

A POLICE OFFICER FEEDBACK SYSTEM
FOR
THE CITY OF GARLAND, TEXAS

David E. Clapp
and
John L. Campbell

45499
GARLAND URBAN OBSERVATORY
1977

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The Garland Urban Observatory is a cooperative research program between the City of Garland and Texas A&M University. University activities are coordinated by the Center for Urban Programs. The Garland program is one of ten funded by the U. S. Department of Housing and Urban Development through the National League of Cities. The objective of the three year program is to encourage cities and universities to work together to apply universities' expertise to the problems of the cities and to increase universities' understanding of city issues.

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Garland Urban Observatory

(A cooperative research program between the City
of Garland and Texas A&M University)

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Mr. Mike McCauley, City Councilman
Mr. Jesse Youngblood, Director, Police Department
Mr. Jerry Freeman, Director, Data Services Department
Mr. J. W. Mayfield, Assistant Director, Police Department
Mr. Larry Wilson, Police Officer

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SUMMARY OF PROJECT

The officer feedback system is a unique project which utilizes the exceptional computer capabilities in the City of Garland, Texas. Garland has introduced computer processing in a wide range of applications including solid waste disposal, energy management, as well as courts and police management. This progress follows a general national trend toward automation of community services especially police activities which are manpower, equipment, and energy intensive.

Most efforts in police automation to date have concentrated on the dispatcher/radio operator function. While this is a critical area, it does not directly impact the patrol officer in terms of his decisions regarding routine patrol or his response to assigned calls. This absence of officer feedback is the underlying motivation of this research project. The project draws heavily upon the computer aided dispatch (CAD) system currently under installation in Garland.

The officer feedback system is a computer program which selects data from existing computer files and produces a one page individualized performance report for each patrol officer. The report contains data of two major types:

- o Countable officer production
- o Elapsed time officer performance.

Countable items include calls handled, citations issued, arrests made and miles traveled; while the elapsed time data is a summary of an officer's performance in responding to calls, handling calls, as well as time spent in other duties. The report is designed to be issued monthly and covers a 30 day period of performance.

The officer feedback system is designed to inform the patrol officer of his performance as recorded by the CAD system. The feedback system does not create any data on any officer, but organizes, summarizes, and displays the data so that the officer can readily grasp and interpret data recorded in his performance. Beyond providing a record of tabulated data, the officer feedback system is designed to provide an officer the means to measure the effectiveness of alternative strategies he may conceive for patrolling his district. The system provides the officer with timely data so that he can assess tradeoffs as he commits his time and the resources under his control to various police activities.

The officer feedback system requires training and upkeep to insure its value to the Garland Police Department. A training program is essential to insure that officers accept reports of performance in proper perspective. Beyond this, training is the key to insuring that officers understand and apply the system effectively in developing and testing alternative performance strategies. Hopefully, as the system matures, individual officers will be motivated to come forward with suggestions to modify and improve the system. The officer feedback system is a dynamic system which must be upgraded to continually meet the needs of changing demands for police services.

INTRODUCTION

The police officer traditionally operates as an independent agent as he carries out his assigned responsibilities. He freely makes a wide range of independent decisions which are likely to impact the effectiveness of his actions as well as the effectiveness of the entire police force. As a partial list, these actions include:

- o Route of travel within assigned patrol district
- o Rate of travel on patrol
- o Total miles traveled in a shift of duty
- o Route and rate of travel to and from assigned calls
- o Time required to process calls
- o Citations issued
- o Arrests made
- o Number and location of stops
- o Non-productive time (breaks, etc.)

All of these parameters clearly have a direct impact on police effectiveness and protection of the public.

Traditionally, the most emphasized statistic in police work has been "response time." Response time may be defined as the elapsed time from receipt of a call for police services, until an officer arrives at the incident scene. While this single measure may possibly be the single most important police statistic the police officer may be unable to influence any significant reduction in response time. Previous research has shown that a significant fraction of response time is lost in the communication center while the dispatcher/radio operator records the call and decides which car to dispatch. Similarly, the selection of which car to dispatch will dramatically affect response time. Once notified of a call assignment, the individual officer gains control of the remaining time required to reach the incident scene.

The identification of response time as a key measure of police effectiveness has led to a wide range of system improvements. The range of improvements is too broad for complete discussion here; however, most efforts have been concentrated in two important areas relative to this project:

- o Dispatcher/radio operator operations
- o Deployment of vehicles in the field

The dispatcher/radio operations have been improved in many cities through the integration of computer-aided dispatching which speeds call handling as well as assists in selection of the closest car. Deployment schemes, on the other hand, are developed from computer analyses of call data and attempt to reconfigure patrol district boundaries to improve overall police response times.

The individual police officer has little direct involvement or role in either computer aided dispatch or deployment schemes. His only awareness of the operation of such schemes may be a recognition of change in procedure or in district boundaries or assignments. These schemes do not solicit input from the individual officer nor can the individual officer receive any return from the system in response to actions he may conceive and attempt while patrolling his district.

This evident need for officer involvement in improved patrol has motivated this research project. The major purpose of the project has been to develop and install a computer-based system to provide individual officer feedback. This project takes advantage of the great strides which have occurred in police computer systems. The City of Garland, Texas is an exceptional example of this trend. The computer facilities and applications in the City of Garland are among the foremost in Texas. The leadership in the City has established landmark computer applications in a wide array of areas including solid waste disposal, energy management, as well as courts and police management.

The establishment of an officer feedback system in the City of Garland is a pioneering effort. The literature review completed on the early phases of this project revealed no similar system currently operational anywhere in the country. This literature review included a search of the National Criminal Justice Information System (NCJIS) which is the most comprehensive index of criminal justice information. Some evidence was discovered of efforts to establish similar systems. The most notable example of this trend is in Atlanta, Georgia. In Atlanta, a Crime Analysis Team funded by the Law Enforcement Assistance Administration (LEAA) is attempting to install an officer feedback system which will provide officers with a summary of criminal history in his assigned district along with limited performance data.

The officer feedback system developed for the City of Garland is carefully tailored to fit within a computer aided dispatch (CAD) system which is under parallel development. The CAD system in Garland is unique and was not adopted or transferred from another city. The officer feedback system, also, is unique, and is directly applicable only to Garland operations. For this reason, the description of the computer program is limited to a general discussion of concepts and interpretation of output. Detailed program listings, flow charts, and run instructions are contained in a separate report submitted to the Data Services Department for the City of Garland.

The remainder of the report is divided into several sections. The first section describes the general principles and operating concepts of the computer program. The second section presents the output product and suggests interpretation of the data. The final two sections include concluding remarks on the research and summarizes recommendations for future implementation and operation of the officer feedback system.

SUMMARY OF COMPUTER PROGRAM OPERATION

The officer feedback system is a relatively large computer program which accumulates data from several existing police/courts files and produces an individualized report for each police officer. The program is written in standard ANSI COBOL and employs the DL/1 data base management system used by the City of Garland.

The underlying design of the program was based on the following areas of emphasis:

- o Time/date flexibility
- o Minimum interruption of existing Garland Computer programs
- o Efficient computer code

Time/data flexibility refers to the provision for an officer feedback run at any time for any period of performance. As an example, reports may be requested at any day of the week and may cover any period of performance (e.g. weekly, monthly, etc.). In general use, however, a single monthly run is assumed covering the previous 30 day period. This interval was selected to allow an accumulation of an adequate quantity of data as well as a trade-off of processing cost and value of information. In considering this trade-off, more frequent reports could yield more current information but the cost of processing increases significantly.

The computer program was designed to minimize interruption with other operating computer programs. The program is a batch job which can be executed from a terminal. Normally, it is expected that the program will be executed in off hours on a once per month basis. Individual print outs will be generated on high speed line printers in Data Services rather than the low speed police line printer.

The officer feedback program gathers data from a number of existing data files within the Garland computer system. In reading these files, a minimum of file entry is programmed. Whenever a file is opened all pertinent data is read and the file is closed. This philosophy minimizes interaction with files and is deemed as an efficient approach to file manipulation.

In developing, testing and debugging the code, every effort was expended to simplify the code and minimize the size of the program. The source deck for the program presently consists of nearly 2500 cards. While this is a large source program, it may be easily manipulated by Garland Data Services personnel through remote terminal operations. Once the program is operational, there should be no further need to handle the physical card deck, and the deck will be retained for backup purposes only.

The basic logic of the computer program is illustrated in Figure 1. In collecting police performance data, the program accesses five (5) files within the Garland data base. While some of these files are data bases themselves with a separate integral structure (root-dependent relationship), they will each be referred to as files for the purposes of this report. These files are read sequentially and in the order shown in Figure 1 (e.g. FPOPRI first, PDSIWACH second, etc.).

Each of the Garland data base files is assigned an eight character name. Generally, the name is constructed to be descriptive of the file. As an example, the first file shown in Figure 1, FPOPRI contains data relative to police personnel. More detail on the naming of files as well as the entire data base design may be obtained from Garland Data Services publications.

Each of the files accessed by the officer feedback program will be briefly described along with the selected data which is obtained from those files.

1. FPOPRI File. This file is the master file for all personnel assigned to the Garland Police Department. The data selected are:
 - a. officer name
 - b. rank index (converted to actual rank by table lookup)
 - c. officer badge number
 - d. officer ID number (used internally by Data Services only)
2. PDSIWACH File. This file is used to collect data on an officer's duty day (watch assignment) and the data selected are:
 - a. officer name
 - b. watch
 - c. miles driven on watch
 - d. citations written on watch
 - e. arrests made on watch

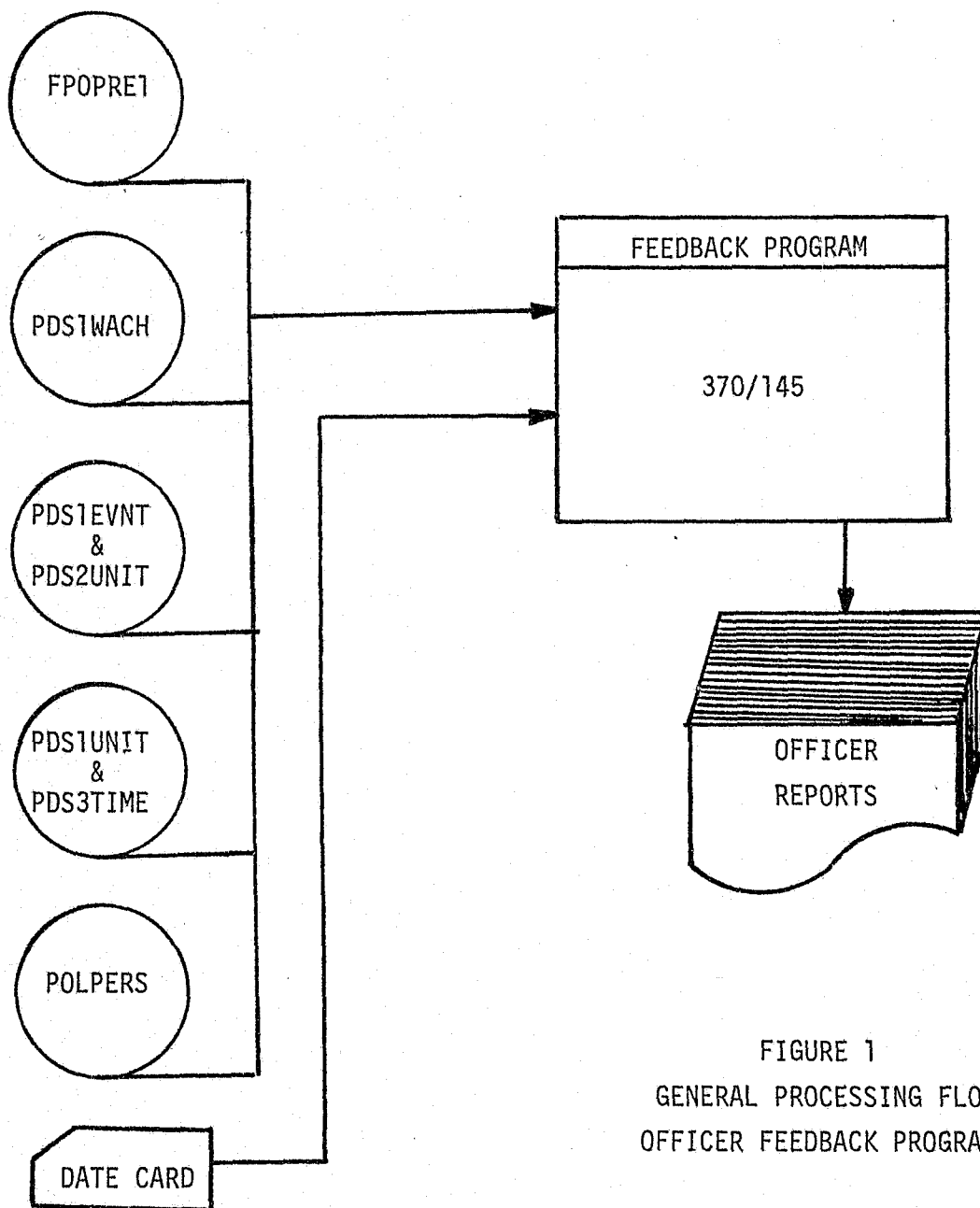


FIGURE 1
GENERAL PROCESSING FLOW
OFFICER FEEDBACK PROGRAM

- f. hours worked on watch
 - g. calls made on watch
3. PDS1EVNT File. This file is arranged in a tree structure (root-dependent relationship) as shown in Figure 2 and contains five record types regarding data collected by the computer assisted dispatch (CAD) system regarding events processed by the police units. The officer feedback program only accesses the PDS1EVNT root segment and the PDS2UNIT dependent segment in obtaining the following data:

From the PDS1EVNT Root Segment:

- a. time call received by dispatch center
- b. time unit dispatched
- c. time unit arrives at scene
- d. time unit clears scene
- e. unit district assignment
- f. event disposition
- g. primary unit watch assignment
- h. back-up unit(s) assigned
- i. officer ID number
- j. priority assignment of event
- k. date

From the PDS2UNIT Dependent Segment

- a. other ID number (of backup assigned plus primary unit)
- b. time unit dispatched to scene
- c. time unit arrived at scene
- d. time unit cleared from scene
- e. unit assignment

4. PDS1UNIT File. As with the PDS1EVNT file above, this file is arranged in a tree structure containing four record types as shown in Figure 3. This file collects data regarding a specific field unit and the performance of that unit. Only the PDS1UNIT root segment and the PDS3TIME dependent segment are used by the officer feedback program. Data collected from this file includes:

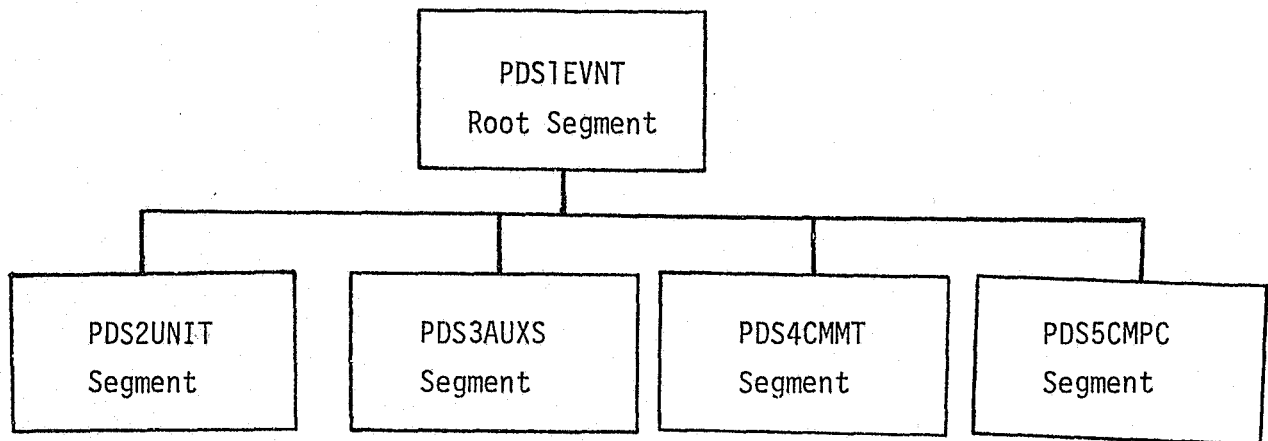


Figure 2
PDS1UNIT Data Base Segment

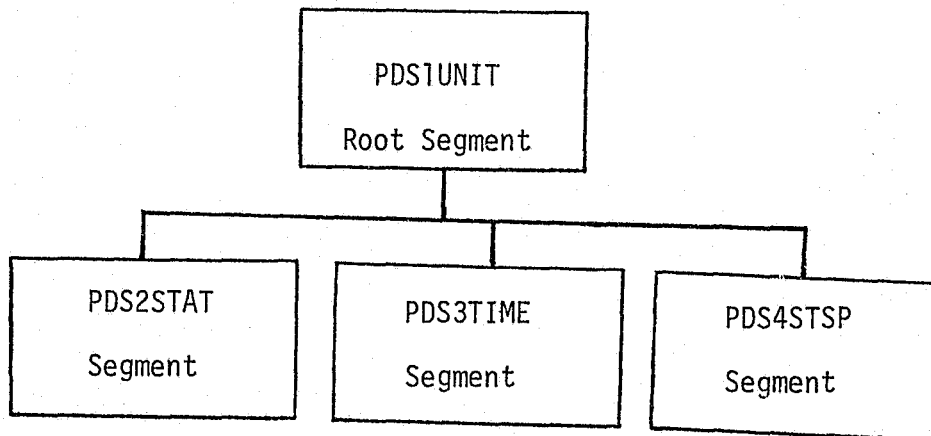


Figure 3
PDS1UNIT Data Base Segment

From PDS1UNIT Root Segment:

- a. unit (watch and badge)
- b. time dispatched
- c. time arrived
- d. time cancelled
- e. priority counters (priority types 1, 2, or 3)
- f. officer ID number
- g. data

From PDS3TIME Dependent Segment:

- a. start/stop times for various status conditions
- b. status information

5. POLPERS File. This file contains police personnel data in addition to the FPOPREF File. The officer feedback program searches this file for arrest-related information as follows:

- a. arresting officer
- b. offense code
- c. district
- d. date

The computer program successively scans the above data base files and builds a matrix of officer performance data. The data matrix contains approximately 125 rows and 500 columns. Each row corresponds to an officer while each column is used to record an element of data corresponding to a specific officer. The program processes each record in the computer files and records appropriate items in the data matrix. In this method of operation, a minimum of computer use is required to transfer and process data. The program as presently configured, requires a 300K partition of computer core for execution which is well within the capacity of the Garland computer system. In the event reports are required on additional officers (125 presently assumed) the data matrix must be enlarged thus requiring more computer core.

OFFICER FEEDBACK REPORTS

The format of the officer feedback report is shown in Figure 4. The values shown are not actual data but are included to illustrate the appearance of the report. At the time of this writing, the officer feedback system was not sufficiently operational to provide "live" data but the following section discussed the general format of the report and possible interpretation of data.

The report is divided into two main sections. The upper section, "Summary Data," includes individually counted items; while the lower section, "Detail Times for Period" displays a variety of elapsed times required for the individual officer to respond to assigned calls and other activities. The format was designed for quick reference and organizes a large amount of data into a relatively small space.

A design objective for the report was to limit output to a single page. This objective was dictated both by cost as well as impact on the individual officer. It was deemed that a lengthy multipage report would be expensive (125 individual reports generated) and not well received by officers. It was further felt that the individual officer would be more receptive to a single page containing a summary of the key measures of his work performance.

The summary data section displays count data of officer productivity by district. In preparing the report, a maximum of five district assignments in any 30 day period was assumed (Figure 4 shows that the officer was assigned to districts 21, 22, 23, 24, 31), although Garland police officers are rarely assigned to more than two or three district assignments in a monthly period. The working hours spent assigned to each district are shown. Importantly, the report in Figure 4 reflects only 40 hours, or one week of performance. "Calls made" lists the total calls assigned to each officer by district. The call data is further segregated by priority including: emergency, priority, and non priority calls.

Citations written and arrests made for the reporting period are displayed in a similar format as call data. Citations and arrests are segregated into classifications as shown in Figure 4. Miles driven by district are displayed as well as back-up assignments and the number of times an officer was backed-up on any of his calls.

**GARLAND POLICE DEPARTMENT
OFFICER FEEDBACK REPORT**

FOR PERIOD ENDING 10/02/77

OFFICERS NAME: ALDRIDGE RANK: JP POLICE OFFICER BADGE NUMBER: 121

***** SUMMARY DATA FOR PERIOD *****

DISTRICT	HOURS	CALLS MADE				CITATIONS WRITTEN			ARRESTS MADE			MILES DRIVEN	BACK UPS ASSIGNED	ASSIGNED BACK UPS	COMMENTS
		1	2	3	TOTAL	1	2	TOTAL	1	2	TOTAL				
21	8	0	2	1	10	2	1	0	2	101	4	0			
22	8	0	0	1	32	3	0	1	2	212	0	1			
23	8	0	0	2	23	3	1	0	2	100	2	1			
24	8	0	0	1	21	1	1	0	1	211	0	0			
31	8	0	0	2	21	2	0	1	2	201	2	0			
TOTALS	40				107	11			9	825	8	2			
RATIOS	HOURS/SHIFT				CALLS/SHIFT	CITATIONS/SHIFT			ARRESTS/SHIFT	MILES/SHIFT	CALLS/HOUR				
	8.00				21.40	2.20			1.80	165.00	2.67				

***** DETAIL TIMES FOR PERIOD *****

DISTRICT	AVERAGE RESPONSE TIMES				*	TOTAL CALL TIMES				*	AVERAGE CALL TIMES				*	TOTAL TRAVEL AND SERVICES		*	TRAFFIC MARK-OUTS		*	TRAFFIC TIME	
	1 HH:MM	2 HH:MM	3 HH:MM	*		1 HH:MM	2 HH:MM	3 HH:MM	*		1 HH:MM	2 HH:MM	3 HH:MM	*		HH:MM	*		HH:MM	*		HH:MM	*
21	0:00	0:04	0:04	*	0:00	0:30	0:20	*	0:00	0:15	0:20	*	1:02	*	1	*	0:35						
22	0:00	0:00	0:05	*	0:00	0:00	0:17	*	0:00	0:00	0:17	*	0:22	*	0	*	0:00						
23	0:00	0:00	0:04	*	0:00	0:00	0:31	*	0:00	0:00	0:15	*	0:39	*	0	*	0:00						
24	0:00	0:00	0:02	*	0:00	0:00	0:10	*	0:00	0:00	0:10	*	0:12	*	0	*	0:00						
31	0:00	0:00	0:04	*	0:00	0:00	0:21	*	0:00	0:00	0:10	*	0:29	*	0	*	0:00						

DISTRICT	BACK-UP RESPONSES				*	BACK-UP CALL SERVICE				*	BACK-UP TRAVEL AND SERVICES		*	COURT TIME HH:MM	*	OTHER TIME HH:MM	*	TOTALS OF ALL TIME	
	1 HH:MM	2 HH:MM	3 HH:MM	*		1 HH:MM	2 HH:MM	3 HH:MM	*		HH:MM	*						HH:MM	*
21	0:00	0:00	0:00	*	0:00	0:00	0:00	*	0:00			*	1:00	*	5:22	*	7:59		
22	0:00	0:00	0:04	*	0:00	0:00	0:19	*	0:23			*	0:00	*	0:00	*	0:45		
23	0:00	0:00	0:05	*	0:00	0:00	0:18	*	0:23			*	0:00	*	0:00	*	1:02		
24	0:00	0:00	0:00	*	0:00	0:00	0:00	*	0:00			*	0:00	*	0:00	*	0:12		
31	0:00	0:00	0:00	*	0:00	0:00	0:00	*	0:00			*	0:00	*	0:00	*	0:29		

CALL AND BACK-UP PRIORITIES: 1= EMERGENCY 2= PRIORITY 3= NON-PRIORITY
 ARRESTS MADE: 1= INDEX CRIME 2= NON-INDEX CRIME
 CITATIONS WRITTEN: 1= HAZARDOUS 2= NON-HAZARDOUS

The summary data section is concluded with a series of ratios. These ratios are tentative and may be readily modified. Previous studies have shown that certain police performance data can be usefully displayed as a ratio for interpretation. The ratios shown in Figure 4 are self explanatory and are intended to aid the individual officer in discerning trends in his performance data from one reporting period to the next. As the officer feedback system matures, it is expected that individual officers (as well as supervisors) are expected to suggest other ratios which may prove more useful for an improved interpretation of the data.

The detailed times shown in the lower section of the officer feedback report (Figure 4) are displayed in hours and minutes. The data is quite extensive and shows elapsed time by both district of assignment as well as priority. Several categories of time data are displayed. As expected, average response time is displayed (time from dispatch to arrival at scene) but this is augmented by total call time (total time to process calls for service), average call time, as well as total time spent in traveling to incident scenes and processing those incidents. In addition to elapsed time for calls, the report includes a count of traffic mark outs and time spent while marked out on traffic duty.

The individual officer should be significantly impacted by a review of his call performance data. Clearly, his response to high priority calls should be shorter than to lower priority calls. The time spent on calls also should be in some proportion to the priority of the call. The officer should notice differences in his performance by district of assignment. His regular district should be familiar thus allowing better statistical performance.

The back up response data displayed under "Detailed Times for Period" is arranged in a similar format to primary call data. In interpreting this data, the officer would use different criteria since he is on a back-up assignment (usually to a higher priority call) and his arrival at the scene may delay any action in the incident. The individual officer may develop a case for the utilization of his services as a back up when he compares the value of this data to data for his primary calls for service.

Finally, the officer feedback report contains summary data in time spent in court and in "other" assignments. With this data, and the elapsed time response data, the individual officer should be able to reconstruct his entire performance for each day of the reporting period. He should be able to discern the relative fraction of his

time which he spends in productive versus nonproductive activity. Furthermore, he should be able to perceive the impact of his style of police work. He may drive extensively, for example, yet yield little results from that effort. On the other hand, he may spend a larger fraction of his time on back-up or in other duties which keep him from preventive patrol in his assigned district. The report is designed to provide enough data so that the individual officer can extract sufficient performance data to evaluate his own personal style of police work.

CONCLUSIONS AND RECOMMENDATIONS

As stated in the introduction of this report, the individual police officer spends many hours in self-supervised performance. To this date no system existed for an officer to receive and evaluate data produced from the individual style and methods he employed while on patrol. The advent of police computer systems, however, has led to the generation of considerable data which should be of value to the individual officer.

This project has developed a prototype officer feedback system. This system does not create data but rather reports to the officer personalized data which is collected on his performance. The City of Garland is unique in terms of the level and breadth of automation of police management activities. Much of the automation to date, however, has not benefited or even impacted the individual patrol officer. The goal of this research therefore, has been to provide the patrol officer with some products of the automation efforts in Garland.

Since the officer feedback report contains data regarding performance, it may be regarded with disdain by some police officers. Yet the police officer should be among the first to know of data regarding his performance which is generated by the automated systems. This data will be available to, and will be used by supervisors regardless of the existence of an officer feedback system. Thus, the officer feedback system is basically a system to provide him with a readable, comprehensive report of his performance data which is readily available to police supervisors.

The police officer is a unique breed of individual. Individual officers appear to develop a seventh sense for their police work. Any viewer of television must be aware of the romanticism associated with police work and the mysterious genius of certain police operatives. In a more realistic sense, however, police patrol officers are only human although they have certain personality profiles and unique training. As the rate of crime rises, the patrol officer must turn to technology for assistance in dealing with his growing responsibilities.

The officer feedback system for the City of Garland is a controversial system. To be successful the system must be supported by top management to insure that officers receive and use periodic reports in the best possible fashion. Clearly, if not used properly the reports can become simply additional overhead for Data Services operations and of little value to patrol officers.

To aid in insuring the effective use of the officer feedback system, several suggestions may be offered as follows:

- o Develop an officer training program
- o Maintain flexibility to modify and upgrade the program in response to needs of the patrol force.

A training program is essential to insure that computer reports are received and interpreted in the proper perspective. Officers must be reassured that the system is positive and not negative. They must be trained and coached in methods for best utilizing data that they receive. They should be encouraged to attempt some novel ideas for police patrol (with supervisory approval) and taught how to search for results of these efforts in their monthly performance reports.

The officer feedback program must be maintained as a flexible system responsive to the needs of the individual officer. The City of Garland is uniquely equipped to perform such a service. The Data Services Department has both the qualified staff and equipment to readily modify the program in nearly any direction. Such changes can be rapidly implemented using the Garland remote terminal operations which allow systems analysts to manipulate and modify programs at their individual desks. Hopefully, an officer feedback system committee may be formed to receive and implement changes suggested by individual officers.

The officer feedback system is a powerful new tool for the patrol officer on the street. The system provides a link for the officer to the computer technology which is rapidly becoming integrated into police operations. To be effective, the patrol officer must seek the understanding and use of the results of this system into his daily activities. He must become more conscious of how he spends his time in an effort to use that time most effectively. He must further become conscious of the

resources which he commands in performing his duty. The costs of equipment and manpower are rising rapidly with inflation in America; perhaps more importantly, the costs of energy to provide a patrol officer in the community are rising even faster. As energy becomes more costly (and less available) the patrol officer will be forced to make decisions regarding his use of community resources to carry out his duties.

The City of Garland is a leader in the application of computer technology to community operations. The willingness of city fathers to extend this technology to a wide variety of services, especially police is a landmark effort. The researchers associated with this project are pleased to have a minor role in assisting the City to further extend the applications of computer technology to the level of the individual patrol officer.

RECOMMENDED SYSTEM IMPROVEMENTS

The present version of the officer feedback system is an important first step to providing vital feedback data to police officers as they conduct their patrol. Most of the data in the present system, however, is performance related. Performance data is essential if the officer is to gain a perspective on the effectiveness of his patrol activities. Beyond this, however, the officer feedback system can be more effective if combined with other production data as well as important police intelligence.

During this research, several meetings were convened with representative Garland police officers to elicit their suggestions regarding aspects of the officer feedback system. While they recognized the value of performance data, they offered additional suggestions for improving the system. These suggestions fell into two general groupings as summarized below:

A. Disposition of Filed Cases by Officer

1. County and District Court Cases. A report of the disposition of cases filed; Class A, B, misdemeanors and all felonies. The report would contain status of pending cases and coding of dispositions; pled guilty, etc.
2. Traffic Tickets. The disposition of traffic tickets showing the date of disposition and the judgement plus all pending cases over 30 days old.

B. Intelligence Information

1. Field Interrogation Reports. A summary of field interrogation reports showing data on persons with police records with information detailed by beats.
2. Code 10 Offenders. A listing of known Code 10 and 10C offenders detailing addresses, vehicle type and tag number, occupation, etc., detailed by beats.
3. Traffic Ticket Data. A summary of intelligence gathered from traffic tickets issued to known offenders including time of stop, location, and others in same vehicle.

4. Criminal Activity Data. A report of criminal activity by beat and district detailing type of crime (i.e. burglary, robbery, etc.), time of day, description of suspects, property taken, recent arrests, etc.
5. Traffic Accident Data. A report of traffic accidents by beat and district. A breakout by causative factors, day of week and time of day.

Much of the data described above is readily available in the Garland Police Data Base. Other information in, however, must be gathered, input, and updated manually. A future project for the Garland Police Department should include a detailed evaluation of source of data, processing, and report formats necessary to produce these additional feedback products. The resources necessary to produce these documents are presently available in the City of Garland and these reports should be a reality in the near future.

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