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REGIS UNIVERSITY
SCHOOL FOR PROFESSIONAL STUDIES

MASTER OF SCIENCE
IN
COMPUTER INFORMATION TECHNOLOGY

**Special Event Computerized Tracking of Officers Reporting
(SECTOR)**

PROFESSIONAL PROJECT

Noel R. Mac Mahon

Spring 2005

Abstract

The New York City Police Department needs a way to rapidly and accurately account for and assign personnel during a pre-planned special event. There are currently many archaic systems utilized throughout the Department, yet none of these formats utilizes a computerized system. Because there is no single off-the-shelf product currently available to perform all of the narrow tasks involved in this problem, a solution needs to be developed.

The solution to this problem is developing a system that will be a single standard for the entire Department. This solution will combine various hardware devices and off-the-shelf software products into a compact, easy to use lap-top system. The goal of this project is to develop a simple, cost efficient, mobile system that will accurately account for and assign police personnel during a pre-planned event.

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1.0 Chapter One: Introduction

The planning of the police presence at a “special event” in New York City is a time consuming and expensive process. Special Events are preplanned events such as parades, concerts, New Year’s Eve celebration, street fairs, sporting events and other events requiring a scheduled police presence. The goal in planning the police presence is to provide as much security as possible while reducing manpower-related expenses to the city. The New York City Police Department is the largest police department in the United States. Some events involve the reassignment of thousands of officers, solely to the security and organization of the event, and often, incurring substantial overtime expenses. The laptop based front end application/database system being developed in this project, **Special Event Computerized Tracking of Officers Reporting System (SECTOR)**, will assign and account for officers in an efficient manner.

1.1 Problem statement

The New York City Police Department needs a system that will improve the deployment of officers during special events. This system is needed to reduce expenses associated with the event and to ensure that the officers available are assigned in some priority format. Accomplishing these two tasks, when dealing with hundreds, and sometimes thousands of offices from all over the city, is extremely complex. The mere act of having a set number of officers appear in a set “meeting” location, at the proper time is often a fruitless quest.

Deploying the officers in a timely and organized manner is also a problem. It may take over an hour to account for and assign all of the reporting officers reporting for an event. Every hour wasted accounting for and assigning officers adds to the expense of the event. The goal is to reduce this overall expense.

1.2 Review of existing situation

One of the primary problems with special events planning is that there is no standardized existing solution to the problem. The Police Department is divided into eight (8) Borough Commands. Each of these commands is responsible for the preparation of events within its area. Depending on where in the city the event is being held, and which individual is responsible for special event planning in that geographical area, the events are organized using various methods. Although the systems differ in substance, in general, special events are developed in the following way:

- A) The Department establishes the number of officers to be assigned to an event. These officers are notified to report to a set location at a specific time.
- B) The officers report to the location they have been instructed to.
- C) The officers line up and are manually counted by the supervisors.
- D) The event coordinator tallies the numbers to determine if there are sufficient numbers.
- E) The event coordinator gives each sergeant a multi-copy post-listing (known as a "roster") for eight (8) officers. The sergeant will then

pick eight officers out of the assembled line, manually write the officers name on the roster and tell each officer their assignment.

- F) The sergeant then tears off the top copy of the roster and submits this to the Field Command Post.
- G) The sergeant and eight (8) officers deploy to their assigned location.
- H) The sergeant attempts to keep track of the location of all eight (8) officers during the event.
- I) At the completion of the event, all officers are directed to return to the Field Command Post and are dismissed.

Within this existing situation, there are several problems. These problems can affect the overall integrity of the safety of the event. There are many reasons the task of having the correct numbers of officers appear is a problem:

- A) Officers are not properly notified to report to the location.
- B) Officers have reported sick, or have become involved in an incident of their way to the location.
- C) Officers have been canceled from the event due to manpower issues within their primary assignment.

Knowing how many officers are available for assignment at an event is extremely important. Assignments must be filled in a priority order. Should the expected number of officers not be available, then some priority assignments may accidentally be unfilled. This may happen if a sergeant with a priority

assignment takes longer to add the eight (8) officers to the roster than another sergeant that has a less important post.

1.3 Goals of the project

This project will research, analyze, design and implement a laptop-based system that will track the reporting and assignment of officers at a preplanned “special event”. The SECTOR will require the use of specific hardware and software, the use of databases and some networking functions. The endpoint of this project will be a working prototype. There are three (3) primary goals of this system. These are;

- A) Reduce the time needed to prepare for a special event, thereby reducing expenses.
- B) Reduce the number officers assigned to a special event thereby reducing expenses.
- C) Increase security by ensuring priority assignments are covered.

These goals are all measurable in time and money. Because these goals are measurable, the effectiveness of this system will be readily seen.

Comparison of events prepared with and without the system will be conducted to show tangible results.

1.4 Barriers/Issues

There are few barriers against developing and even implementing this system. Because there is no organized system in place, there should be minimal

resistance to its use. There may be issues with operational integrity until the system, and the hardware used at the events, is shown as reliable.

The issues that may impact the effectiveness of the system include:

- A) The ability of the design team to gain information regarding the NYPD Smart ID cards. These cards are integral part of the system. Without the capability of reading the ID cards, the system will have to result on a backup of manually entering officer ID numbers at the event.
- B) The capability of reverting to the old system, as a backup, must remain in place. This will involve keeping sufficient staff trained in the new system, while also training these same staff members in the old, backup method.
- C) This system must be capable of expanding its networking capabilities. As designed for this project, it is not expected to provide live, real time information to wireless, handheld devices. This system must be capable of being upgraded, at a later date, to include this capability.

1.5 Scope of project

The scope of this project is very specific. This project will create a laptop-based system that will scan an officer's ID card, assign the officer to a post (in priority order), print the officer's assignment on an index card for the officer, and then print a completed roster and a map of the area of responsibility for the

supervisor. The project will also allow for the potential of information regarding the availability and location of officers to be relayed to handheld wireless devices. This project will first deliver a working prototype that will accomplish the given task. Upon successful operation of the prototype one (1) SECTOR system will be built. When the NYPD is fully satisfied with the final product, the remaining 11 systems will be delivered.

To better define the project, the hardware and software limitations are defined:

- A) Scope of Hardware:
 - a) Laptop Computer
 - b) ID Card Scanner
 - c) Color laser printer
 - d) Card printer
- B) Scope of Software:
 - a) Operating system
 - b) A database program
 - c) A word processing program
 - d) Graphic editing software (for map making)
 - e) Networking software
 - f) Other software as necessary

By staying within the defined scope of the hardware and software, the project should remain within the projects overall budget.

1.6 Summary

The Special Event Computerized Tracking of Officers Reporting System (SECTOR) efficiently assigns officers during special events. The system is designed to track, assign and then account for officers. The use of the laptop-based system, using off-the-shelf hardware and software, will create a user friendly system that should be readily accepted by the users. This system is expected to reduce the amount of time hundreds of officers must wait to be assigned at an event by utilizing one or two officers to operate the SECTOR system. Overall, this project should result in the reduction of approximately one hour from the report time before an event. The system will also increase accountability by ensuring there is an accurate list of officers that are present and their respective assignments.

2.0 Chapter Two: Review of Literature and Research

The development of this system will require some research in the various fields being applied. This research is primarily needed to explore hardware options, as well as some of the more limited software and training issues. In all, the purpose of the research will be to ensure the system will meet the various requirements within the Police Department. These requirements included technological, training, personnel and substantial financial issues. There may be some level of union (work rules) issues that may also need to be addressed. These are basic personnel related issued but may have some effect on the final outcome of the equipment utilized (due to OSHA regulations).

2.1 Review of Existing Solutions Available

Within this project proposal, some preliminary basic research was conducted to understand why a system is needed and what capabilities are available.

To alleviate the problem, three (3) potential solutions were investigated. The solutions reviewed all varied in scope and price.

- A) Solution # 1- Do nothing
- B) Solution # 2- Limited modification of current system. A computer system could be utilized to account for officers' presence at an event but the actual assignment of officers would remain a more or less manual process (as current).
- C) Solution # 3- Project as proposed

Since some type of change is needed within the process, solution #1 is not a remedy for the Department's problems. Solution #2 would work but then the system is limited to being nothing more than a "time clock." In addition, the basic equipment expense would not be justified by keeping the project minimized as in Solution #2. This project proposal (solution #3) is the best solution to resolving the problems the department is having with special events. The solution is simple, relatively inexpensive, and will fulfill the needs of the users.

2.2 Research Methods Used

The best way to develop a system that performs the necessary functions is to conduct extensive research in the matter. This research will focus on establishing the protocols that will be in place with event development as well as research on the actual technical parts of the system. Team members will be required to conduct web searches, interviews, site visits and work sampling in an attempt to gain sufficient knowledge about the solution.

2.2.1. Interviews

Interviews will be conducted with several members of the Police Department. These should be members involved in the day to day tasks associated with special events, and the Department's computer systems. The purpose of these interviews is to establish what tasks need to be accomplished by the SECTOR system, as well as review what pre-existing computer capabilities the Department already has.

2.2.2 Work Sampling

Team members will be required to conduct work samples of past events. These samples should be focused on learning what is needed in the SECTOR system. The primary task is learning what the physical written materials the system will create should look like. This is important to ensure that sufficient information is available to the supervisors and officers assigned to the event.

2.2.3 Site Visits

Site visits will be conducted to the following locations:

- A) NYPD Management Information Services Division (MISD) headquarters.
- B) An NYPD Borough Command Operations Office in the process of preparing for an upcoming event.
- C) A Field Command Post during a special event.

The purpose of these site visits will be to observe the current system, from start to finish, in place. This will reveal the development strategy and flow of information. The site visit should also reveal to the observers the problems that need to be rectified. By looking at the problems firsthand, from an outsider's perspective, additional solutions may become obvious to the team.

2.3 Contribution the Project Will Make to the Field

This project will create a much more efficient deployment system for the Department. In all cases where the SECTOR system is utilized the assignment of officers should be quicker and the accounting of the officer's presence is

definite. While this system is designed to be associated with “special events” the basic concept behind it can be expanded into other areas of police work. With modification to the hardware, the system will be capable of accounting for personnel on the scene of a large-scale disaster, and pinpoint their presence within a reasonable distance. The primary limitation to the hardware currently is the ability to “read” the Smart Identification Cards over a distance. When this technology is available, the basic SECTOR system can be expanded to account for officers while on the scene within a limited area, similar to a vehicle-tracking device.

2.4 Discussion of Other Available Tools

Because this is a limited field, there are few tools commercially available that will accomplish this specific task. As it is, the database programs that may need to be used for the SECTOR will be used out of their originally designed context. As part of preliminary research an Internet search was conducted on the topic. The search did not yield and results that completely fit the needs of the project. Research may yield positive results when dealing with the individual components of the system.

2.5 Why SECTOR as Opposed to the Other Options

SECTOR is the only system proposed to fulfill this solution. Regardless, it is a good system because it is a well thought out option for the improvement of the current system. The other options are basically useless to the department. SECTOR is the only logical next step in the process. SECTOR is a simple

solution that can grow into a complex one later on if needed. SECTOR happens to be in a situation where the simplest solution is the best solution. The Department's primary problems are accountability and efficiency. The solution has to be a system that will efficiently account for and assign personnel. SECTOR easily accomplishes this at minimal expense.

2.6 Summary

This project will require the team members to conduct a modest level of research. Because the team members are specialist in their respective fields, the research for each member should be limited to their duties. Web searches, interviews, work samples and site visits will be conducted to develop sufficient information to enable the development of the system.

This project will be a great stepping-stone for the NYPD. This will be a venture into the automation of a process that is currently completed manually. Because the Department has many other manual processes, the successful implementation of the SECTOR system would likely cause a snowball effect into the development of future systems.

3.0 Chapter Three: Project Methodology

3.1 Research Methods Used

Three types of research will be utilized in the development of this system. Conducting Interviews, reviewing Work Samples and performing Site Visits should be more than sufficient to provide a broad overview of the problem and the potential solution. These research methods ensure the design team can get sufficient feedback from the potential users, while at the same time make honest, unbiased observations of other underlying problems that may exist. It is only through the thorough the unbiased examination of the problem that a solution can be created.

3.2 System Development Life Cycle Model Followed

Because this project will consist of a small team, with each member dedicated full-time, the project will be implemented using a basic Waterfall methodology over a period of no more than three (3) months (120 days).

3.2.1 Research Analysis Phase

3.2.1.1 Problem Analysis

The purpose of this phase is to understand the problem and determine if the system is worth developing. Because this project requires only a relatively small team all of the personnel assigned to the project will participate in this phase. The team members will conduct interviews, site visits and review samples of work related to past special events. Each of these research methods will yield insight into the overall problem.

A) INTERVIEWS:

Interviews will be conducted with personnel involved with every level of special event planning. The interviews will be designed to yield unbiased information and be open to all findings. The interviews should reveal that there are several problem areas. Based on the preliminary observations, it is anticipated problems will be found in the following areas:

- a) Accounting for personnel assigned to a large-scale event.
- b) Rapid assignment of personnel assigned to a large-scale event.
- c) Failure to utilize personnel to maximum capabilities based on each officer's unique skills and qualifications.

B) SITE VISITS:

Site visits will be conducted at the scene of actual preplanned special events. The site visits will primarily be used to see why there is a delay in the current process and what may be done to more rapidly execute the event related tasks. The site visits will be designed to yield unbiased information and also be open to all findings. The visits will also be designed to specifically look for the following areas that may be problematic based on early observations:

- a) Reporting of assigned personnel at the event location in a timely manner.
- b) Role of supervisors in holding personnel accountable for reporting in a timely manner.

- c) What system is currently in place to record the time officers actually arrived on scene.
- d) How officers arriving late are factored into the overall assignment process. (i.e.- are they given lesser priority, and possibly easier, assignments because they are late.)

C) REVIEW OF WORK SAMPLES:

A review will be conducted of the administrative aspect of a special event.

This includes reviewing the current rosters, maps and instructions issued to officers at an event. Based on preliminary review the following areas will need special attention during the review:

- a) Preparation of rosters by the supervisor.
- b) Accountability of officers on rosters (i.e.- every officer assigned to the event must be on a roster)

It is anticipated this research will reveal there are various problems with many alternative solutions. From the preliminary observations made on this topic, it would appear that most of these problems would be alleviated through the use of a relatively simple computer system.

3.2.1.2 Requirements Analysis

The purpose of this phase is to define project goals into specific functions. To complete this, the design team will conduct meetings with the anticipated users to formulate an initial requirements document.

A) Business Requirements

The requirements interview will be planned to reveal the basic needs of the NYPD with respect to this project. As always with local government projects, the goal of the Business Requirements will be to ensure the project is implemented with ease and efficiency. Based on earlier observations with this agency, the major concern has always been developing an efficient system that will increase public safety while maintaining an overall reduction in costs. With respect to the Business Requirements, taking all newly learned information into account, the team should utilize this past premise as a starting point in developing the business requirements. In particular, the team must gather information on the details of the following requirements areas:

- a) Developing an efficient assignment system.
- b) Developing an accurate system of accounting for officers.
- c) How to maximize the assignment of officers based on each officer's unique skills and qualifications.

B) Technical Requirements

The Technical Requirements of this project will be the most important aspect of the project. Since, like most other government projects, this project's approval will rely heavily on the cost of the completed item. The goal of this project is to keep the physical expense of each unit less than \$3,000. With this in mind, the goal of the Technical Requirements is to develop a plan of what specifically is being asked from the system. Once this has been established, the technical requirements can be examined and itemized based on the potential

budget. Based on the preliminary project proposal, the following technical aspects must be thoroughly reviewed within the development of the technical requirements:

- a) The potential for the incorporation of the Department's current ID Card system into the new system.
 - b) How the system will access the NYPD Personnel database as necessary for updates.
 - c) How a database will be established with event specific assignments.
 - d) How officers will physically receive their assignments.
- C) Hardware Requirements

The goal of this project is to develop a portable, laptop-based system for special events. As currently envisioned, the minimum hardware this project prototype will require is a laptop, ID card scanner, and laser printer. Since the goal is to eventually have at least 12 functioning systems, hardware will be required in multiples. While other hardware may be incorporated based on the findings from the hardware requirements, the team may anticipate the greatest needs will be in the following areas:

- a) Laptop computers (Windows O/S)
- b) USB 2.0 / Firewire ID Card scanner
- c) USB 2.0 / Firewire Laser Printer
- d) Secure data storage (CDR/ HARD DRIVE)

e) Networking capabilities

The Laptop's basic speed/memory/storage specifications will need to be established by the team. Based on past experiences, modifying these specifications of the laptop will be one of the easiest ways to adjust the completed price per unit. Because it is already known the users will come from a large pool of Police Officers, many with only a limited knowledge of computers, the team should start their planning based on a Windows Operating system.

The choice of ID Card scanner will be limited due to comparability issued with the ID cards. It is likely the cards will require a proprietary card reader/scanner.

All of the hardware used must be both portable and rugged. In addition, all hardware must be capable of future expansion and upgrade. Power consumption will not be an issue as power is provided on scene by a generator in the Field Command Post.

D) Software Requirements

At minimum the team will need to develop the Software Requirements based on the basic premise of the system. As envisioned, the system will "read" an officer's ID card, assign the officer to an assignment based on individual skills, and then print out a one (1) page assignment sheet for the officer with instructions and a small map indicating the officers post. To meet these basic preliminary requirements, the team must explore the following areas:

- a) ID card reading software
- b) Database software
- c) Map editing software
- d) Word processing software

The specifics of each type of software are open for the team to explore based on the needs learned in the requirements phase. Because this project is designed to have only 12 units upon completion, it is preferred that licensed off-the-shelf software be used. In all likelihood the expense of developing proprietary software would be greater than the purchasing/licensing of off-the-shelf software.

E) Pre-Implementation requirements

The team will need to ascertain the Pre-Implementation Requirements based on the NYPD's various needs and scheduling. These requirements will include the timetable leading up to implementation, and the actual switch from the manual to the SECTOR system. The team must look at the approximate completion date for the project, and consider the scale of the events scheduled at that time. Phasing the system in during smaller events may be preferable prior to use at large scale (greater than 32 police officers) events.

F) Training Requirements

The Training Requirements will be one of the more difficult aspects of the plan. Because the NYPD operates 24 hours, seven days a week, the plan will need to take into account extensive training Requirements. Basically, to ensure

there is always someone available to operate the system, for every one unit there needs to be, at minimum, six (6) trained people. In addition, there must be some level of training readily available to train additional officers on short notice. For the purpose of this project, the Training Requirements will center on the following areas:

- a) Hardware operation
- b) Software operation

The team will need to develop the specific plans for each element of these two (2) fields. Training must be designed for people with minimal experience with computer operation.

3.2.1.3 Decision Analysis

The Decision Analysis will establish a feasible target solution for the project. The team will review all of the information gathered during the Requirements Phase, and utilize the ideas and requests to develop an overall plan. For the purpose of this phase, each team member will focus on his/her area of expertise. The next step will be for the team members to work together to ensure the various solutions can be combined into a single system. As a result of the interaction, the feasibility of the overall project will be established.

3.2.2 Design Phase

3.2.2.1 Create the Project Plan

Once the approval has been given for the system the team members will both individually and collectively begin designing the complete system. By

utilizing the information from the Requirements Analysis to develop the system, an overall project plan will be established. The project plan should try and use the 120-day time frame. A realistic schedule must be set for all members of the team.

3.2.2.1.1 Technical

The technical aspect of the design phase will focus on the overall interacting of the various elements of the system. This will basically explain how the entire system will operate during an event and how the hardware and software will operate to form an overall technical system. In addition, issues such as compatibility with the existing database systems will be reviewed and solved.

3.2.2.1.2 Hardware

Hardware design will focus primarily on the five hardware items that will make up this system:

- A) Laptop computer
- B) ID card scanner
- C) Laser Printer
- D) Networking device
- E) Storage device

The design must ensure all items are compatible and fall within the overall \$3,000 per unit budget.

3.2.2.1.3 Software

Software Design will focus primarily on the four areas that will make up this system:

- A) ID card reading software
- B) Database software
- C) Map editing software
- D) Word processing software

The completed design must ensure all items are compatible and fall within the overall \$3,000 per unit budget.

3.2.2.2 Design the Support Plan

Team members must be able to design individual Support Plans for each of their respective areas. In addition, an overall system plan must be established. Support plans must take into account the possibility of upgrades, future changes in hardware or software. The primary goal should be to develop a plan that can be utilized by NYPD in-house support personnel.

3.2.2.3 Design the Training Plan

The Training Plan will be designed by each team member respectively. This plan should be geared toward users with basic computer skills. A basic training session will be held with NYPD certified instructors, who will then conduct training to NYPD personnel as needed.

3.2.3 Construction Phase

After the system has been approved and a design established, construction, based on the design, will begin. At the end of this phase, a system will have been built that will fulfill the stated business requirements. The construction phase should be relatively quick. Because the preferred plan is to use off-the-shelf hardware and software, the primary obstacles will be compatibility issues.

3.2.3.1 Develop the system

The development of the SECTOR system will be the responsibility of the entire team. The technical aspects of the project will consist of the merging of the best combination of hardware and software. This development will include precise record keeping. The purpose of this documentation is to provide reference in the event that a specific piece of hardware or software ends up being problematic. In addition, this phase will consist of substantial testing of the individual components as well as the components as a system.

3.2.3.1.1 Technical

The technical aspect of the system is basically the planning of the flow of information in the system. This will include the implementation of the interfaces between the new system and the Department's current personnel database. The team will need to develop the systems technical plans to ensure that the results requested by the users are reflected in the day-to-day operation of the system as well as the outcomes of every transaction.

3.2.3.1.2 Hardware

The construction of the hardware aspect of the system will involve the purchasing and testing of the hardware approved in the Design Phase. This is an important part of the project as the hardware is the most substantial part of the overall budget. Hardware must be thoroughly tested to ensure it is both durable and relatively easy to utilize. If at any point during the development of the hardware problems are found that may compromise the success of the overall project it is imperative these problems be brought to the Project Managers attention. The individual team members will for the most part, do hardware procurement. Approval for hardware purchases or modifications, beyond those authorized during the design phase, may not be made without permission of the Project Manager. Compatibility between hardware and software may become an issue if non-approved items are used.

3.2.3.1.3 Software

It is preferred that off-the-shelf software be used with this project. The use of multiple applications to perform the various tasks is acceptable and therefore created a larger pool of possible applications. It is believed the use of the off-the-shelf software will be easier to implement and have less compatibility issues in the long run. In addition, the majority of off-the-shelf applications available have user interfaces familiar to most basic computer users. This familiarity may create a shorter learning period and will hopefully reduce the overall training needs. Software development issues should be similar to those that are of concern with

hardware. Compatibility with other software, compatibility with all hardware devices and ease of use are the most important factors. The software designer(s) must be capable of utilizing the approved software to meet all of the systems needs. If any problems are discovered during the construction and testing of the software, it must be immediately investigated. In addition, authorization of the Project Manager, with consultation of the rest of the design team, is mandated for any changes to the approved plan.

3.2.3.2 Create Documentation for system

As with all NYPD projects, documentation for this system will be developed in accordance with the Department's standards. All team members will maintain documentation. In addition, team members will prepare and submit their deliverables on time and in the appropriate format. For aspects of the project that crosses over between team members, the Project Manager will assign the overall documentation responsibilities to one of the team members. This team member will be responsible for the submission of the team's documentation. In general, documentation must be maintained during the entire construction/development process. The purpose of this documentation is to permit review or problematic areas that may arise.

3.2.3.3 Establish Training plan

Training for this system is expected to be one of the more difficult aspects of the overall project. In general, the users of this system may not have an extensive background in computers. For this reason extensive step-by-step

training documentation will be prepared for the user. In addition, extensive training will be held with several members of the NYPD Academy's Computer Training Section. It will be the responsibility of the NYPD to train the actual individual users. The training that is developed should explain the operation of the hardware, software and the flow of preparing a completed event. In addition to preparing this training, a support (help) document will be maintained on each Laptop. This support file will contain the training information as well as a substantial trouble shooting section.

3.2.4 Implementation Phase

During this phase the new system will be incorporated into the Department's special events. To ensure this transition does not cause problems for the Department it will be implemented carefully. During the phase all of the training and manuals prepared during the construction phased will be used to assist in the successful implementation.

While a more thorough review of the options is necessary, preliminary recommendations are that the project is phased in over the course of many smaller events. Events that require as few as 24-48 officers would fall within a sufficient testing range. This will ensure the system is performing as designed, yet will also permit a quick conversion back to the manual system should the system fail its real-life tests.

3.2.4.1 Deliver the product

Upon completion of this project a working prototype is expected. Because of the simplicity involved in this project, this deliverable should actually be more than just a prototype it should be a fully functioning model. While the project is designed and budgeted for the implementation of 12 complete laptop systems, this teams responsibility will be preparing one (1) fully functioning system. Upon final approval of the prototype product, the additional machines will be delivered. This will permit final adjustments to be made until the last minute. Providing the additional systems after the final approval will be a minimal task requiring the delivery of the hardware and installation of software to the combined system. It is estimated this extension, while awaiting absolute final approval of the “prototype,” will extend the completion of the delivery phase by five (5) days.

3.2.4.2 Deliver the end-user training (written format)

The written end-user training has two (2) parts. The first part is the delivery of the written materials that will be the field handbooks. This printed user guide will consist of training materials for every piece of hardware and software involved in the system. The second aspect of the training will be the development of materials to be used for the classroom-based course. While this course will be provided by the NYPD, the instructors will be utilizing some materials prepared under this project. Delivery of the end user training materials will be completed after review and approval by the NYPD Directors of Training and MISD. In order to ensure the successful delivery of the system,

modifications will be made to the end-user training based on their recommendations.

3.2.5 Maintenance Phase

Under this plan maintenance beyond that provided with the initial delivery and setup will be provided exclusively by the NYPD MISD personnel. This is consistent with all NYPD systems projects of this nature.

3.2.5.1 Conduct Operation \ Support per the maintenance Plan

As designed the support plan will primarily consist of technical support provided by in-house NYPD personnel. The design team will complete initial setup and testing. In addition, any software bugs associated with the system, as designed and delivered, will be supported by the project team. Conflicts arising from the addition of any other applications or hardware to the system, as designed and delivered, cannot be supported by the design team.

NYPD in-house personnel will provide user assistance. In general, this system is designed for ease of use. This design will reduce the need for user assistance for day-to-day operation of the system. The project, as designed, has allotted two (2) additional complete systems as temporary replacements/backups. Major problems requiring the removal of a system from the field should not produce long-term delays

Regarding the support and maintenance phase, it should be noted that the project team, as planned, consists of employees of the NYPD, including the Department's MISD. All personnel involved with the design and delivery of this

project should be available for support services beyond those mandated within the design of this project. While the project only calls for support up to the completion and delivery of the systems, as long as the team members are employees of the Department, their support services are available.

3.2.5.2 Wrap up the project

Project wrap up will involve the following aspects:

- A) Delivery of all documents related to the project to storage.
- B) Return of all equipment related to his project to NYPD-MISD.
- C) Reassignment of personnel to other tasks as directed by the Department.

3.3 Short Review of the Deliverables from each phase

The following deliverables will be due, upon completion of the respective phase, as indicated:

- A) RESEARCH ANALYSIS PHASE
 - a) Delivery of a Business Requirements Document
 - b) An approved written system proposal.
- B) DESIGN PHASE
 - a) An approved written system design.
- C) CONSTRUCTION PHASE
 - a) One (1) fully functioning “Prototype” of system.
- D) IMPLEMENTATION PHASE
 - a) Final operational system as designed. (12 full systems)
- E) MAINTENANCE PHASE

- a) Support related reports.

3.4 Short Review of the Milestones from between the phases

A) RESEARCH ANALYSIS PHASE

The primary milestone for this phase is the development of an overall Requirements statement.

B) DESIGN PHASE

The milestone for this phase is the approval of a design for the system.

C) CONSTRUCTION PHASE

The milestone for this phase is the successful testing of the delivered prototype.

D) IMPLEMENTATION PHASE

The milestone for this phase is the delivery of one (1) completed system, its final approval, and then the delivery of 11 additional systems.

E) MAINTENANCE PHASE

The milestone for this phase is the handing over of the support obligations from the design team to the NYPD MISD personnel.

3.5 Outcomes

The primary outcome of this project will be the successful implementation of an efficient SECTOR system. In addition, and an even more important long-term outcome, will be a show of initiative in the advancement of the Department's technical capabilities. This is very important to the long-term success of the agency. By improving on decades old methods of planning, the SECTOR

system will show that technical development can improve the Department at all levels. In addition, this outcome should lead to further advancement in areas not traditionally seen as possibly benefiting from the addition of low-cost technological solutions.

3.6 Project Methodology Summary

The chosen project methodology will create quick and efficient results. Each phase is carefully planned to ensure the project can flow into the next stage.

The goal of the Research and Analysis phase will be to determine the needs of the project.

The Design Phase will take the information learned in the previous phase and incorporate as much as possible into the design of the system.

Upon completion of the system design the Construction Phase will begin. Proper construction, in strict accordance with the designed system, should result in a successful product delivery.

The Implementation Phase consists primarily of the delivery of the completed system. The full system will be tested under several scenarios to ensure functionality and ease of use.

After initial implementation, the Maintenance Phase sets the groundwork for continued support and maintenance by the design team members. The careful maintenance of the system is important to the overall long-term success of the project.

4.0 Chapter Four: Project History

4.1 How the project began?

This project began out of a need to develop a uniformed system for the planning of special events. The basic premise of the project is that a well-designed computer system can improve the Department's efficiency in the planning of and execution of a special event. From this premise, the idea of developing a formal project plan was proposed. This initial proposal states what the project needs to do, and then how the team will go about fulfilling their design and implementation obligations. The project will develop a plan for a design team to follow regardless of the actual hardware and software choices that are made by the team.

A review of Department resources reveals that there have been no similar efforts made to enhance the Department's special events planning through the use of a computer system. From this point, a decision was made to develop a plan that would propose the development and implementation of the system. The plan would include the steps to be taken by the design team in the completion of the project. This project is only a proposal for the Department to consider, rather than the actual completion of the SECTOR system. The actual project will involve levels of specialty in various fields such as hardware, software, database management and networking. This project was designed as the initial proposal basically because the completion of the system will require several specialized team members, a substantial amount of hardware and

authorization for access to the NYPD personnel databases. Assuming the proposal is accepted all of these needs can be readily satisfied.

4.2 How was the project managed?

This proposal was managed by taking all of the needs of the Department into consideration and then developing the groundwork for an overall solution to the problem. While, at this proposal level, management is not a substantial task, management will be an intricate part of the actual SECTOR system development.

Management of the proposed SECTOR project will also be a relatively simple task. As planned, the project will only require five (5) to seven (7) full time staff members. This team will be headed by a project manager who will be responsible for the daily progress of the team. The proposed project has a generous time line, with consideration given to the team members' vacations, sickness and holidays.

The best possible scenario would be for the team manager to be one of the project stakeholders. Someone involved from both the operational and technical side of the project. This type of manager would be best capable of troubleshooting both technical and operational questions for the team members. The manager need not have expertise in the technical side of the project, but must be familiar enough to understand the limitation or full capabilities of the SECTOR system.

4.3 Was the project considered a success?

The proposal presented in this project is a success because it presents a plan to develop an efficient system that will improve the quality of policing with regards to special events. The proposed SECTOR system is a simple, cost-efficient concept that will not only improve the quality of policing, but will also give a stepping stone for the department to venture into other low-cost technological solutions.

The type of system proposed in this project will be capable of meeting most of the current needs of the Department. While a more in-depth look into the needs of the Department will be conducted prior to actual development, the requirements discovered during preliminary research can be fulfilled through the basic system proposed.

The success of the SECTOR system cannot be determined until it has been developed, implemented and then utilized in real-world scenarios. While the SECTOR system has yet to be built, the concepts behind it and the functions it is likely needed to perform are all fairly common functions. It is the merging of these common applications that will determine the ultimate success of the SECTOR system.

It should be further noted that the success of the proposal developed in this project does not necessarily guarantee the success of a later developed SECTOR system. From a technical standpoint, the SECTOR system will operate as designed and be capable of performing well. But, the SECTOR system will

rely heavily on its use by trained operators, its constant maintenance, and a change in the mindset of the Department to accept a system that will greatly increase the accountability of personnel. Because this is primarily a human factor, there is no guarantee that the final product will be an acceptable solution.

4.4 What changes occurred to the plan?

For the most part, there was one major change to the project and only a few minor changes. Prior to that start of the project there was consideration given to actually developing the SECTOR system prototype during this project, rather than only developing a proposed project for the company to consider. This change was primarily made due to financial, and in some cases technical, reasons.

With respect to the project proposal as submitted, the primary change was to initially allow for the use of wireless devices (handheld PCs) to provide up to the minute information for field supervisors. This would have, in theory, provided overwhelming accountability for the presence of personnel. This was removed from the basic proposal because the technology involved would be too expensive at this time. In addition, in some respects, this level of accountability is not common within the Department and would be met with significant resistance.

An additional change that was made was in the Implementation Phase. Initially, the project called for the development and delivery of 12 completed SECTOR systems at the end of the Implementation Phase. While the plan is to still deliver the full compliment, this will not be done until significant field testing

has been done on one (1) completed SECTOR system. Unlike the prototype that is developed during the Development Phase, the test unit delivered after the Implementation phase is a completed and deliverable unit. The reasoning behind this delay in delivery is to ensure the Department's complete satisfaction with the hardware prior to spending the additional \$35,000 dollars. As planned, this added approximately 5-7 days to the project.

4.5 How did the project end?

The project ended as planned. The plan for this proposal was for the Department to consider it as an option for improved efficiency. It is anticipated the project will be approved, and immediately implemented. The time-line in the proposal is both reasonable and flexible. The budget, while not flexible, is reasonable and in some cases, depending on the Department's ability to negotiate the purchase of hardware and software purchases projects with other bulk purchases, may be overestimated by as much as 10%-20%.

4.6 What went right and what went wrong?

Because this project was developed as a proposal and recommendation to develop the system, there was little opportunity for this project to have elements that went either wrong or right. While this SECTOR system is yet to be developed the functions associated with it are far from theoretical. The functions addressed in the project are basic functions that are capable of being completed by the average home-office user.

4.7 Project variables & their impact

There are several likely variables that may affect the project. The primary variable is the cost per unit. The preferred plan is to use rugged laptops (similar to the Panasonic Toughbook). These laptops are already used in the Department's entire fleet of vehicles. Discontinuance of this product, or a substantial increase in the overall cost of this item, would greatly hamper the project.

Staffing for the team is a variable. The Department has a limited number of MISD personnel. The plan is to have the personnel assigned to the project full time for the project time frame. If a higher priority project or problem arises during the projects development or implementation then it is likely the staffing for this project will be pulled. This has happened to many of the Department's projects in the past and cannot be planned for. Assuming the personnel will eventually be returned to this project the impact is minor in that it delays the completion date.

4.8 Project Summary

The project began as an idea to develop a system to increase efficiency and accountability at special events. This is an important need because there has been a substantial increase in the number of events held while there has also been a substantial reduction in the number of officers available to police these events.

The proposal is to develop an inexpensive and easy-to-use system to resolve the above need. To fulfill this need a laptop-based system is proposed that will complete the entire event related tasks under one system. This system, the Special Events Computerized Tracking of Officers Reporting (SECTOR) system is designed to assist with the preplanning and execution of an event. Through a carefully designed combination of hardware, software, networking and database capabilities the SECTOR system will accomplish this task.

The proposal is to have the project developed using a basic SDLC Waterfall model. For the most part, all members of the five (5) to (7) member team will work full time through all of the phases of the project. Within each phase specific phase defined milestones will be reached and deliverables will be required prior to moving onto the next phase. The project manager will ensure the timetable for the project is complied with, as well as be available to offer assistance to team members as needed.

The project will require the team to develop a prototype, then one (1) operable unit and then the final 11 additional units. By developing the actual systems in this way the plan Department is taking a smaller financial risk as well as allowing more opportunity for modification.

Upon delivery of the 12 SECTOR systems the team will provide the required level of support and training. The team will then be then be disbanded and made available for other tasks. At this point, the NYPD MISD will assume support and maintenance responsibility.

5.0 Chapter Five: Lessons Learned

5.1 What was learned from the project being proposed?

In proposing this project, the author has learned that solutions for big problems can often be fairly simple. In looking at this project, the solution to a problem that has existed for decades, and continues to grow, is a basic computer system. It is the application of the system to this large problem that will correct the situation. The addition of a \$3,000 system, in conjunction with a few hours of training on the system, may result in the overall saving of hundreds of thousands of dollars annually. This is money that may be applied directly to other technological developments within the organization.

5.2 What would you have done differently?

Because this is a basic proposal to develop a system there were few changes that could be made. The project is being presented, with the option to increase or decrease the budget and the capabilities upon development of the system. Because this proposal does not actually develop the system, but rather lays the groundwork for a team to develop the system, there is plenty of room for adjustment.

5.3 Did the project meet initial expectations?

This project was less difficult than expected because research was not a large factor of the proposal. The actual development of the project will require some level of research, but this research will come more in the form of on site interviews and visits rather than textbook review. For the respective team

members the tasks at hand are fairly simple. Each team member is knowledgeable in the specific field he/she is assigned to. Even a basic knowledge in a specific field should be sufficient for researching by a full time-dedicated specialist. There is no reason the completed project should not meet the initial expectations of the proposal. Project completion is primarily just a matter of the various team members actually combining basic tasks into one system.

5.4 What would be the next stage of evolution for the project if continued? (Including expansion options available)

After completion of this project the most important expansion would come in the form of the wireless capabilities. Every supervisor assigned to the special event would have hand-held PCs that would be capable of monitoring the availability of resources at all times. The assignment, location and status of every officer assigned to the event would be displayed and updated in real time. In addition, the ability to make changes in the assignments would be available directly from the Field Command Post to the supervisor on the scene. Should this expansion be made, the Department will be on its way to a very high level of modernization and technological implementation.

5.5 Conclusions/recommendations

This project should immediately be implemented. The benefits of this project are such that they are cost effective. By implementing this project immediately, the systems would be ready for use during the Department's busy

season. Approval of the full project (12 systems) is necessary to avoid reassembly of the team at a later date for fulfillment of the project.

The project should also be implemented as proposed. The addition or removal of any features at this time is not necessary. As proposed, the project will complete the minimum number of tasks in order to alleviate the problem. Removal of any of the features will make the entire project less effective. Adding features to the project is also unnecessary at this time. Additional features would delay the project, add to the overall cost, and make the training process more difficult. Additional features can always be added on later on once the basic system has gained acceptance.

5.6 Summary

Lessons learned is an important part of developing the capabilities to enable future planning. This applies both to the planning of a computer system as well as the planning of a special event. In hindsight, the simplicity of the SECTOR system can cause frustration as well as a certain level of aggravation. It can be frustrating to see resources wasted due to mismanagement of personnel. It becomes aggravating when the solution is readily available and awaiting implementation. The primary lesson to be learned from this project is that solutions are available to problems, and sometimes basic risks need to be taken to test these solutions.