial impact of any improvement that could be made. On a per capita basis, Washington, D.C. has one of the highest (if not the highest) EMS

[3] Stout, Jack. 1988. *High Performance EMS Systems*. 1st ed. Carlsbad, CA: JEMS Publishing. Also, Henson, Kevin J. 1992. Unit-Hour Utilization at Albuquerque Ambulance Service. an unpublished paper, p.5.

call volumes in the United States. Ironically, while the population of the District has fallen since the 1980s, the call volume has sky-rocketed.

Reducing demand for EMS will not be easy. The populace of the District has been conditioned to expect that an ambulance is available for the asking–almost irrespective of need. In 1980, the District of Columbia issued an executive order from the mayor requiring that all patients–at their request–shall be transported to a hospital by an ambulance *without regard for the medical necessity of such transportation*. While the policy (which is still in effect) was intended to prevent EMS personnel from subjecting the city (and themselves) to liability for poor medical decisions, it has resulted in ambulances being tied-up on non-emergency calls when other, more suitable means of getting a person medical attention are available. An unintended consequence of the policy effectively has been to create an on-demand "taxi" service for anyone wishing a ride to the hospital.

Reducing demand faces the problem of lack of access to primary care for thousands of District residents. The EMSB fills a void left by a largely inaccessible medical system. Residents of the District know that medical assistance is only a phone call away and that arriving at a hospital by ambulance expedites a patient past crowded waiting rooms. According to informed observers, a large but unquantifiable portion of the EMS demand represents a transfer of usage away from primary care and towards EMS. This experience is consistent with the findings of a 1991 study of EMS usage in New York City, which noted that "[p]roblems of access to primary care looms [sic] large in our findings."[4] Some of the important observations of the New York report include:

- 45 percent of the respondents indicated they would have called a family doctor (rather than EMS) had they had one to call.
- 67 percent of the respondents indicated that a major reason for calling 9-1-1 was to obtain medical advice.
- 47 percent of the respondents indicated that they had no regular physician.[5]

[4] Knickman, James R., Dennis Smith, and Carolyn Berry. 1991. Improving Ambulance Use in New York City: A Final Report. New York: New York University. p.75.

[5] Knickman, James R., Dennis Smith, and Carolyn Berry. 1991. Improving Ambulance Use in New York City: A Final Report. New York: New York University. pp.31-32.

Although no similar study exists for D.C., it is likely that a somewhat similar condition might exist in D.C.. This leads to the first of two major suggestions for reducing call volume:

Provide Alternative Pathways for Entry into the Health Care System – The EMSB (and Health Department) should explore mechanisms by which alternatives to EMS usage could be provided to callers. This includes the use of intensive telephone triage under a stricter than presently used medical protocol to identify callers who do not require emergency ambulance service, and who could be better served by other means. The Medical Priority Dispatch system currently being used by the FEMSD has a medically validated adjunct which can be utilized for just this purpose. This MPD "*Omega"* protocol is in active use in Montreal, and has resulted in lowering EMS call volumes by as much as 20 percent there. If this savings is transferable to Washington, D.C., then the potential exists to reduce EMS demand by over 21,000 annually, using the number of EMS incidents in FY 1996 as a baseline. A reduction of this magnitude would impute a yearly UHU of 0.424–only four one-thousandths off of the national standard![6] In short, this means that *if* the District reaps the same benefits as Montreal is experiencing, the UHU target could be reached without adding additional resources. This implies that implementation of the *Omega* protocol should be considered as a high-priority improvement project. Our judgment is that it will not work as well as in Montreal because of the larger percentage of people who lack other access to medical care and other factors, but it should be tried because it will reduce call volume to some degree, thus lowering the burden on the system.

In order to implement the *Omega* protocol, several things must happen. First, the EMS public safety answering point (PSAP) must become "accredited" by the National Academy of Emergency Medical Dispatch. The accreditation process entails having dispatchers attend certification classes, demonstrating competency in the emergency medical dispatch (EMD) procedures through a recurrent EMD quality assurance program, and finally through application to the National Academy of EMD, which includes a self-assessment on twenty distinct competencies and a site visit by qualified

[6] UHU is not generally calculated using years as the unit of analysis; however, since the projection is for reduction of annual call volume, it is necessary to compute a yearly UHU.

raters. Once the PSAP is accredited at the basic EMD level, the additional software and training can be implemented to bring the EMD function up to the *Omega* level.

Once implemented, the *Omega* protocol can be used to identify calls that could be referred to other points in the health care system. If the statistics from the New York study are an indication of the level of unnecessary overuse of the EMS system that exists in the District, the EMSB can expect to route a large number (as much as 40 percent) of calls to more appropriate services. These could include scheduling the patient to be picked up by an ambulette,[7] linking the caller to a medical telephone consultation service, providing visiting nurse service, or even delivering prescription medications.

There is a wide range of possible alternatives that can be designed to meet patient needs. Most (if not all) of these alternatives would be cheaper than providing emergency medical response and transportation, and certainly any means of placing a patient into the health care system via a point of access other than an emergency department (ED) ensures that the patient's hospital care will be less expensive.[8] Further, most patients would probably opt not to go to an emergency department if a suitable alternative could be found, because the patient could receive the needed service without spending hours in an ED waiting room or generating an expensive ED bill.

On-scene Diversion–In a survey of the 10 most-populated cities conducted as part of the above-mentioned New York City study of improving ambulance usage, five of eight (62 percent) of cities providing data on the subject indicated that a policy was in place which enabled ALS providers to refuse transportation.[9] In these cities, alternatives to ALS transport were allowed—generally when paramedics, in consultation with medical control, made the decision that ALS transport was not indicated. In San Francisco (which was not part of the New York survey because it is ranked thirteenth in population), by size, paramedics carry tokens, good for transportation to a hospital by bus or taxi, which they may issue to patients who do not need ambulance transport.

[7] An "ambulette" is a multi-passenger van (or other transport vehicle) used to take non-recumbent (i.e., those who are not lying down) patients to medical facilities on a non-emergency basis.

[8] Because the emergency department is classically *the most expensive* care available.

[9] Knickman, James R., Dennis Smith, and Carolyn Berry. 1991. Improving Ambulance Use in New York City: A Final Report. New York: New York University. p.54.

All of these programs require on-line medical review of any decision by a paramedic to refuse transportation. Systems which permit such refusal generally report that EMS personnel exercise this prerogative rarely, preferring usually to transport a patient who doesn't really need transport rather than refusing to take someone who actually needs transport. The main benefit of implementing such a policy is that word quickly travels that paramedics can refuse transportation if it is not deemed medically necessary, so there is a disincentive to call for medical assistance spuriously.

EMS Public Education – It is not sufficient simply to provide alternatives to EMS usage in order to reduce the heavy call volume under which the system labors. The public needs to know about the existence of the alternatives before they will consider them acceptable or use them. If the public can be made to understand what services are available, and when and how to call for them, they will begin to make accommodations in they way they use the system, so it better meets *their* needs. The evidence of this is that the public has learned to use certain key words (e.g., "chest pain") when speaking with a 9-1-1 telecommunicator to get an ambulance more quickly for less serious conditions.

A *concerted* public education program needs to be established to modify public behaviors about how limited EMS resources are consumed. This includes the full-time assignment of at least one person who possesses a strong EMS background and good communications skills to conduct community-based public education activities. This person needs to be a trained public educator; therefore, if no EMS employee currently has the required training, at least one person should be sent to attend the National Fire Academy's *Presenting Effective Public Education Programs* class (which is free of cost). The EMS public educator needs to establish an excellent liaison with community groups, the schools (both public and private), and the media. The latter is especially important, and therefore a designated media relations or public information officer (PIO) for EMS should be appointed, or the existing PIO office expanded to include a person devoted to this work. Although the FEMSD has a firefighter PIO, the specialized subject matter of medical care argues for having a PIO who is trained as a paramedic and who can answer questions about medicine and EMS with assuredness.

The existing *Make the Right Call* program, sponsored jointly by the U.S. Fire Administration and the Department of Transportation, can be the centerpiece of the

public education effort. In addition to the basic messages of the *Make the Right Call* campaign—who and what comprises the EMS system, when to call for help, how to call for help, what to do until help arrives—key concepts to be communicated to the public about the D.C. environment in particular include information about the alternatives to sending an ambulance that might be offered, the rationale for sending first responders to high-priority calls, and the reason for longer response times to lower priority calls.

Finally, New York City's experience with public education efforts needs to be heeded, as a poorly designed public education program can backfire. In the early 1980s, New York City attempted to reduce its false alarm problems through a public education program which utilized the message "When you call 9-1-1 as a joke, nobody's laughing." Instead of producing the intended reduction in call volume, the campaign was associated with an increase in prank calls!

Public Education on Injury and Illness Prevention – The most efficacious treatment of illness or injury is to prevent it from happening in the first place.

> [T]hrough their successful efforts aimed at preventing fires and burns and driving while intoxicated, fire departments and law enforcement agencies have, respectively, demonstrated that primary prevention is an essential public service. Primary prevention is also a fundamental public health activity.[10]

As EMS is a hybrid of public health and public safety, it makes sense that the EMSB should take an active role in illness and injury prevention throughout the District. Such efforts would undoubtedly lead to a reduction in EMS demand. This can be done by adding injury and illness prevention messages to the opportunity to deliver fire safety messages, and additional public education on injury and illness prevention, coordinated with any Health Department effort.

[10] National Highway Traffic Safety Administration. 1996a. Consensus Statement on the Role of Emergency Medical Services in Primary Injury Prevention. Washington, DC: National Highway Traffic Safety Administration (NHTSA). p.13.

Costs and Benefits

Benefits–

Potential lowering of UHU to 0.424 (with concomitant decrease in response time).

Increased availability of EMS resources.

Lower incidence of injury/illness.

Lower MPD quality assurance (QA) costs through computerization.

Possible savings of millions of dollars that will be needed to improve response time by adding many new ambulances.

Reduction of call volume may alleviate other systemic problems such as poor morale, vehicle wear and tear, etc.

Costs–

Complete implementation of MPD *ProQA* = $37,500 (one-time cost)

Implement MPD *Omega* = $26,000 (one-time cost)

NAEMD Accreditation = $4,500 (one-time cost)

MPD Extended Service Plan = $4,875 per year

10,000 Metro fares @ $1.20/fare = $12,000 per year + 11,000 taxi rides @ $10 = $110,000.[11]

1 FTE (EMS Public Educator) = $30,000 per year + 33% benefits = $40,000/yr.

Total: $67,000 one-time and $162,000 per year recurring.

[11] We have not costed other alternatives such as an EMS van service. A van service that moves 60 people a day would handle most of the demand. An airport-type van service can be run for about $15 per person trip, or $300,000 per year or less.

Capacity for Change

The MPD implementation can be done with ease. Personnel are already using the MPD flip-card system. They can easily be trained to use the computer-assisted version. The Health Department should "buy-in" on this proposal. The alternatives for care will take some time to arrange. There are relatively few impediments to implementing a successful public education program, and the mission can be accomplished with ease, once a full-time public educator is identified and trained (or hired). The EMS public educator could be located in the prevention division's public education unit or in the EMS office.

Priority Status: Level 1 (Highly Urgent/Critical)

Work Plan

Within 30 days – Obtain price quotes and work schedules for MPD components
Determine milestones for PSAP accreditation
Within 60 days – Implement on-scene diversion protocol
Identify and hire/train EMS public educator
Within 90 days – Implement *ProQA*
Within 120days – Implement concerted EMS public education and injury/illness prevention effort
Within 180 days – Gain PSAP accreditation
Within 365 days – Implement *Omega* protocol

EMS Improvement Project 2: Provide more EMS Units and More Efficient Matching of EMS Resources to EMS Demand.

Identification of Issue

The low response time and high EMS unit utilization factors were discussed above. When the problems affecting response time are assessed, it becomes clear that one of the problems is that the available resources are not as efficiently allocated and

utilized as they could be. In addition, analysis of FEMSD data reveals that there are serious shortfalls in EMS transport capabilities. More closely matching resources to demand requires understanding the nature of the demand better and having the willingness and ability to provide the necessary resources. Simply put, the District needs more ambulances and a more refined deployment strategy that places a priority on meeting EMS usage patterns rather than on scheduling convenience. Specific recommendations to improve EMS resource allocation follow.

Suggested Improvement Project

Increase Number of Units – Although implementation of the *Omega* protocol might by itself be sufficient to reduce UHU to a desirable level, it is unlikely that Washington's experience would be similar to that of Montreal. In all probability, the *Omega* protocol and a concerted public education effort would only provide part of the solution; increasing the number of EMS resources in the EMS system would provide the other part.

In order to achieve a target UHU of 0.420, as many as 15 additional transport units would be needed during the hours of peak demand, from 3:00 p.m. to 9:00 p.m. (and fewer at other times). This analysis is an average for the week as a whole, and—as will be discussed later—optionally scheduling resources requires analysis to be conducted at the day level.

Additional ambulances (and their complement of personnel and equipment) do need to be placed in service by the District. The ideal would be to acquire the vehicles, personnel, and equipment within one year to bring the system's capacity up to demand immediately. The project also could be accomplished in phases to spread the one-time costs over a longer period, and to allow some time to see how well the demand reduction program works.

Fully Implement Peak Load Staffing – As discussed earlier (and in the Task I final report), a primary determinant of EMS demand is the hour of the day. As demand varies by hour (and by day of week, to a lesser extent), improving efficiency requires scheduling more personnel during peak loads and fewer personnel during the downtimes. This concept—Peak Load Staffing (PLS)—is complex to implement well. It would

require starting and ending shifts at "odd times," and scheduling units in a more "free-form" manner than has customarily been done in the FEMSD.

Using PLS, a closer match between EMS resources and EMS demand could be achieved. The primary benefit is that using PLS helps lower UHU, which, in turn leads to with lower response times.[12] In fact, the EMS system in Kansas City became 35 percent more efficient when it adopted demand analysis and PLS.[13]

Implement System Status Management – Linked closely to PLS and demand analysis is a concept called "system status management" (SSM). The central principle of SSM is that the units available for assignment are dynamically deployed to areas in which calls are historically most likely to occur. The deployment can shift a unit from one intersection to another, hour to hour. This can be projected with a fair degree of accuracy using a combination of geographically coded data and linear regression techniques.

This approach differs from what is being done at present in that EMS units, once they leave the hospital, generally attempt to return to the fire station at which they are quartered.[14] Under SSM, once a unit cleared the hospital, it would be sent to whatever part of the city was most likely to receive the next call, not a "home base."

The SSM concept attempts to improve response time by pre-positioning EMS resources in the area they are most likely to be needed. This projection is dependent on both the time of day and the day of the week (and, to some extent, the month or season). Since the deployment plan is data-driven, the quality of the call volume and response time data affects the ability of the system to make accurate predictions about future need. This implies a need for improved data collection, which will be discussed later in this report.

One of the frequent objections to SSM is that personnel are forced to spend their entire tours of duty in the ambulance. Under SSM, EMS units are "posted" to various

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[12] Smith, Janet E. 1994. Administration, Management, and Operations. In *Principles of EMS Systems*, edited by W. R. Roush. Dallas: American College of Emergency Physicians. p.115.

[13] Ryan, Joseph L. 1994. Quality Management. In *Prehospital Systems and Medical Oversight*, edited by A. Kuehl. St. Louis: Mosby Lifeline. p.225.

[14] Generally, however, the units receive another call before being able to "make it home."

locations throughout a service area. These may be police stations, hospitals, fire stations, street corners, or any other location. While EMS personnel who are awaiting assignment may opt to remain in their vehicles, they are not forced to. Observation of the current EMSB units in action reveals that many EMS personnel already choose to remain in their vehicles rather than to return to the firehouses at which they are stationed. All in all, it seems unlikely that there would be much opposition to the SSM-lifestyle. Police officers regularly spend their entire shifts operating out of their patrol cars, so the concept of a vehicular workplace is not unfamiliar.

The primary requirements for successfully implementing SSM are to have a system status manager who truly understands the concepts which govern the technique, and, as noted earlier, solid data collection abilities integrated into the system to ensure quality data are used in the deployment analyses. This implies that there will be a "shake-out" period following initial implementation during which time the SSM plan will need to be continually refined. As the system participants become more familiar with the SSM plan and as the learning curve on data collection begins to shift in favor of the EMS system, the SSM plan will become increasingly more accurate. Managers and field personnel should be prepared for a bumpy road during the initial stages of SSM implementation, however.

Rapid Advanced Life Support – Earlier, it was pointed out that the national standard for response times to critical calls is to have ALS arrive within 8:59 with a 90 percent reliability.[15]

> The standard of eight minutes has not been arbitrarily chosen: a Seattle study of cardiac arrest victims in coarse ventricular fibrillation found that if BLS is initiated within four minutes after insult and ALS is initiated within eight minutes or less, the victim has a much greater chance of survival. Modern EMS systems should expect providers to achieve this demanding eight-minute efficiency at least 90% of the time.[16]

[15] This standard, in fact, is <u>not</u> as exacting as the one recommended by the American College of Emergency Physicians—the College's standard is a 90th percentile response time of eight minutes or less (effectively 7:59); however, at a national level, the words "eight minutes" are commonly interpreted to include all of the 59 seconds in the eighth minute.

[16] Smith, Janet E. 1994. Administration, Management, and Operations. In *Principles of EMS Systems*, edited by W. R. Roush. Dallas: American College of Emergency Physicians. p.115.

This standard recognizes a "window of opportunity" within which life-saving treatment must be initiated for critical patients. The concern about the EMS system's present response time is that the window is shut by the time the personnel trained to deliver the advanced care arrive on the scene. Using "paramedic engine companies" to provide ALS first response would afford critical patients rapid access to life-saving care throughout the District.

The reason that this will work is the wide geographic distribution of engine companies across the District. According to the International Association of Fire Fighters, "the industry standard for deployment of fire suppression equipment includes locating engine companies to achieve a response time of less than [four] minutes."[17] The average FEMSD fire unit response time in FY 1997 was 4:32.[18] Were paramedics to be placed on engine companies, the FEMSD could provide ALS within the target of 8:59 (or the more exacting 8:00 target specified by the American College of Emergency Physicians). In addition to keeping the window of opportunity for administering life-saving treatment open longer, the paramedic engine concept provides an excellent means of mentoring firefighter/EMTs assigned to the FFD. Finally, having a paramedic on board during the first response to critical medical emergencies would make engine company crews feel much more satisfied because, as one firefighter put it, "We would feel as if we were really doing something for the patient instead of standing around watching and waiting for a medic."

One major concern exists regarding this potential solution—there is a major disparity between fire unit response times for fire calls versus EMS calls. As noted in the Task I report, fire units take an average of 1:53 longer to respond on critical medical emergencies than they take to respond on fire emergencies. For the paramedic engine company concept to work, a substantial change in FFD personnel attitudes toward providing EMS first response would need to occur. However, the very use of paramedics on the engines should provide significant motivation. There would be no standing and waiting for a medic to arrive, and much reason for getting to the scene quickly.

[17] (IAFF), International Association of Fire Fighters. 1995. *Emergency Medical Services: A Guide Book for Fire-Based Systems*. Washington, DC: IAFF. p.9.

[18] The FEMSD data did not show 90th percentile response times for fire units, so this analysis uses average response times.

Another obstacle to implementation of the paramedic engine concept is that there are literally not enough paramedics to go around. It will take a while to train enough paramedics to make all the engine companies in the District ALS-capable first responders. The concept would have to be phased in over time, with those engine companies that run the highest number of critical medical calls being converted first. There already are some personnel in the FFD who have taken paramedic training elsewhere, and who could be the engine company paramedics during the phase-in period.

In order to supply the FFD with an initial infusion of paramedics, and to satisfy the desires of some of the EMSB personnel to become cross-trained/dual-role firefighters, the department should offer all EMSB personnel the opportunity to take firefighter training and switch from the EMSB to the FFD. EMSB personnel at the EMT-Basic level who wished to cross-train could do so, with the proviso that the transfer would become effective upon their attaining paramedic certification. (An alternative might be to transfer the EMTs over to the FFD and to require them to attain paramedic certification with a specified period of time (e.g., two years).

Remove Engine Companies from Most "Bravo" Calls – First response by engine companies is really warranted only on Delta- and Charlie-level emergencies. Removing engine companies from most Bravo-level assignments would keep them free to respond both to fires and other, more serious medical conditions for which sending a medical first response would truly make a difference. Consideration should be given to retaining an engine company on certain Bravo responses, such as burns, carbon monoxide exposure, and motor vehicle collisions because of the nature of these calls. Further, it would probably be advisable to retain the option to dispatch an engine company as a first responder on Bravo assignments that had been pending for 15 minutes or Alpha assignments that had been pending for greater than 20 minutes.[19] This is in keeping with the recommendations of the MPD system.

Because engine companies would be respond to fewer calls, fuel costs and "wear and tear" would be reduced. Moreover, under this scheme, the need for first response would be evident in a higher percentage of the runs made by engine companies. This

would alleviate some of the frustration associated with being sent on calls which are perceives as not warranting a medical first response. In essence, this suggestion would treat engine companies as a more valued resource than they currently are treated. Response times should be tracked by company by shift, to determine if a few crews are affecting department averages.

Decrease Hospital Drop Times – Hospital drop times by EMS personnel average over 30 minutes and are *two to three times* longer than those being achieved elsewhere in the country. Reducing hospital drop times would decrease ALS and BLS response times because EMS units would be ready for service sooner, allowing communications center staff to position the unit in anticipation of another call or to give the unit another assignment (thus reducing the time that a call sits in the pending queue).

To reduce hospital drop times it will be necessary for the EMSB to set reasonable and achievable drop time goals. Initial efforts should focus on attaining drop times in the range of 20 to 25 minutes for critical patients and 15 to 20 minutes for non-critical patients. Ultimately, a further five to 10 minute reduction in each category would be ideal. To accomplish this, the communications center and EMS supervisors must monitor drop times and analyze them by specific crew (in order to determine whether individual crews are unduly slow at the hospital). Crews that take a long time at the hospital need to be "encouraged" to go back in service. It should be made clear that crews will be held accountable and subject to disciplinary action for excessively long drop times. Obviously, some patients will have complex or critical conditions that necessitate longer drop times, and supervisors will need to be sensitive in this respect.

Recognizing the causes for extended drop times is also important in designing means to reduce drop times. Causes of extended drop times can be classified as endogenous and exogenous to the EMS system. The differentiation is based on the amount of control the EMS system has to affect that cause.

The primary endogenous cause is that hospital time affords EMS crews a "sheltered" time during which they know they will not get another call, so they can relax

[19] Although Medical Priority Consultants (the firm that assists with MPD implementation) indicates that engine company responses on Alpha-level calls can be delayed as much as 30 minutes, they acknowledge

for a minute, make a phone call, go to the bathroom, drink a cup of coffee, etc. This can be controlled (as suggested above) by tighter supervision, but creating a formal break (such as the police department's "10-70E") recognizes that EMS personnel are humans who need to attend to certain needs, and it would likely go far in reducing this cause.

Another endogenous cause is the time it takes to clean and restock a unit after a call. The so-called "make-ready" time could be shortened by the use of a mobile supply unit. This concept is discussed in detail later.

The final endogenous cause is actually an artifact. EMS personnel report that they radio the communications center to let the dispatcher know that a unit is in service, but that this fact gets missed, either because the communications personnel didn't hear the transmission or because they were too busy to enter the in-service time into the dispatch computer. This problem would be obviated through the use of a "unit statusing" system, (USS) which will be discussed in detail below.

The other major cause of prolonged drop times is exogenous (i.e., the EMSB has little or no control over it). EMS personnel report that they frequently must wait in the hospital until a bed becomes available on which to place the patient. The wait can sometimes be upwards of 15 minutes. This problem cannot be overcome by tighter supervision or technological innovation. The solutions lie mainly in the power of the receiving hospitals to implement free beds or provide personnel to take over for EMS personnel. One thing the EMSB could do is to communicate with the various emergency department directors and explain how shortages of hospital stretchers affect the operation of the EMS system. There might be a willingness on the part of the hospitals to purchase additional stretchers or to make minor adjustments in the operation of the emergency department that would allow more rapid turnover of the patient. Health Department assistance should be solicited.

Another intended solution to this problem exists in the increased use of personnel from the rapid response units to provide ALS during the transport phase. Under this plan, all ambulances would be BLS ambulances, and ALS providers from rapid response units would "upgrade" the BLS ambulance as necessary. The advantage of this

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that setting the threshold for first response at 20 minutes is more customer-service oriented.

mechanism of service delivery is that the patient could be left on the BLS ambulance's stretcher. Once the paramedic delivered a patient report, the rapid response unit (with the paramedics) could return to service while the BLS ambulance crew waited at the hospital with the patient. There would not be a reduction in the level of care provided, because the patient would be under the care of the emergency department – simply on an EMSB stretcher until a hospital stretcher became available. This configuration would maximize the amount of ALS time available. It is better to keep a BLS unit stuck at the hospital than an ALS unit.

BCC Rescue Squad – For many years, the Bethesda-Chevy Chase Rescue Squad (BCCRS) has provided ambulance service to the residents of the Upper Northwest area from its headquarters in Bethesda. The service is provided without cost to the District or users of the service—it is funded solely on voluntary contributions. The level of emergency medical care afforded is excellent, and response times (according to the BCCRS) are faster than can be provided by FEMSD ambulances. The BCCRS has both basic and advanced life support units.

The BCCRS has sought to expand the scope of the service offered to its traditional Washington, D.C. service area; however, for a variety of political and regulatory reasons, be overcome by either negotiation or action by the D.C. Authority, the FEMSD has not capitalized fully on the volunteer resources of the BCCRS. This has been a long-running issue in the provision of EMS in Upper Northwest D.C. For a number of years, a memorandum of understanding has been in place governing BCCRS' provision of BLS. Under the agreement, BCCRS may send a BLS ambulance into the District in response to a direct request from a resident or on a "mutual aid" basis when the FEMSD communications center requests such assistance. ALS is provided solely on a mutual aid basis, and an agreement governing ALS has yet to be negotiated.

Residents of Upper Northwest D.C. have expressed frustration in attempting to have the FEMSD commit to calling for mutual aid from the BCCRS whenever a FEMSD EMS unit will have an extended response time to Upper Northwest. They also desire to see an ALS memorandum of understanding signed as soon as possible.

Given the willingness of the BCCRS to provide free EMS to a large section of the District, it seems illogical to do anything but welcome the service with open arms.

Counting more on the services of the BCCRS would allow Ambulance 8 the flexibility to cover more calls in other parts of the city. Accepting the services of the BCCRS, in effect, is tantamount to increasing the number of EMS units in the District. The few regulatory issues that affect this proposal could be worked out with the FEMSD and the Department of Health in specific detail during the implementation phase. Of course, this is predicated on the quality of service being kept high.

Suggested Improvement Project

More closely match resources to demand by:

1. Increasing the number of EMS units on duty at peak hours (phased in over one year)
2. Fully implementing peak load staffing (within 90 days)
3. Implementing system status management (within 180 days)
4. Implementing an initial group of six paramedic engine companies (within 90 days)
5. Removing engine companies from "Bravo" calls (within 30 days)
6. Augmenting number of rapid response units (within 90 days)
7. Concluding BLS and ALS agreements with BCCRS (within 90 days)

Costs and Benefits

Benefits–

Decreased unit-hour utilization

Decreased employee stress

Reduced response time (because calls would not be pending as long)

Increased availability of ALS

Less use of ALS for BLS calls

Saving citizen lives, decreasing discomfort, increasing responsiveness, decreasing complaints.

Costs–

A sharper analysis is needed. A rough estimate is as follows:

15 ambulances @ $55,000/ambulance = $825,000 in addition to existing fleet replacement schedule.[20]

2 rapid response units @ $35,000/unit = $70,000

SSM software package = $25,000 (one-time cost)

12 sets of miscellaneous ALS equipment @ $1,100/set = $13,200 (one-time cost)

9 Laerdal Heartstart 1000 AEDs @ $4,000/unit = $36,000 (one-time cost)

18 LifePak 10P defibrillators @ $8,995/unit = $161,910 (one-time cost)

Total one-time cost: $1.31 Million

91,615 additional unit-hours needed to meet demand @ $74.56/unit-hour = $6,831,193 per year[21]

There may also be back-filling costs for 25-50 personnel during paramedic training, depending on the training required and the acceptability of training personnel have obtained elsewhere. Also, the cost of pay differential for paramedics on engines needs to be considered. The total recurring cost will be about $7 million +.

Capacity for Change

Dispatchers will need to adapt to becoming system status controllers (a slightly different mind-set about relative priorities of what EMS resources are required). A significant hurdle may be getting the FFD to lower its response times on medical emergencies to the four-minute range they attain for fires. A slight adjustment on the part of ALS personnel accustomed to having "their own" medic units will be required, as working on a rapid response unit means providing care in different ambulances all the time. Equipment must be uniform and stored in the same location. Managers will need

[20] An alternative is having a mix of 15 ALS and BLS units under the present system. Further analysis is needed to fine tune what would be the optimum mix between rapid response and transport vehicles.

[21] This figure is in FY 1997 dollars and includes only personal services (PS) and other than personal services (OTPS) costs for the responsibility center. It does not include "centralized" expenses such as radios, uniforms, etc. Also, it is based on EMS personnel salaries, not firefighters. Use of firefighters for peak staffing, with reversion to adding a fifth person to truck companies at other times should also be considered.

to learn new SSM and PLS techniques. Some "rough" periods are to be expected during the first few months of the SSM program, as the database required for refining the system will is being constructed.

Priority Status: Level 1 (Highly Critical/Urgent)

Work Plan

Within 30 days:

Issue revision to response configurations for "Bravo" calls

Issue special order soliciting transfer requests for cross-training

Identify paramedics presently in FFD for assignment to paramedic engine companies

Order additional ALS equipment for paramedic engine companies

Conduct EMS demand analysis

Identify potential vendors for SSM integration package

Identify potential vendors for ambulances and rapid response units

Initiate discussions on forming mutual aid with BCCRS

Within 90 days:

Develop scheduling of EMS resources according to demand analysis

Institute new EMS schedule

Conclude BLS and ALS agreement with BCCRS

Institute required training for cross-training personnel and for FFD paramedics

Select SSM vendor and issue purchase order

Place paramedic initial six engine companies in service

Place additional three ambulances and additional three rapid response units in service

Within 180 days

Debug SSM

Train communications (and field) personnel on SSM operation

Convert to SSM

Within one year
Add 11 ambulances and 2 rapid response units

Within two years
Add 4 more ambulances

Within three years
Continue placing paramedic engine companies in service according to relative ALS demand to a total of approximately 30 units..

EMS Improvement Project 3: Improve EMS System Control (Dispatch) Operations

Identification of Issue

In the present EMS System, with its unsatisfactory ALS response time and high unit utilization rates, the communications function of the EMS system has been equated with dispatching operations. In a system status management effort environment, as recommended above, dispatch and communications need to be components of a higher technology approach that is better called "system control." The "dispatchers" would have a more complex function–they control the deployment and allocation of system resources. For simplicity, we will continue to refer to these people as "dispatchers"; however, their function would be more akin to air traffic controllers.

Suggested Improvement Project

In order to improve the system control operations, we recommend investing in a high-technology approach that offers two inter-related benefits. First, use state-of-the-art computers and communications equipment to make EMS resource assignments, and thereby speed the process of identifying the most appropriate unit to send to a call, while increasing the accuracy with which such units are selected and dispatched. Second, having the computing power at the heart of the system creates an ever-reinforcing set of management data which can be used to produce detailed feedback to EMS system

management, and continuous refinements to system control. In other words, the degree of system control attainable will increase from the ability of the system to generate sophisticated management information. In many respects, an improved system control operation will resemble statistical process controls and quality management techniques used in many modern manufacturing operations. If a high degree of management information is necessary to produce commercial products with a very low defect rate, it just makes sense that the same level of information ought to be obtained to manage a process that seeks to reduce morbidity and mortality.

Implement MPD ProQA – The first step in the process of improving system control operations is to finish the installation and implementation of the Medical Priority Dispatch (MPD) system. As noted in the Task I report, MPD is currently being performed using a set of flip-cards rather than the state-of-the-art system which was originally slated to be implemented in the EMS communications center.

ProQA is a computerized version of the flip-cards. This package is better than the flip cards for three reasons. First, it assists the telecommunicator in navigating through the medical interrogation decision tree. Because the telecommunicator does not have to flip from card to card, the chance of a call-taker making a mistake in a stressful situation is reduced while the processing time is shortened. Second, after the dispatch information has been gathered, the program assists the telecommunicator in delivering pre-arrival instructions.[22] Third, the program gathers quality assurance data on MPD protocol compliance, thus facilitating the job of the Quality Assurance (QA) office.

As discussed earlier, one of the strategies that should be employed to lower UHU and reduce demand for EMS is the provision of alternatives to EMS, and specifically, the adoption of the MPD *Omega* protocol. To reiterate, if Washington, D.C. is able to reap the 20 percent reduction in EMS call volume that Montreal has been able to obtain, the UHU problem would solve itself without the addition of a single EMS unit.

A prerequisite to *Omega* is the successful implementation of *ProQA*, the computerized MPD caller interrogation protocol. Even if the *Omega* protocol is never

[22] Pre-arrival instructions are medically validated instructions that are read to callers so that they can administer assistance prior to the arrival of trained help. Pre-arrival instructions are written for each specific dispatch category. The use of pre-arrival instructions has been credited with saving many lives.

implemented, *ProQA*, will improve call processing times, increase the accuracy with which medical priorities are assigned to calls, and make the MPD quality assurance function substantially easier and less time consuming.

Focus Supervisory Attention on MPD and Communications – Field personnel complain that calls are frequently upgraded from a lower priority to a higher one because dispatchers want to "clear the board" (i.e., assign backlogged calls to units so they are removed from the pending queue). While the pressure to get pending calls out of the queue is understandably great, it defeats the strategy of the MPD system to upgrade a call's priority for that purpose. It also wastes ALS resources to send them on a BLS call when there is high probability of more ALS calls coming shortly. Close supervision and thorough quality assurance activities should be employed to ensure that the MPD triaging and dispatching protocols are being followed. Dispatchers should be held accountable for ensuring that the system is operated as it was designed to be operated. Shortcuts and homespun improvements are not helpful and can potentially be harmful.

Additionally, both communications and field supervisors should be monitoring the radio frequencies to ensure that radio communications remain professional at all times. In monitoring the EMS communications channels, we were surprised at the laxness of the transmissions. Field personnel and dispatchers are equally guilty of using rude or sarcastic language or tone of voice, and frequently radio users speak so fast as to be unintelligible. Superfluous transmissions and "editorializing" are commonplace. Radio users will change their behavior if they are held accountable for improper use of the radio and if supervisors are held accountable for ensuring that all communications are conducted professionally.

Implement an Automatic Vehicle Location System – An automatic vehicle location (AVL) system consists of a vehicle-mounted radio transponder that relays a vehicle's location to a computer located in a dispatch center. The computer uses that vehicle location system for two purposes. First, the information is used by the computer to assess the relative distances of available units from a call and to recommend an appropriate dispatch configuration based on those distances. Second, a symbol representing a vehicle's status (i.e., available for assignment, responding, on scene, etc.) and its location can be displayed on a computer-generated map in the dispatch center,

allowing dispatchers to have a visual snapshot of the status EMS fleet. This can aid the dispatcher in overriding the dispatch recommendation if necessary.

The use of AVL cuts down on dispatch time because dispatchers do not have to query units for their locations—that information is automatically updated on a system-wide basis every 15 seconds. Furthermore, EMS personnel will be less tempted to give incorrect location information to dispatchers. This practice occurs in just about every EMS system in the country—units give fictitious locations in order to get assigned to more exciting calls or to avoid unwanted calls. While there does not appear to be a huge problem in this respect in the FEMSD, it does happen, and when it does, the system is compromised along with patient care.

In addition to increasing the efficiency of dispatching, one of the primary benefits of AVL systems is that they increase supervisory capacity. By knowing the exact location of any unit in the fleet, supervisors can practice "management by walking around"—they can arrive unannounced and make spot inspections of units or observe patient care.

AVL systems can also be configured to provide a mobile readout in an EMS unit of a map showing the location of the vehicle and its destination (the call location or a hospital). This can be of enormous assistance to an EMS unit that is attempting to navigate in an unfamiliar area. Finally, an AVL system can be equipped to send an emergency distress signal. Because the dispatch center will be able to pinpoint the location of the vehicle, it is possible to send assistance without having to make voice contact with the ambulance crew. A feature such as this could mean the difference between life and death in a potentially hostile situation.

Implement a Unit Statusing System – In Task I, we note that response data collection is hampered by the fact that all "timestamping" of incident events is done manually by the dispatcher. Although this may seem like an innocuous administrative detail, it has large implications for effective system management. Because timestamping of an event may be delayed (either due to inability of the crew to relay information over the radio or due to the dispatcher's being too busy to make the appropriate notation on the response record) or may be accomplished using non-synchronized clocks, the data

that identify key intervals are frequently wrong. If the data being entered are wrong, the management decisions made using those data will be flawed.

A Unit Statusing System (USS) uses an electronic box on each vehicle that sends a sub-audible radio frequency to the computer-assisted dispatching system. Timestamps will be accurate and synchronized. This will improve the quality of the management data, and hence the quality assurance efforts and other decisions that follow from that data.

Unit statusing is an integral component of a comprehensive system status management effort—it is the feature by which the status of a resource is updated in the computer-assisted dispatching system, allowing unit location/status to be displayed as described above. It relieves dispatchers from one of the time-consuming administrative details of their job, thus allowing them to focus attention on overall system status management and on communicating critical information to units in the field and from EMS units to hospitals.

An additional benefit of a USS is that radio transmissions would be reduced, thus freeing up air time on the communications channels. Because the radio channels are less cluttered with unit status messages, it is easier to get air time to broadcast a priority message.

It should be noted that implementation of a USS requires a working radio infrastructure, and so the entire communications system will need to be addressed, as per the recommendations contained in Chapter 8.

Implement an In-Vehicle Navigation System – As mentioned earlier, EMS units can be equipped with in-vehicle navigational systems (IVN) that show a computer-generated map indicating present location and destination. The primary benefit of IVN systems is that they reduce the chance for getting lost when the driver is unfamiliar with the area – something that has happened all too often in D.C. While most FEMSD EMS personnel are quite familiar with the District, it is impossible to know every street. Furthermore, it is easy to get lost at night or in times of extreme pressure, not to mention that we are all prone to making an occasional mistake.

Additionally, most IVN systems can receive text messages, so the display screen can be used for dispatching and listing the status of receiving hospitals, thus reducing the chances of errors and freeing up radio channel air time for critical voice transmissions.

It is probably best to procure AVL, unit statusing, and IVN together as an integrated package; however, the IVN component is the least critical of the three, and its procurement could be delayed if it were necessary.

Work Plan

Within 90 days:
Implement MPD *ProQA*
Focusing supervisory attention on MPD and communications protocol compliance

Within 180 days:
Implement an AVL system
Implement a unit statusing system
Implement an IVN system

Costs and Benefits

Benefits–

Ability to locate vehicles anywhere in the District, and to dispatch from where they Actually are, reducing response times.

Forced compliance with the MPD interrogation protocol

Facilitated navigation to victims through both interrogation protocol and pre-arrival instructions

Ability to locate vehicles anywhere in the District

Less "clutter" on communications frequencies

Improved collection and quality of management data

Less chance that an EMS unit will get lost

Ability to send text messages to EMS units

Costs–

Costs of *ProQA* were already included in EMS Project #1, above

AVL system = $122,000 (one-time cost)

Unit staffing system (62 vehicles @ $680/vehicle) = $42,160 (one-time cost)[23]

IVN system = $89,000 (one-time cost)

Total: $353,000

Capacity for Change

The communications center personnel have adapted quite well to the MPD system. The conversion to *ProQA* will make their lives easier by automating the navigation through both the interrogation protocol and the pre-arrival instructions. The additional components of this improvement project will have a similar effect—they will be readily accommodated because they will facilitate people's jobs. Minimal training will be required of field personnel, and they will also be happy about the change.

[23] The figure of 62 vehicles includes 41 ambulances, 12 rapid response units, four reserve ambulances, and five supervisor's cars.

Priority Status: Level 1 (Critical)

Work Plan

Within 30 days
Direct communications center supervisors to assure compliance with MPD triaging protocol and FEMSD dispatching/communications protocol

Obtain price quotes and work schedules for MPD components

Identify vendors of AVL, unit statusing, and IVN systems

Within 90 days
Select SSM vendor and issue purchase order

Implement *ProQA*

Within 180 days
Debug AVL, USS, and IVN

Train personnel on AVL, USS, and IVN operation

Go on-line with AVL, USS, and IVN

EMS Improvement Project 4: Reorganize Management of EMS Function

Identification of Issue

The technological advancement and changes in the EMS system recommended above will not be as effective as they could be if there still is a clash of cultures, and if the management of the system doesn't keep up–you need an EMS system management capable of handling high performance EMS with dynamic reallocation of resources. There needs to be improvement in the management structure to handle the changes. There also needs to be improvement to reduce the culture clash.

Suggested Improvement Project

Decide on Organizational Placement of EMS–The clash of the cultures identified during Task I can be a major stumbling block to improving delivery of EMS. The cultural chasm is the primary cause for poor morale in the EMSB, and it also affects firefighter morale. It has a significant impact on the ability of the EMSB leaders to ensure that EMS is delivered efficiently with the patient's needs held foremost in mind.

One comment was heard resoundingly from everyone with whom we talked (EMS personnel and firefighters alike) – the present structure of EMS delivery is inadequate and must be changed. Many of the strains on the whole fire and EMS system would be significantly reduced if the changes recommended above and in other chapters are made. There would be more resources, less fatigue, less bickering over limited budget resources. And this might reduce the need fore changing the organizational structure. However, the depth of the feelings of personnel on this issue cannot be overstated.

There are a number of models of EMS systems that could be adopted. Ultimately the question boils down to a choice between better merging the EMSB and the FFD into an integrated cross-trained dual-role Operations Division which would be responsible for all EMS and fire suppression responses, or breaking the EMSB out of the FEMSD entirely.[24]

The decision must rest on whether one believes that the changes in the culture necessary to make the firefighting operational side more hospitable to the EMS personnel are feasible, and to the cost tradeoffs of the various options. (e.g., the use of an all crossed-trained firefighter system vs. one EMS mixed with personnel, and to the flexibility of work schedules for both types of workers under a system with varying numbers of units to meet peak demand, and dynamic movement of EMS vehicles hour to hour.

Recent history argues against a likely change in the firefighter culture. First, the engine companies have a much slower response time to medical emergencies than to fire emergencies, and this has been going on for some time, without any attempts to rectify the problem that we know of. Second, in private, some officials of the FEMSD have expressed little enthusiasm for the transport function. Moreover, rookie firefighters, those in whom the greatest faith for cultural change should exist, still use derogatory language when referring to EMS providers and the EMS function. Since these firefighters are cross-trained as EMTs, it raises doubts about the cultural context in which they were trained and in which they presently work. It is possible that the D.C. fire

culture may change to better accept EMS; it seems more likely that EMS will continue to be regarded as a stepchild unless department leadership or employee representatives can motivate their colleagues to be less negative about the EMS function and personnel.

Options for the Future

There are five choices to consider:

1. *Create a separate EMS agency*–This is the necessary choice if the "two-cultures" issue does not seem resolvable in a reasonable amount of time (within several years). There is little evidence thus far to indicate it is resolvable. A number of major cities have this as a successful model.

2. *Retain EMS in the FEMSD, but with its own budget*–This would not assure the cultural change the FEMSD needs, but would ensure a viably funded EMS function not subject to budget raiding.

3. *Convert to a cross-trained/dual-role department*–This option is the main alternative to creating a separate EMS agency. The department's firefighters already are cross-trained dual-role. This option needs to be implemented at least in part in order to pursue the paramedic engine company concept recommended earlier for the provision of ALS first response. That is, the dual role concept needs to be carried further. The main question is how far– should it include transport? There are definite benefits to pursuing this option to the maximum – namely, improved benefits and training for those providing EMS, more functionally integrated emergency response crews, and a unified command and control of departmental resources, and reduced cultural friction. The major drawbacks include having a dysfunctional EMS system if the culture cannot be changed and a lack of clarity in how line management should be provided (i.e., whether EMS managers should be cross-trained and made fire officers at the same time that fire officers receive EMS training that would enable them to be EMS managers). There also are problems in how flexible can the scheduling of

[24] A third option, keeping it in the FEMS, but requiring a change in behavior on both sides exists, but offers a less optimistic outlook for success Ultimately, the choice comes down to the capacity for changing

firefighters assigned to EMS units. And of course the cost-tradeoffs taking into account FLSA rules for overtimes, and the positive potential of having firefighters available to staff fire units that are short-handed, when not serving on peak EMS demand units.

4. *Privatize the EMS function*—Privatization of EMS offers the benefit of removing costs associated with the provision of ambulance transportation from the budget altogether. However, privatization has too many drawbacks to be effectively implemented in the District. In order for a private ambulance company to provide EMS in Washington, D.C., some sort of subsidy would be required because of the large amount of uncompensated care. The need for this subsidy would be further exacerbated by proposed changes in Medicare/Medicaid, which would likely reduce reimbursement rates for ambulance services. Privatization of EMS would result in a $6.4 million loss of patient revenues to the City. The FEMSD would still need to provide medical first response (most likely at the ALS level), and these services would be fully uncompensated. Finally, although performance bonds could be required of an ambulance service contractor, if a private company goes bankrupt or its employees strike, the District will still need to assure ambulance service.

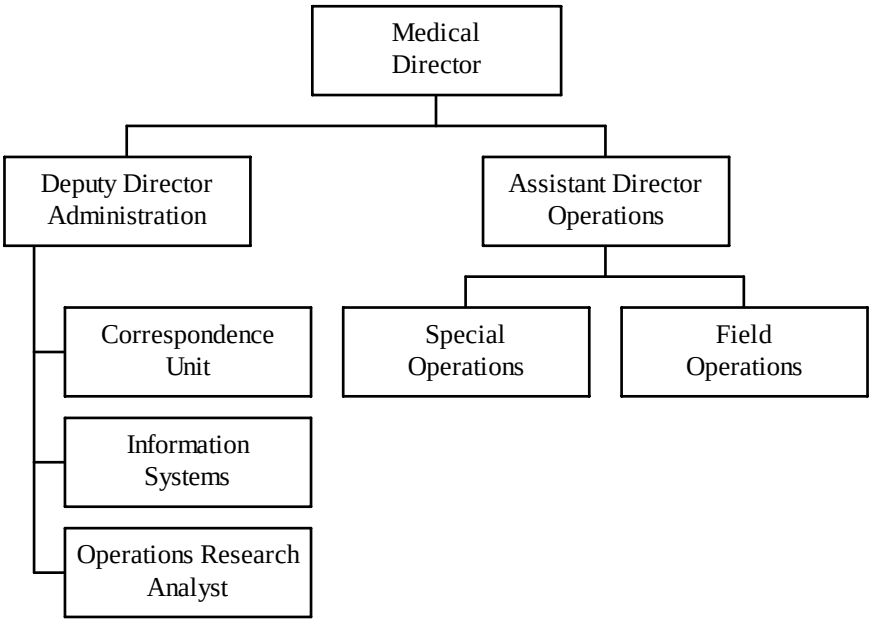
5. *Retain the status quo organization*–This is not a very good option because it leaves the culture clash problems unsolved.

Regardless of how the final choice is made, we recommend a major change in the organization of EMS, as follows. We believe the choice from any the above options needs further consideration and costing, and more input from the stakeholders.

Realign Management of EMS–At present the EMSB is headed by an emergency physician who is supported by an Assistant Director of Operations and a Deputy Director of Administration. Figure 1 shows the current organization chart for the EMSB.

D.C. firefighters' cultural perspective of EMS and both groups willingness to work together.

Figure 1: Current EMSB Organizational Alignment



The functions of EMS Training and Medical Supply were recently moved from the EMSB and placed under the Assistant Chief for Operations and the Assistant Chief for Services, respectively, since both firefighters and paramedics need consistent medical training, and both need some of the same supplies.

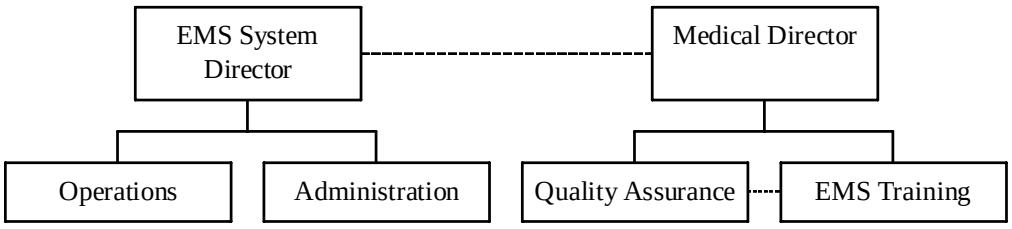
The problem with the current EMSB management structure is that it does not provide for the real day-to-day needs of running an EMS organization with a $15.5 million annual budget. A patient-centered, medically oriented organization needs strong overall managerial expertise as well as strong medical leadership. The field personnel are clamoring for more contact with the Medical Director and urgently desire a visionary medical advocate to provide a crisp, medical focus to the operations of the EMSB. A *strong* consensus exists among the EMS field personnel that the current Medical Director does not have time to provide the needed medical leadership because he is too busy "running the system." In order to restore time for the medical leadership and provide for the basic logistical, political, and managerial needs of the EMS function, the EMSB should be restructured as follows:

1. Appoint and EMS system Director responsible for the day-to-day management of the EMSB, with the authority over all non-medical aspects of running the EMSB.

2. Make the Medical Director of the EMSB responsible for providing medical leadership, and give the Medical Director authority over quality assurance, EMS training (regardless of where it is in the organization) and all areas of clinical practice, including treatment protocols used by firefighters and EMS personnel.

The EMS Director would head the organization from a managerial standpoint, deferring to the wishes of the Medical Director on issues relating to clinical care. Figure 2 depicts the proposed realignment of the EMSB organizational structure. The Medical Director would be the consultant and final word on medical protocols and contents of courses.

Figure 2: Proposed EMSB Realignment



The proposed restructuring of the EMSB is necessitated by two things. First, there is a crisis of leadership. Field personnel worry that the current structure deprives them of both the medical leadership and the bureaucratic leadership they desire. More importantly, irrespective of whether the FEMSD converts to a cross-trained/dual-role department or becomes a separate entity, the new EMS system needs to be a high-performance organization. To make the conversion from the present EMS organization to what will be required in the very near future will require top management who understand not only the constraints of running an EMS agency, but also the technical and managerial fundamentals of a system driven by data analysis, statistical process control, and quality management principles.

Refocus the Medical Director Position – Providing medical leadership for a high-performance EMS system is a full-time job that requires a singularity of focus on clinical excellence. The skills and background needed for this role can only be found in a

physician, and then only in one who specializes in emergency medicine, EMS, or traumatology. The medical practice surrounding prehospital care is constantly in flux, requiring that the Medical Director maintain a constant knowledge of current medical literature and evolving standards of care. It is simply not possible to administer an EMS system and provide the required medical leadership, if one is going to do justice to both.

The Medical Director needs to assume a proactive role in protocol development, liaison with the medical community, oversight of quality assurance activities, and active participation in and oversight of EMS training (for both EMSB personnel and cross-trained/dual role paramedics).

The role of liaison to the medical community (and Health Department) will be especially important because over the years, the medical community has demonstrated a strong interest in EMS and has measurable political clout and professional prestige. Ensuring a steady dialogue with the medical community will demonstrate that the EMS system views itself as a medically oriented public safety service. This will be important in gaining institutional buy-in from hospitals for political, medical, educational, and (potentially) financial support.

Review Managerial Positions and Incumbents – There is an active distrust of the EMSB supervisors and management among the field providers; it is pervasive and organizationally limiting. The current management would almost surely lose a vote of confidence. There are a number of reasons for this.

First, there is a widespread feeling that promotions are made on the basis of cronyism and without regard to the merit of the individual for the position. Second, the EMS field personnel feel that they are always the last to know of any decision, and that important information makes its way slowly from the top of the EMS organizational structure to the bottom. Third, promotions are not made on the basis of a competitive examination, and the "residential preference system" tends to ensure that well-qualified employees who reside outside the District may be passed over for promotion.[25] A feeling of resignation that non-residents do not stand a chance of getting promoted is rampant

[25] This will be discussed at length later.

and divisive. Finally, since some managers are not viewed as deserving of their positions, and command little respect (and in some cases, active distrust).[26]

Given the critical role that managers and supervisors will play in the establishment of a high-performance EMS system, it is apparent that some impartial review of the qualifications of incumbent managers will need to be undertaken in conjunction with a revamping of the EMS promotional system.

In order for the review to truly be judged as objective and not influenced by favoritism or prejudice of any kind, it will be necessary to first construct criteria by which incumbents will be reviewed. This should be done by a panel of EMS experts from areas other than the Washington, D.C. metropolitan area, with a few *ex-officio* members from the EMSB (to provide guidance and answer questions about the nature of the EMS operation in the District).

After the criteria have been established, a different panel should be assembled to review the fitness of incumbent managers for managerial roles in the new system. This panel should make recommendations regarding what personnel to retain, promote, or demote. The reviews should be done on a "blinded" basis (i.e., the panel should have access only to copies of an individual's work history, educational records, performance reviews, and other applicable documentation that have had references to name and sex deleted. This will remove all individual bias from the review process. The panel should be directed to review each incumbent based on the qualification criteria established by the earlier board.

If vacancies at senior levels need to be filled, the DCFRA should consider conducting a national search for experienced managers of high-performance EMS systems. This would increase the likelihood of a successful implementation.

Costs and Benefits

Benefits

[26] For example, a number of EMS personnel made statements to the effect that some people who had claimed a residential preference were, in fact, non-residents. Their reasoning continues that if these people will lie to get a promotion, they are not to be trusted in other areas.

Improved delivery of EMS through a rational organizational structure
Improved morale
Organizational structures logically grouped by functional responsibility
Re-instilled faith in EMS management
Establishment of bona fide prerequisites for managerial positions
Reinvigorated medical leadership

Costs

Travel, per diem (five nights), and honoraria for 10 panel members = $13,000
1 FTE (EMS Director/Assistant Chief) = $70,000 per year + benefits = $93,000
Option #1: Separate EMS Agency
(costs to be determined)
Option #2: cross-trained/dual-role department
(costs to be determined)

Capacity for Change

The question of the capacity of the FFD to change its cultural outlook about EMS lies at the heart of the quandary of what to do with the EMS function. EMS currently accounts for 75 percent of the activity of the FEMSD. In future years, the role of EMS can only be expected to grow. The huge cultural rift between the firefighters and EMS personnel forces serious consideration of whether it will be possible to merge the two work-forces. Indications are that the FFD would view a full merger as "taking over" EMS. Were EMS to be merged into a culture where fighting fires is more highly valued than rendering quality medical care, it is unlikely that any real improvements would be noted. On the other hand, were the FFD able to effect a cultural shift—to change its paradigm—improvements in EMS could be obtained. In reference to the realignment of the EMS management structure and the review of EMS managers, most EMSB personnel would support realigning the EMS management structure as outlined, while the three top managers would most likely oppose the realignment. Most managers would oppose the qualifications review, and most field personnel would welcome it.

Priority Status: Level 2 (Urgent)

It is important that a decision be made quickly regarding the future of the EMSB.

Work Plan

Within 2 months:

Establish and convene a panel that develops qualifications criteria for EMS management positions

Within 3 months:

Have DCFRA and/or Fire Chief issue any special orders needed to implement the chosen plan

Create an Interim EMS Director (or Assistant Chief) for the EMS function, to whom the Assistant Director for Operations and the Deputy Director for Administration would report.

Transfer EMS QA to report to the Medical Director, and clarify the EMS Training line of authority to the Medical Director.

Establish and convene a panel to review qualifications of incumbent EMS managers

Within 4 months:

Receive recommendations of review panel.

Within 6 months:

Have DCFRA decide on the organizational structure of the EMS function, after further discussion with stakeholders and a full costing of the options.

Determine if any statutes or regulations will be affected or need to be changed/waived to implement the chosen plan (within 10 days)

Have DCFRA and/or Fire chief issue any special orders needed to implement the chosen plan.

Have DCFRA issue orders for retention, promotion, or demotion of EMS managers based on recommendations of panel.

EMS Improvement Project 5: Make the EMS Promotional Process Competitive

Identification of Issue

The promotional process currently is not merit-based. Its perceived unfairness by EMS personnel is a major cause of their poor morale, and leads to good people quitting the bureau. One of the key reasons that the process is considered unfair is that it is non-competitive. When an opening for a promotion exists, a vacancy announcement is issued, and those interested in the promotion make application to the D.C. Office of Personnel. A personnel specialist then reviews the applications (presumably by comparing the applicant's stated knowledge, skills, and abilities to the requirements stated in the position description). According to the D.C. Office of Personnel, virtually all applicants receive a rating of "Q – Qualified." Because all the applicants are rated equally, the "residential preference" (RP) becomes the deciding factor in selecting the person to promote. Applicants are grouped into two alphabetical lists—one of applicants with "RP" and the other of those without RP. The certification list is then forwarded to the FEMSD and a "selection officer" then chooses an applicant for each vacancy. The selection officer is free to choose any person on the list, except that vacancies must be filled from the RP list before they are filled from the non-RP list. The only other rule affecting the promotion process is that if one applicant is interviewed for the position, then all must be interviewed.

This process gives vast discretionary power to the selection officer, which subjects the entire process to criticism and accusations of favoritism. Since no objective weight is given to experience, performance, or demonstrated managerial capacity, there is little wonder that the promotional process is viewed as fundamentally flawed, and the source of poor morale.

Suggested Improvement Project

Make Promotional Process Competitive – A solution for future promotions would be to make them on a competitive basis (i.e., by applicants taking a criterion-referenced examination that produces a ranking based on performance on the examination).[27] One impediment to doing this is a D.C. Office of Personnel rule that employees who are not hired on the basis of a competitive examination cannot be promoted using a competitive examination. Waiver of this rule for present employees is an action that the DCFRA could take to facilitate this recommendation. The DCFRA

[27] This is the system currently employed for promotions in the FFD.

should also direct that future hiring of EMSB employees be done on a competitive basis, so additional waivers of this rule would not be necessary.

An important adjunct to a promotional examination is a promotional review board (similar in concept to the promotional boards employed in the military). This board would meet as necessary to interview and recommend candidates for promotion. The membership of the board could be by appointment (preferably for a period of a year and in advance of the receipt of any applications for promotion).

This scheme implies the existence of a promotional examination. There are two basic alternatives for conducting an examination. First, one could be administered by a commercial promotional/hiring testing firm. There are many firms that offer validated examinations. Second, the department could attempt to develop its own. This is generally a less desirable option because internally developed promotional examinations are more easily challenged and less easily defended than those already written and validated by an outside firm.

Finally, the use of an assessment center should be considered, especially for higher-level positions. An assessment center combines a written examination and oral interview with real-time demonstrations of ability to perform job-related tasks. For example, candidates may be asked to write memos, perform scheduling, conduct a mock counseling session, etc. The assessment center candidates would be reviewed by EMS managers from other jurisdictions. Assessment centers are in wide use in the fire service throughout the United States because they are considered the ultimate in a job-related competitive promotional process.

Eliminate/Reduce Weight of Residential Preference – Since virtually all candidates for a promotion in the EMSB are rated qualified by the D.C. Office of Personnel, the residential preference becomes the major factor *per se*. If a competitive promotional process is not adopted, then the DCFRA should eliminate the residential preference and allow all EMSB personnel to vie for the position on their merits.

Establish Clear Promotional Criteria Tied to Job Descriptions – As suggested in the section above on "Review Managerial Positions and Incumbents," a panel of EMS experts should develop qualification criteria for each position in the EMSB. These criteria should be based on the actual job functions and should incorporate factors such as

tenure, educational attainment, and specific preparatory experience. The criteria should be widely disseminated so that all personnel know the specific prerequisites for all positions in the EMSB career ladder.

In short, upward progression within the EMSB ought to be based on what the individual has accomplished and demonstrated rather than where he or she lives.

Costs and Benefits

Benefits:

Better-qualified EMS managers

An orderly, established EMS career ladder

Better retention of personnel

Improved morale

Costs:

Professional services for hiring/promotional testing = $1,000 per year

Professional services for promotional assessment center = $25,000 per administration

Capacity for Change

EMS personnel residing outside the District would welcome the changes to the residential preference. Personnel residing within the District would generally oppose such changes. Most personnel would probably not have any problem with the changes concerning competitive hiring and promotional qualifications. The D.C. Office of Personnel and the FEMSD (or a new EMS agency) would need to make some modifications to their current operating practices; however, these changes should be fairly easy to accommodate.

Priority Status: Level 3 (Important)

Work Plan

Within 30 days:

Have DCFRA issue a waiver of the D.C. Office of Personnel rule forbidding competitive promotions for personnel not hired competitively

Have DCFRA issue an order directing that all future hiring of EMS personnel be done under a competitive hiring process

If items #1 and #2 are not implemented, have DCFRA issue an order directing that the residential preference be eliminated for EMSB promotions

Create a promotional review board from within the EMSB

Identify vendors of assessment centers and validated, competitive EMS hiring/promotional examinations

Within 90 days:

Issue a contract for professional services to administer assessment centers and hiring/promotional examinations (within 60 days)

Distribute promotional qualifications criteria upon receipt to all EMS personnel

EMS Improvement Project 6: Better Integrate EMS Documentation, Quality Assurance, and Training

Identification of Issue

Documentation of patient condition and treatment received is a crucial function which has more implications than simply ensuring that a good record is made of what was done for a patient and why. Accurate documentation provides a means to pass vital information from provider to provider and serves as a venue for collecting data that are critical for efficient management of an EMS agency, such as billing information. It also provides EMS managers with specific patient treatment information that can be used to monitor the quality of care being rendered by EMS personnel. This last function is especially important in the context of a medically oriented service delivery system.

One of the problems identified in the Task I review of the EMS billing operation was a high degree of faulty documentation which lead to a large percentage of unbillable service. The FD-151 form (the ambulance call report) currently in use is not user-friendly—it is hard to read and even harder to fill out, which tends to mean EMS personnel take a long time to fill the form out. Although the FD-151 was developed to be optically scanned, that technology has been in a state of disrepair since the departure of Dr. Bass as Medical Director.

Implement Pen-based Computer-Assisted Documentation – Pen-based computer-assisted documentation has been in use in numerous EMS systems throughout the country since the beginning of the decade. Pen-based computers are similar to the devices carried by UPS delivery personnel and are programmed to perform patient care documentation. The advantage of using this type of documentation is that the information stored in the computer can easily be downloaded to a central database, allowing measurement of any aspect of patient care. This is particularly critical for the quality assurance function, as well as for empirical research into EMS.

Another benefit of using automated patient care reports is that billing information that is currently abstracted from paper reports by hand could be provided to the EMS billing vendor, Lockheed IMS, in electronic form. This would greatly reduce the time it takes to process the bills as well as the rejection rate for illegible forms. These benefits would have a three-fold effect. First, the collection rate would likely increase, thus generating more patient revenues. Second, it might reduce the vendor's processing costs, which could be justification to review the compensation the vendor receives. Finally, personnel who currently spend their days reviewing FD-151 forms prior to shipping them to Lockheed IMS could be reassigned to more productive work in the EMS Bureau.

Although pen-based computers are more expensive than paper forms, they would be a cost-effective investment because they greatly improve efficiency. Two disadvantages of their use are the potential for breakage and downtime. To avoid these problems, any computers purchased should be "ruggedized." A number of pen-based computers are built to military specifications and have been demonstrated to be virtually unbreakable. Second, the FEMSD should purchase a sufficient quantity of reserve computers for use if front-line computers develop a problem.

Automate Quality Assurance Function – The chart review function of the QA office currently takes seven QA evaluators about half of each day to complete. This leaves little time for other activities such as spending time in the field interacting with and monitoring field care providers. An automated patient care documentation system would dramatically reduce the time spent performing chart reviews. Patient reports would be screened automatically as they were being written, thus ensuring that critical data elements were not overlooked and that illogical entries, typographical errors, and illegible entries would be avoided. Second, the reports could be screened at the QA office for specific "quality triggers" that would identify anomalies in patient care. Only those reports identified by the screening program would need to be read by the QA evaluators. In addition to being less time consuming, the process would be vastly more thorough because a QA audit would be performed on every patient record instead of the sample currently being submitted by Lockheed IMS (the EMS billing vendor).

Place QA and Responsibility for EMS Training Under the Medical Director – As the name implies, the role of the Medical Director should be to provide overall medical direction to the EMS function. "In its simplest form, medical [direction] is the authority and responsibility of a single physician charged with making independent decisions regarding all the medical aspects of the system."[28]

Quality assurance and EMS training are directly related to the clinical care delivered by non-physicians in the field. As such, they should be within the province of the Medical Director to oversee. This comports nicely with the function of the Medical Director discussed earlier.

The benefits of having the QA and EMS training functions report to the Medical Director include tighter control over medical practice issues, assurance that training reflects the protocols authorized by the Medical Director, and better communication between the QA and training offices. This final benefit is especially important. The mission of the QA office should be to ensure excellence in clinical care and identification of problems in administering such care–both at the system-wide and individual provider levels. When excellent care is recognized, it should be communicated to the training

[28] Racht, Edward M., and Howard David Reines. 1994. Medical Oversight. In *Prehospital Systems and Medical Oversight,* edited by A. Kuehl. St. Louis: Mosby Lifeline. p.182.

office, so the specifics of that care can be disseminated to all the field providers. Likewise, when problems are identified, they should be communicated to the training office so remedial education can be delivered. This is doubly important for problems that are systemic in nature. Note that although the EMS training personnel would report to the Medical Director for their course content and evaluation, they would be jointly housed with the Fire Training Academy, and coordinate logistics, course scheduling, etc. through the Training Director at the Academy. The training personnel would have two supervisors in effect, one for day-to-day matters and one for what is taught.

Costs and Benefits

Benefits

More accurate patient documentation

Faster hospital drop times through faster report writing

Automation of data collection for research

In-field error-checking

Downloading of EMS billing information to billing vendor

Automation of QA activities

Elimination of illegible documentation

Costs

41 Pen-based computer-aided documentation systems @ $1,200/unit = $492,00 (one-time cost)

14 Printers (one per hospital) @ $300/printer = $4,200 (one-time cost)

1 Pentium-class PC = $2,500 (one-time cost)

Total: $496,200

Capacity for Change

EMS personnel are clamoring for a more user-friendly means of patient documentation than the FD-151 form. Any device that made patient documentation easier would find easy acceptance. Realignment of QA and EMS Training under the Medical Director would be welcomed by EMSB personnel, the QA office and the EMS

Training Office, and the Medical Director.

Priority Status: Level 2 (Urgent)

Work Plan

Within 30 days:

Identify vendors of pen-based computer systems

Transfer EMS QA and EMS Training to report to the Medical Director

Within 90 days

Issue a contract for printers and computers

Train field and QA personnel and supervisors on the use of the new system

Within 120 days

Convert to pen-based documentation

EMS Improvement Project 7: Improve EMS Materiel Supply

Identification of Issue

Oxygen is the most important and most frequently administered medication carried by EMTs and paramedics. It is inconceivable that EMS units should be allowed to run out of oxygen, and it is inefficient that they should have to traverse the District looking for it.

Fuel for ambulances and other medical supplies have similar supply problems. Through monitoring EMS radio transmissions, we learned that EMS units often have to go great distances to refuel. The question of how best to effect fueling continues to be a District-wide problem.

It is important that the FEMSD take steps to assure that critical supplies and fuel are procured in a timely fashion and that they are made available to EMS units in a fashion that does not required them to be held out of service.

Suggested Improvement Project

Some consideration should be given to implementation of an automated fleet fueling system that would allow multiple agencies to refuel at any District government fuel pump. Further, consideration should be given to establishing a mobile supply unit (MSU). The MSU would consist of a radio-equipped utility vehicle staffed by an EMS supply technician. The MSU would carry extra oxygen bottles, backboard, miscellaneous EMS supplies, cleaning equipment, and vehicle supplies.

The purpose of the MSU would be to reduce hospital drop times by assisting with cleaning and restocking of units that had transported a critical patient. Treating these patients often creates a mess in the back of the ambulance that requires thorough cleaning and restocking. The concept of the operation is as follows: When an EMS unit notifies the dispatch center that it is transporting a patient who is receiving intensive prehospital treatment, the communications center would notify the MSU to meet the ambulance at the appropriate hospital. Upon arrival, the EMS crew would bring the patient inside, give a report, assist with patient turnover, and write the necessary patient care documentation. While this was happening, the MSU technician would clean and restock the unit. When the EMS crew was finished with its paperwork, the unit would be ready to go back in service.

Because the MSU would be radio-equipped, EMS units in various parts of the District that were running low on supplies (e.g., oxygen) could radio for a rendezvous. This would allow them to be restocked while they remained in their assigned areas. The MSU could monitor the radio on an on-going basis to determine the transport destinations of EMS units and meet them at the hospital to effect a *proactive* resupply. This is like refueling ships at sea, rather than making them return to port to refuel, they can be kept on the job, in-service for longer periods.

Implement an Inventory Control System – At present, there is no inventory control system in use by the EMSB (or the whole FEMS). This means that there is no accountability for equipment or supplies. There are any number of commercially available inventory control systems that could be used to help the EMSB track the status of equipment and the utilization rates of supplies. This information would be helpful in budget planning and materiel management.

Knowing the rate at which disposable supplies are used is important for establishing re-order points. Outages of important EMS supplies will be avoided if this knowledge can be combined with an understanding of manufacturer/distributor lead-time requirements for delivery of orders and an improved procurement system (see Chapter 9, Services, for the proposed new inventory control and supply distribution system).

Costs and Benefits

Benefits

EMS units remain in strategic positions and are not forced to drive all over the District in search of oxygen, medical supplies, or fuel

More accurate re-order points; fewer "stock-outs" of critical supplies

Better accountability of capital items
Better materiel management data; more reliable equipment budget forecasts

Costs

- Convert an existing vehicle (or used vehicle) into a mobile supply unit - $5,000 (one-time cost)
- Staff with 4 people @ $25K + benefits = $133K

Capacity for Change

There are currently a number of vehicles that could be converted into a mobile supply unit (MSU). There appear to be no major impediments to implementation.

Priority Status: Level 4 (Desirable)

These changes would improve operations, but their implementation could be delayed in favor of other, more important projects. Note that if these projects are delayed, the EMSB will need to ensure that adequate supplies of oxygen and fuel are available through conventional means.

Work Plan

Within 30 days
Identify a vehicle that could be used as a MSU

Equip vehicle with appropriate equipment for mission, including a radio

Identify vendors for oxygen supply

Within 90 days
Issue a contract for oxygen supply

Identify personnel to staff the MSU on a 24/7 basis

Stock the MSU

Effect any needed personnel transfers

Within 180 days
Inventory all EMSB capital equipment and disposable supplies

Train all personnel on inventory control techniques and policies

Go on-line with inventory control system

Summary

The above is a long list of improvement projects that need to be undertaken. The D.C. EMS system is among the most dysfunctional of any that we have seen. That sentiment is echoed widely by EMS experts across the country. In one publication of the National Association of EMS Physicians, the D.C. EMS system is described as "low quality with above average cost."[29] The EMS system of the nation's capital ought to be a model of efficiency, quality medical care, and customer service. The recommendations proposed in this section are designed to move the EMS system from last to first—to make it an exemplary service that others wish to emulate rather than deride.

The EMS system in Washington, D.C. needs to incorporate all of the concepts presented here in a comprehensive fashion. The public will be best served by a system that can be described as follows:

- Happy, healthy personnel who are enthusiastic about providing patient-centered, medically oriented care.

[29] Stout, Jack. 1994. System Design. In *Prehospital Systems and Medical Oversight*, edited by A. Kuehl. St. Louis: Mosby Lifeline. P.85.

- ALS first response by paramedic engine companies on critical calls.
- BLS ambulances which provide transportation for all patients.
- ALS rapid response units which support BLS ambulances on critical patients.
- Alternative transportation for patients who do not require ambulance transport.
- Referral/alternative service for patients who do not require EMS.
- State-of-the-art system control using the principles of Medical Priority Dispatch, system status management, and peak load staffing.

CHAPTER 5 – FIREFIGHTING

Firefighting Improvement Project 1: Develop Accelerated Emergency Vehicle and Equipment Replacement Program

Identification of Issue

The present emergency vehicle fleet is in deterioriating condition. There are many reliability problems, and the present vehicle fleet is old. This includes suppression, and support unit vehicles. There also are shortages of cars for prevention and vehicles for supply delivery. This department has no reserve apparatus fleet to speak of and that creates an almost need to shut down active fire companies simply because there are no vehicles to replace those that are made unavailable due to needed mechanical repairs. When a unit is out of service, fire protection in their immediate area is diminished. Also, Fire Prevention personnel are routinely forced to use privately owned vehicles to perform their work.

Suggested Improvement Project

Develop, implement, and maintain a reasonable apparatus replacement program in all categories including suppression, EMS and staff support functions. The details of this program should be based on past experience, current workload and generally accepted vehicle standards. Immediate emergency purchase, scheduled future purchases and the feasibility of leasing will all be explored after the actual number of each type of vehicle needed is determined, along with establishment of an adequate reserve to front line vehicle ratio.

In addition, major equipment should be purchased as part of the major apparatus purchase. This assures that necessary equipment to place the vehicle in service arrives at the same time as the vehicle.

There is a backlog of needed major equipment items that has been identified by the Apparatus Maintenance Division that needs to be addressed. This list is extensive and amounts to almost $4 million over the next two fiscal years. The disposition of this

list, which is attached, should be reviewed following resolution of EMS deployment issues and further study to validate the requests. Most if not all is warranted. The specific plan is shown below under Costs and Benefits. It is based on the current configuration of 32 engine companies and 16 truck companies, information taken from the Apparatus Maintenance Division Vehicle Data form dated 8/15/97 and accepting a 10-year front line life for engines and 15-year life for trucks. The following recommendations are made for FY98 assuming a front line fleet of 32 engines, 16 trucks, and a reserve fleet of 8 engines and 4 trucks. When these purchases have been made a new apparatus replacement plan should be devised using the 10/15 year first line vehicle life expectancy as a basis. Take all engines over 15 years old out of service. Some of these can be used for other activities such as training and standby. Those not needed should be auctioned off. Take all trucks over 20 years old out of service. Some of these also can be used for other activities. Those not needed should be auctioned off.

A complete review is needed to ascertain or develop a replacement program for administrative and/or support vehicles. All 73 of these vehicles are 10 years old or less, but some are in poor condition, and more are needed.

Dispose of all inoperative apparatus at the earliest convenience.

The current apparatus replacement plan (State of Facilities, 1996) is too conservative and would not properly address the many problems with this aspect of the Department. The Department provided a revised replacement plan, with which we basically concur. An immediate influx of new equipment is sorely needed. It goes without saying that other recommended projects relative to the automotive fleet must be adopted in order to keep any apparatus replacement program on track. There is no sense in buying new vehicles if you are not going to maintain them and track the work done on them.

Costs and Benefits

Costs–

The cost of including major equipment purchases with procurement of vehicles would vary, but is on the order of $27,000 in addition to the cost of an engine apparatus.

FY98 Firefighting Apparatus Purchases

Quantity	Description	Cost Per Unit	Total Cost
10	Engines	$240,000	$2,400,000
4	Trucks	425,000	1,700,000
	Rescue Squad/HM	Under Special Operations	
2	Other Special Operations Vehicles	Under Special Operations (Chapter 6)	
	Ambulances	Under EMS (Chapter 4)	
	Rapid Response Units	Under EMS (Chapter 4)	
5	Supervisory Response Vehicles	25,000	125,000
5	Utility Trucks	27,000	135,000
TOTAL			$4.36 M (Under Property and Supply)

If all suggested immediate purchases are made for firefighting, the total would be approximately $4.36 million. While this is a considerable amount of money, it only reflects the current state of the fleet, and is necessary to prevent a continued crisis in vehicle quality and availability.

FY 99 Purchases

Quantity	Description	Cost per Unit	Total Cost
7	Engines	240,000	1,680,000
1	Truck	425,000	450,000
Total			$2.13 M

FY00 Apparatus Purchases

Quantity	Description	Cost per Unit	Total Cost
6	Engines	240,000	1,440,000
2	Trucks	425,000	850,000
Total			$2.29M

Major Equipment Items Needed

Apparatus Maintenance Division (10-20-97)

Item	Quantity	Total Cost
Upgrade Lifepak 5 defibrillator units to more advanced model	15	$143,775
Battery support units Required for updated Lifepak units	15	21,000
Heart Start 1000 units with case (automatic advisory defibrillator) required to maintain the first responder units currently equipped with this capability	5	15,195
Nonin 8500N Pulse Oximeter, required to update ALS units and supervisor units	20	14,850
Stryker stretcher, to update current stretchers that are in poor condition	30	80,850
1 and ¾ inch hose	660 sections	58,410
4-inch hose	528 sections	362,736
Hydraulic rescue tools	8	120,000
Self-contained breathing apparatus units w/PASS alarms	500	*1,829,000
Reserve air cylinders	1000	1,179,000
Positive pressure ventilation fans	48	54,000
HydraRam tools for forcible entry	34	41,480
TOTAL		$3,936,426

*These are further discussed under Safety in Chapter 9.

Benefits – Being able to provide emergency services without vehicles breaking down. Not having holes in coverage. Reducing the need to continually repair so many vehicles. The department can handle the surge purchase of the vehicles specified above. The purchasing sub-unit of the CFO needs to be strengthened to assist.

Capacity for Change

Priority Status: Level 1 (Critical/Highly Urgent)

Firefighting Improvement Project 2: Provide Supplies to Improve Fire Station Maintenance – "Quick Fix"

Identification of Issue

The availability of station supplies must be improved. This includes paper products such as towels and toilet paper as well as cleaning materials needed to wash floors, windows, and fire vehicles. The cost avoidance of cleaning these facilities has been overlooked. While most government facilities pay or contract for cleaning staff, the fire stations are cleaned by fire personnel, and the only expense is for supplies. The same is true for the care and cleaning of fire apparatus (vehicles) and hand tools carried on the vehicles. That is all the more reason to make the minor investment in supplies.

Suggested Improvement Project

The fundamental problem in supplies is the lack of a supply purchasing and distribution system. A totally new system for managing supplies is recommended in Chapter 9, Services. Here we address the specific supply needs of the stations.

Each Fire Captain responsible for a fire station should prepare an annual budget which includes itemized lists of cleaning supplies, paper products, and light maintenance needs such as light bulbs, air conditioning filters, etc. These should be priced and included in the Firefighting Division's budget. Checklists should be provided to each station with what might be considered a minimum set of supplies for a "standard" station. The station captain can iterate from this list. Once the new supply management system is up and running, supplies used by each station can be tallied by year and the station captain can receive a list of what was spent the previous year. Any anomalies (unusually high or low expenditures) or unusual items can be identified automatically, and given to the battalions to justify.

The maintenance budget should include routine maintenance needs of fire apparatus including vehicle polish, replacement tools and equipment, paint and cleaners. The budget process should also identify those facility maintenance items which will need attention in the next year, such as heating and air conditioning systems, plumbing, interior and exterior painting, etc. The budgets for each station should be submitted to the Battalion Chief, and the funding and maintenance cost levels should be identified for

each battalion. [Costing could be done centrally and reviewed by the Battalion Chief and Captains.]

Every attempt should be made by the D.C. government to provide a two-month supply of essential products to each station.

Costs and Benefits

Cost – The average annual cost of supplies for each station should be about as follows: There will of course be variations depending on the number of units housed in the station. Per station:

$ 500	Office supplies
$3,500	Housekeeping and fire vehicle cleaning supplies
$3,800	Small tools and hose (under $500) replacement
$7,800	Per station x 33 stations = $257,400

Total: 33 x 7800 - $257,400

Benefits – The labor to clean and provide light maintenance of fire stations is provided by the station personnel. Only the cost of cleaning supplies is necessary. By fixing the logistical problems and providing supplies, the station will be better maintained and therefore incur less costly repairs in the future.

Regardless of pay and fringe benefits of the job, if the basic needs of a clean work environment and the necessities such as toilet papers are not provided, employees will be negatively motivated, which will affect the quality of service provided to the citizens. It is only humanly decent to provide the basics such as toilet paper.

Priority Status: Level 2 (Urgent)

This should be immediately corrected. Station supplies should be a "quick fix."

Firefighting Improvement Project 3: Reevaluate Firefighting Unit Deployment (Station Locations, Unit Locations, and Staffing)

Identification of Issue

The existing distribution of firefighting resources within the District was determined largely by historical precedent. In light of recent station closures, it is likely that some incremental adjustments could improve coverage on a citywide basis. Additionally, the Anacostia area, despite experiencing a relatively high incidence of fire and population density, is served by only a few fire companies. Response for working fires must typically come from across the Anacostia River. Equity concerns and consideration of response times for the entire response assignment (and not just the first-due company) suggest that some redeployment of resources from the downtown section (an area of high potential but little fire demand) to this area (an area of higher actual demand) be undertaken.

Suggested Improvement Project

Redeployment should be considered in several phases or options.

Relocation of Selected Units Within Existing Station Locations – An in-depth analysis is needed of the current response times and coverage of the firefighting resources in the District. Only a cursory, preliminary review was possible in the four-weeks made available for Tasks 1 and 2). Based on the preliminary review and discussions with the Department leadership, some limited number of unit relocations seems desirable.

The following recommendations were developed based on TriData's review of response statistics and the Department's recommendations, based on its own analysis and those undertaken as part of the RESO study in 1996. These recommendations, while appropriate, should not be viewed as the optimal solutions, but as incremental improvements to the existing arrangement of resources. These movements are constrained by the limited number of facilities that can accommodate truck companies. In particular, Engine 19's quarters would require some modification in order to

accommodate a modern truck company apparatus, and would be the preferred location for a truck company. Any recommendations for facility modifications in this regard should be undertaken as part of a comprehensive deployment study, as described below.

Those two relocations are designed to improve truck company coverage in the southeastern portion of the City, particularly Anacostia:

Move Truck Company 16 to Station 25
Move Truck Company 9 to Station 15

Marginal Adjustment in Facility Locations – The existing computing and modeling resources of the DCFEMS could be used to perform an analysis to identify a limited number of stations for relocation. This computer analysis could use proposed station locations from previous studies and the District's master plan as candidate sites for evaluation. Some outside support would likely be necessary due to the limited analytical staff within the Department.

Our preliminary suggestions, based upon analysis of current facility locations, would be as follows:

Relocate Station 22 to the North at least one mile from its present location.

Relocate Station 26, toward Fort Lincoln, generally south and east from its present location.

The main criteria is improvement of response times for the first-due units.

Full Station Location and Deployment Study – Simple station location modeling exercises assume that units will respond from their stations. In most cities, there are so few calls that these assumptions are satisfactory. However, these assumptions are not appropriate in the District given the high demand for services and the frequent response of units from other than their quarters. Also, there are two competing criteria: response times to an geographic area, and response time averages to the actual location of calls.

Deployment patterns would differ if the goal is reducing average times (or percent calls within x minutes).

Due to the dynamic nature of the District's fire service and emergency medical services deployment, simple location models will not be sufficient as they will not reflect the real-world nature of the system's performance. A high-end modeling program needs to be undertaken. There are relatively few computer models available for this Task. Each has it limitations and depends on reasonably accurate maps and data. The RESO model (in its more recent updated form is one candidate to consider, despite its past criticism.

Any redeployment decisions in the long term will be dependent on the permanent facility relocation decisions made under the proposed comprehensive deployment and station location study.

Costs and Benefits:

Option 1: The redeployment of two trucks recommended under this improvement project involve almost no cost, as they involve movement of units from one station to another that can accommodate them without modification. The only other costs are to update the computer aided dispatch system at Fire Communications to reflect the changes in unit locations.

Benefits – The benefits will be reduced response times to areas presently underserved within the District. These reduced response times for fire apparatus (ladder or truck companies) should result in greater firefighting effectiveness and reduced fire losses in the net. There will be slight negative impact on the existing coverage pattern for those areas losing the services of a ladder company.

Option 2 –The costs of this option are the construction of two new stations. Estimated costs would be approximately $1.5 million dollars each, not including site acquisition costs. Donated sites should be considered, but used only where they can

stand on their own merits. Construction costs for new stations would be slightly offset by reduced maintenance expenditures for the existing station.

Option 3 – The cost of a comprehensive station location study is likely to be on the order of $250-350K. The capital costs of new facility construction as a result of recommendations from the overall study remain to be determined. Some of the capital costs would be offset by avoided need to maintain aging and obsolete facilities.

The benefit of a full deployment and station location study will be to "optimize" the pattern of station locations and units within them to use resources most effectively in response to emergencies within the District. The benefits are in the form of reduced fire loss, and to a lesser degree, reduced mortality associated with emergency medical response, owing to faster intervention in critical care incidents. Customer service will be enhanced by improved response times and more modern community facilities, enhancing neighborhood image and allowing public access to facilities such as meeting rooms. There also is the potential for more efficient use of firefighting forces – the major cost driver of the Department's budget. Major changes in strategies should be considered in such a study.

Capacity for Change

Option 1 – This project is within the capabilities of the Department to implement. Many of these improvements were derived from planned relocations that were never undertaken by previous management.

Option 2 – This project is within the capabilities of the Department to implement. Some outside assistance to review findings would be helpful in assuring that the solutions proposed would be the best available. Analysis could be done with existing software and data within the Department. Some training of in-house staff is required to undertake this option. Training costs would likely range about .20 person years total for personnel in the MIS section plus support from chief officers to support the decision and research effort.

Option 3 – This option is beyond the capabilities of an in-house effort. Sophisticated modeling and analysis would require the use of outside operations research expertise.

Priority Status: Level 2 (Urgent)

Firefighting Improvement Project 4: Evaluate Implementation of Automatic Mutual Aid

Identification of Issues

Within the Washington metropolitan area, all major public fire departments with the exception of the District utilize the principle of automatic mutual aid, in which the closest firefighting unit to a reported emergency is called upon to respond regardless of which jurisdiction the incident may be in. This system reduces the need to staff and maintain facilities along the borders of jurisdictions and can assure the fastest possible response to a reported emergency. Automatic aid is regarded as the highest level of service integration.

Suggested Improvement Project

Evaluate implementing automatic mutual aid with neighboring jurisdictions to allow the closest unit to respond to reported fires or medical emergencies regardless of what jurisdiction that unit is from. Assess whether the neighboring jurisdiction has nearby units competent to respond to D.C.'s needs, in a timely fashion. Milestones on the path to do this are the following:

- Estimation of impact of automatic aid on the District's resources, including areas likely to produce an uneven give and take (more help from D.C. to the neighbor than vice versa).
- Negotiation with surrounding jurisdictions.
- Implementation of joint training exercises and standard operating procedures to operate routinely with units from other jurisdictions.

- Monitoring of the response time statistics and adjustment of the agreement as required. These adjustments may include limitations on the types of calls for which mutual aid is requested or offered, for example.

We recommend in the EMS chapter that mutual aid be started for EMS calls with the Bethesda/Chevy Chase Rescue Squad.

Costs and Benefits

Costs – This program would require compatible radio communication, which should exist after the new communication system is built. Training for surrounding jurisdictions and creation of standard operating procedures for mutual aid response will impose a small burden of perhaps 0.25 person years in a chief officer level staff position at headquarters.

The benefits of automatic aid and closest station response are better customer service for District residents. More rational utilization of resources on a metropolitan basis, and possible savings due to the relocation or elimination of redundant facilities and the avoided costs associated with providing additional coverage near borders.

Depending on the circumstances of the arrangement, it may be appropriate for the District to enter into an agreement with a surrounding jurisdiction that may involve compensation in the event of severe disparities in the frequency of services provided (i.e., if one helps the other disproportionately more often). There is likely to be some concern among surrounding jurisdictions about over-utilization of emergency medical services aid by the District.

Capacity for Change

Existing management staff are able to carry out any policy changes and required training that would be required to implement automatic aid. The use of automatic aid is likely to be a nearly mutual exchange of resources, resulting in little net impact on the overall utilization of District firefighting resources. Responses outside the District are

likely to be balanced to a large degree by responses on neighboring jurisdictions into the District.

Members of the Department are currently on a Council of Government's committee that promotes such agreements. However, there is likely to be concerns within the Department of working with combination departments (career and volunteer), which will fade if the experience proves positive.

This change is strongly recommended, but will require a moderate amount of adjustment and liaison on the part of the management staff and the Communications Center.

Priority Status: Level 3 (Important)

Work Plan

These changes are likely to take several months at a minimum, and could best be accomplished on a schedule of at least one year to permit time for negotiation with surrounding jurisdictions and any necessary policy changes.

This project should be undertaken in parallel with station location planning, as these policies may influence decisions on relocation of facilities.

Also, the full use of mutual aid depends on getting the inter-operability problems solved with neighboring jurisdictions with the new communications system, which will take over a year to implement.

Firefighting Improvement Project 5: Reevaluate Standard Response to Structure Fires

Identification of Issue

The DCFEMS sends more personnel and apparatus to reported structure fires than most comparably-sized cities (see table below). To the extent that this response level does not differentiate between the type of structure involved, it may unnecessarily utilize

firefighting resources and reduce availability of units for actual fires or medical emergencies (see Figure 1).

A related issue is the impact of a series of staffing reduction on the firefighting division. Over the past ten years, the number of companies was reduced, the staffing on both engines and trucks was reduced, and battalion chief's aides were eliminated (see Figure 2).

Figure 1 -- Response Levels for DCFEMS and Other Departments Serving 500,000 to 999,999 Population[1]

	Engines	Ladders	Chiefs	Other	Total Personnel
Detached Dwelling	2.7	1.7	1.1	1.8	18.1
Attached Dwelling (Rowhouse)	2.9	1.4	1.1	1.8	19.4
Commercial	3.2	1.6	1.3	2.1	22.2
Hospital, School, Institutional	3.3	1.7	1.4	1.9	23.7
Industrial	3.2	1.7	1.3	2.1	22.3
High-rise	3.3	1.8	1.5	2.6	24.6
DCFEMS (All structures)	4	2	1	1?	29

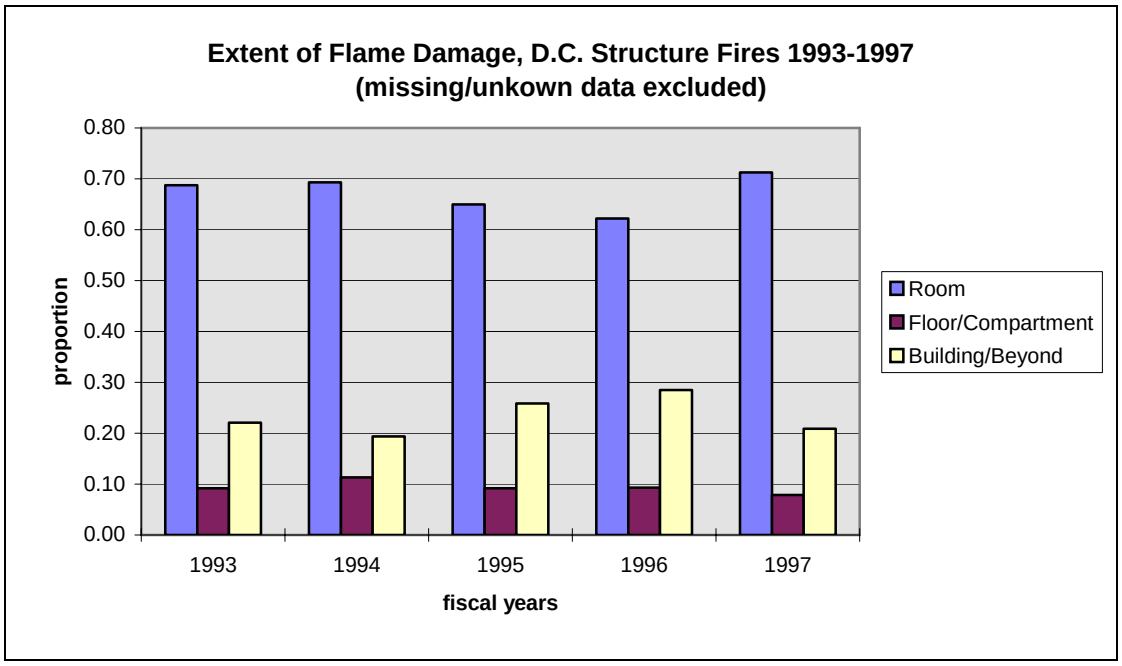


Figure 2

[1] 1995 Phoenix Fire Department Survey of nineteen departments in this population range.

Unfortunately, only five years of structure fire data were available at the time of this study, which post-dates most of the serious reductions in the Department's on-duty staffing. The results of extent of flame damage, a gross measure of fire service effectiveness, does not indicate any clear trend either better or worse.

Suggested Improvement Project:

Monitor the current activity levels and consider the impact on activity levels and structure fire response of changes to this policy. No immediate change in response policy is recommended.

Costs and Benefits:

The cost of this project could be included within a full deployment study of the DCFEMS. Historical data should hopefully be available for a more thorough analyses.

Capacity for Change

The current response to structure fires is a long-standing DCFEMS practice that has evolved over many years. While the response pattern of four engines, two trucks, and a rescue makes sense for attached and major structures, its legitimacy for smaller, detached structures may be questioned. The Department's RESO study of 1996 evaluated the structure fire response and found that reducing the assignment had little impact on company availability and reduced the response to actual structure fires.

Priority Status: Level 3 (Important)

Any further action on this item would be dependent on overall EMS deployment decisions and any station location adjustments made as a consequence of a full deployment study. Short of this, we would concur with the findings of the RESO analysis, which found that there were relatively few full responses, and the current assignment did not unnecessarily burden existing units and was therefore appropriate.

Assessing firefighting effectiveness will require more detailed study, although current system performance appears stable.

CHAPTER 6 – SPECIAL OPERATIONS

This chapter addressed the specialized services of technical rescue, hazardous materials, fireboat, Metro and rail operations, and counter-terrorism preparation that have been grouped under a battalion chief in the Fire Operations Division.

Special Operations Improvement # 1: Provide, Upgrade or Repair the Equipment and Apparatus Needed to Provide Effective Special Operations Services

Identification of Issue

The identification and apparatus available for rescue and other special operations is deficient to perform the required functions. Special rescue and hazmat incidents requires a combination of the standard equipment commonly carried on fire apparatus, and specialized rescue and hazmat equipment.

The DCFEMS Special Operations units lack up-to-date and intrinsically safe equipment and protective clothing to perform special operations functions safely, efficiently, and effectively. The apparatus (Rescue Squad vehicles) used by the units are in very poor condition, and cannot carry all the equipment required to fulfill each special operations function.

The vehicles used by the HAZMAT unit are inadequate in terms of capability, storage space, and personnel safety. The front-line hazardous materials response vehicle shows signs of extreme wear, including stress fractures, a generator that works sporadically, a very rough-riding suspension (which causes damage to the sensitive electronics of the air monitoring equipment and personal computer), and broken compartment doors and door locks. The doors to the personnel seating area occasionally open without warning, and one member must ride in a small jumpseat that would probably be unsafe if the unit were involved in an accident. There is not enough storage space on the unit for full complement of hazmat response equipment, the unit has no lighting capability, no air compressor for tools/pumps, and no reliable power source for the computer or other electrically-operated tools. The roof leaks into the personnel seating and research area, which is also where the computer and air monitoring

equipment is stored. The Support Unit (which was donated several years ago by PEPCO) shows signs of extreme wear and does not have enough storage space for the supplies it is intended to carry.

Other key equipment and apparatus problems include:

- Lack of confined space rescue equipment, including tested and NIOSH-compliant Supplied Air Breathing Apparatus (SABA), lock-out/tag-out kits, hazardous atmosphere monitoring equipment, working ventilation fans, intrinsically safe communications.

- Lack of necessary hazardous materials mitigation equipment, including a support vehicle, containment and confinement equipment, leak and spill control equipment, air monitoring and detection equipment, and decontamination equipment.

- The Hazmat Unit is generally well-supplied with defensive mitigation equipment like sorbents, booms, pads, pillows, and pipe for constructing dams; however, most of the items used to take offensive leak/spill control measures have been donated, borrowed, or purchased with the hazmat technicians' own money. The wide assortment of plugs and patches are very old and in need of upgrading. More pipefittings and flexible patching materials are needed.

- Since every company in the city has the potential to be among the first responses to hazardous materials incidents, all field personnel need training and continuing education at "Level 2" or the Operations-level HazMat competency. Annual refresher training should be provided for all field personnel. Not all have had this training.

- The Foam Unit is relatively busy considering its specialized nature. Its primary mission is to protect the lives of the First Family and other dignitaries during helicopter takeoffs and landings. It needs better training and more highly functional equipment.

- The collapse response team is making great strides in preparing to handle collapse emergencies in structures and in trenches. But the unit is handicapped by the lack of a support vehicle that can carry the heavy equipment and shoring materials to the scene of emergencies. The current step van is old, unreliable, unsafe, and inadequate.

Suggested Improvement Project

A variety of equipment and special training are needed to remedy the above deficiencies. The department needs to do the following:

- The front-line HAZMAT vehicle unit should be replaced with a larger vehicle designed to safely carry the personnel and equipment needed to perform research(identify suspicious or materials), take offensive leak and spill control measures, and begin defensive confinement and containment. The unit should be large enough to allow chemical protective suits to be stored flat and protected from the elements. Proper storage of suits and equipment will help prolong their useful life and provide the maximum level of protection to entry personnel.
- The new vehicle needs to have a command center area to allow personnel doing research to have access to cellular/fax communications, printed reference materials, and a personal computer/printer with the ability to use CD-ROM based software. Pre-plans should be developed from fixed-facility reporting documents required by SARA, and stored on the HAZMAT unit. Internal/external jacks should also be provided to allow hook-up to hard-wired phone lines.
- The hazmat unit should have a high output generator to supply electric power. It should be equipped with body-mounted scene lights and a telescoping light tower. Adequate lighting is critical for preventing injuries, and adequate electrical power is needed for operating tools. An air compressor should also be provided for operating air tools, air patches/plugs, and pumps used to transfer materials from damaged containers. A safe, secure storage area should also be provided for delicate air monitoring equipment. This will help prolong and preserve the useful life of these very expensive items.

- To avoid having to purchase a new support unit, have the current Hazmat unit rehabilitated to function as the Support Unit. The current Support Unit should be permanently retired. The Support Unit should be capable of carrying larger quantities of spill control equipment like sorbents, booms, and overpack drums. Hazmat releases often require large quantities of these items, which cannot usually be carried on the front-line apparatus. The Support Unit could also then be fitted out to carry more adequate supplies of decontamination equipment including tents, showers, pools, and decon solutions. If the hazmat team had a safe and reliable Support Unit, the two apparatus could respond together and help reduce the response time to critical hazmat emergencies where minutes count.
- Procure confined space rescue equipment.
- Procure needed HAZMAT mitigation equipment noted above.
- Purchase Carbon Monoxide (CO) meters for all truck companies.
- Procure appropriate support vehicles for the special operations teams.
- Purchase additional protective clothing for technical rescue and hazmat personnel (Nomex suits, helmets goggles, pads, etc.)
- Replace the current hazmat suit communication system with a more reliable system having greater range. It is vital for safety that entry team members, who may be out of sight for long periods of time, are able to communicate with other team members. Members currently rely a great deal on hand signals.
- Obtain flash suits and thermal protection for cryogenic materials. The present chemical protective clothing is not adequate protection for hazmat members dealing with flammable or cryogenic (extremely cold) materials. Fire-resistant undergarments and hoods should also be provided, along with some form of head impact protection.
- More Level A (totally encapsulating, vapor-tight) hazmat suits need to be provided, and disposable suits should be disposed of after every use, as designed. A wider range of suit materials should also be provided to give more options during chemical-compatibility assessments.

- More Level B (non-vapor tight) hazmat suits should be provided for use during decon operations or during the appropriate entry operations.
- Adequate supplies of lightweight SCBA cylinders should be dedicated to the Hazmat team since weight reduction is especially critical for entry operations.
- Procure needed lighting equipment for night fire, technical rescue, and hazmat operations.
- Replace vehicle extrication equipment with modern, updated, and reliable equipment.
- Procure ice rescue equipment for fireboats.
- Procure electrical and pneumatic tools for rescue squads for vehicle and machinery rescue.
- More and larger overpack drums are needed.
- New dome covers for trailers and railcars are needed since the existing ones on the unit may not work on newer versions of the trailers and railcars.
- The regular and non-sparking toolkits need upgrading. More efficient pumps, including air-operated pumps, should be purchased to allow for quicker offloading of product from damaged containers, thus reducing the potential impact of an incident on traffic flows and commerce.
- More capable detection and monitoring instruments should be provided including photo-ionization detectors (PIDs, which are on order), more multi-gas monitors, and remote air-sampling pumps.
- New radiation-detection equipment is critically needed, especially with the threat of terrorism in DC.
- A wider range of detection tubes for the Draeger system is needed enhance the capability of equipment currently carried by the unit.
- It is vital for both safety and legal reasons that a regular maintenance, calibration, and replacement schedule be implemented for all monitoring and detection devices.

- The printed reference material library carried on the hazmat unit needs to be regularly updated to ensure that the latest information is available to the team. The safety and effectiveness of mitigation efforts and decon operations are severely compromised without adequate and complete reference materials.
- The personal computer on the hazmat unit needs to be replaced with a newer model capable of using CD-ROM based software. The purchase of this software will enable a reduction in the amount of space needed for carrying printed materials. The new PC should also have a more capable printer.
- Fax and cellular phone communications on the hazmat need to be enhanced. Members should be able to send and receive faxes while simultaneously talking on the cellular phone. This requires at least two dedicated cellular lines. Digital wireless communications may be preferable to cellular because of security concerns.
- A reliable weather station should be installed on the hazmat unit and linked to the computer to take full advantage of computer-modeling options currently available with CAMEO software.
- Tents, heaters, and personal decon showers should be purchased for decontaminating civilians exposed to materials. This type of decon requires people to strip naked, and some method for preserving their dignity is needed.
- More durable showers are needed to perform technical decon on entry-team members as well.
- Bleach and powdered detergent are currently the only available materials for decon solutions, and these have been purchased with firefighters' own funds. Other decon solutions should be procured to enable the team to neutralize a wide range of hazards. Better control-zone markers are also needed.
- The apparatus currently used by the Foam Unit are adequate, although there are several chronic maintenance problems that need to be uncorrected. The manufacturer of these units no longer exists, so replacement parts and trained mechanics are becoming increasingly difficult to find.
- Better emergency lighting needs to be installed on Foam Unit 2, and the TAU. The lighting on these vehicles may have been adequate for their previous

assignments at an airfield, but is totally inadequate for the streets of DC. This is a vital safety issue for both the personnel assigned to the units, and for the public with which they share the streets.

- Scene lighting also needs to be installed on all of the Foam Units. Adequate lighting is vital for preventing injuries and allowing the units to operate in an all-weather, day/night mode.
- Some method for replenishing the units' onboard foam supplies should be provided. Currently, the only way to load foam concentrate is by hand, which would not be adequate in the event of a major incident requiring large quantities of continuously applied foam.
- The electrical systems on the units need to be replaced and/or upgraded to provide their operators with timely and accurate information concerning the units' status. This is vital for ensuring the continued functioning of the units and to prevent a catastrophic breakdown.
- Thermal imaging cameras are needed on each rescue unit to help search for trapped firefighters and victims.
- The proximity suits for aircraft rescue and firefighting that are currently provided to the unit are generally in poor shape. New suits should be purchased and utilized by the personnel from Truck 10 who are responsible for rescuing the victims of a helicopter or aircraft emergency. Members of the unit indicated that "someone" had told them that proximity suits were not necessary and that structural firefighting clothing would be adequate if they needed to make a rescue after an aircraft crash. This is not true. Trained firefighters who are regularly assigned to aircraft rescue and firefighting duties must be provided with the appropriate clothing for the high-radiant heat environment characteristic of this type of incident. The provision of, and proper training in the use of this clothing is a critical safety issue.
- Training suits need to be provided for use during initial training and for continuing education and periodic suit recertification drills. Currently there are no reusable training suits available, and disposable entry suits should not be re-used.

Costs and Benefits

Costs – There is a substantial cost in maintaining elite units capable of effective special operations. The equipment necessary to perform these operations is expensive and very specialized. If the DCFEMS is going to provide these special operations functions, which are provided in other major urban centers and in all the surrounding suburban Washington fire and rescue services, an additional capital expenditure must be made on the order of $500,000 for equipment, including four thermal imaging cameras @ $30K each = $120K, and approximately $1.6 million to repair or upgrade the rescue squad apparatus and purchase needed support vehicles.

The costs of the needed vehicles would be approximately as follows:

Rescue 1	$250,000
Rescue 2	250,000
Rescue 3	250,000
HazMat Unit	400,000
HazMat Support Unit	125,000 (if new; less if refurbished)
Collapse Support Unit	125,000
Fireboat 4x4 and Trailer*	75,000
Floodlight Unit	100,000
	$1,575,000

* Explained in Improvement #2: Inland Water Rescue

The newly obtained donated, refurbished rescue vehicle can be used as one of the "new" rescue units until the last of the new rescue units is purchased, and then it can be used as the spare unit. The HazMat support unit might be a refurbished version of the existing HazMat unit if it can be refurbished for well under the approximated $125,000 cost of a brand new unit.

Long term costs must also be incorporated in budget plans for Special Operations. New technology and procedures are constantly being developed. It is realistic to expect a budget outlay of 20 percent of the initial capital outlay per year to replace broken or outdated equipment, and to constantly keep life-safety equipment in top working condition. Therefore, the department should expect to have an annual outlay for special

operations equipment repair and replacing of $160,000. Additional amortized costs for apparatus would be on the order of 10 percent per year, given a 10 year replacement cycle, which should be appropriate for a large urban city (that would be another $158,000 per year, in current dollars.)

The benefit derived from these costs is put simply: the citizens will have a working special operations function within their fire-rescue service that can perform many types of rescues, save lives and mitigate injuries. The units also can better mitigate many types of hazardous materials incidents, and be more effective in responding to potential terrorist threats. If these items are not procured, the DCFEMS will continue to function with a band-aid approach to its technical operations, and will not be able to function in the safest and most efficient manner. Additionally, if provisions are not made to maintain this equipment through continual financial support, the department will find itself in the same poor condition after a few years of service, as the equipment breaks down and is not replaced.

Capacity for Change

In terms of resource utilization, the department has the necessary technical expertise to procure and employ the proper equipment, given appropriate funding. The newly created special operations command is in a position to handle these acquisitions

Priority Status: Level 1 (Critical/Most Urgent) (Requires immediate action.)

Work Plan

Within 1-2 months:	Survey all special operations equipment and develop critical priority list for current inventory that is not working or non-compliant with standards.

Within 2-4 months	Develop a procurement and replacement plan for critical equipment shortages, especially confined space equipment, hazmat equipment, air monitoring equipment, and personal protective gear. Develop an apparatus replacement schedule and evaluate options for new vehicles and support units.
Within 4-12 months:	Procure remainder of special operations equipment needed for bringing equipment in line with projected operational capabilities. Start the procurement process for vehicle replacement according to developed schedule. Evaluate and procure thermal imaging systems for rescue companies and the hazmat unit.

Special Operations Improvement #2: Strengthen the Administration of the Special Operations Section and Add Two New Functions, and Reassign Inland Water Rescue– "Quick Fix"

Identification of Issue

The newly formed special operations section does not yet have budget plans, standard operating procedures, or a hazard analysis for the District. (The unit was in the process of developing a plan to accomplish these tasks at the time of this report.) Some additional functions should be considered for addition to Special Operations.

Suggested Improvement Project

The following steps should be taken to improve the administration and operation of Special Operations:

- Develop budget plan for Special Operations Bureau.
- Develop dispatch, first response, and operations Standard Operating Procedures for technical rescues, hazardous materials incidents, and terrorist threats.

- Prioritize repair and replacement schedules for special operations equipment.
- Develop an apparatus replacement plan for all the Special Operations Bureau Units.
- Conduct target hazard planning for all known potential technical rescue sites, hazardous materials storage areas, etc.
- Add a special operations bureau insignia or uniform patch for all special operations bureau personnel to improve "esprit-de-corps" for Fire Fighting Division and EMS Division personnel who have participate in Special Operations Bureau functions.
- Create formal procedures to enable cost recovery for the materials, time, and equipment used by the Hazmat unit during incidents. This would allow the "Responsible Party" for the release to be held accountable and would require that they reimburse the DCFEMS for the personnel hours and materials used by the Hazmat Unit during the mitigation of the incident. Some mechanism should be provided to allow these funds to be directly used for the replacement and improvement of the equipment used by the Hazmat team, instead of being directed into the city's General Fund. Explore pros and cons of federal reimbursement for operations on federal properties.

Special Operations can be the coordinating center for all special events and dignitary protection functions for DCFEMS, in addition to providing specialized rescue and hazardous materials response. The coordination of these functions, as identified in Task 1, should greatly improve the relationship with federal agencies such as the Secret Service and improve the gathering of intelligence information on threats to protected individuals or the public at special events that would require the resources of the Special Operations Bureau.

The Special Operations Bureau should also arrange for mutual aid in special operations with the surrounding jurisdictions, which have several world-class, well-trained and equipped special operations functions, including: two FEMA Urban Search and Rescue Task Forces (structural collapse – Montgomery and Fairfax Counties); the Metro Medical Strike Team (NBC terrorism --Council of Governments); several

Hazardous Materials response teams (local -- Montgomery, Prince George's; Northern Virginia Regional -- Arlington/Alexandria); confined space rescue (Bethesda/Chevy Chase Rescue, P.G. County, Arlington/Alexandria); and water rescue (National Airport River Rescue & Dive Team, Montgomery County River Rescue, P.G. County Dive Team). As part of a working special operations mutual aid agreement, DCFEMS should be prepared to provide assistance as well as receive assistance for large or multiple incidents.

As part of an overall examination of the staffing and deployment of operation units, a more detailed evaluation of the Special Operations Bureau resources should be conducted to determine if the existing resources and their deployment need to be adjusted to improve the level of service, or increase department efficiency. The staffing and use of the fireboats in particular need review, as discussed in Task 1. (Time is too short to complete the analysis in Task 2.)

To improve water rescue capability, give the fireboat crews the responsibility and equipment for inland water rescues. Reassign the inflatable rubber boats (IRBs) currently allocated to each rescue squad to the fireboat. Give the fireboat crew a 4x4 truck and trailer for deploying the rubber boats. The existing pickup truck is not in good condition but can be used until the new 4x4 truck is procured. Replace the IRBs on the rescue squads. with updated lifejackets and first responder equipment, to assist in water rescue. Require all personnel assigned to the fireboat even temporarily to know how to swim. ***(This is a QUICK FIX to address the lack of training of rescue squads in water rescues, and the under-use of fireboat crews, and the problem of unqualified fill-in substitutes on the fireboat.)***

- Ensure that all fireboat and rescue squad personnel are trained to at least the EMT-Basic level. In the longer run, train/reassign one EMT-Paramedic to replace one position on each Special Operations Team per shift (Confined Space, High Angle, Collapse Response, Hazmat, and Fireboat), to get ALS care to victims in positions that "regular" ambulance or engine paramedics could not reach safely.

Costs and Benefits

Benefit – The benefit is better plans and procedures, greater safety, and better services. No significant costs are involved in the above changes. Development of administrative procedures, standards operating procedures, and target hazard planning are an integral part of the functions of the special operations staff. There should be no direct costs involved in incorporating the additional functions of special events and dignitary protection into the section, as these functions will be transferred from other areas within the department. The establishment of a staff position to handle this function will be a transfer of an existing FTE.

Costs – The establishment of mutual aid protocols incurs only minor costs to the department in terms of personnel hours dedicated to meeting with the jurisdictions and establishing these standing procedures. The long term establishment of mutual aid will save money as the DCFEMS will not have to develop resources to stand alone when facing these types of incidents, and will have a reliable back-up when DCFEMS units are already committed to an incident or to training exercises.

The additional training or assignment of Paramedic-Firefighters to the Special Operations Bureau will not increase personnel costs as the Firefighter Paramedics are not currently granted premium salaries. If Firefighter Paramedics are granted salary compensation, the cost increase would be the marginal difference between a Firefighter and a Fire Medic at each of the companies on each of the shifts (R1, R2, R3, HM,FBx4 = 20 positions upgraded to paramedics), plus any overtime or additionally trained personnel in the eligible pool to fill those positions when a paramedic is off duty). The benefit would be faster advanced medical services provided to patients at special operations incidents, as well as additional protection afforded to the rescue teams by having a qualified paramedic as a day-to-day member of the crew.

Capacity for Change

The personnel in the newly created special operations bureau have the appropriate training and background to develop these plans and procedures. Expending the horizon of the special operations will require some readjustments in assignments. Reassigning inland water rescue from rescue units to the fireboat view may take some mental

adjustment. Strengthening mutual aid goes somewhat against the culture of a self-sufficient Department, but it is efficient to share regional resources – both ways.

The organization has the ability to incorporate these additional functions and redeploy these resources. The option to place trained firefighter paramedics on the special operations companies is not currently available due to DC Health Department requirements for two paramedics to work together, as well as the lack of a true capability for firefighters to function in a dual role-cross trained capability. Contingent on several recommendations from this study, however, a long term plan to incorporate this change is possible, and desirable. Engine company paramedics are used in many cities.

Priority Status: Level 2 (Urgent)

Work Plan

Within 1-2 months:	Transfer inland water rescue response capabilities to the Fireboat crew. Reassign IRBs to Fireboat (Retain first response shore based rescue capabilities with the Rescue Squads.). Reassign planning functions for counter terrorism and special events planning to Special Operations Bureau. Develop a budget plan for Special Operations
Within 3-6 months:	Develop dispatch, first response, and operational Standard Operating Procedures for all types of special operations incidents. Contact and establish mutual aide agreements and procedures for special operations with all metropolitan fire-rescue departments that border the District, which should include an evaluation of available resources, and procedures for requested and receiving mutual-aide or providing mutual aide to those departments.
Within 6-12 months:	Begin Target Hazard Assessment and Planning for all special operations target hazards (this should become a continual an ongoing function of the Special Ops units.) Develop a plan for costs recovery for special operations incidents.

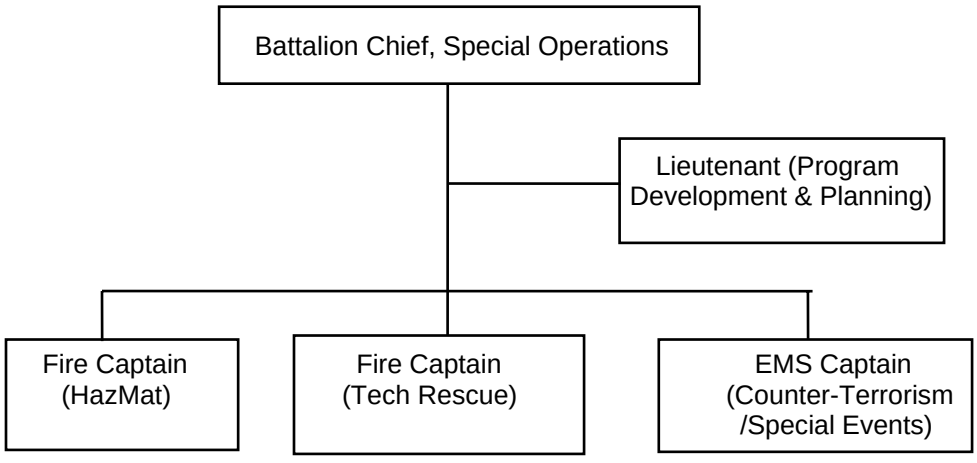
Special Operations Improvement #3. Provide Staffing Necessary to Administer and Conduct the Special Operations Missions.

Identification of Issue

The Special Operations function, newly formed, must be assigned several additional FTE positions to achieve its mission, develop policies, and manage its resources. Additionally, special operations units are often staffed with firefighters who have no special operations training, reducing their ability to operate safely and effectively.

Suggested Improvement Project

- Add/ reassign a lieutenant and two captains to join the existing Battalion Chief for Special Operations. Reassign the EMS captain who handles the unit EMS, counter-terrorism and special events (his role would be broadened). The organization would be as follows:



- Stop the temporary assignment (details) of untrained personnel as substitute staffing on the rescue squads and fireboats. Develop a pool of back-up personnel from one or

two land companies for each unit. ***("Quick Fix" – Address minimum standards for assigned squad and fireboat detailed personnel.)***

- Improve selection process for rescue squad personnel to lessen amount of time units must respond with less than 5 minimally qualified personnel.
- Additional incentive pay for officers and members of the Special Operations Bureau should be considered to help reduce turnover (increase tenure) within the unit, and make it easier to recruit talented members. Training can be expensive, and retaining quality members is important to ensure that the knowledge and experience gained during training and response remains in the Unit. The incentive pay also would reward unit members for the increased training and increased risk that goes with rescue and hazmat duties.
- A larger number of qualified personnel need to be provided and used during entry operations to ensure the safety of members and compliance with OSHA's "Two-in, Two-out" rule. Entry teams should always consist of two members, with a backup team (also having two members) standing by. Additional personnel are needed to ensure that the "decontamination corridor" is set-up prior to the initiation of entry operations. The need for these personnel is the chief reason that personnel on the hazmat support units (E12, T4, R1, R2, R3, M17) need to be included in continuing education and refresher training for hazmat.

Costs and Benefits

Costs – The costs incurred will be the addition of three FTE officer positions to the Special Operations Bureau. In reality, these positions would be filled by transfers of FTE positions from elsewhere within the department, but the net additions to fill in behind them would be:

2 captains @ $52,220 + 33%	= $138,905
1 lieutenant @ $44,161 + 33%	= $ 58,734
Total	= $197,639

At no added cost are the current Battalion Chief of Special Operations and the EMS captain assigned to counter-terrorism and special events.

Personnel costs on the special operations units would be marginally increased if premium pay is given for special operations bureau personnel, but these costs will be somewhat offset by reduce turnover in personnel in the Bureau, which will reduce initial training costs for newly assigned members, and recovery of costs by charging for haz mat operations.

Stopping the detail of untrained personnel will necessitate a short term layout of overtime to fill the specified positions, until a pool of trained personnel is developed (within one year).

Benefit – The benefit will be appropriate staffing for safer and effective operations, and a reduction in the department's liability and risks associated with using untrained firefighters in specialty positions.

Capacity for Change

The DCFEMS has the capacity to reorganize its staffing for Special Operations to improve the safe and effective delivery of these special operations functions.

Priority Status: Level 2 (Urgent)

Work plan:

Within 2 months:	Stop detailing untrained personnel to special operations units. Add/reassign recommended personnel to develop a working special operations staff.
Within 6 months:	Develop a new procedure for the selection, training and assignment of Special Operations Bureau personnel that will not force units to be understaffed with untrained members for the evaluation phase of selection.

Special Operations Improvement #4: Improve Training of all Members of the Department in First Responder and Awareness Skills for Interaction with Special Operations.

Identification of Issue

There is a department-wide lack of awareness of special operations, and a need to improve training in special operations.

Technical rescue and hazardous materials incidents pose some of the greatest dangers to firefighters and the citizens they protect. The current basic knowledge of these dangers is inadequate across the department, and the training academy only recently incorporated awareness training on special operations into its recruit curriculum.

Additionally, the aspects of commanding special operations incidents need to be incorporated in chief officer level training.

Some of the specialty units do not have adequate training, and lack confidence in undertaking some of their duties (by both their self-assessment and ours). The department cannot take shortcuts in its initial training and rectification of members assigned to perform these functions.

Suggested Improvement Project

- Provide first responder (awareness) training for technical rescue to entire department.
- Increase amount of training allotted to each rescue squad for technical training and maintenance of skills. (QUICK FIX - Increase amount of Squad training from current 4 hours per month.)
- Develop a chief officer training program for incident command considerations for technical rescues, and terrorist acts. (training for hazmat incidents is already underway.)

- Develop a standardized vehicle extrication training program for all the rescue squad and rescue engines.

- All personnel assigned to the Hazmat Unit should be trained to a level equivalent to that of a Hazardous Materials Specialist, as detailed in OSHA 1910.120. This is especially important due to the potential extreme danger posed by hazmat incidents, and will bring the team inline with the standard of care provided by surrounding jurisdictions. The current level of training for Hazmat Unit personnel is "Level 3", which is equivalent to the Technician level. [An estimate of the hours of training involved needs to be developed.]

- The effort to train and certify support personnel (on certain line companies) is commendable. Hazmat incidents are very labor-intensive and a pool of qualified personnel is needed to ensure the viability of mitigation efforts. However, it is important that these personnel receive adequate initial training and continuing education to maintain their skills. The "Level 3" personnel assigned to Engine 12, Truck 4, Rescue Squads 1/2/3, and Medic 17 should be made an integral part of the Hazmat Team, and should receive regular training and re-certification in suit operations.

- The effort to train all personnel in the First Battalion to "Level 3" is also commendable. However, the 24 hours allotted by the Training Academy for this training is inadequate and not up to NFPA 472 Standards, which require a minimum of 40 hours of training to receive certification at the Technician level. Many surrounding jurisdictions exceed this 40-hour minimum standard when training personnel to the Technician level, requiring the completion of up to an 80-hour course before allowing personnel to become certified. At least 40 hours should be made available for this training. Hazmat technician training is very intense and extensive without room for shortcuts. One benefit enjoyed by the DCFEMS is the current assignment of several qualified hazmat instructors to the Unit. Still, these instructors must be given the time and resources to do their job right.

- Efforts to train and certify command personnel to "Level 5" are commendable and should be supported.

- Efforts are underway to create a regular drill schedule and provide continuing education for members of the Hazmat Unit. This is very important, as Hazmat is a dynamic and ever-changing field which demands regular drills and refresher training. These efforts should be supported in every possible way by the Department and the Training Academy.

- Provisions should be made to send selected members of the Hazmat Unit to outside training schools to increase their knowledge and skills, and in turn, teach what they have learned to the rest of the members. Specialized training in the handling of railcar and tractor-trailer emergencies is sorely needed.

- The Hazmat Unit should take advantage of training opportunities with other Hazmat teams in the Metro area, since an interagency or intergovernmental response is a definite likelihood in the event of a major hazardous materials emergency.

- Training in the handling of Nuclear, Biological, and Chemical incidents should be provided to members of the Unit if they are to be responsible for handling potential terrorist incidents involving these materials.

- Since every company in the city has the potential to initially respond to hazardous materials incidents, it is imperative that all field personnel receive training and continuing education at "Level 2" or the Operations-level. Annual refresher training should be provided for all field personnel.

- Personnel assigned to the Foam Units and Truck 10 need additional training. They should be trained as Airport Firefighters according to appropriate NFPA and FAA standards. They need more realistic training in the application of foam during aircraft emergencies. (More frequent flammable liquid pit training could be accomplished with the aid of surrounding airports.) They also need realistic training in the use of proximity suits for rescue from a burning aircraft. The intense radiant heat present in these situations demands specialized training and is different from that encountered during structural fires. Further, continued attention should be paid to aircraft familiarization efforts. Training should be

provided on the use of extrication tools to disentangle and gain access to trapped victims in aircraft.

- Train personnel assigned to the fireboat for ice rescues. Make sure they are trained for rescues on inland bodies of water using the inflatable rubber boats reassigned to them from rescue companies.

Costs and Benefits

If awareness training is incorporated into a routine drill schedule for all on duty companies, costs incurred would be negligible. The initial training of the hazardous material level 3 hours will be 14 additional hours per employee trained to comply with the NFPA minimum contact time, plus an additional 14 hours instructional time. This training can also be provided on duty. Training for these incidents is not just a desirable addition; it is the cost of doing business safely in the modern fire service.

The benefit of increasing this training will be a safer initial response to technical and specialized emergency by first response units, and efficient size up and resource utilization of the special operations resources when they respond. Additionally, liability will be reduced because the department will be meeting industry consensus standards established by the National Fire Protection Association (OSHA) and federally mandated standards established by the Occupational Safety and Health Association (OSHA).

Capacity for Change

The current Training Division staff is inadequate to handle these additional training functions on top of their current assignment. One FTE should be incorporated into the training division functions to handle record keeping and coordination of all Special Operations training and recertification. The Special Operations Bureau has qualified instructors to teach all the disciplines related to its mission, and can obtain unique regional resources from the federal government. (It remains to be determined whether the recommended increase in training staff needs another position beyond those recommended in Chapter 7.)

Priority Status: Level 1 (Critical/Most Urgent)

Work plan:

Within 6-12 months:	Develop a tiered training program, curriculum and courses for providing a tiered level of special operations training to all members of the department, to include first responder awareness training for all members of the department, advanced training for all members of the special operations bureau, and specialized training for personnel assigned to specific special operations functions.
Within 12-24 months:	Begin implementation of the special operations training curriculum. Develop and provide command level training to chief officers.

CHAPTER 7 – TRAINING

Training Project 1: Rebuild and Improve the Training Facility

Identification of Issue

The training facilities are in great disregard, and lack needed modern training facilities that are safe for firefighters to use, and train them to be skilled in delivering emergency service to the public.

Live Burn Building – The live firefighting training building has been condemned and has been inoperable since 1988. This is very critical because firefighting training requires a live burn simulation building which allows for fires to be burned and extinguished over and over without damaging the building's structure. Live burn training in specially designed buildings is the only way firefighters can be trained realistically and safety.

Fire training is to be conducted in accordance with NFPA standards 1402 and 1403 which include the standards for training centers and live burn facilities. These NFPA standards emphasis safety. The live fire burn training building is necessary to provide training in the safest manner possible.

Underground Fuel Tanks – Another important concern at the fire academy facility is the ground fuel tanks that are damaged, and the cracked concrete around the buildings and the driving course. Also needing attention is the inoperable water storage tower that takes up needed space but still requires maintenance because it is in the flight patch of aircraft heading to National Airport.

The damaged concrete was probably a result of the increased weight of present day fire apparatus. If the deteriorated surfacing is not corrected it will result in further damage until the area is not serviceable and damages vehicles.

The department has been ordered (by EPA) to remove four underground fuel storage tanks at the training facility by December 1998 because of the threat of environmental contamination. Failure to remove the tanks on time or discovery that the tanks have leaked will require additional clean-up expenses, if not also fines.

The water storage tower should be removed before it becomes a safety hazard.

Junk fire vehicles are stored at the training academy and used as a source of spare parts by the Fleet Maintenance Division. While it is necessary and prudent for the department to utilize these parts, it is inappropriate to store the junked fleet at the training academy. Efforts should be made to locate a suitable lot at a DC Government site for the junked vehicles. If a site is not readily available, the DC Government should locate a joint site where public works, fire, police, and other agencies can store vehicles.

Classroom Building – The DCFEMS is in need of adequate training and classroom facilities. The McMillan Drive classroom facility is too small

Suggested Improvement Project

Four facility improvements are needed:

- The live firefighting training building
- classroom building renovation
- underground fuel tank removals; driver training, concrete repair and water storage tower removal
- junk fire vehicles storage

Developing a safe live firefighting training building is the most urgent need because the absence of this facility is critical to fire training. Also urgent are improving classroom conditions, and providing adequate lockers and rest rooms. The excavation of underground tanks at the training facility as well as repairing the concrete and removing the water tower are important. The fuel tank removals are required by EPA. Failure to comply in a timely manner may result in more costly expenses. The junk fire vehicles can be removed as a “quick fix.”

The Training Division conducts fire training out of a small facility in the southeast, which was constructed in 1961. The training for EMS bureau personnel is conducted at the McMillan Drive facility. Both facilities are inadequate to house the entire Training Division and do not provide suitable classroom, and rest room facilities. The Fire Training Academy was built before women were accepted into the fire service. Therefore, all the female locker rooms and facilities were originally added as temporary structures and are substandard.

New Burn Facility – The DCFEMS has already researched and funded the development of plans for a new live firefighting training facility. This new facility is state of the art with regards to safety but is not extravagant. Although planned, the building was never included in the capital improvement budget.

The original cost estimate should be updated and included in the capital improvement as soon as possible. Approval of funds for this facility should be fast tracked. The construction of the new building should be bid as soon as possible and include demolition cost of the existing structure.

Classrooms – The DCFEMS should plan an addition and renovation of the Training Academy classroom building, and make it adequate for the fire and EMS program sections**.** This construction project should include two additional classrooms divided by a rear projection visual media center for emergency incident training and include male and female student and instructor locker rooms and rest rooms facilities.

The addition should include: a lunch room kitchen area where students can eat and take class breaks, and a storage facility for training equipment.

The existing classroom building should be renovated to include new mechanical heating, venting, and air conditioning systems as well as plumbing. The two existing classrooms should be retained. The remainder of the building should be divided into work areas for permanent and adjunct staff. A division conference meeting room should be included.

Establishing a site for fire training facilities is important because of the potential future residential development, which can become too close and result in complaints about smoke, odors and noise. The present facility is in a good location protected from developmental encroachment. It would be difficult to rebuild a new fire training facility about anywhere else in the city. Renovation at the present location makes sense and delaying the enviable with just be more expensive.

Underground Tanks, Broken Concrete and Water Tower Removal – This is an important fix should be coordinated with the renovation of the classroom building. There are three options to consider:

Option #1: The concrete removal and fuel tank removal could be done at the same time the condemned burn building is being demolished. This would reduce the expense of heavy excavation and removal equipment. Assuming the firefighting burn building is given a high priority, the work would begin in the near term, which would ensure timely removal of the tanks.

Option #2: Include the removal of the fuel tanks, concrete road repair and water tower removal with the training classroom renovation and addition. The excavation of the tanks and concrete could be done while footings are dug for the addition.

Option #3: Break the training academy capital improvement needs into three bids, one for the removal of the underground fuel tanks, broken concrete, demolition of condemned burn building and the removal of old water tower. The water tower is a lower priority and was estimated to cost $65,000 to remove. Combing these into one bid may be the most cost effective. A second bid would be for the renovation and addition to the classroom building, and repair of concrete and driver training course. The third bid would be for the live firefighting burn building. This is specialized construction and the contractor may only wish to build these structures and safety control features.

Costs and Benefits

Cost – The original cost estimate for the new live firefighting building was $2.5 million. The updated cost plus demolition of the existing building would probably be a one-time cost of about $2.7 million.

One time cost estimate for plans and construction of the classroom structure would be approximately $4 million (the current estimated cost of commercial construction is $150 per square foot.)

In addition, fuel tank removal $30,000; concrete removal $30,000; water tank removal $65,000. Total one-time cost = $7.1 Million.

Benefits – Safe training in skills critical to safe and effective delivery of firefighting service.

The renovated classroom building is needed to conduct important training. The classroom should also help instill a professional attitude and conduct. To centralize the department training, a centralized, adequate training facility is required. Fire, EMS and Adjunct training personnel need to work in the same facility. The continued use of multiple facilities is inefficient and costly. Different fire and EMS facilities encourages separation.

These repairs must be done for safety, EPA compliance, and to provide a training facility to build staff capability. It will only become more expensive if delayed not to mention the threat of EPA fines for leaking tanks. If a tank leaks, all the contaminated soil will have to be removed and processed to remove the contamination sharply increasing the costs. Efforts should be made to locate a suitable lot at a D.C. Government site for these junked vehicles. It a site is not readily available, the D.C. government should locate a joint site where Public Works, Fire, Police, and other agencies can store vehicles. The need will only get greater with time.

This is a “quick fix” issue and the fleet maintenance division should make arrangements to remove these vehicles. The Training Division should not permit the

academy facilities to store any vehicles that cannot be driven, or permit unsightly conditions.

There will be some cost associated with towing the junked vehicle to another storage area. The benefits will be a much improved appearance as well as increased student parking and open grounds. The open space will be critical once any construction at the facility begins.

Priority Status: Level 1 (Most Urgent/Critical)

The detailed priorities as follows:

Live Fire Building – 1 (Most Urgent/Critical)
Classroom Renovation/Addition – 2 (Urgent)
Underground tank removal – 1 (Most Urgent/Critical)
Concrete and water tower removal – 2 (Urgent)
Junk vehicles – 3 (Important)

Work Plan

Within 2 months:	Update cost estimate of live burn facility.
Within 6 months:	Prepare renovation requirements for training classroom building, and issue RFP for construction.
Within 12 months:	Demolish existing live burn training structure, and start construction of new structure. Must remove underground storage tanks. Remove junk vehicles to other site.
Within 24 months:	Complete renovation of classrooms.

Training Project 2: Reorganize the Training Division and its position within the DCFEMS.

Identification of Issue

The DCFEMS Training Division mission was recently expanded from primarily training firefighters to include coordinating EMS training. This is a step in the right direction to consolidate departmental training but it does not go far enough. There is a need to have a central focus for all of the department's training to ensure consistency with changing national standards, plan and prepare the department for technological advancements (e.g., new firefighting equipment) and provide the fire chief and top management with department-wide training data that can provide current status and help project needs for the department's training.

Presently much training is undertaken throughout the department without involvement of the Training Division. The training in one unit often impacts other segments of the department, and the impacts are not adequately coordinated. For example, the Communications Division facilitates the training of communications personnel for fire and EMS dispatch, directly impacting on important department wide functions. The fire and EMS users have been critical of the dispatchers performance, and it appears the training of dispatchers is not meeting the departmental objectives. A central and comprehensive Training Division could better deliver and evaluate the effectiveness of this training.

The Fire Prevention Division also conducts its own training for various inspections and investigation positions. It is important that this training be monitored to ensure it is in accordance with national standards, and that it gets done.

The Training Division should be able to provide training to any division of the department when the fire chief determines the need as results of current trends or events. For example, the DCFEMS Fire Prevention Division was given the responsibility to inspect school roofs by the federal court. Roof inspections are not usually the responsibility of fire inspections. A training program quickly researched, developed and delivered by the Training Division could have provided needed support to ensure DCFEMS met its court directed obligations professionally and competently.

Training currently is a division within Fire Operations, even though it also now has the responsibility for EMS Bureau Training. The dominant fire department culture overshadows the equally important aspects of EMS training.

Suggested Improvement Project

For the Training Division to equally support EMS and fire operations, it should be positioned in the organization where it can support the entire department. The DCFEMS should consider moving the Training Division out of Operations, to become part of either a fourth new command established (in addition to Support Services, EMS Bureau, and Fire Operations), or to an expanded Services Division.

Within the Training Division, the Training Battalion Chief should become the official DCFEMS Training Records Registrar responsible for the confidential training records and transcripts of the entire department. These records should be maintained by the administrative captain, and should include training from departmental Fire Academy courses, EMS training, classes taught by adjunct departmental staff, U.S. Fire Academy classes, and certified training courses from other states. They all should become part of each employee's training record.

The Training Division should be subdivided into EMS Programs headed by an EMS captain, and Fire Programs headed by a fire captain. A Leadership Development Program section and a Special and Adjunct Programs section should in the future each be headed by a captain; in the short term, these two sections can be combined in one until the work load warrants that they be divided. The administrative captain should initially lead this new section supported by a lieutenant.

The present EMS training (paramedic and EMT) should be grouped in the EMS Programs section. Recruit training and in-service training should be assigned to Fire Programs. Leadership Development Programs should include officer training. The officer course taught to fire sergeants should be expanded to include all fire and EMS first level supervisors. This course should address emergency and non-emergency management and supervision as well as incident command operations. The Leadership

Development Programs section also would include other officer training, such as Instructor level II training, and coordinating course attendance at the U.S. Fire Academy.

The Special and Adjunct Programs section should address the training needs for the other divisions outside of operations, such as Fire Prevention, Communications, and Special Operations. These divisions should have training liaisons which function as adjunct faculty of the Training Division. This section should ensure that classes are developed by certified level II instructors with appropriate lesson plans which meet certification standards.

Costs and Benefits

Cost – The reorganization of the Training Division in the short term can be done with existing staff. Therefore, no additional cost is immediately necessary. After the combined first level supervisor's course is scheduled, an additional captain should be assigned to training to supervise the Leadership Development Programs section. The recurring salary cost would be $52,220, plus 33 percent benefits = $69,600.

Reorganizing the Training Division to a Technical Operations command will most likely require an additional assistant chief position for Technical Operations. It is not necessary that this position be a fire officer; it could be an EMS Assistant Chief, which balance top management with two fire assistant chiefs and two EMS assistant chiefs. Another option is to supervise the Technical Operations command with the training Deputy Chief, who is underutilized. (See staffing recommendations in a later improvement project below.) Where training is put on the organization chart should be part of a department-wide design for organization and administration – discussed in Chapter 2, Office of the Fire Chief. (See organization charts on following pages.)

Benefits – Duplication will be eliminated (both fire and EMS have been providing Emergency Medical Technician Training.) Officer development would be given more attention, a training shortcoming at present.

The Training Division will be able to coordinate all Departmental training and make sure training of prevention and support positions is acceptable. It also would help balance tracking management between fire and EMS services.

Adjunct training from other divisions in the department will be coordinated to ensure appropriate standards are met. The reorganization will allow top management to direct needed development of special training throughout the department. Human resource development for new technologies can be researched and planned for the future.

Capacity for Change

The organization should be able to make these adjustments easily, however, there may be some resistance from fire personnel to fully accept EMS personnel in training.

This recommendation applies whether or not the EMS transport function stays within DCFEMS. Although who does EMS training of firefighters would have to be rethought, the centralization of all other training still is needed.

The EMS medical section would have its medical curricula (EMT and paramedic levels) directed by the medical director for the department. The medical part of EMS training for firefighters must be consistent if not identical to that of most ambulance personnel.

Priority Status - Level 2 (Urgent)

Work Plan

Do over next 12 months.

Training Project 3: Restore Training Division Staffing (FTEs) and Reassign Some Duties.

Identification of Issue

The Training Division staff is down from the 1996 levels of 29 personnel to 9 personnel. The staffing is short to accomplish many tasks of curriculum development, recruit instruction, special operations training, record keeping, and routine administration of the facilities. Much of the training conducted by the training academy since 1995 is now done using personnel detailed temporarily to training from the Firefighting Division, requiring backfilling with overtime. The use of these field personnel in training, especially the sergeants seems to be working well, except for the problem created by pulling these personnel from the Firefighting Division, which needs to be resolved elsewhere than training.)

The Deputy Chief and Battalion Chief in Training provide adequate upper level management. The Captains and Lieutenants, however, seem bogged down in many mundane tasks such as data entry and facility maintenance, rather than serving as lead instructors or developing other training courses.

Suggested Improvement Project

The Battalion Chief should be the training division manager, serving as director and registrar with the responsibility to prepare a training division budget each year. A five year plan should be developed an kept updated. It should focus on training needs of the entire department (not just firefighters) and how the Training Division can meet the future needs.

The EMS Quality Assurance Coordinator must be included as a liaison with EMS trainers in order that the continuing EMS education, refresher training and in-service training reflect EMS needs.

Two additional instructors with primary roles to develop and deliver training should be added to the Training Division. These instructors should be one Lieutenant and one Sergeant who are Level II fire service instructors, and are distinguished in their technical knowledge, with demonstrated ability to provide professional instruction and course presentation.

The present fire instructors who teach Emergency Medical Technician courses should be assigned to the EMS programs Section 1 and all EMS training should be coordinated from that section.

The Deputy Chief over training should also assume additional duties as coordinator of departmental safety and of the Planning section. The Deputy Chief should ensure that problems and issues identified through the departmental safety officer reports are feedback and are addressed in appropriate training programs. The Planning section (not within the training division) should be rejuvenated with the objective to explore new fire, EMS and rescue technologies, procedures, and needs. Those significant discoveries and suggestions be forward to top management. The Training Division should prepare the department with training to adopt new technologies.

The Deputy Chief should be responsible to evaluate the performance of the Training Division in the entire department. This should include adjunct training programs in fire prevention and communication, etc.

Costs and Benefits

Cost – The salary of one individual Lieutenant ($44,161) and one Sergeant ($38,133) to develop and deliver programs with benefits. Total Cost $110,000. [Note that a third position, a captain, was recommended in the organization section for a total of three new training positions.]

Benefits – The additional training staff will allow increase the capability of the department the Training Division to deliver more quality training as well as develop training courses to be delivered by adjunct instructors. This additional salary expense could save the expense of contracts paid for training to the communication division. It also will release overtime from detailed FTEs who have to be backfilled, because they will help deliver as well as plan the training.

The additional duties of the Deputy Chief as well as the budgeting and five year planning of the Battalion Chief emphasizes future planning and forward thinking expected of these positions.

The EMS Quality Assurance and fire safety officer feedback is important to evaluate and update existing training performance to the department.

Capacity for Change

Will require some adjustment and broadening of viewpoint of training staff.

Priority Status: Level 3 (Important)

Work Plan

With the exception of adding two instructors, the organizational changes are "quick fixes" within the department.

Training Improvement Project 4: Provide Adequate Training Equipment and Apparatus

Identification of Issue

The Training Division needs the same tools, equipment and supplies that are used by EMS and fire units. This equipment is used for instruction purposes and for the students to perform practical applications necessary to develop skills and proficiency with the equipment the will use in emergency operations. The condition of the current equipment is either not very serviceable. The fire academy's equipment and tools are often "borrowed" without authorization from the academy to be used on fire units. Thus, the Training Division suffers from the same ineffective procurement system as the entire department, both directly and indirectly, by having its equipment swiped to make up for short falls elsewhere. The net result is having to personnel trained on outdated, substandard tools and equipment.

The tiller ladder truck used at the academy can only be used for driver training and not ladder operations because the aerial ladder is not safe for ladder operations.

The training staff also supports in-service training – the training conducted in each of the six battalions throughout the city. It is not practical for fire companies to frequently go to the fire academy for training, and be unavailable for emergencies, so the training is taken tot the companies by the academy staff as often as possible. This requires that the training instructors have adequate and dependable staff vehicles. The training staff vehicles are at the end of their service life and need replacing.

Alternative instruction methods such as using slides and overhead visual aids of the equipment that is not available are not possible because Audio Visual projectors and programs are also inadequate.

Suggested Improvement Project

The procurement system needs to be fixed, and broken equipment should be repaired or replaced. The Training Academy needs adequate, secured storage for tools, equipment and supplies.

Apparatus (fire vehicles) used at the fire academy do not have to be first line units, however, they need to be usable and safe to operate.

Appropriate supplies, tools, equipment, and apparatus should be obtained to support training. This should also include visual aid projectors, commercial training programs, and outside lighting for training in the evenings.

The entire training staff vehicle fleet should be replaced based on “mileage and age criteria.” As vehicles reach the end of their service life, they become expensive because of repairs and are unreliable.

Costs and Benefits

Cost – Estimated for training equipment should be $100,000 per year for the next three years to bring equipment, vehicles, and equipment repair up to standards. After three years, the cost could be reduced by about a third or more, and these funds used for maintenance and normal equipment replacements caused by wear and tear.

Benefits – The necessary equipment would allow the proper training of new personnel and would ensure that the Training Division is able to conduct safe, professional quality training for the entire department which translate to safe and efficient emergency operations for the citizens. The upgrading of vehicles and fire apparatus will ensure scheduled training is conducted in reliable manner.

Priority Status – Level 2 (Urgent)

Work Plan

Phase in new equipment and apparatus over 12-18 months.

Training Improvement Project 5: Revise Training Curricula

Identification of Issue

The DCFEMS has been in the process of being approved as an accredited academy that can certify training to national standards. This is very positive and cost beneficial, because the department will not have to rely on other agencies for certified training. Requirements that go along with this responsibility are having training curricula that meet national (NFPA) standards, which includes testing, recording of course grades, and transcripts of training. Also, instructors must be certified. There are gaps in meeting those requirements.

The Training Division has a good computer system and Paradox software for keeping firefighting training records. However, there is no capability or compatibility with the EMS training record system. This is needed.

The Training Division uses adjunct officers from the Firefighting Division and other divisions to develop courses. This is a good approach because they have the most technical expertise in the department on the subject. The problem is that some of the adjunct instructors have not received Fire Instructor II training, which is required by national standards to develop curricula and course lesson plans. This jeopardizes the accreditation of the training program.

Independent of the accreditation of the training program and some other curricula issues. One is that the Training Division does not offer EMS employees the same type of first line supervisor training as it does for Fire Sergeants. A course curriculum which includes training for all supervisors is needed. Furthermore, leadership development training is needed for all supervisory levels, not just the first level. Supervisory training needs to be expanded to include all supervisors. Lieutenants and Captains level courses should be developed to include certifying officers tot he NFPA Fir Officer II level. NFPA Professional Fire Officer Standards 1021 stipulate that candidates must meet the performance standards before they can be certified to that level. They must have this training and required experience before they can be certified to the next higher level.

Battalion chiefs and higher level training should incorporate selected courses at the U.S. Fire Academy. This is very cost effective training and not being utilized to the fullest extent. (Only part of living expenses have to be paid; the instruction is free.)

Driver Training and Accident Prevention – The skill level of equipment operators should be improved. There are substantial losses due to vehicular accidents. Presently the safety and loss data is not analyzes by the DCFEMS to determine common causes or indicators of the accidents, and incorporate these findings into in-service and driver operator training courses to correct curricula deficiencies.

Suggested Improvement Project

1. The Training Division should adjust the present fire Sergeant Officer candidate course to include EMS and other departmental supervisors. The University of Maryland Fire and Rescue Institute has nationally certified fire and EMS officer courses which can be purchased and taught by Training Division staff. These courses have been researched and fully packaged with lesson plans and visual training aids. The Training Division should make the one-time purchase of these courses and tailor them to DCFEMS supervisors needs.

2. The training Division should identify the additional training that is necessary to certified fire and EMS Lieutenants and Captains to national standards. This will require the Fire Instructor II and Fire Officer II courses. These could be developed from within the department or purchased complete with visual aids, whichever is deemed most cost effective.

3. To increase upper- and mid-level officer training, the Training Division should be the coordinator of the department for all U.S. Fire Academy courses. The Deputy Chief over training, with guidance of top command staff should identify appropriate USFA courses for key assignments throughout the department and submit courses applications in the fall of each year to the USFA. The USFA course schedules are published in advance, so leave, vacations, and shift schedules can be arranged around class attendance. The USFA will also schedule some programs at a local fire academy when requested to service a region. This option should also be used.

4. All adjunct instructors used to develop lesson plans for training should be nationally certified to the level II fire service instructor level. This course is available routinely through the Maryland Fire and Rescue Institute. Once the Training Division is approved as a certifying academy, it should teach this course in–house.

5. The five year training plan should be revised annually to identify important needs. For example, course development requires visual aids, and the development of overhead slides requires computer skills and equipment. Within several years a

visual arts/photographic employee will be needed to support departmental training. It is not now planned.

6. The EMS section of the Training Division should be given access to the computer system, so student records can be networked.

7. The accident reports and property loss data relating to employee injuries and vehicle accidents should be analyzed by the Training Deputy Chief. The results of this risk management analysis should be used to update driver operators courses and other training curricula where safety can be improved through training.

   If necessary an in-service training program specifically for driver operators should be developed to address the common accident causes and methods, to immediately improve skills.

   Driving large fire vehicles is a practical skill that must be practiced. The driving range at the academy as well as the driving vehicles need attention, previously referred to in this report.

Costs and Benefits

Costs – Purchase the following: Fire Officer I course $450, EMS Officer I course $450, Fire Instructor II course $100, Fire Officer II course $450. Additional cost of student work books and text books average $20 per student, for 1000 students. Total: $20,500 mostly one-time cost (workbooks have to be replaced annually, and every several years, the textbooks.)

Staff to enter data from accident and injury reports and a personal computer and software to make data retrievable.

Staff annual salary:	$26,000
Computer software:	$3,000

Benefits – This officer training is necessary to prepare the department for change. Many internal departmental employee grievances are associated with inconsistency of dealing with personnel issues. Important to resolving personnel issues is adequate supervisor training. Supervisor training also is an important investment in the department's future and overall professionalism. The ability to improve human resources and prepare the department for change may be most cost effectively done through training. The most important mission of training is to prevent injuries and accidents. Using the safety and risk management data to adjust the training curricula should show reductions in fatalities and injuries, reduction in maintenance expenses due to vehicle accidents, and should reduce equipment down time caused by needed repairs.

Capacity for Change

There should be no problem implementing these changes.

Priority Status: Level 2 (Urgent)

Work Plan

Within 6 months:	Purchase course materials and make minor adaptations for DCFEMS.
Within 9 months:	Identify instructors and schedule "students."
	Review injury and equipment damage reports, and feed findings into new order or other training, as needed.
Within 12 months:	Start teaching new courses.

Training Project 6: Upgrade MIS

Identification of Issue

The Training Division has a good computer system which allows students records to be maintained. Presently, they use Paradox software.

The EMS trainers at the McMillan Drive location do not have access to the Paradox system. There is a need for all Training Division EMS instructors to have the same capability networked together.

The MIS improvement should be part of the department – while MIS improvement package, and is not further detailed here.

Priority Status: Level 3 (Important)

CHAPTER 8 – COMMUNICATIONS

This chapter discusses management reforms and improvement projects for the Central Communications Center for fire and EMS calls, and communication equipment used throughout the department.

Communications Improvement Project 1: Resolve whether the Fire/EMS Communications Center is or is not to be consolidated with police communications.

Identification of Issue

Whether or not to consolidate fire/EMS communications with 9-1-1 and the police communications must be decided in the very near future. The recommendation on this decision should be a product of discussion between the Police Department and Booze-Allen-Hamilton and the Fire/EMS Department and TriData/Arthur Andersen, and other city officials.

Suggested Improvement Project

Although there is no detailed cost benefit study or detailed implementation plan available to evaluate, we think that a consolidated communications center is likely to be more costly to establish than improving the current independent police and fire/EMS communications centers.

As point of comparison, Chicago has recently completed a consolidation that was at least twice as costly ($271 million) to achieve than had been estimated and budgeted, and it encountered many unforeseen problems. In San Francisco, which is currently in the midst of a consolidation project, the cost is already increasing beyond estimates and budget.[1]

[1] Note that our local team member for communications directs a highly successful integrated police, fire and EMS Communications Center, and we are not at all adverse to the concept.

Costs and Benefits

There are many communications needs of the fire/EMS department that require immediate attention and they will degrade to an extreme crisis situation unless addressed immediately. The risk of delaying a decision to await for another study of a consolidated system seems higher than proceeding with the existing reform, and there is no guarantee that a consolidated system will be more cost-effective.

Capacity for Change

If a decision to consolidate is made, it must have 100 percent support of both departments, and be a separate independent agency within the city government. The decision on this matter will determine with much more certainty how best to address associated technological (computer aided dispatch system/CAD), operational and personnel (staffing) issues.

Priority Status: Level 1 (Most Urgent/Critical) (The decision to consolidate or not to consolidate)

Work Plan

Within sixty days, arrange a meeting of all key parties noted above. Within ninety days, decide whether or not to consolidate.

Communications Improvement Project 2: Improve Selection and Training of Fire/EMS Communications Center Staff

Identification of Issue

Notwithstanding the technology needs in communication, the most critical need for an efficient communications center operation is highly qualified and well trained personnel.

There is a critical need to improve the manner by which the communications center personnel are recruited, have their qualifications validated, are hired, initially

trained, provided ongoing training, have their performance measured, and are selected for advancement.

Suggested Improvement Project

The fire/EMS communications training program should be revised to incorporate training that is more focused, holds trainees more accountable and provides the means to fairly but effectively dismiss trainees who prove not to be suited or qualified for these positions. The training program should be conducted under the auspices of the Training Division.

A complete review should be made of existing contractual obligations with the vendors whose services are utilized in the current fire/ EMS training program. This review should focus on the current adequacy of the services rendered and the terms and conditions of the contracts – whether those services could be provided better and/or more cost effectively. This review may result in cost savings.

A comprehensive quality assurance program for communication-staff should be implemented and adhered to, covering all areas of performance including, but not limited to public contact, EMS and fire protocols, and operations and organizational values and principles.

A comprehensive in-house study should be initiated to determine the minimum skills and abilities needed of new employees and how best to determine those most qualified applicants. Alternatively, this study could be contracted out or assigned as part of the follow-in implementation phase.

Costs and Benefits

The cost, if any, should be minimal (unless the proposed study has to be done externally). The review of the existing training-related contractual agreements may lead to a cost savings.

The benefit is a workforce more highly trained and qualified to perform this vital function. There are too many anecdotes of major problems.

Capacity for Change

This will require some considerable time and commitment of the communications management. It also requires assistance from the D.C. personnel department to develop position descriptions, new screening of applicants, and new criteria for successful performance.

Priority Status: Level 2 (Urgent/Critical)

If validated, a recent (October 15) incident of an EMS paramedic/lieutenant not having the communications center call the police to assist him is would be an alarming example of the critical need to improve training.

Work Plan

Within three months:	– Undertake in-house study of skills and abilities needed for new employees
	– Review current training contracts.
	– Determine if certification programs can be reduced in length.
Within six months:	– Revise the training program for new employees and on-the-job training.
	– Develop and implement quality assurance program.
Within nine months:	– Have all employees training upgraded.

Communications Improvement Project 3: Replace and Upgrade The Fire/EMS Radio System and Sub-Systems

Identification of Issue

The radio system is a critical part of delivering emergency services, and is inadequate. There are holes in radio coverage, and lack of compatibility with radio systems in surrounding jurisdictions. The number of channels, the absence of

interoperability capability, the age of the imbedded technology, insufficient coverage in some buildings (particularly large private and government buildings), and the condition of the components of the below ground Metro tunnel radio system for which the fire/EMS department is responsible are all deficient.

Although funding has already been approved to replace this system with an 8 channel 800 MHz trunked radio system, the FCC is still reviewing the city's application to renew this license. **Nothing can happen until the application is renewed.**

Suggested Improvement Project

It is recommended that the highest attention be given to having the license renewed quickly so that the replacement radio system project can move forward.

It is also recommended that there be an “independent third party (perhaps a "not for profit” firm) to conduct a propagation study, to ensure that the number of proposed transmitter/receiver sites is adequate by number and location to provide the required geographic and "in building" coverage required.

Additionally, the funding currently authorized for this project is based on a design and on system and sub-system components that are as much as seven years old. As a result, the authorized funding is unrealistic.

Starting with the already designed system and the requirements that drove the design, the present and future radio system needs of the fire/EMS department must be quickly re-evaluated to determine the present cost of a replacement radio system, including the associated sub-systems that are supported by the radio system.

Also, the cost of adding the radio system should include the cost of adding “unit statusing,” which allows the units dispatched, with the touch of a button on their mobile radio control head, to automatically report, without having to speak, that the unit is enroute to an incident, has arrived on scene, is enroute to a hospital, has arrived at the hospital, or has arrived back in their quarters. Also to be included as a cost should be the

replacement of the Vocalarm system with a Fire Station Alerting system (refer to the Communications Project 4 that is incorporated in and is part of the radio system.

Costs and Benefits

Costs – The cost of a propagation study is $50,000. The capital cost of the new radio system has already been approved and a contract let, but the cost may have to be increased.

In the first year of a new system, all components of the new system/ sub-systems will be under warranty. Thus a small offset in operating expenditures will be realized in the department radio repair/maintenance budget.

Benefits – Radio communications are absolutely critical for dispatching and coordinating emergency services. A new radio system including sub-systems will provide for more reliable and efficient communications for a department that is communications dependent. Some of the cost of the system will be offset by significant savings from not having to keep the present system and sub-systems operating.

Capacity for Change

The organization has been awaiting this change for 13 years. The crossover to a new system may create some serious short-term problems as it is phased in.

Priority Status: Level 1 (Highly Urgent/Critical)

Work Plan

ASAP:	– Get FCC to complete approval of frequencies.
	– Start construction on the system elements least likely to be changed from the current plan.
Within 4 months:	– Develop any revision needed to the current design as a result of the time delay in getting started.
	– Charter the propagation study.

Communications Improvement Project 4: Make Emergency Repairs to Fire / EMS Fire Station Alerting System

Identification of Issue

A fire/EMS unit in quarters currently must be alerted to respond to an incident via the department's aged and largely dysfunctional "Vocalarm" system (Fire Station Alerting System). The vocalarm system is supposed to have an "acknowledgment" feature which allows the communications center to know that units dispatched have received the alarm and are responding. This feature of the vocalarm system is not functioning. This causes every unit dispatched to have to acknowledge via radio that they are responding, which causes much radio traffic on a system with too little radio capacity already.

Suggested Improvement Project

The long-term solution is for the vocalarm system to be replaced by a Fire Station Alerting system incorporated in the new radio system. However, the reality is that the "acknowledgment" portion of the system is broken now and needs immediate repair; and the new radio system may take a year or more to develop. As a stop gap for the short term, the DCFEMS should be authorized to make emergency repairs to the vocalarm system to ensure that fire/EMS units dispatched can acknowledge their response, pending replacement of the system.

Costs and Benefits

Cost – $ 50,000, one time.

Benefit – Help reliably dispatch units and clear the radio airways to enable critical radio traffic to get through.

Capacity for Change

This project will require the assistance of an outside firm/service provider.

Priority Status: Level 1 (Most Urgent/Critical)

Work Plan

Within 2 months:	–	Secure outside assistance for making the repairs.
Within 6 months:	–	Get repairs made.

Communications Improvement Project 5: Make Emergency Repairs to Metro Tunnel Radio System.

Identification of Issue

The components of the Metro tunnel communications system for which the fire/EMS department is responsible are in need of immediate repair. The planned new radio system should, if specified and designed properly, place all-new base-station equipment in the tunnels when it is installed. Until that time, radio communications at fire/EMS incidents in tunnels and on the platforms will be unacceptable. In a significant emergency, the lack of reliable communication could place the safety of Metro riders and fire/EMS personnel at risk.

Suggested Improvement Project

As a stopgap, the current system must be repaired and adequately maintained so that it is dependable until it is replaced. The repairs should include the portion of the metro tunnel system in the Potomac River Tunnel between the Foggy Bottom and Rosslyn Metro stations.

Costs and Benefits

Cost – (is being developed at this time)

Benefit – Avoid worsening a disaster if a fire or accident occurs in a tunnel over the next year or two before the new radio system is fully installed.

Capacity for Change

No problem.

Priority Status: Level 1 (Most Urgent/Critical)

Work Plan

Make repairs within six months, or sooner.

Communications Improvement Project 6: Replace and Update the Fire/EMS Computer-Aided Dispatch (CAD) System.

Identification of the Issue

The CAD system is as critical to the quick and efficient dispatch of fire/EMS units as is the radio system and vocalarm/fire station alerting system. If it does not work well, emergency responses can be significantly slowed. The response time for 9-1-1 calls already is much higher than acceptable. In addition, the current CAD does not provide reliable response time data and does not provide some other needed management information.

This system needs replacement from a variety of technological and operational perspectives. In addition, it is not "year 2000" compatible. With it being only two years from the year 2000, many things must be done quickly to address these needs.

Suggested Improvement Project

Currently a request for proposal (RFP) is being developed by the fire/EMS department for a replacement CAD system. This RFP should be thoroughly reviewed to ensure that it indeed meets the current and future needs of the fire/EMS department. These needs include functionality requirements to provide calltakers and dispatchers "on screen" (computer monitor) information that will allow operators to make critical assessments and provide instructions and protocols in a time-critical manner to a wide range of fire/EMS events.

Additionally, to assist in mutual aid coordination, the new CAD system must be capable of accessing the unit status component of CAD systems of surrounding jurisdictions.

Costs and Benefits

Cost – $4 Million capital expenditure.

Benefit – The ability to dispatch fire/EMS units in a quicker, more efficient manner, and to collect needed management information..

Capacity for Change

No problem; the division management wants the change.

Priority Status: Level 1 (Most Urgent/Critical

Work Plan

Within 3 months: Issue RFP, after reviewing its satisfactoriness

Within 5 months:	Let contract
Within 18 months:	Install and test new CAD

Communications Improvement Project 7: Develop Fire/EMS Automatic Vehicle Location (AVL) System

Identification of Issue

When EMS units return to service they are often at a hospital or otherwise far removed from their normally assigned geographic area. If the CAD system could dispatch the actual closest in-service unit to a specific location based on knowing the constantly changing location of the EMS unit, as opposed to assuming the static location of the fire/EMS station to which the unit is normally assigned, it would dramatically reduce EMS response time, and make the use of EMS units more efficient.

Suggested Improvement Project

Purchase an Automatic Vehicle Location (AVL) System. (A more accurate name is an "Automatic Resource Location" (ARL) System, since it can apply to individuals as well as vehicles. An AVL/ARL system should be provided for all EMS units. The new radio and CAD systems should be designed to support of an AVL system.

Costs and Benefits

Cost – Covered in EMS Chapter (4).

Benefit – The benefit is that AVL-equipped EMS units can be deployed more effectively and significantly reduce EMS response times.

Capacity for Change

An AVL system may be resisted because the actual location of an EMS unit will be known at all times. You cannot hide from it.

Priority Status: Level 2 (Urgent)

Work Plan

Start in conjunction with new radio system

Communications Improvement Project 8: Fire/EMS Mobile Data Terminal (MDT) System

Identification of Issue

Many fire/EMS departments utilize a Mobile Data Terminal (MDT) System to exchange important location, hazard and EMS [patient information in a quick and secure manner. These systems also allow for the input of data now done manually and at considerable cost of time.

Suggested Improvement Project

An MDT system should be added to all EMS and some selected fire units. The two new radio and CAD systems should be specified to include support for an AVL system.

Costs and Benefits

Costs – To be determined.

Benefit – All manner of information, including confidential patient information, can be transmitted to EMS quickly, securely and with much saving of radio talk time. EMS units will also be able to go back into service more quickly since they will not have to spend as much time at the hospital filling out paperwork.

Capacity for Change

No apparent problem.

Priority Status: Level 2 (Urgent)

Work Plan

Start in conjunction with new radio system.

Communications Improvement Project 9: Miscellaneous "Quick Fixes"

9-1-1 Answering

The police department 9-1-1 calltakers should change the phrase by which they answer 9-1-1 calls from:

"Police emergency, Operator ##,"

to

"District of Columbia 9-1-1, Operator ##, what is your emergency?"

This will quicken and improve the overall 9-1-1 call processing time, identify to the caller that their 9-1-1 call was answered by the District of Columbia, identify the type incident (police, fire, or EMS) being reported and thus allow for fire/EMS calls to be more rapidly transferred to the fire/EMS communications center.

Clean Up Communications Center

The current fire/EMS communications center should be thoroughly cleaned, painted where necessary and new carpeting installed. This will at least freshen the appearance of the center and improve employee morale.

Overtime Handling

All firefighters that work in the communications center should have their overtime pay charged against the communications center personnel budget.

When a firefighter is detailed to the communications center and that detail then results in another firefighter working overtime in the firefighting division to fill the

detailed firefighter's position, the overtime pay of the firefighter working overtime should be charged against the communications center personnel budget.

This will allow for a more accurate recording of the true personnel cost to staff the communications center.

Roadway Repair

The roadway (McMillan Drive, N.W.) leading to the fire/EMS communications center should be regraded and repaved immediately. Currently it resembles a road used to test the durability of military combat vehicles.

Staff Meetings

A policy of regularly scheduled staff meetings between the Communications Center Director and the Center's operations personnel (all members of each shift) should be immediately instituted.

This will allow for better "up and down" communications between management and staff, clearly define what the organizations vision and values are, affirm that the organizational culture must and will change for the better, help foster a "we can do it" attitude and reaffirm on a continual basis who the customer is, what the customer expects, and what the customer is entitled to.

This staff meeting approach should also be instituted throughout all components of the Communications Division.

Reconfigure Fire Dispatch

An immediate effort should be made to reconfigure the fire/EMS operations area of the communications center to place calltakers, fire/EMS dispatchers and supervisors in closer proximity. This will have an immediate and positive effect on the dispatch operation. This effort should not be limited to just reconfiguring existing consoles but

should include at a minimal expense some new work stations comprised of "off-the-shelf" modular furniture.

Fire Alarm Boxes

The existence of old fire alarm box pedestals (no longer used with the actual fire alarm boxes removed already) on city streets creates a very negative impression as to the state of the City's fire protection in general.

These pedestals have, to certain groups, a high value as fire department memorabilia. A vendor should be contracted to remove all fire alarm box pedestals. The value of that contract should be established in consideration of the value of the old pedestals as memorabilia, so that the low bidder doesn't end up with a windfall profit at the City's expense.

CHAPTER 9 – SERVICES

This chapter discusses improvements in the diverse set of support functions reporting to the Assistant Chief for Services

Management Information Systems

The lack of an adequate management information system hurts almost every function of the DCFEMS. Some of the specific needs are described in the discussion of various functions (e.g., the need for supply management system, property management, a personnel records management system, and a fleet management system) described in later sections of this chapter.

This section describes the MIS function from an overall departmental perspective. It also discusses links to the rest of the City's departments.

Improvement projects are listed singly, however, the completion of some specific projects must occur prior to the start of others. This critical path dependency will be completed as part of Task 3. MIS improvement projects are outlined below:

MIS Improvement Project 1: Develop a Department-wide Local Area Network (LAN)

Identification of Issue

The current MIS infrastructure is inadequate for future needs. The Fleet Management, Training, and Fire Divisions are all at different locations, and have minimal or no LAN and/or WAN (Wide Area Network) connectivity. This lack of networking capability makes it difficult for them to effectively communicate with each other and share/retrieve information. Implementing an agency-wide LAN, connected to the District's WAN, will allow divisions to share resources, communicate efficiently and effectively, and improve overall productivity.

The MIS budget for FY98 is approximately $1 million, significantly less than the projected cost (calculated by the MIS Director) of approximately $4 million (which does not include CAD or telecommunication costs).

Suggested Improvement Project

Implement an agency-wide LAN that will connect all DC Fire and EMS facilities to each other and to the District's WAN. An agency-wide LAN connected to all divisions within the Fire and Emergency Medical Services Department, and to the DC WAN, will allow for resource sharing and electronic communication capabilities.

The specifics regarding the LAN architecture need to be thoroughly researched to ensure that the most cost-effective and efficient configuration is implemented. Software applications, for example, can be housed on the client workstations or on the servers. Both advantages and disadvantages exist for each type of setup and should be considered in the decision making process.

Costs and Benefits

Costs – The following estimates are for LAN hardware and do not include client PCs, which are included in Project 4, below, at approximately $1.8 million.

One-time costs:	
16 Servers @ $25,000	$400,000
Network-related hardware	368,000
Total	$768,000
Networking Software	$1,00,000
Maintenance Support	170,000
Telecommunications (see later project)	
Total	$1,938,000

Recurring Costs

SMDS lines, remote access	$93,000/yr.
User Training would be: 4 hours @ 400 users @ $50 =	$80,000/yr.

However, this is not out-of-pocket, unless overtime is needed to fill-in or pay for work displaced by training.

Benefits – Allows for resource sharing. Allows divisions to effectively communicate with each other via electronic mail, provides for immediate access to information. Ease of maintenance for support personnel. Improves overall efficiency of the Department – faster communications of supply gaps, operating procedure changes, management information, etc.

Capacity for Change

The Fire and Emergency Medical Services Department's MIS Director has the knowledge and expertise needed to implement an agency-wide networking infrastructure; however, he is lacking the appropriate personnel to assist in this effort. The skill set of the current MIS staff does not seem to be sufficient for this type of project. Additionally, budget constraints and hiring practices currently do not allow for the hiring of experienced technical staff.

Budgetary constraints may also hamper this effort with regard to hardware, software, and communication needs. The FY '98 budget falls substantially short of the estimated costs for an agency-wide LAN implementation (by approximately $3 million).

Priority Status: Level 2 (Important)

Work Plan

Short-Term (30-90 days)

- Determine the network architecture that will best suit the agency's needs.

- Identify the hardware and software required to establish the initial agency-wide networking infrastructure.
- Determine the most cost-effective physical connection/transmission medium (i.e. T1 lines, ISDN lines, etc.)
- Establish a plan for a phased approach to implement the network across all locations, including the priority of each site to be connected.

Near-Term (90-180 days)

- Obtain and install appropriate communication/transmission medium.

Long-Term (180 + days)

- Install required hardware and software at pre-determined locations.
- Conduct training for all end-users.
- Connect all remaining Fire and Emergency Medical Services locations to the agency-wide LAN and to the DC WAN.

MIS Improvement Project 2: Standardize Software

Identification of Issue

Various versions of standardized software exist throughout the Fire and Emergency Medical Services Department. A standardized group of software applications has been established within the Department, however the standards do not specify versions, and they are not enforced. Software applications vary within divisions, as well as across divisions, by types and versions. Currently, software applications in use include, but are not limited to, various versions of the following applications:

WordPerfect*	-	MS Word
Lotus 1-2-3*	-	MS Excel
dBase*	-	QuattroPro
MS Access	-	cc:Mail*
Netscape Navigator*	-	Jetform

WinFax Pro* - Ontime*

* Denotes current software standards.

Not properly standardizing software causes compatibility problems between applications. Further, allowing the use of various versions and types of software may cause maintenance and licensing problems. The variety also increases training difficulty, and reduces compatibility between areas of the department.

Suggested Improvement Project

Truly standardize the versions of the DC Fire and EMS' "standard set" of software applications and enforce their use. This standardization will permit compatible and efficient data sharing, as well as ease of maintenance and support. After a transition period, all non-standard software should be removed from PC workstations and servers.

Work Plan

Short-Term (30-90 days)

- Conduct a gap analysis to determine the shortfall between standardized software (including proper version) and existing software.
- Determine the number of client copies or licenses needed. (This would depend on whether the application software packages were housed on the servers, or on the clients.)

Near-Term (90-180 days)

- Determine 'special' software needs (e.g., the inventory management system, discussed in Project 3 below).
- Purchase required software and/or licenses.
- Establish a plan to install standardized software and remove non-standard software.

Costs and Benefits

Costs –

WordPerfect Licenses

- The number needed would depend on gap analysis results.
- The cost is approximately $160 for an upgrade, per client machine. Total = $6,000)
- Approximately 300-400 user licenses @ $75/each = $30,000 (if housed on the server)

Note: If housing the application on the server, the cost would include the $160 software cost plus $75 for each license needed.

Lotus 1-2-3 Licenses

- The number needed would depend on gap analysis results.
- Approximately $120 for upgrade per client machine. Total = $6,000.
- Approximately 300-400 user license @ $135/each (if housed on the server) = $54,000

Note: Here, too, if housing the application on the server, the cost would include a discounted $20 software cost plus $135 for each license needed.

Base Licenses

- The number needed would depend on gap analysis results. Approximately $200 for upgrade per client machine (Visual dBase 7.0 – using ODBC.)
- Approximately $1000 for SQL-based client/server version (this version is needed if more than 20 users will need access to dBase).

Other Miscellaneous Licenses TBD

The total would be approximately $100,000 - 200,000, depending on the number of changes and upgrades needed.

Benefits – Ease of maintenance and support. Eliminates software compatibility problems. Decreases training costs. Eliminates potential licensing concerns. Most importantly, increases efficiency because of compatibility. As employees move from one division to another, they would be able to use the software anywhere.

Capacity for Change

Personnel who are used to "their" particular software package may be adverse to making the software changes, depending on the applications and versions they are currently using. However, if the change is a gradual one and proper training is conducted prior to removing non-standard applications or upgrading outdated versions, the transition should be successful and well received by personnel.

However, staffing deficiencies and budget constraints may impact the completion of this project. Although the MIS Director could assist with the installation/removal of software applications, particularly within the Grimke building, he would need staff support to help install/remove the software of 300-400 users at various locations within the department.

Priority Status: Level 3 (Important)

Work Plan

Select packages, purchase licenses and software, and implement over 12 months. Offer software training on standardized packages periodically.

MIS Improvement Project 3*: *Automate Selected Clerical and MIS Functions That Are Currently Done Manually or Not at All.

Identification of Issue

Many manual processes are in place that would substantially benefit from computer automation.

Numerous clerical and management information tasks are being performed manually within the Fire and Emergency Medical Services Department. For example, as was discussed in Chapter 4, ambulance run reports are hand-written and manually filed; personnel timesheets are manually completed and processed by the payroll clerk. An inventory control system currently does not exist in any form (manual or automated).

Suggested Improvement Project

The Fire and Emergency Medical Services Department should automate those numerous tasks currently being performed manually that could benefit from computer automation. Departments such as Police and Corrections have already begun a similar type initiative with the automation of their respective payroll functions (implementing TACIS and KRONOS respectively).

An analysis should be performed on the current manual processes to determine which processes would benefit most from automation.

With regard to the lack of an inventory control system, a short run project could consist of installing bar code readers at inventory locations to tag new and existing equipment. This bar code tagging effort would ready the inventory for future input into the chosen automated inventory management system. The Fire and EMS Department should coordinate with the CFO office to ensure their choice of an automated inventory management system (as well as any other system choice) is compliant with any existing city-wide standard. (Inventory Control is discussed further under Supply and Property Function discussion later in this chapter.)

Work Plan

Short-Term (30-60 days)

- Conduct a review of all manual processes that could benefit from automation. (Conducted by a contractor, 30-60 days; conducted in-house, 90-180 days)

- Purchase and install bar code readers.

Near-Term (90-180 days)

- Prioritize the list of manual processes to be automated.
- Analyze the specific requirements of each automation project (e.g., COTS package, tailored software application development, etc.).
- Choose an automation tool (COTS package or plan the development of a new application)
- Train staff in the proper use of bar code readers.

Long-Term (180 + days)

- Establish a plan for rolling out the new automated system.
- Tailor the COTS package to specific needs and/or being system development life cycle activities.
- Train personnel in the proper use of the new system.

Costs and Benefits

The costs cannot be estimated before an inventory is taken of what exists and what is needed.

Costs – Example COTS package(s):

- BuySpeed (automated inventory control and management system). Approximately $92,000 (includes software with 125 user licenses, SQL database, installation, training, and support).
- TACIS/KRONOS (automated time & attendance and payroll systems). Approximately $1.2 million (includes a 22-user license, bar code reader, fax interface, and telephone interface). Systems development efforts (will vary depending on the complexity of the system being designed and/or the modifications needed to a COTS package) Approximately 2000 hrs. of

contractor time @ $100/hr. and approximately 2000 hours of 5 internal staff members time at $35/hr. (including benefits) would be needed ($270,000).

- Bar code readers at approximately $25,000/each (2 sites) = $50,000 plus training of personnel. (Actual staff counts will vary depending on the type of system being implemented – inventory, time and attendance, etc.). Approximately 3 hours of training for each FTE requiring training; estimate of $50/hr. (Including benefits) on average for 50 employees/system = $75,000/new software system.

  Total $1.7 million

Benefits – Computer automation, in general, improves productivity, decreases errors by reducing manual intervention, and reduces paper and physical storage needs, and eliminates duplicate data entry.

Capacity for Change

The expertise needed to perform a project of this nature does not currently exist within the Fire and EMS Department. Therefore, outsourcing the development of new systems and/or modification of COTS (off-the-shelf) packages should be considered. Further, the staff expertise needed to perform the analysis portion of the project may not currently exist within the MIS group.

Priority Status: Level 2 (Urgent)

MIS Improvement Project 4: Modernize the Information System Hardware

Identification of Issue

Much of the information equipment in use, PCs in particular, are extremely outdated and not upgradeable. The PCs within the Fire and EMS Department range from very old 8086s to Pentiums, but only a small minority (approximately 10 percent) has the capability to meet anticipated future computing needs. The lack of necessary MIS

equipment has led to employees who use their personally owned equipment for office computing needs.

Suggested Improvement Project

The Fire and EMS Department should replace their old and outdated information equipment with new equipment that will fulfill their current and future computing needs. This project could be completed in phases, with the oldest equipment being replaced first, however, all PCs below a Pentium class should be replaced prior to implementing the full connectivity of the agency-wide LAN, as most of the machines are inadequate for a LAN. A phased approach would help distribute the cost of equipment replacement over time, as well as reduce the burden on the MIS staff's initial efforts regarding installation and configuration.

Additionally, the current Computer Aided Dispatch system (CAD) is old and is need of reengineering. Parts required for system repairs are hard to find since the hardware used is virtually obsolete. (The reengineering efforts for the CAD are discussed in the Communications section, as it is not currently a MIS function.)

Work Plan

Short-Term (30-60 days)

- Determine the true numbers and types of current MIS equipment in use.
- Identify new MIS equipment needed.

Near-Term (60-90 days:

- Establish an approach for phasing in new MIS equipment.
- Train MIS staff on proper installation and configuration of new MIS equipment.

Long-Term (180 + days)

- Budget and plan for the replacement of all remaining outdated MIS equipment.

Costs and Benefits

Costs –

PCs

350 servers @ $5,000 = $ 1.75 M

(Pentium Class 2, 256 MB RAM, dual processors, RAID 5, dual power supplies, etc.)

Printers

30 LaserJet 5 SI @ $4,000	=	1 .12M
20 LaserJet 5N @ $2,000	=	1 .04M

Other

To be determined, in addition to LAN-wide costs included in Project 1 above = $ 1.9M

Benefits – Increased productivity. Decreased maintenance costs. Decreased system downtime. Decreased 'help' support required.

Capacity for Change

The MIS Director indicated that although this is an important initiative, it is lower on the list of improvement projects than implementing an agency-wide LAN. We concur with the MIS Director with regard to the importance of an agency-wide LAN, however, the information equipment replacement effort must be completed to allow end-users to use and benefit from the agency-wide LAN implementation, and to eliminate paperwork and carbon paper modes of operation, so we assign them equal priority.

Priority Status: Level 2 (Important)

MIS Improvement Project 5: Increase Staff Capability to Handle Modern MIS

Identification of Issue

The existing MIS staff lacks appropriate technical skills to cope with upgrading the department's MIS. Competent new staff is difficult to attract and retain at current salary levels, and with the existing work environment. Skilled MIS talent is in high demand.

The current MIS staff consists of five people, three assigned and two detailed. They include:

- One person on EMS payroll, working on EMS network
- One person on Communications payroll working on the Computer Aided Dispatch system (CAD), and also performing various other MIS functions
- Three people under the MIS Director who were originally working with a Unisys mainframe (mainly data entry) that is no longer in use. They have minimal knowledge of the current technology needed at DCFEMS (networking, object oriented application development, relational database management systems, PC configurations, etc.)

The skill set of the current MIS staff should be assessed to determine gaps.

Suggested Improvement Project

The Fire and EMS Department should evaluate the skill sets of their current MIS staff to determine the gap that exists between current staff's skills and required skills. If a determination is made that required skills do not exist within the current environment which is likely, the Department should consider training existing staff (if the individual possesses the potential and desire to gain technical expertise); or hiring appropriate staff at competitive salaries; or hiring outside contractors to perform MIS-related activities. Analysis should be conducted to determine the proper number of MIS staff needed to

adequately support 300-400 end-users operating in the environment described in the above four projects.

Additionally, continuous training should be provided for the resulting MIS staff, to allow them to stay current with new and upcoming technologies.

Work Plan

Short-Term (30-60 days)

- Identify industry standards for required skill sets and competencies for MIS staff, as well as industry salaries for similar positions. Identify appropriate number of MIS staff needed to adequately support 300-400 end-users.
- Assess actual qualifications of personnel in each position against industry standards and district salary levels. (May want to consider obtaining an outside firm to conduct this assessment, to achieve independence and impartiality and cause less internal animosity.)

Near-Term (60-90 days)

- Establish a plan to address skill set and competency gaps, and salary level issues identified by the assessment.

Long-Term (180 + days)

- Execute plan to address skill set and competency gaps and salary level issues.

Costs and Benefits

Costs – Hire new FTEs (number will depend on results of analyses) to fill in for currently detailed personnel, reducing department overtime. Approximately $45,000 - $65,000 annually/employee (dependent upon experience and skill set required).

Contract out selected MIS activities (the number and cost will depend on results of analyses). Approximately $150/hr. for each experienced MIS consultant needed.

Cost: Replace 2 detailed personnel = $175,000 with benefits

Upgrade 3 positions	= $ 75,000 with benefits
Total	= $250,000

Benefits – Allow the Department to use new MIS technology and provide support to the entire Department. Not having this support will impede the entire Department's ability to modernize its management and use technology. The staff changes will increase productivity of the MIS group, improve end-user support, result in more efficient use of MIS staffing and capital improvement dollars, and increase the ability to perform MIS-related activities.

Capacity for Change

Issues that could potentially impede the removal of existing MIS staff include unionization, budget constraints (for hiring technically skilled personnel at competitive salary levels), and personnel regulations.

Completing this improvement initiative may be difficult, due to the human resource aspect of the problem and proposed solution. Many areas would have to be researched and considered, such as potential legal challenges. However, if an impartial assessment of the current staff's skill sets and competencies is properly conducted, the aforementioned potential problems could be mitigated.

Priority Status: Level 1 (Most Urgent)

Personnel Liaison

Services Improvement 1: Develop a personnel unit for the Department, and give it autonomy from the D.C. Office of Personnel.

Identification of Issue

Lack of a personnel management unit for the Fire Department adds to many personnel problems in the Department. Currently there is only a liaison person to

coordinate personnel activities, no personnel unit or director. The liaison with the D.C. Office of Personnel has been unsatisfactory – with low responsiveness to Fire and EMS needs. The personnel liaison has no authority to recruit, select and discharge personnel for the Department.

Adding positions to the department, and getting the position descriptions to be satisfactory takes a long time and is sometimes not achieved (e.g., the position descriptions for mechanics are unsatisfactory.)

At present, the department lacks a proper records management system for the personnel services. There is no means for properly tracking, archiving and retrieval of all the sensitive and important personnel documents. There is a lack of policies, procedures and practices for personnel records management. Staff files are reported lost at the D.C. Office of Personnel.

Many Position Descriptions (PDs) are out-of-date, but still in use by Central Personnel.

There is a lack of electronic communications linkages between the FEMS personnel unit and central personnel, as well as with other District-wide functions.

There is a lack of a proper arrangement within the personnel unit to coordinate and manage the administration of benefits, retirement, salaries, and payroll in collaboration with the central personnel and payroll offices.

Suggested Improvement Project

Establish a personnel management unit for the Fire and EMS Department similar to those established in other District agencies, with as few constraints as is reasonable under D.C. law.

Appoint a trained and experienced Personnel Director for the unit.

The personnel unit should preferably have the autonomy to recruit, select and discharge personnel for the Department, with minimal involvement from the central personnel office.

Establish a memorandum of understanding and take the required action to separate the Fire Department personnel unit from the central personnel office.

An alternative to this admittedly expensive recommendation is to engineer a complete turnaround in service and understanding of Fire and EMS needs at the D.C. Office of Personnel, something hard to envision, but needing coordination with other changes in D.C. government.

As part of the new FEMS personnel unit, establish appropriate, modern personnel policies and standard operating procedures. Antiquated policies and procedures being utilized should be discontinued with the agreement of the central personnel office. As part of the new personnel office:

- Review current policies and procedures to separate the useful from the outdated, and draft new policies. This may require outside help, because the new personnel team probably will not be familiar with D.C. or the special environment of FEMS.
- Establish a proper, state-of-the-art records management system for the personnel unit. Develop and reinforce policies and procedures for records management. These policies and procedures should ensure that documents remain secured, but accessible at all times to authorized users.
- Develop revised Position Descriptions (PDs) for each function within the Fire Department to replace the out-of-date PDs in use by central personnel.
- Establish technological interfacing capabilities to formulate proper linkages between the personnel unit and central personnel, as well as other District-wide functions. For example, the personnel unit should have the capability to input information to CAPPS/UPPS/FMS. Similarly, the staff within the personnel unit should have the ability to read information from these systems.

- Develop a transition team to assist in handing over the personnel function to a newly appointed personnel director
- Properly equip personnel offices with modern furniture
- Automate personnel processes when possible, with interfacing capabilities to the LAN system.
- Establish a sub-unit of the personnel office to administer benefits and retirements for the FEMS staff. The personnel with responsibility for this function should be trained at central personnel and payroll divisions.
- Establish proper arrangements within the personnel unit to coordinate and manage the administration of salaries and payroll in collaboration with the central personnel, payroll and budget offices.

Costs and Benefits

Costs – The following is a list of the various positions that will be required to staff the personnel unit. Some lower level positions may be filled internally, or from the D.C. Office of Personnel staff; however, the higher level positions probably require filling from outside the department. The cost of providing most services to FEMS by the D.C. Office of Personnel should be deducted from its (Office of Personnel) budget and added to the FEMS budget.

Quantity	Job Title	Grade	Annual Base	With Benefits
1	Personnel Director	DS14	$54,858	
3	Specialists	DS9	$27,018	
1	Secretary	DS9	$27,018	
2	Clerical Support	DS7	$22,285	
1	Messenger	DS4	$16,400	
8			$270,371	$313,100

Cost for training personnel office staff include the following:

Typical Courses	Est. Costs
Personnel Management	$4,000/yr
Benefits Management	$2,000/yr
Human Resources Management	$4,000/yr
Health Insurance Processing	$2,000/yr
Effective Management	$2,000/yr
Employee Counseling	$2,000/yr
Conflict Resolution	$2,000/yr
Stress Management	$2,000/yr
Total	$20,000/yr

A new personnel unit must have office space within the Fire Department headquarters at Vermont Avenue. Space should become available upon the removal of the supply function to a new warehouse (as recommended later in this chapter) at no additional cost.

Costs for Equipment

Six (6) computer terminals and all accessories @ 2800 each =	$12,000.
Office furniture and supplies	$10,000
Total	$22,000

The cost for a personnel records system is included as part of the MIS plan.

Benefits – The FEMS must have a functional personnel department, The D.C. Office of Personnel has not demonstrated that it can provide the service. Staffing of many new positions requires support so that qualified employees are hired and current employees are well served.

Capacity for Change

This area has been neglected. The current fire department liaison does not have sufficient experience to lead the new personnel unit but has the diligence and conscientiousness to support a qualified leader. There is a trained and experienced personnel officer in-house who currently performs Equal Employment Opportunity functions. This person may be used as a resource person, at least in the short-term.

Some funds were allocated (above) for training and development of the staff of the new personnel unit, to specialize them for the FEMS function.

To build personnel capacity:

- Conduct a needs assessment to determine the requirements of the staff and organization.
- Identify workshops with private sector firms for conducting training class for personnel management staff.

The current staff does not have the capacity to implement this change. The new personnel unit properly staffed (and perhaps supported initially with help from outside consultants) should be able to implement the changes.

Priority Status: Level 3 (Important)

Work Plan

Within three months:

- Obtain approval from the Director of Personnel to separate the Fire Department personnel function.
- Identify the key processes that will be discontinued and operated within the Fire Department; e.g., position classification, records management, personnel actions, etc.

- Identify a transition team which will assist with development.
- Identify space and furniture for offices.
- Develop position description
- Establish a project plan to execute effort.
- Appoint a trained and experienced Director for the personnel unit.

Within nine months:

- Hire staff
- Set up office

Property and Supply

The property and supply function needs trained personnel, a warehouse, inventory management system(s), and distribution vehicles. Below are four management improvements that should be considered as a group for improving the extremely poor supply situation in the department.

Services Improvement Project 2: Reorganize and Train Supply Staff

Identification of Issue

Supply services for Fire and EMS already have been combined at the strategic level, but the change has not been well coordinated or communicated throughout the organization. The organizational structure was not finalized and no clear indication given of the new reporting relationships as a result of the Fire and EMS supply function merge.

The supply function has inadequate staffing, which prevents proper coverage at all locations eight hours per day. The supply staff lacks training and development in supply, and needs to enhance its technical competence in supply management.

Suggested Improvement Project

The supply function requires process and structural streamlining to develop clear divisional boundaries, prior to making other changes in the supply system. An alternative would be to outsource all or part of this function, if reengineering the function internally does not prove to be more workable and more efficient. After initial streamlining of the operation, a detailed analysis should be performed to determine the optimal solutions to the management of the function in the long run.

The current staffing of four FTEs could handle the function if they are trained to enhance their technical competence in supply management. The staff should be provided with required cross-training in fire and EMS functions to develop their skills and understanding. Finalize the organizational structure, with reporting relationships. Circulate the new organizational structure throughout the hierarchy, with adequate briefings to staff to ensure effective communication and good understanding of the supply function.

Cost and Benefits

Costs –

Typical Courses	Est. Costs
Purchasing Management	$4,000/yr
Supply Management	$4,000/yr
Just-in-Time Inventorying	$2,000/yr
Efficient Warehousing	$2,000/yr
Distribution Management	$2,000/yr
Other Courses/Resources	$6,000/yr
Total	$20,000/yr

Benefits – Develops supply management staff with capacity to better manage supply, thereby reducing waste, reducing frustration, and improving morale, and keeping

the department functioning. The training also encourages continuous improvement of the supply function.

Capacity for Change

The existing staff of the supply management function has the interest and ability to accept increasing responsibility and appropriate training to enhance their skills. The staff is willing and capable of supporting the recommended change, but requires proper direction and guidance from senior management.

Priority Status: Level 3 (Important)

Work Plan

Short-term (30-90 days):

- Conduct a needs assessment to determine the requirements of the staff and organization.
- Establish contracts with private sector training firm(s) and conduct training class for all supply management staff.
- Provide all required tools and resources for staff.
- Communicate organizational structural changes to entire FEMS staff and obtain buy-in and support.
- Establish temporary measures and spacing to accommodate the personnel files at Fire Department Headquarters
- Organize files in sequential order, e.g., chronological, numerical, etc.
- Prepare files for scanning into new database.

Near-term (90-180 days and beyond):

- Develop and execute program to provide ongoing training for staff

- Permit staff to participate in conferences and workshops on supply management, to enhance their knowledge and keep current.
- Establish a proper database and scan or key-in personnel information
- Perform an inventory and audit of files to ensure 100-percent accuracy of each person's file.
- Maintain the personnel files in proper and efficient and effective manner.

Services Improvement Project 3: Create a Proper Warehouse for Stockpiling Supplies

Identification of Issue

The Department lacks an appropriate warehousing facility with proper entrances for receiving and shipping. The existing facility is not adequately lighted or ventilated, is infested with insects and rodents, and is poorly maintained.

Suggested Improvement Project

Obtain an appropriate warehousing facility with proper entrances for receiving and shipping, including a loading dock. The facility should be permanent in nature, and have the capability to be fitted with state-of-the-art storage and retrieval facilities. The facility should be adequately lighted, ventilated and clean. It should be maintained in compliance with all safety regulations such as OSHA, EPA, etc.

Alternatives to obtaining warehouse space and furnishing it:

- Rent storage space with an already complete supply facility
- Utilize city-owned space other than a firehouse, or

- Utilize a more convenient and larger firehouse.

Whatever the location, the warehouse should be operated in a continuous improvement mode by proactively adjusting the practices to suit the needs of the users, and strive for total customer satisfaction.

Cost and Benefits

Costs – Estimates are shown in the table below, using industry estimates.

Equipment/Facility	Quantity	Cost
Warehouse Rental	30,000 sf	$120,000
Structural Steel Pallet Rack	Adequate	$ 10,000
Channel Load Beams	160	$ 14, 000
Fork Lift	1	$10,000
Conveyor Belt with Rails	60 feet	$ 5,000
Hydraulic Lift	1	$15,000
Other Fixtures	1	$ 5,000
Total		$179,000

The warehouse was said to be already budgeted for. The alternatives noted above should be explored to determine the most economical but satisfactory approach to obtaining the warehouse space.

Benefits – A new warehousing operation would improve efficiency and effectiveness of supply, resulting in higher customer satisfaction. It would have the ability to store all types of supplies in a single area. It will have proper layout and design of delivery areas for the convenience of all users. Proper receiving areas will facilitate quality control activities and property management tagging. Proper shelving permits smooth storage and retrieval of items. The new warehouse would be safer and cleaner. It will lead to improved productivity and less lost time for firefighters when they utilize supply management.

Capacity for Change

The staff of the supply management area has a clear understanding of the current inefficiencies and has provided good information on the requirements for a properly functioning warehouse. It appears that the staff, with some outside advice, will be able to implement the new warehouse and its infrastructure.

Priority Status: Level 1 (Most Urgent/Critical)

Work Plan

Short-Term (30-90 days)

- Review the current warehouse locations to determine their adequacy for permanent warehousing (already underway).
- Conduct a further search for larger or more economical facilities which has the potential for development into a world-class warehouse (already underway).
- Decide on the facility of choice for use as a warehouse.
- Expeditiously process contracts and other documentation to secure the warehouse facility.
- Place order for the internal equipment such as shelving, partitions, hydraulic lifts, fork lifts, etc.
- Identify and provide all required tools and resources for staff.
- Communicate status with staff and maintain their involvement.

*Near-Term (90-180 days and beyond)**:***

- Acquire the warehouse facility.
- Renovate where necessary and customize for Fire Department/EMS use.
- Install state-of-the-art shelving to focus on efficiency.
- Relocate all supply management staff to the new warehouse.
- Move all on-hand inventory to the warehouse and initiate reception of new stock at the receiving unit.
- Acquire new distribution vehicles, trucks, vans etc.
- Develop and circulate to all staff/end-users, the new policies and procedures for obtaining household and medical supply items from stock.

- Implement and enforce new policies, procedures and practices.

Services Improvement Project 4: Develop an Inventory Management Process

Identification of Issue

The manually operated inventory management system lacks the capability to track all items entering the warehouse facility and lacks efficient storage and retrieval capability.

There is no system to monitor the usage of bulk and individually packaged supplies, including medical supplies. As a result, supplies run out at times in the fire houses, without forewarning.

There are no proper policies and procedures for the inventory management of firefighters' uniforms. Firefighters are in short supply of uniforms and accessories.

Suggested Improvement Project

Design or obtain an integrated inventory management system which has the capability to track all items entering the warehouse facility with efficient storage and retrieval abilities. The system should have the capability of monitoring the processing of bulk and singularly packaged supplies including medical supplies, and protective outfits and equipment.

Implement and enforce policies and procedures for the inventory management of all supplies. In particular, firefighters should be outfitted with appropriate uniforms and accessories and have a sufficiency of all items–a particular sore point with the Department's members, and properly so.

Costs and Benefits

Costs – An inventory management system is estimated to cost $92,000, including installation and user training. "Extra" remote terminals may increase the cost; the number of terminals required needs to be examined.

Benefits – Efficient documentation and tracking of each item in inventory. Efficient storage and retrieval of information on stock items. Means to manage inventory levels for re-ordering and maintain just-in-time inventory management. Again, cost savings from avoiding waste, operational improvement by not waiting for critical supplies that run out.

Capacity for Change

The current staff, perhaps with support by consultants, appears capable of undertaking the effort to implement the inventory management system. The project may require heavy involvement with the consultants in the early stages and progressively less over time.

Priority Status: Level 1 (Most Urgent/Critical)

Work Plan

Short-term (30-90 days)

- Develop specifications for inventory management system.

Near-term (90-180 days)

- Procure the system.

Services Improvement Project 5: Purchase and Maintain an Adequate Supply Distribution System

Identification of Issue

The supply function is not equipped with appropriate distribution equipment and tools to permit efficient and effective movement of supply items to the end users. There

are two delivery trucks that are inefficient in configuration and have low reliability. There are three vans that provide a delivery service for the smaller items, however one is very unreliable and the others are not adequate to cover all routes.

Suggested Improvement Project

The supply function should be equipped with appropriate vehicles to allow for efficient and effective distribution of supply items. The vehicles should be reliable and maintained in readiness for deliveries. Needed are two flat-bed delivery trucks for distribution of larger, general products, and two enclosed delivery vans for distribution of medical products and housekeeping items.

In the interim, before obtaining the new vehicles, perform rapid repairs on the current vehicles and make them roadworthy.

Schedule frequent visits to firehouses to replenish stock items before they run out, with the aid of the inventory control system.

Cost and Benefits

Capital Costs

#	Equipment	Costs
2	Trucks	$80,000
2	Vans	$40,000
	Miscellaneous	$10,000
	Total	$130,000

Benefits – Prompt distribution of supplies to the firehouses.

Capacity for Change

The current staff has the capacity to implement change in this area. This requires the procurement of the specified vehicles and the development of proper routing schedules for the vehicles. The change is highly desired by the department.

Priority Status: Level 2 (Urgent)

Work Plan

Short-term (30-90 days):

- Repair current vehicles
- Prepare purchase order and initiate process for procurement of new vehicles.
- Develop standard operating procedures which ensure the maintenance of appropriate quantities of supply items at the central warehouse, and properly supplied storage racks at the firehouses.

Medium- to Long-term (90-180 days and beyond)

- Obtain and initiate the use of new vehicles on pre-designed routes
- Implement and enforce the new standard operating procedures for distribution of supplies District-wide.

Services Improvement Project 6: Develop Property Management System

Identification of Issue

There is no dedicated property manager, and no real property management system. The person currently responsible for this function does not focus on it due to shortage of resources. The result is little accountability for equipment entering or leaving the department. There also is poor security for property held in storage.

Suggested Improvement Project

1. Hire or appoint a trained and experienced property manager. Appoint two property management personnel to assist property manager in coordination of the function.

2. Develop a property management and accountability system. The property management system should provide current and historical information on each item including costs, age, location and assignment.
3. The Department should develop an efficient and effective receiving process which documents and assigns a location to each piece of equipment or apparatus entering the Department. Consideration should be given to the implementation of the bar coding system being used District-wide.
4. There need to be quality control practices for incoming inventory.
5. The property management system needs to include a property disposal system. It needs to identify, store, and sell or otherwise dispose of unneeded or worn out/junk property. Disposal may include establishing relations with potential users of the disposed equipment, e.g., other fire departments.
6. Develop a methodology and system for reporting on all property held and utilized by the Fire Department.
7. The department should establish a security system for all property held in storage, and at assigned Fire Department locations.

Cost and Benefits

Cost –

Personnel (Recurring Expenditures)

Quantity	Job Title	Grade	Annual Base	Total (with Benefits)
1 1 1	Property Manager Secretary Clerical Support	DS11 DS9 DS7	$32,577 $27,018 $22,285	
3			$ 81,880	$108,900

Equipment - Capital Expenditures

Quantity	System	Cost
1	Property Management System (Adequate Licenses for all users)	$92,000 per 125 users
1	Temporary bar code system with minimum of 2 users (Short-term only)	$50,000
	Total Personnel and Equipment	$142,000

Benefits – Tracking property prevents waste, theft. The benefits of an efficient and effective property disposal system will better organize the movement and storage of used property throughout the Fire and EMS Department, create a safety environment by disposing of old and environmentally unsafe equipment, and generate revenues for the department. Some old but useful equipment may be shared with other agencies or not-for-profit entities. Disposal creates room for better space management. It also eliminates expenses.

Capacity for Change

The leadership of the department has the required skills and knowledge to select a capable property manager. Additional support staff may be obtained from within the uniformed force, as this job could be fulfilled by for light duty firefighters. Some outside consulting will be needed to establish the property management system and get it to a high level of proficiency. (This could be part of the implementation phase of this project.)

Priority Status: Level 3 (Important)

Work Plan

Short-term (30-90 days)

Personnel and Procedures

- Place request with D.C. Office of Personnel for property management position or advertisement.
- Conduct internal search for a temporary appointment to act in this capacity.
- Initiate the development of policies and procedures for property management which comply with District codes.
- Provide current staff with adequate training to perform function or to be cross-trained for future support of this function.
- Prepare purchase order and initiate process for procurement of vehicles
- Develop standard operating procedures which ensure the maintenance of appropriate quantities of supply items at the central warehouse, and properly maintained storage racks at the firehouses.

Equipment and Software

- Identify an appropriate property management system and place purchase order with vendor.
- Develop and implement limited standard operating procedures for property management within the Fire Department
- Review all existing files and establish a limited security system for all property held in storage and at assigned Fire Department locations.
- Access the current bar-coding system being utilized District-wide to perform property and inventory management. It is anticipated that this will require the use of at least two bar code readers initially.

Medium- to Long-term (90-180 days and beyond):

Equipment and Software

- Obtain and implement property management system
- Obtain and initiate the use of new vehicles on pre-designed routes
- Implement and enforce the new standard operating procedures for distribution of supplies District-wide.
- Communicate the new procedures for property management Department-wide.
- Assign responsibility for all property held by the Fire Department. Finalize and implement permanent standard operating procedures for property management within the Fire Department.
- Establish new database or filing system and enforce the new security system for all property held in storage and at assigned Fire Department locations.

Research and Development

"Research and Development" is a misnomer. The main function of this unit is facilities management. It also does planning, coordinating medical services for personnel, and handles grant applications.

The ***medical services*** can be handled by the expanded personnel function, with input from the Medical Director.

The ***planning function*** needs to be started in earnest.

The facilities maintenance is discussed below. There is virtually no R&D being done; in the sense of engineering development.

Services Improvement Project 7: A major facilities renovation and building program should be undertaken, and better maintenance provided to existing facilities.

Identification of Issue

Deferred maintenance has resulted in a crisis in the status of facilities. DCFEMS facilities generally are in poor condition. Fire stations suffer from numerous deficiencies that cause unhealthy working and living conditions. Numerous facility problems exist and can be addressed through several distinct programs that are detailed as subsidiary projects. The facilities issues will be treated in three areas: roofs, concrete repairs, station interiors, equipment and systems, and the Apparatus Maintenance Division facility repairs.

a) Roofs – Leaking roofs are the rule rather than the exception among DCFEMS facilities. Leaking roofs create health hazards that have led to OSHA citations for the Department. The roof leaks result in premature facility degradation and collateral damage to interior structural elements.

No capital project for roof repair has been done since FY1994.

b) Concrete Repair – Several fire stations have driveways and apparatus "aprons" that are in poor condition and have holes that require apparatus to slow down in order to proceed. These holes also pose a hazard to personnel and citizens who may trip or fall due to these problems.

c) Station interiors, equipment and systems – Inoperative air conditioning, inoperative lights, and poor overall condition are common to most facilities. In addition, there are major needs to update facilities to reflect the current mission of the Department. Interior renovation and building system repair in all facilities as needed. These projects are outlined in the Department's Capital Plan for FY1997 to 2002. The plan includes retention of a consultant to inspect and prioritize needs for roofs. The other elements of the plan can be inferred from the suggested service life for major components contained in the revised "State of the Facilities report."

d) Apparatus Maintenance Division facility repairs – The Apparatus Maintenance facility needs considerable work and investment in equipment to meet EPA and OSHA standards as well as perform its mission.

Suggested Improvement Project

The repair program is of such magnitude and the number of problems so numerous that a detailed work plan is beyond the scope of this report. The revised "State of the Facilities" report lists deficiencies on a station by station basis. Available funding, the need to maintain the use of stations, and limited oversight capabilities realistically limit the number of facilities that could be done in a single year. No cost estimates were even contemplated for facility renovations, and coordination of trades and economies of scale are likely to suggest that many of these issues be consolidated into renovation programs for some stations.

There are considerable data collection issues that are required to prioritize the overall repairs. Funding for the capital budget in the near term limits the repairs that can be undertaken to several roofs and heating plants in the worst condition.

a) Roofs – Use the prioritized list of roofs needing repair, the Department plans on repairing some 18,000 of the Department's total 270,000 square feet of roof area annually. $500,000 has been appropriated in the capital budget to begin this process.

b) Concrete Repairs – Repair severely damaged concrete and driveways at three facilities.

c) Station interiors, equipment and systems – Implement a major facilities repair needs assessment and implement a prioritized program. The magnitude of the effort requires a plan in excess of the three year planning window of this study. Another issue is the need for complete facility renovations. Nine stations are currently outside the recently-developed guidelines for renovation (36 years or older). Of these nine facilities, four are relatively close to the suggested age for renovation, as they were constructed after 1957. This leaves five stations: (7, 14, 16, 17, and 30 in need of renovation).

The Department has staff working on these issues and is capable of administering these repairs. In the event that a sizable budget is approved and a significant number of projects are undertaken simultaneously, there will be a need to supplement the staff of the

Facilities Maintenance unit to allow oversight of the contract administration that would likely be done by Public Works or an outside contractor.

d) Apparatus Maintenance Division facility repairs – engage a consultant to study the facility and recommend an improvement program to bring the facility into compliance with regulatory requirements and its mission needs.

Costs and Benefits

Costs – a) Roofs – Total costs for replacement of all leaking roofs would be approximately $ 1.1 million, assuming that 186,000 square feet of roof needed to be replaced. This is based on $6.00 per square foot for replacement.

The benefits of this project include reduced damage to facilities and increased safety for personnel due to avoidance of mold, mildew, and standing water.

b) Concrete Repair –Total costs for replacement all severely damaged concrete at Truck 12 and stations 15 and 32 would be approximately $ 131,000. These costs would be essentially one-time costs as concrete requires no ongoing maintenance.

The benefits of this project include reduced damage and wear and tear on apparatus. Additional benefits include reduced hazard of tripping for staff and the public.

Numerous major repairs are needed at many facilities. A very rough and incomplete estimate of needs indicates a first year emergency cost of $1.2 million. Additional ongoing annual costs for the next two to three fiscal years will be $935,000. Total costs associated with a systematic replacement of facility components representing one cycle is $5.9 million, of which $2.4 million is for bay door replacement over 20 years. Included in this program is staged retrofit of existing fire and EMS apparatus with diesel exhaust filtration devices. This total cost does not include emergency repairs, complete renovations, and roof items.

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The benefits of this project include reduced damage and wear and tear on apparatus. Additional benefits include reduced hazard of tripping for staff and the public.

c) Station interiors, equipment and systems – Getting the Department's facilities back into acceptable condition will require a major capital program. An accurate figure for total facility repair needs of the Department is impossible to determine without a more thorough investigation of each facility and an assessment of the cost of repair versus replacement of key components.

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d) Apparatus Maintenance Division facility repairs – The costs of upgrading the apparatus maintenance facility and equipping it with necessary equipment could likely surpass $1 million. The Department has a detailed list of desired repairs and needed improvements.

The benefits of these changes would include regulatory compliance and improved capability to perform routine maintenance functions.

Capacity for Change

The Department has staff working on these issues and is capable of administering these repairs. In the event that a sizable budget is approved and a significant number of projects are undertaken simultaneously, there will be a need to supplement the staff of the Facilities Maintenance unit to allow oversight of the contract administration that would likely be done by Public Works or an outside contractor.

A considerable portion of the detailed planning, administration, and estimating work would need to be done by architectural/engineering consultants.

Priority Status: Level 1 (Most Urgent/Critical) Planning and prioritization should proceed immediately. Individual projects are subject to lower priorities.

Work Plan

Immediate:	Continue with retention of roof consultant and contractors to perform repairs already funded under the roof and concrete programs.
30 days:	Review facility information, conduct limited reinspection, and confirm priorities for emergency replacement to be programmed into a budget request. In the meantime, proceed under the original estimates, with an eye toward making minor adjustments.
60 days:	Retain an architectural/engineering contractor to conduct facility inspections and develop estimates for repairs. Include a task to develop an estimate of the annual emergency repair needs based on facility inspections and projected life spans as assessed by appropriate consultants. Also, develop a prioritized list for facilities to be renovated. Coordinate overall inspections and schedule with roof and concrete work already programmed.

120 days: Develop an accurate budget for facilities issues based on inspection by architectural/engineering consultants and program these into a capital plan for years FY1999 and beyond. Include a projection of the personnel needs to supervise these projects and make arrangements for additional staff to oversee repairs, as needed.

Services Improvement Project 8: Institute an Underground Fuel Storage Tank Removal Program

Identification of Issue

The U.S. Environmental Protection Agency (through Title 20, Chapters 55-68 of the D.C. Municipal Regulations) requires operators of underground storage tanks to upgrade, replace, or close their tanks to prevent the possibility of environmental contamination caused by leaking fuel. The deadline for removal of these tanks is December 22, 1998 (federal regulation 40 CFR 280). As the deadline approaches, finding a competent contractor will become more difficult, leading to higher costs and delays. For most institutions relying on underground tanks for fuel storage, the age of tanks and costs of upgrading are likely to outweigh the costs of removing them, particularly if the tanks are not determined to be free of leaks.

Underground storage tanks can be a source of immense liability in the event that they leak and cause contamination of soil or an adjacent water supply. Fines for failure to remove tanks can be as high as $15,000 per day per tank.

Suggested Improvement Project

Remove the 48 underground storage tanks on DCFEMS property by December 1998.

Costs and Benefits

Costs – The costs of the program are likely to range from $400,000 to $1,000,000 depending on whether a private contractor or the Department of Public Works is used. The Department has obtained a private sector bid which is the lower figure listed above. Relaxation of the previously exclusive relationship between the Department of Public Works and DCFEMS might allow the less expensive option to be taken.

Benefits will include regulatory compliance and avoidance of liability associated with leaking underground storage tanks and possible legal sanctions resulting from failure to comply with the regulations. Fines could be $720,000 per day if no action is taken!!

Capacity for Change

This project is well within the capacity of the DCFEMS management. There will be minimal organizational impact, but the program will affect the operation of some facilities on a temporary basis, and create the need for an alternative system for fuel distribution to supply the apparatus of DCFEMS. Plans for removal of the tanks have already been prepared within DCFEMS.

Priority Status: Level 1 (Most Urgent/Critical)

Work Plan

Within 30 days:	Decide whether to use DPW or a private contractor Solicit bids, if possible
Within 60 days:	Start work
Within 12 months:	Finish tank removal

Professional Standards

This unit, headed by a Battalion Chief, includes responsibility for safety, labor relations, special projects, regulations, and internal investigations. The main problem area is safety., which is addressed by the following two improvement projects that explicitly address safety, plus the many areas of this report that address equipment, apparatus, and training.

Services Improvement Project 7: Revive the Planning Function in the Department

Identification of Issue

Under the prior administrations, budget cuts reduced the research and planning function to a shell of its intended purpose. It has been so long since this function was active that the Department is essentially "starting over" on this critical function. Personnel within the unit are busy with other essential duties.

Suggested Improvement Project

The research and development function, which currently includes facilities maintenance and medical services, is staffed by four personnel: a Battalion Chief, two Captains, and a Lieutenant. Irrespective of the future duties of the unit, there is a need for permanent, specialized expertise. A uniformed or civilian research, planning, and grants officer should be the principal planner and R&D person in the department. This person would preferably have a graduate degree in public administration, urban planning, or a relevant social science, would take on some of the high-level planning functions within this unit.

A person with these qualifications and some familiarity with fire and emergency medical services could be retained in the salary range of a Lieutenant or Captain, depending on their experience.

Representative projects to be undertaken are:

- Liaison with MIS and Communications sections to collect and monitor data on incident trends, including generating special reports for firefighter safety

and health, station location, and analysis of the fire problem using geographic information system GIS software already in-house.

- Assist with development of specifications for new or revised apparatus and equipment, including administering field tests.
- Develop estimates of demand and forecast possible changes in unit workloads due to relocation of units, or other policy changes such as implementation of mutual aid programs.

Costs and Benefits

Costs–The costs of this change would be the salary and benefits associated with the position, and a corresponding budget to support this function. A modest initial support budget (high-end networked personal computer, supplies, conference travel, and publications) could be provided to be followed by a formal budget request developed by the incumbent after the position is filled. Many of the resources needed for this position already exist within the Department. Estimated costs for the first year are approximately $60,000.

Benefits – The benefits of staffing this unit would be numerous. At present, there is little time for organized long-range thinking within the DCFEMS. This unit would serve as the in-house center of institutional planning activity and would provide a needed support to top management. Direct benefits are difficult to calculate, but the potential leverage for major improvements across all areas of the Department is high. Planning ultimately improves the quality of services provided to citizens and the cost-effectiveness with which it is delivered.

Capacity for Change

There exist engineers and graduate degree holders among the firefighting ranks. There may be a qualified person interested in taking the position. If not, recruitment of a civilian research analyst would be required. Formation of a permanent staff or use of consultant or academic resources on tightly focused assignments would be a likely long-range objective.

Priority Status: Level 3 (Urgent)

Work Plan

Identify someone to be the planner, or hire from outside with 6 months.

Services Improvement 10: Replace or Repair All Defective Firefighter Protective Equipment and Apparatus

Identification of Issue

Firefighting breathing apparatus and clothing is in a critical state of disrepair. The SCBA used by firefighters is out of compliance with federal standards. A majority of the air cylinders are beyond their hydrostatic testing dates, making them non-compliant with DOT and NIOSH standards. This is a serious violation of safe working conditions and holds the department and individuals in management positions open to serious liability.

Some firefighters' protective clothing is in poor condition, and the procurement process delays necessary replacement to the point that some firefighters are wearing unsafe gear. Many firefighters are purchasing their own protective boots, gloves, and Nomex hoods because the DCFEMS is not providing these critical items to them.

Suggested Improvement Project

Breathing Apparatus

- Develop and implement a plan to replace all SCBA in the department with modern SCBA. New SCBA includes an integrated PASS (Personal Alert

Safety System) that cannot be turned off, a critical feature. (Many firefighter fatalities involve situations where PASS devices were not working or were turned off. The new generation of SCBA puts them in line with the breathing regulator, so that they are on automatically when the SCBA is used.)

- In the interim, survey all breathing apparatus to determine which units are not compliant.
- Bring breathing apparatus cylinders into compliance through hydrostatic testing of cylinders.
- Conduct testing of existing SCBA regulators to determine which units are no longer in compliance with NIOSH standards.
- Develop a process to ensure the continued maintenance of all SCBA, and thorough record keeping on it.

Protective Clothing

- Upgrade gear for firefighters wearing old and worn turnout gear
- Develop a reserve inventory of gear to issue to firefighters when their gear becomes worn or contaminated at an incident.

Costs and Benefits

Costs for conducting and immediate survey and testing all SCBA to bring them into compliance from a private vendor have been estimated at approximately $10-$30 per cylinder for hydrostatic testing, and approximately $80 per unit to conduct testing of SCBA regulators to determine if they are still compliant with respiratory protection standards. The costs to repair defects discovered in these masks cannot be measured at this stage.

A new NFPA-compliant SCBA costs approximately $2,700, including one air cylinder. The cost for procuring 420 needed new units = $1,134,000. The total testing costs would be $10 x 600 + cylinders and $80 x 350 regulators = $40,000. Also needed are 480 spare new carbon fiber air cylinders @ $825 = $396,000.

Overall Cost – Approximately $1,530,000 capital cost for new cylinders, plus about $50,000 for testing. Some breathing apparatus may be able to be upgraded instead of replaced, saving $1,300 per unit, for units purchased after 1988. This might save $100,000-$200,000 from the total.

Benefit – The benefit of these expenditures is to bring the SCBA units and turnout gear in the department into compliance with established standards. It is perhaps best to speak of the costs of not testing or updating these units, which will inevitably lead to serious firefighter injuries or fatalities, and millions of dollars in liability. A lawyer might term the failure of the DCFEMS to keep SCBA and protective clothing within compliance in terms of "willful and wanton" disregard for the safety of the employees. The cost is small compared to the liability exposure.

Capacity for Change

The department has the capacity to bring these units into federal compliance if provided the appropriate funding. The improved recordkeeping should be part of the proposed new property inventory system described earlier in this chapter.

Priority Status: Level 1 (Critical/Most Urgent)

Work Plan

Within 2 months:	Have vendor test SCBAs and regulators
Within 4 months:	Complete testing of all SCBAs Repair or replace defective units
Within 6 months:	Purchase new protective outfits to replace those in poor condition.
Within 12 months:	Start replacement of oldest SCBAs.

Services Improvement Project 11: Revamp Organization, Procedures, and Staffing of the Safety Function in the Department.

Identification of Issue

The department lacks adequate staff for the safety function. At present, there is one safety officer, who must be called in from home to large fires when not on duty, with unsatisfactory response time.

The department also lacks adequate training of its employees in wellness, safety and injury prevention. There also is not a strong enough link to feedback.

The department is lacking a comprehensive policy regarding risk management and employee health and safety. The department is not complying with delivering initial and yearly training in mandated safety topics such as airborne/bloodborne pathogens training.

Suggested Improvement Project

DCFEMS needs to develop comprehensive policies and procedures governing employee safety in general, and fireground safety for emergency response, in particular. The following should be included:

- Complete draft of risk management plan.
- Develop bloodborne/airborne pathogens training program for all members of department, per OSHA standards.
- Pursue efforts to comply with NFPA 1500, Standard on Fire Department Occupational Safety and Health Program.
- Develop an employee wellness program.
- Develop injury and accident data collection, tracking, and review process, and use this process to target firefighter injury prevention programs.

- Move the safety office organizationally under training, to link safety experience directly to training on-the-job training and training in courses. The safety office should be physically located at a central station to facilitate the response of the proposed Shift Safety Officers to all working incidents (as Incident Safety Officers under ICS).
- Add/reassign FTEs for a functioning Safety office, including 1 Battalion Chief, 1 Captain, and 3 Lieutenants (1 per shift). This requires adding all but the Captain position, which already exists, and would also be available to staff one shift.
- Train safety personnel to perform Safety Sector functions at emergency incidents.
- Develop Safety and Injury Prevention training for all officers.
- Develop a physical fitness program and fitness training sites for fire department personnel.

Costs and Benefits

Costs –

	Loaded Salary
1 Battalion Chief @ $57,946 + 33% =	$ 77,068
3 Lieutenants @ $44,161 + 33% =	$176,202
Total	$253,270

These positions are in addition to the existing captain assigned to safety. Other costs include the establishment of a safety office, computer, phone, fax, and copy machine, and office supplies, and a response vehicle and radio for the incident safety officer. Total: Approximately $24,000

The development of fitness training sites would incur costs of weight-training and cardiovascular equipment (or the costs with contracting with private fitness centers to allow fire department personnel use of their facilities. All new stations and fire station

renovations should include a fitness area. Stations without the space may require some creative low cost/low equipment approaches, or contracting to use facilities at a local fitness center. ($30,000 - $50,000)

Benefits – The benefits will be a healthier workforce, reducing costs to injuries and more effectively handling the physical aspects of the job; and improved safety for a 1,600-person department, with a reduction in injuries and lost time from work.

Capacity for Change

The department has the personnel with the experience and education to serve in an expanded safety office. There will be high motivation to accelerate changes as a result of the tragic firefighter fatality in October.

Priority Status: Level 1 (Critical/Most Urgent)

Work Plan

Develop office over a one-year period. Procure fitness equipment for stations.

Fleet Maintenance

Services Improvement Project 12: Revise the Vehicle Maintenance Program for Fire and Heavy Duty Apparatus – "Quick Fix"

Identification of Issue

The current state of repairs in the fleet is poor due to a number of factors acting simultaneously. The increased age and utilization of the fleet, the deferred apparatus replacement program, procurement delays, and limited performance of some mechanics all exacerbate the problem. The facilities of the apparatus maintenance division are generally old and do not allow significant repairs to be done in house. The complete lack of a management information system and computerized fleet maintenance data cripple

the ability to measure workload, track expenditures by apparatus, or identify poorly performing personnel.

As a practical matter, major repairs to vehicle systems such as engines, transmissions, suspensions, and anything under warranty are referred to outside vendors. In reality, the staff in the division work on fire-related systems, preventive maintenance, and minor repairs only. The success of this division of labor is difficult to measure since procurement delays plague all aspects of the repair process. There remains a problem of staff and their capabilities to perform to necessary standard.

There is a need to maintain an in-house capacity for minor apparatus repair and preventive maintenance.

There are significant needs for a management information system, use of computers, and increased control over staff performance.

Suggested Improvement Project

- Formally address the issue of major apparatus work being referred to outside contractors. Term contracts should be obtained for ongoing repair needs to permit the timely completion of repairs. These items would include diesel engines, Allison transmissions, tires and tubes, waste management, and batteries.
- Revise standards for selection of maintenance personnel. The current position descriptions are outdated and do not require the necessary skills to work on modern fire apparatus. Adequate resources must be devoted to background checks to assure that potential employees are free of undesired legal or work-related problems that would affect their performance. Certification (or ability to earn it in a reasonable time period) by organizations such as the National Association of Emergency Vehicle Technicians or the Institute for Automotive Service Excellence should be required.
- Existing poorly performing employees need to be removed from these critical positions if they cannot adopt the skills required for their positions. Perhaps they

could be assigned to a non-emergency service repair position where their employee rights could be protected without impacting on the public safety of the District. For those employees already identified with disciplinary problems, a concerted effort with the support of the District's Office of Personnel should be initiated to assure that future performance meets standards or that they be discharged.

- Perhaps the highest priority change is being able to speed the emergency authorization monies for repairs. There is great confusion as to how to use the emergency spending authority of $500,000 that was given to the Department, especially for repairs. (This is a "quick-fix" project.)
- An MIS System for tracking vehicles as property and vehicle maintenance records is needed to run the system efficiently.

Costs and Benefits

Costs – The costs of executing term contracts for repairs will have little or no fiscal impact, since these repairs are currently being done by outside vendors. The benefits will be significantly reduced time for repairs to be completed and faster acquisition of needed parts and services. This will have a direct impact on the availability of emergency apparatus for service to the citizens.

Requiring higher entry standards for mechanics will likely require higher salaries, in order to compete with the private sector. Estimates are that current salaries are between $5,000-$17,000 below that paid by comparable employees in surrounding jurisdictions. This should be viewed as a necessary expense, and will offer benefits of increased productivity, better reliability of apparatus, and offers the possibility of a reduction in staff as the operation shifts from a low-performance mode to a high-performance, high-skill operation.

The only significant outlays required for this element would be the cost of training for those employees who were willing to participate.

Benefits – The benefits would include better overall performance of maintenance tasks and higher morale among remaining employees. Emergency vehicles will be returned to duty faster, avoiding gaps in coverage.

Capacity for Change

The authority for entering into such agreements has apparently been granted, but word of how that authority can be used has not yet reached the operational level of the organization. With clarification of enhanced procurement authority by the Fire Chief, term contracts can be executed within existing resources.

The Department must cooperate with the Office of Personnel to reclassify the mechanic positions. Added costs for staff could likely be offset by a smaller staff as more tasks are performed by the private sector.

The Department would need the cooperation of the Office of Personnel to train, discipline, and reassign employees. A management commitment to support the line managers at the apparatus maintenance division would also be required, but is within current staff capacity.

Priority Status: Level 1 (Highly Urgent/Critical)

Services Improvement Project 13: Revamp the Vehicle Maintenance Program for Passenger Vehicles

Identification of Issue

DCFEMS has a significant fleet of over 70 passenger vehicles. Many of these vehicles are in poor condition. The limited resources within the vehicle maintenance shop spend much time maintaining an aged fleet of passenger vehicles, many of which are used for non-emergency purposes.

The maintenance of passenger vehicles detracts from the ability of mechanics to maintain more essential ambulance and fire apparatus, and could easily be performed by an outside vendor.

Suggested Improvement Project

- Perform a comprehensive needs assessment on the number of passenger vehicles required by DCFEMS. The fleet should be adjusted (presumably upward) to reflect this number.
- The implementation of a motor pool concept whereby vehicles are shared may be a possible improvement in the utilization of passenger vehicles within divisions (e.g., Prevention).
- Implement a program whereby at least part of the administrative vehicle fleet is leased and maintained by the leasing dealer, with maintenance coordinated by the apparatus maintenance division. If this works well expand to the whole fleet.

Costs and Benefits

Costs – The cost for moving to a leasing arrangement for administrative (non-emergency response vehicles only) would be approximately $115,000 annually for 35 vehicles. This leasing price does not permit these vehicles to be equipped with emergency lights and siren. Therefore, it will still be necessary to purchase passenger vehicles needed for potential emergency response.

By disposing of vehicles while or shortly after they are under warranty, significant repair expense can be avoided. Unfortunately, exact estimation of savings is difficult since there is no computerized maintenance records within the Department, and no clear cost of repairs to passenger vehicles. The savings should be significant, however, and the quality and reliability of the vehicles should improve considerably. Benefits would accrue directly, through reduced expenditures, and indirectly, through greater mechanic attention to emergency apparatus.

Capacity for Change

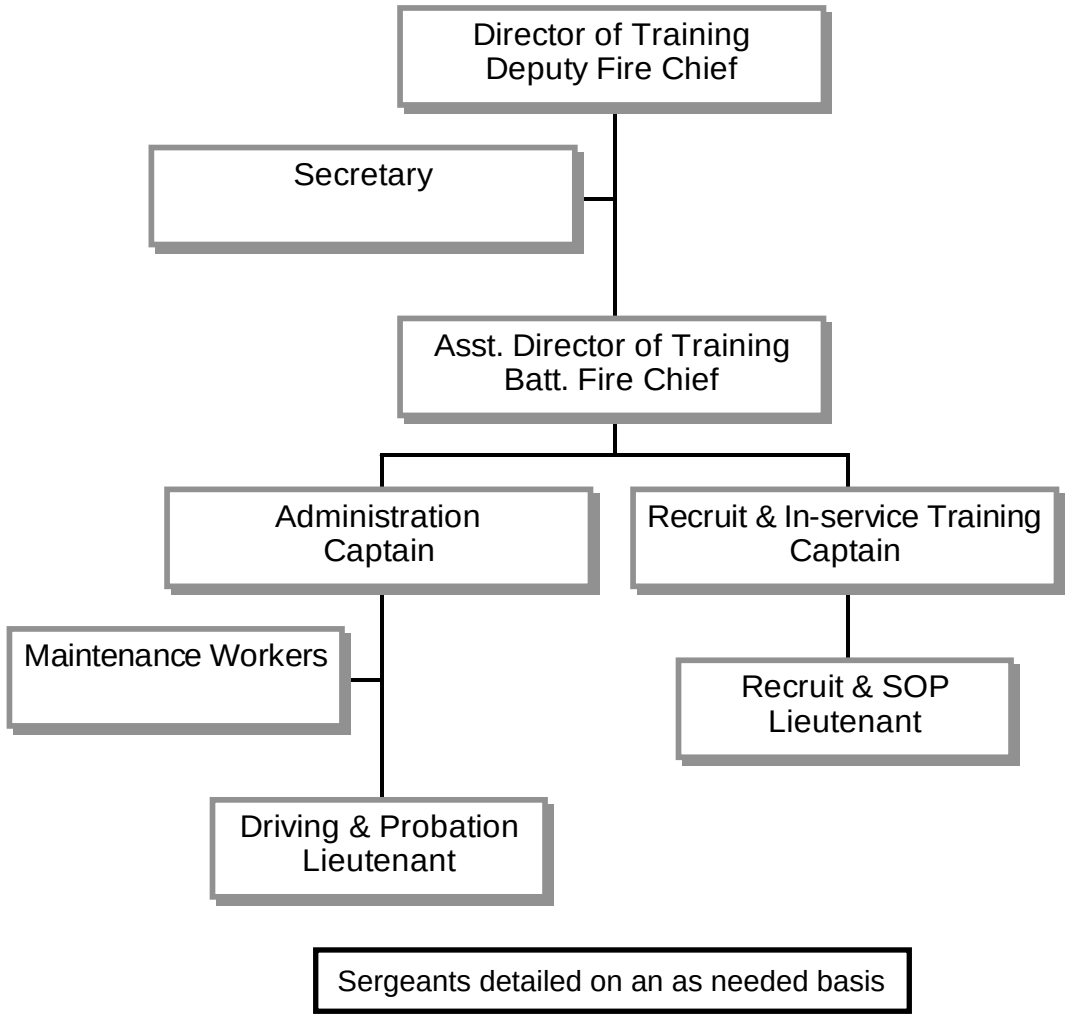
The current staff is capable of implementing this change. There are no major impediments to this project. There is a need for a top management commitment to address the likely resistance of personnel who might lose use of a dedicated vehicle.

Priority Status: Level 4 (Desirable)

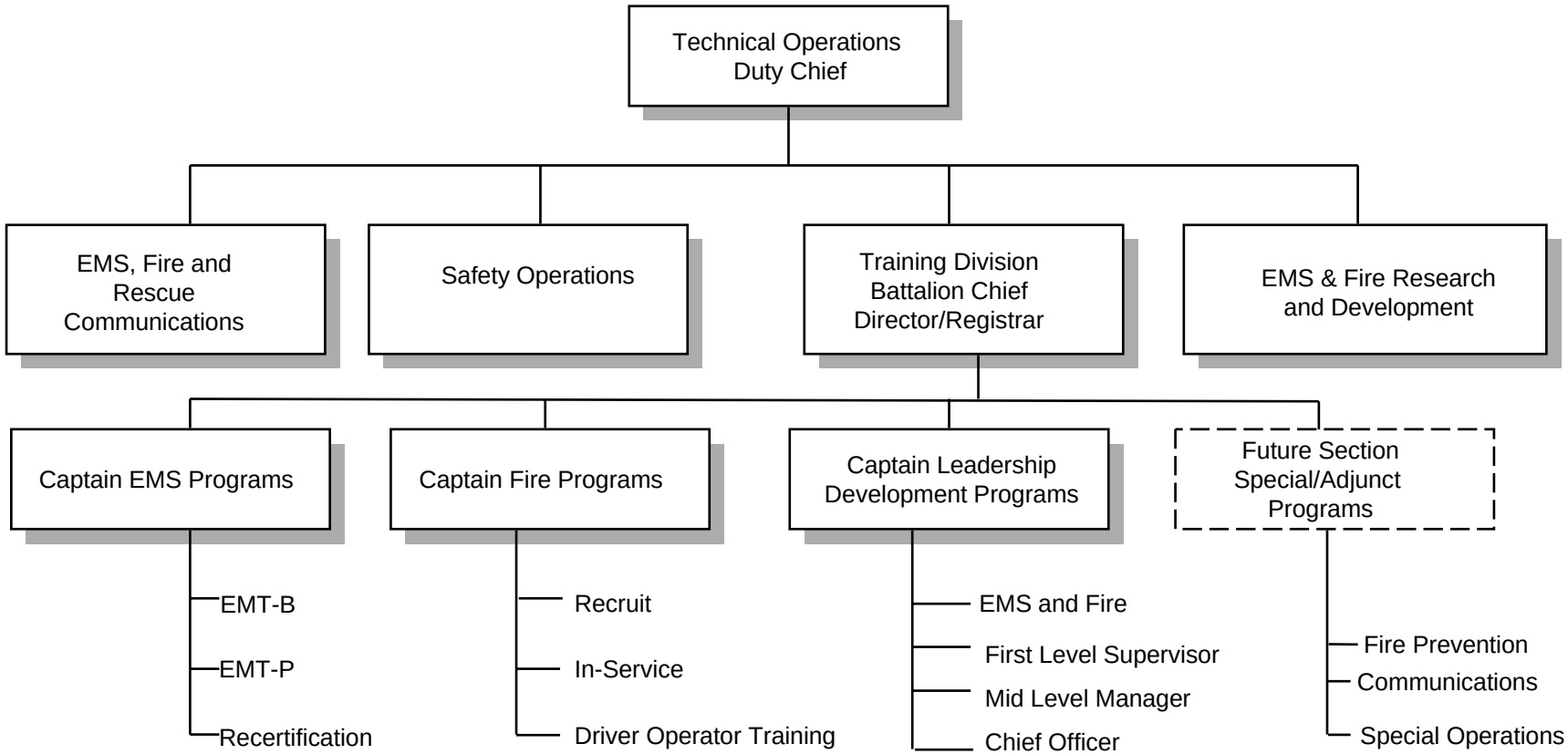
Compliance

No recommendation, other than the "Accountability" section of Chapter 2, Office of the Fire Chief.

D.C. Fire and Emergency Medical Services Department
Training Division
Current Organization



Suggested DCFEMS Training Division Placement and Internal Organization



Proposed DCFEMS Organization Chart