

URBAN TRAFFIC RECORDS SYSTEM DEVELOPMENT:
AN INVENTORY OF CURRENT NEEDS

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CHAPTER I
INTRODUCTION

The major urban areas in Texas are experiencing rapid growth and, commensurately, increased traffic problems. This growth is spurring an interest in computerized traffic records systems at the local level of government. Interest in accident data is also widespread at the State level, with the State Department of Public Safety (DPS) having responsibility for maintaining a computerized traffic records system for Texas. Accident information contained in this system is available to cities throughout the State, and to all State agencies.

When a traffic accident of specified severity occurs in the State of Texas, an accident report form is filled out by a police investigator. (By law, accident information must be collected for accidents involving fatalities and injuries. The collection of accident information may be required for property-damage-only (PDO) accidents, depending on the requirements specified in city ordinances. If a city ordinance specifies that PDO accidents must be investigated, then police investigators must collect (at a minimum) the items of information contained on the State Accident Report Form designed by DPS-Austin. However, state law does not require the investigation of PDO accidents below \$250 damage.) Each accident report is typically processed through the local Police Department and Traffic Engineering Department, and then forwarded to DPS-Austin. The Statistical Services Bureau of DPS encodes the information on the accident report, keypunches and transcribes the data onto magnetic computer tape. Computer programs extract the accident data from magnetic tape in formats of interest to DPS and other State agencies.

In January of 1975, the Office of Traffic Safety (now the Traffic Safety Section of the State Department of Highways and Public Transportation) initiated

the Urban Accident Location Coding (UALC) Project. Two primary purposes of the Project were: 1) to provide a precise method for recording the locations of on-system and off-system traffic accidents that occur within municipalities and 2) to provide a method by which cities could receive feedback concerning their accident experience. (On-system accidents are those accidents which occur on state- and federally-maintained highways. All other accidents are off-system accidents.) All Texas cities with populations exceeding 25,000 were invited to participate in the Project. In order to participate, the city had to agree to place 5-digit location codes on each accident report prior to sending it to DPS-Austin (one code for the primary street and one code for the secondary street if the accident occurred at an intersection; and one code for the primary street if the accident occurred at a midblock). In return, each participating city was given a choice of feedback medium--a monthly computer tape or a quarterly computer printout. Initially, 9 cities chose to receive monthly computer tapes and 25 cities chose to receive quarterly computer printouts.

Many cities believed that the accident data provided by DPS-Austin were inadequate for meeting their needs. Thus, cities such as San Antonio, El Paso, and Wichita Falls did not join the Project and continued to rely on previously-developed systems. Although Houston is a participant in the Project, this city is currently involved in a local-entry/local-processing system known as the State Accident Statistical System (SASS), a project funded by the Traffic Safety Section of the SDHPT. Lubbock, a nonparticipant, is currently involved in a local-entry/local-processing system also funded by the Traffic Safety Section. In addition, numerous smaller cities have requested federal/state funds from the Traffic Safety Section to purchase computer hardware and software for the development of their own systems--with some cities desiring to be independent of the State system at DPS. This wave of interest in local traffic records systems from cities of varying sizes suggested that an assessment of existing

systems was needed to assist orderly development across the State. It was apparent that effective planning and evaluation of traffic safety programs at the State level could not be accomplished if Texas cities develop unique systems which are incompatible with the UALC Project, and incompatible with each other. The Traffic Safety Section preferred to guide this local system development in a direction which would keep intact the basis for a statewide system.

To conduct this needs assessment, site visits were made to 25 Texas cities with populations exceeding 25,000 (13 of these cities have populations greater than 100,000; 12 of these cities have populations between 25,000 and 100,000). During each visit, personnel in the police department and traffic engineering department were interviewed concerning the ways and means by which the city's traffic records system was created, is maintained, and is utilized. Data processing personnel in some cities were also interviewed. A structured questionnaire was used to ensure that comparable information was gathered at the 25 sites. (See Appendix A for an example of the structured questionnaire and Appendix B for a schedule of site visits.) After the site visits were made, analyses of the collected data were performed. The analyses for the 25 cities are presented in Appendices C, D, and E of this report. Each analysis of a traffic records system includes a narrative description of procedures, as well as discussions about the following points:

- 1) The source of data used by the police department, the traffic engineering department, and other departments; the level of use of the data system; and the impact of the data system upon agency planning, scheduling, and operations.
- 2) The level of development of the data system; the degree of manual versus automated procedures; the quality of input data; the quality of output reports; the degree of administrative support for the system; and the capacity of the system.
- 3) The degree of automation; the degree that major users participate in the data-entry tasks; the interest in improving the system; and the plans for system changes based on anticipated growth and technological improvements.

Chapter II of this report presents a discussion of the traffic records systems for 8 cities that receive monthly computer tapes from DPS-Austin. Chapter III presents a discussion of the traffic records systems for 8 cities that receive quarterly computer printouts from DPS-Austin. Chapter IV presents a discussion of the traffic records systems for 9 cities that receive no coded accident data from DPS-Austin. Chapter V presents an organized set of findings and recommendations to the Traffic Safety Section of the SDHPT. These recommendations constitute a plan of action to facilitate the orderly and coordinated development of local traffic records systems, and the management of the Urban Accident Location Coding Project.

CHAPTER II

DISCUSSION OF TRAFFIC RECORDS SYSTEMS FOR CITIES THAT RECEIVE MONTHLY COMPUTER TAPES FROM DPS-AUSTIN

Eight cities are currently receiving coded accident data via monthly computer tapes from the State Department of Public Safety in Austin. For this contract, the researcher visited all 8 cities (i.e., Houston, Fort Worth, Austin, Corpus Christi, Garland, Beaumont, Victoria, and Orange) to interview police and traffic engineering personnel concerning their traffic records system. The following is a detailed comparative analysis of these systems. (An abbreviated comparative analysis is presented in Table 1 at the end of this chapter and the 8 site visit reports are contained in Appendix C.)

The 8 cities vary widely in population, with a high for Houston (approximately 1,232,000) and a low for Orange (approximately 30,000). The cities also vary widely in the number of traffic accidents investigated annually, with a high for Houston (approximately 70,000) and a low for Orange (approximately 1,400). Police personnel in 5 of these cities place the required location codes on accident reports prior to sending the reports to DPS-Austin. In the remaining 3 cities, traffic engineering personnel perform this task. Overall, the cities have poor quality control systems for insuring the accurate coding of accident locations. In addition, the coding task is frequently assigned to employees in lower-level positions with high rates of turnover.

The 8 cities vary widely in the type and location of computers used to analyze accident data contained on the monthly tapes. Houston uses 2 Univac 418-3 computers and 1 Univac 11-12 computer located in the Police Department. Fort Worth uses an ITTEL 371-45 and an ITTEL mainframe computer located in the Data Processing Department. Austin uses an IBM System 3, Model 10 located in the Police Department and an IBM 1800 located in the Department of Urban Transportation. Corpus Christi uses an IBM 370 located in the Staff Services

Department of the Data Processing Division. Garland uses an ITTEL ASA 3-5 computer located in the Data Processing Department. Beaumont uses an IBM 360, Model 20 located in the Data Processing Department. Victoria uses an IBM System 3 located in the Data Processing Department. Orange uses an IBM System 3, Model 8 located in the Data Processing Department. Although IBM equipment is most frequently used, the hardware capabilities are extremely diverse across the cities. For example, some cities have tape drives; others do not. Also, the hardware capabilities in certain cities are in a constant state of flux. For examples, Victoria has ordered an IBM System 38 and Orange is currently installing a new IBM System 34. Such hardware changes usually disrupt on-going traffic records systems. Thus, there is a lack of commonality in hardware across cities and a lack of long-term stability in hardware within particular cities.

Once the accident tapes arrive at the 8 cities, various data processing problems are experienced. Four of the cities (Austin, Beaumont, Victoria, and Orange) experience data conversion problems, i.e., these cities must convert the accident data from magnetic tape to an input medium compatible with their local computer systems. In Austin, the Police Department does not experience a data conversion problem but the Department of Urban Transportation (DUT) does. DUT must transfer data from magnetic tape to IBM cards, since its computer has no tape drive. Other data processing problems are related to DUT's use of outmoded equipment. In Beaumont, the computer in the Data Processing Department (DP) has no tape drive, so a local utility company transfers data from magnetic tape to IBM cards; then DP transfers data from IBM cards to disk. DP must also enter locally-coded citation data into the computerized traffic records system. This requirement bogs down the entire system in Beaumont. In Victoria, the computer in the Data Processing Department has no tape drive, so the DPS magnetic tape is sent to Corpus Christi where the accident data is transferred to diskette.

The diskettes are returned to Victoria and processed. In Orange, the computer housed in the Data Processing Department has no tape drive, so a local construction firm transfers the accident data from magnetic tape to disk. Other data processing problems are related to complex software, inefficient local-entry procedures, and inadequate coordination among city departments involved with the traffic records system. The software requires local input of citation data, which is meshed with DPS accident data. The input of citation data by police personnel is not prompt; this delay bogs down the entire traffic records system in Orange.

Four of the cities (Houston, Fort Worth, Corpus Christi, and Garland) do not experience data conversion problems. These larger cities have more sophisticated computer hardware, including tape drives. In Corpus Christi, the Traffic and Transit Department (T&T) edits each monthly tape. Then, the Data Processing Division produces numerous types of computer printouts. This editing process includes adding to the monthly tape those "less-than-\$250 damage" PDO accidents not coded by DPS and includes completing/correcting information concerning accidents reported to DPS only via blue forms. This burdensome editing process creates data processing problems for Corpus Christi. In Garland, the existing computer software does not allow access to vehicle, driver, casualty, and occupant information contained on DPS tapes. The traffic engineer is especially displeased with this software limitation.

The 8 cities vary widely on what type of employee wrote the computer programs used to access accident data contained on magnetic tapes. Employees of police departments wrote software for Houston and Austin. Employees of traffic engineering departments wrote software for Fort Worth, Austin, and Corpus Christi. Employees of data processing departments wrote software for Garland and Victoria. Employees of two different consulting firms wrote software for Beaumont and Orange. As a result of this diversity, the quality

and usefulness of computer output vary considerably across cities. If the police had more input to the writing of software, the resulting computer printouts are typically more useful to police. Similarly, if traffic engineers had more input to the writing of software, the resulting computer printouts are more useful to traffic engineers. None of the cities produce computer printouts that are useful to the police and the traffic engineers. In Houston, the computer output is adequate for police, but poor for traffic engineers. In Fort Worth, the computer output is good for traffic engineers, but poor for police. In Austin, the computer output is poor for both the police and traffic engineers, i.e., the output is too limited to be of much value to anyone. In Corpus Christi, the computer output is good for traffic engineers, but poor for police. In Garland, the computer output is poor for both, i.e., the output presents only a small portion of the information contained on the monthly tapes from DPS. In Beaumont, the computer output is poor for both, i.e., some of the information is presented in "unreadable," coded format and traffic engineers have no use for the citation data presented along with the accident data. In Victoria, the computer output is adequate for both. In Orange, the computer output is good for the traffic engineer, but poor for the police.

There are numerous obstructions to better use of computerized accident data by police in the 8 cities. In Fort Worth, Austin, and Orange, the police are apathetic toward the use of accident data as a management tool. The Fort Worth Police Department has a hostile attitude toward its traffic records system as a whole. According to the policemen interviewed, police resent having to collect excessive amounts of data at accident scenes, because the data is only useful to insurance companies. The data is not being fed back to the PD in formats that will help police do their jobs better. In addition, the police are displeased with DPS's "\$250 damage rule" because it leads to an

incomplete picture of Fort Worth's accident experience. Finally, the Fort Worth police distrust the quality of accident data collected by their own police investigators. In Corpus Christi, the police are dissatisfied with the formats of the computer printouts designed mainly for traffic engineering use. The police are also displeased with the excessive volume of printouts received each month and displeased with the incomplete nature of DPS data (due to the \$250 damage rule). In Beaumont, the police are dissatisfied with the computer output designed by a consultant and dissatisfied with the support provided by the Data Processing Department in implementing the city's traffic records system. Consequently, the Police Department is now participating in the SASS-Houston Project. In Victoria, the major obstruction to better use of computerized accident data by police is the limited software presently being used. In Garland, the police are dissatisfied with the late arrival of the monthly tape from DPS-Austin (the tape arrives approximately $1\frac{1}{2}$ months after the close of a particular month). The police are also dissatisfied with the incomplete nature of DPS data (resulting from the \$250 damage rule). Consequently, the Garland PD is heavily involved with implementing a new local-input system and may eventually withdraw from the Urban Accident Location Coding Project. In Houston, the PD has insufficient manpower to analyze accident data and implement appropriate countermeasures. Thus, computer printouts based on DPS-coded data and printouts based on SASS-coded data are used very little.

There are numerous obstructions to better use of computerized accident data by traffic engineers in the 8 cities. In Houston, there is an insufficient number of traffic engineers (5) to adequately analyze accident data and implement appropriate countermeasures. In Fort Worth, the traffic engineers are dissatisfied with the quality of raw data initially collected by police investigators. In Austin, traffic engineers receive an insufficient amount

of data from the police and from their own traffic records system. In Corpus Christi, the traffic engineers are dissatisfied with the cumbersome administrative procedures associated with the traffic records system. The traffic engineers would like more control over the data entry, editing, and retrieval procedures, i.e., they would like a computer terminal of their own. The traffic engineers are also displeased with the incomplete nature of DPS data (resulting from the \$250 damage rule). The traffic engineers in Corpus Christi are apparently the only ones in the State who are doing anything about the "incomplete data" situation, i.e., they edit the DPS monthly tape before computer printouts are produced. In Garland, the traffic engineer is dissatisfied with the late arrival of the monthly tape from DPS-Austin, dissatisfied with the incomplete nature of DPS data, and dissatisfied with the locally-written software used to access data contained on DPS monthly tapes. In Beaumont, the traffic engineers were dissatisfied with the computer output designed by a consultant and dissatisfied with the support provided by the Data Processing Department in implementing the city's traffic records system. The traffic engineers would like to have more control over the processing of accident data, i.e., they would like to implement a new traffic records system using their in-house computer, new software written by in-house personnel, and DPS monthly tapes. (As previously mentioned, the Beaumont PD was also displeased with the consultant-designed traffic records system, so the PD joined the SASS-Houston Project.) In Victoria, the traffic engineer is satisfied with the existing traffic records system; however, the researcher feels the existing software is too limited to be of much value for performing traffic engineering functions. In Orange, the traffic engineer is displeased that the consultant-designed traffic records system has never operated smoothly. Police personnel are not prompt in completing the tasks they are responsible for, and the traffic engineer does not have the authority to see

that these tasks get done. Thus, the system has stalled due mainly to cumbersome administrative procedures, splintered responsibilities, and splintered authority.

The police departments in the 8 cities vary widely on the quality of their manual traffic records systems. The police departments in Garland and Victoria have excellent manual systems. Of the 25 cities visited for this contract, the Garland Police Department was making the best use of accident data, as well as crime data. Both types of data are used to manage the day-to-day operations of the Garland PD. The Assistant Director uses the data in a Management-By-Objectives approach to decision-making. The Victoria Police Department also has an excellent manual system, even though the records section is understaffed. The police departments in Houston and Orange have good manual systems; and the police departments in Fort Worth, Austin, Corpus Christi, and Beaumont have adequate manual systems. In most of the cities, data are collected to fulfill requirements for completing daily, monthly, and yearly reports that are used mainly for public relations purposes. Thus, accident data have little day-to-day operational value for most cities visited.

Overall, the quality of the manual systems used by traffic engineers in the 8 cities tended to be lower than the quality of the manual systems used by police. The traffic engineering departments in Fort Worth, Corpus Christi, Garland, Beaumont, and Orange have adequate manual systems. The traffic engineering departments in Houston, Austin, and Victoria have poor manual systems. The relative difference in overall quality between police manual systems and traffic engineering manual systems is probably due to such factors as:

- a. Accident reports originate at the Police Department and the PD is the "department of record" for storing these documents. Thus, with physical control over accident reports, the PD is more likely to establish a manual system that will facilitate the storage, retrieval,

and use of hard copies, as well as the manual compilation of accident data.

b. The typical traffic engineering department tends to rely heavily on the manual system at the PD, while pushing for a better computerized system. When compared with police officers, traffic engineers are generally more aware of the value of computerized accident data to the successful performance of their jobs.

The 8 cities vary widely on the degree of cooperation among the accident data collectors, processors, and users at the local level. Garland and Victoria have excellent working relationships among the city departments involved in traffic records systems. Austin has a good working relationship among such departments, and Houston has an adequate working relationship. Fort Worth, Beaumont, and Orange have poor working relationships among local departments involved in traffic records systems. In Corpus Christi, there is poor rapport between the police and traffic engineers, and between the police and data processors; however, there is good rapport between the traffic engineers and data processors.

TABLE 1: DESCRIPTION OF PARTICIPATING CITIES THAT RECEIVE MONTHLY COMPUTER TAPES FROM DPS

CHARACTERISTIC	CITIES							
	HOUSTON	FORT WORTH	AUSTIN	CORPUS CHRISTI	GARLAND	BEAUMONT	VICTORIA	ORANGE
1. Population (approximate)	1,232,000	424,000	252,000	205,000	155,000	140,000	60,000	30,000
2. Traffic Accidents Investigated Annually (approximate)	70,000	24,000	17,000	7,000	3,600	6,300	1,600	1,400
3. City Department That Places Location Codes on Accident Reports	Police (PD)	Police (PD)	Police (PD)	Traffic and Transit Dept. (T&T)	Traffic and Transportation Dept. (T&T)	Dept. of Urban Transportation (DUT)	Police (PD)	Police (PD)
4. Type and Location of Computer Used to Analyze Accident Data Contained on Monthly Tapes	2 Univac 418-3 computers and 1 Univac 11-12 computer in PD.	IBM 371-45 and ITEL mainframe in Data Processing Dept. (DP).	IBM System 3, Model 10 in PD. IBM 1800 in Dept. of Urban Transportation (DUT).	IBM 370 in Staff Services Dept. of Data Processing Division (DP).	ITEL ASA 3-5 in Data Processing Dept. (DP).	IBM 360, Model 20 in Data Processing Dept. (DP).	IBM System 3 in Data Processing Dept. (DP). IBM System 38 ordered for DP.	IBM System 3 in Data Processing Dept. (DP). IBM System 34 being installed in DP.
5. Necessity to Convert Coded Data to Another Input Medium At Local Level	No	No	No for PD. Yes for DUT.	No	No	Yes	Yes	Yes
6. Problems Encountered in the Processing of Accident Data	None noted.	None noted.	DUT must process data on outmoded equipment.	Editing monthly tape is cumbersome task for T&T.	Software does not allow access to B Record and C Record on monthly tapes.	Requirement for DP to enter citation data bogs down traffic records.	Inadequate software limits amount of data retrieved.	Requirement for PD to enter citation data bogs down traffic records.
7. Personnel Who Wrote Computer Programs to Analyze Accident Data	Employees in PD	Former employees of Transportation Dept. (TD)	Employees in PD and DUT	Former employee of T&T	Employees of DP	Consultants of PAWA, Inc.	Employee of DP who modified Austin PD software	Consultants from Lamar Univ.
8. Overall Assessment of Computer Output	Adequate for police. Poor for traffic engineers.	Poor for police. Good for traffic engineers.	Poor for both. Too limited to be of much value.	Poor for police. Good for traffic engineers.	Poor for both. Incomplete data.	Poor for both. Some data is presented in coded format.	Adequate for both.	Good for traffic engineer. Poor for police.

TABLE 1: DESCRIPTION OF PARTICIPATING CITIES THAT RECEIVE MONTHLY COMPUTER TAPES FROM DPS

(CONTINUED)

CHARACTERISTIC								
	HOUSTON	FORT WORTH	AUSTIN	CORPUS CHRISTI	GARLAND	BEAUMONT	VICTORIA	ORANGE
9. Major Obstructions To Better Use of Computerized Accident Data By Police	Insufficient manpower to implement countermeasures	Police apathy toward use of data as management tool	Police apathy toward use of data as management tool	Dissatisfaction with formats of printouts and incomplete nature of data	Dissatisfaction with delayed arrival and incomplete nature of data	Dissatisfaction with formats of printouts and service rendered by DP	Software limitations	Police apathy toward use of data as management tool
10. Major Obstructions to Better Use of Computerized Accident Data By Traffic Engineers	Insufficient manpower to analyze data	Dissatisfaction with quality of data collected by police	Dissatisfaction with amount of data received. Hardware and software limitations.	Cumbersome entry and edit and retrieval procedures that rely too heavily on DP	Dissatisfaction with delayed arrival and incomplete nature of data, and with software	Dissatisfaction with formats of printouts and service rendered by DP	Software limitations	Cumbersome entry and edit procedures that rely too heavily on PD
11. Overall Assessment of Manual Traffic Records System Used By Police	Good	Adequate	Adequate	Adequate	Excellent	Adequate	Excellent	Good
12. Overall Assessment of Manual Traffic Records System Used By Traffic Engineers	Poor	Adequate	Poor	Adequate	Adequate	Adequate	Poor	Adequate
13. Degree of Cooperation Among Accident Data Collectors, Processors, and Users At The Local Level	Adequate	Poor	Good	Poor between police and traffic engineers. Poor between police and data processors. Good between traffic engineers and data processors.	Excellent	Poor	Excellent	Poor

CHAPTER III

DISCUSSION OF TRAFFIC RECORDS SYSTEMS FOR CITIES THAT RECEIVE QUARTERLY COMPUTER PRINTOUTS FROM DPS-AUSTIN

Thirty-two cities are currently receiving coded accident data via quarterly computer printouts from DPS-Austin. For this contract, the researcher visited 8 of these cities (i.e., Arlington, Waco, Laredo, Midland, Brownsville, Galveston, Bryan, and Texarkana) to interview police and traffic engineering personnel concerning their traffic records systems. The following is a detailed comparative analysis of these systems. (An abbreviated comparative analysis is presented in Table 2 at the end of this chapter and the 8 site visit reports are contained in Appendix D.)

The 8 cities vary widely in population, with a high for Arlington (approximately 181,000) and a low for Texarkana (approximately 37,200). The cities also vary widely in the number of traffic accidents investigated annually, with a high for Arlington (approximately 9,000) and a low for Texarkana (approximately 1,300). Police personnel in 7 of these cities place the required location codes on accident reports prior to sending the reports to DPS-Austin. In the remaining city (Brownsville), traffic engineering personnel perform this task. Overall, the cities have poor quality control systems for insuring that accident locations are accurately coded. In addition, the coding task is frequently assigned to employees in lower-level positions with high rates of turnover.

The 8 cities are very consistent on the degree to which quarterly printouts are used, i.e., the printouts are generally not used by city departments. In Arlington, the Police Department does not use the quarterly printout, but the Traffic and Transportation Department makes good use of it. In Waco, the PD and the Transportation Department do not use it. In Laredo, the PD makes limited use of it, i.e., quarterly printouts are only used to

cross-check hand tallies related to the STEP Program. The Laredo Traffic Department does not use it. In Midland, the PD and the Traffic Engineering Division of the Public Works Department do not use it. In Brownsville, the PD does not use the quarterly printout, but the Traffic Director makes limited use of it for spotting high accident locations. In Galveston, the PD and the Department of Urban Planning and Transportation do not use it. In Bryan, the PD and the Traffic Engineering Department do not use it. In Texarkana, the PD makes limited use of it for aiding personnel assignment and scheduling, but the Public Works Department does not use it.

Seven of the 8 cities cited "format deficiencies" among their objections to the quarterly printout. The cities were generally displeased that some data elements are presented in coded format, rather than readable format. Most departments lack sufficient personnel to decode and further process the accident data to make it useable. Also, the cities were generally displeased with the accident-by-accident presentation of data, with no cross-classified or singly-classified tables of summary data. Further processing of accident-by-accident information would be necessary to make the quarterly printout useful. A few of the cities indicated that the long reporting period of the quarterly printout (i.e., 3 months) decreased its usefulness for directing day-to-day operations. A few of the cities stated they were displeased with DPS's \$250 damage rule for coding PDO accidents, because implementation of the rule causes the quarterly printout to portray an incomplete picture of a city's accident experience.

The police departments in all 8 cities use their manual traffic records systems more than they use the quarterly printouts from DPS. In addition, the police departments in Bryan and Texarkana participate in local-input systems which are potential alternatives to the quarterly-printout system offered by the UALC Project. Both local-input systems are presently functioning very

poorly. In Bryan, the police coder for the local-input system has been as much as 6 months behind in coding accidents. Additionally, the quality of the raw data and coded data is poor. In Texarkana, the local-input system is operating very inefficiently due to inadequately-defined responsibilities and hardware deficiencies.

Five of the police departments are very concerned about the poor quality of their traffic records systems and their inability to rely on the quarterly printouts from DPS. They either actively or passively support the implementation of alternative systems or the improvement of the present quarterly-printout system. For example, the Arlington PD plans to get an IBM 370 computer which can be used to process either locally-coded accident data or DPS-coded data contained on monthly computer tapes. Police personnel in Arlington are eager to implement a new traffic records system. In Laredo, the police passively wait for improvements in the quarterly-printout system--hoping for software changes at the State level so Laredo can receive accident data in more useful formats. In Midland, the police are not actively pursuing a competing system, but they support the traffic engineers' efforts to get the Data Processing Department involved in analyzing DPS monthly computer tapes on DP's Burroughs 1855 computer. In Texarkana, the PD is more concerned with improving its local-input system than with improving the quarterly-printout system. The PD hopes to get its own computer so it will not have to rely on the Water Company's computer to process locally-input accident data. In Galveston, the police passively wait for the traffic records system designed by consultants to become operational. The system is totally dependent on actions taken by the Finance Department, which houses the city's NCR computer that is supposed to process accident data contained on DPS monthly computer tapes. Numerous data processing problems were encountered in operationalizing the consultant-designed system, so the PD requested quarterly printouts from

DPS to use in the interim. The police departments in Waco, Brownsville, and Bryan are apathetic about the use of accident data to plan and schedule police operations. Consequently, they do not advocate the implementation of a competing system to the quarterly-printout system.

The traffic engineering departments in 6 of the cities (Arlington, Waco, Laredo, Midland, Brownsville, and Galveston) use their manual traffic records systems more than they use the quarterly-printout system. The traffic engineering departments in Bryan and Texarkana do not have manual traffic records systems, so neither system is used. In Bryan, the traffic engineer relies heavily on special reports produced by the Urban Transportation Study Group at the district SDHPT office in Bryan. In Texarkana, the Public Works Department does not have a traffic engineer so accident data is not used at this time.

The traffic engineering departments in Waco and Midland are actively involved in developing alternative systems to the quarterly-printout system. Waco's Transportation Department has the bulk of responsibility for the operation of a local-input system which does not utilize DPS-coded data. Midland's traffic engineers are spearheading a move to get the city's Data Processing Department involved in analyzing accident data contained on DPS monthly computer tapes. Such analyses could be accomplished on Data Processing's Burroughs 1855 computer. The traffic engineering department in Arlington would like to become more actively involved with an alternative system. For instance, Arlington's Traffic and Transportation Department plans to get a computer terminal connected to Data Processing's IBM 370 computer, and then use DPS monthly computer tapes. Four of the traffic engineering departments (Brownsville, Laredo, Bryan, and Galveston) are passively involved in the development of alternative systems. In Brownsville, the Traffic Department advocates that the city's Data Processing Department become more involved in the

traffic records system, with DP's Hewlett Packard 3000 computer used to process accident data contained on DPS monthly tapes. The traffic engineers in Laredo and Bryan are eager to receive accident data in more useful formats, but they only passively advocate changes in software at the State level. The traffic engineer in Galveston is eager to receive accident data in the formats designed by consultants, but he has not actively sought to alleviate the implementation problems for this alternative system. Texarkana's Public Works Department does not use accident data presented on quarterly printouts nor does it advocate the use of an alternative system. Overall, the traffic engineers were more disturbed than were the police about the poor format of the quarterly printouts.

The manual traffic records systems used by the 8 police departments were judged according to their overall usefulness. The manual systems in 2 departments (Arlington and Midland) were rated "good." The manual systems in 5 departments (Laredo, Brownsville, Galveston, Bryan, and Texarkana) were rated "adequate." The manual system in 1 department (Waco) was rated "poor."

The manual traffic records systems used by the 8 traffic engineering departments were also judged according to their overall usefulness. The manual system in 1 department (Arlington) was rated "good." The manual systems in 4 departments (Waco, Laredo, Brownsville, and Galveston) were rated "adequate." The manual systems in 2 departments (Bryan and Texarkana) were rated "poor."

The 8 cities were rated on the degree of cooperation among accident data collectors, data processors, and data users at the local level. Two cities (Laredo and Midland) received an "excellent" rating. One city (Brownsville) received a "good" rating. Two cities (Arlington and Bryan) received an "adequate" rating. Three cities (Waco, Galveston, and Texarkana) received a "poor" rating.

TABLE 2: DESCRIPTION OF PARTICIPATING CITIES THAT RECEIVE QUARTERLY COMPUTER PRINTOUTS FROM DPS

CHARACTERISTIC								
	ARLINGTON	WACO	LAREDO	MIDLAND	BROWNSVILLE	GALVESTON	BRYAN	TEXARKANA
1. Population (approximate)	181,000	100,000	85,000	80,000	76,000	61,000	45,000	37,200
2. Traffic Accidents Investigated Annually (approximate)	9,000	6,000	3,800	3,500	3,000	4,300	1,600	1,300
3. City Department That Places Location Codes on Accident Reports	Police (PD)	Police (PD)	Police (PD)	Police (PD)	Traffic Dept. (TD)	Police (PD)	Police (PD)	Police (PD)
4. Degree of Use of Quarterly Printouts By City Departments	Not used by PD. Good use by Traffic and Transportation Dept. (T&T).	Not used by PD or Transportation Dept. (TD)	Limited use by PD. Not used by Traffic Dept. (TD).	Not used by PD or Traffic Engineering Div. of Public Works Dept. (TE)	Not used by PD. Limited use by Traffic Director.	Not used by PD or Traffic Engineering Sec. of Dept. of Urban Planning & Transportation (UP&T)	Not used by PD or Traffic Engineering Dept. (TE)	Limited use by PD. Not used by Public Works Dept. (PW)
5. Stated Objections to Use of Quarterly Printouts	Poor format. Late arrival decreases its usefulness.	Too difficult to use	Limited value of accident-by-accident information. Cross tabulations are needed.	Unuseable format. Cross-classified or singly-classified tables of data are needed.	Poor format. Lack of personnel to decode and further process data.	Too cumbersome to use. Manual system easier to use.	Poor format.	No stated objections.
6. Type of Alternative System Used by Police Department	Manual system	Manual system	Manual system	Manual system	Manual system	Manual system	Manual system and local-input system	Manual system and local-input system
7. Type of Alternative System Planned by Police Department	PD plans to get an IBM 370 which can process locally-coded data or DPS-coded data contained on monthly tapes.	None. PD is apathetic about the use of accident data to plan and schedule police operations.	None, but PD is eager to receive accident data in more useful formats.	None, but PD is eager to receive accident data in more useful formats.	None. PD is apathetic about the use of accident data to plan and schedule police operations.	PD would like the consultant-designed system to become operational. For this to occur, data processing problems in the Finance Dept. must be solved.	None. PD is apathetic about the use of accident data to plan and schedule police operations.	None. PD hopes to get its own computer so it will not have to rely on the Water Company's computer to process locally-coded data.

TABLE 2: DESCRIPTION OF PARTICIPATING CITIES THAT RECEIVE QUARTERLY COMPUTER PRINTOUTS FROM DPS

(CONTINUED)

CHARACTERISTIC									
	ARLINGTON	WACO	LAREDO	MIDLAND	BROWNSVILLE	GALVESTON	BRYAN	TEXARKANA	
8. Type of Alternative System Used by Traffic Engineering Department	Manual system	Manual system and local-input system. TD has bulk of responsibility for the local-input system. DP keypunches and processes accident data on its Honeywell 6440 computer using software written by consultants.	Manual system	Manual system	Manual system	Manual system	Manual system	TE relies on special reports requested from the Urban Transportation Study Group at the district SDHPT office in Bryan.	None. PW does not employ a traffic engineer so accident data is not used.
9. Type of Alternative System Planned by Traffic Engineering Department	T&T plans to get a computer terminal connected to DP's IEM 370, and then use DPS monthly tapes. T&T is eager to improve the present system.	None. TD and DP hope to improve the existing local-input system.	None, but TD is eager to receive accident data in more useful formats.	TE is spear-heading a move to get DP involved in analyzing DPS monthly tapes on DP's Burroughs 1855 computer. TE is eager to receive data in more useful formats.	TD wants DP to become involved, with DP's Hewlett Packard 3000 used to process data contained on DPS monthly tapes.	UP&T would like the consultant-designed system to become operational.	None	None	
10. Overall Assessment of Manual Traffic Records System Used by Police	Good	Poor	Adequate	Good	Adequate	Adequate	Adequate	Adequate	
11. Overall Assessment of Manual Traffic Records System Used by Traffic Engineers	Good	Adequate	Adequate	Excellent	Adequate	Adequate	Poor	Poor	
12. Degree of Cooperation Among Accident Data Collectors, Data Processors, and Data Users at the Local Level	Adequate	Poor	Excellent	Excellent	Good	Poor	Adequate	Poor	

CHAPTER IV

DISCUSSION OF TRAFFIC RECORDS SYSTEMS FOR CITIES NOT PARTICIPATING IN THE URBAN ACCIDENT LOCATION CODING PROJECT

Many Texas cities with populations above 25,000 chose not to participate in the Urban Accident Location Coding Project. The researcher visited 9 of these cities (i.e., Dallas, San Antonio, El Paso, Lubbock, Amarillo, Wichita Falls, Tyler, Mesquite, and McAllen) to interview police and traffic engineering personnel concerning their traffic records systems. The following is a detailed comparative analysis of these systems. (An abbreviated comparative analysis is presented in Table 3 at the end of this chapter and the 9 site visit reports are contained in Appendix E).

The 9 cities vary widely in population, with a high for Dallas (approximately 944,000) and a low for McAllen (approximately 63,000). The cities also vary widely in the number of traffic accidents investigated annually, with a high for Dallas (approximately 53,000) and a low for Mesquite (approximately 2,000).

Two of the cities (Tyler and McAllen) had no computerized, local-input system at the time of the site visits. The remaining 7 cities had some type of computerized traffic records system. These 7 cities vary widely on the type, number, and location of computers/terminals used to analyze accident data. In Dallas, 2 ITTEL mainframe AS/4 computers are located in the Data Processing Department. The Police Department has 120 terminals connected to these computers, 17 of these terminals are CRTs located in the Reports Division of the PD. The Reports Division also has 3 line printers. Personnel in the Reports Division use this equipment to process accident data. In San Antonio, an IBM 370 computer is located at the City Water Board. The PD has 65 terminals connected to this computer. None of these terminals is used for on-line processing of detailed information about traffic accidents. This

information is batch processed at the City Water Board. In El Paso, a Sperry-Univac 94-80 computer is located at the El Paso County Data Processing Department. The computer is used to process data for city, county, and district offices. Fifty terminals are located in these offices; 5 of these are located in the PD. The terminals in the PD are not used to process traffic accident data, however. Accident data is batch processed at the El Paso County Data Processing Department. In Lubbock, a Honeywell 6605 is located at the Data Processing Department. The PD has 1 terminal connected to this computer and the terminal is only used to process dispatch information for all calls for service. The Traffic Section of the PD will be getting a terminal when the new local-input system becomes operational. Personnel in this section will be responsible for inputting accident data to the computer. A terminal is not planned for the Traffic Engineering Department in Lubbock. In Amarillo, an IBM 370 is located at the Data Processing Department. The PD has no terminal connected to this computer. Accident data is batch processed on DP's computer. In Wichita Falls, an IBM 370 is located at the Data Processing Department. The PD has no terminal connected to this computer, so the Data Processing Department keypunches accident data directly into its computer. In Mesquite, a Data General Nova System 3 minicomputer is located at the Police Department. The PD has 3 CRT terminals and 1 line printer connected to this minicomputer. The equipment is used to process accident data, as well as other types of police data.

The 7 cities that have computerized traffic records systems vary widely on the procedures used to encode and input accident data to the computer. In Dallas, the PD encodes and inputs accident data directly to the computer via remote computer terminals. In San Antonio, the PD encodes accident data onto code sheets, and the City Water Board keypunches and batch processes the accident data on its computer. In El Paso, the PD encodes and keypunches IBM

cards. The PD sorts these cards and develops Summary IBM cards, which are sent to the El Paso County Data Processing Department and processed on its computer. In Lubbock, the PD will encode and input accident data directly to DP's computer via remote computer terminals (when the local-input system becomes operational). In Amarillo, the PD encodes and keypunches accident data onto IBM cards. The Data Processing Department transfers the information from cards to magnetic tape, which is used to produce computer printouts. In Wichita Falls, the PD encodes accident information onto code sheets which are sent to DP. DP keypunches the information contained on code sheets directly into its computer. In Mesquite, the PD encodes and inputs accident data directly to its minicomputer via computer terminals.

The 9 cities vary considerably on the major types of data processing problems experienced, but the three problems most frequently mentioned were: 1) inadequate hardware, 2) inadequate software, and 3) insufficient manpower. In Dallas, there are 500 terminals connected to DP's computers; therefore, remote operations are plagued with slow response times. Due to manpower shortages in the PD and the Data Processing Department, the PD responds slowly to special requests for accident data when new software must be written. In San Antonio, there are 392 terminals connected to the City Water Board's computer and the computer system is inadequate for handling the data processing load for the entire city. Accident information is analyzed with inadequate software, so the PD must use a laborious card-sorting technique to obtain numerous frequency counts. In El Paso, the traffic records system operates with inadequate hardware and inadequate software. The users of accident data have no control over the computer that processes the data. Furthermore, there are too few computer programmers in the El Paso County Data Processing Department to meet the needs of the area. In Lubbock, a computerized traffic records system is in the developmental stage, so data processing problems had

not been experienced. In Amarillo, the data-entry procedures are burdensome and very inefficient. Accident data is keypunched onto IBM cards at the PD, and transferred from cards to magnetic tape at the Data Processing Department. The software needs to be updated so that much of the hand tallying can be eliminated. In Wichita Falls, the traffic records system operates with inadequate hardware and inadequate software. Additionally, the keypunchers in the Data Processing Department contribute significantly to the poor quality of the accident data. In Mesquite, the traffic records system operates with inadequate hardware and inadequate software. One problem is the slow retrieval time when the minicomputer is being used heavily. Another problem is that the system operates with too few computer disks. This, along with the limited storage capacity on a particular disk, causes problems with multi-year analyses of accident data. In Tyler and McAllen, there is insufficient manpower in the PD to manually process accident data for analysis purposes.

The 7 cities having computerized traffic records systems vary widely on what type of professional wrote the software and which department had its data needs emphasized. In Dallas, San Antonio, Amarillo, and Mesquite, local consultants were hired to develop systems emphasizing the data needs of police. In El Paso, a former employee of the city's Traffic and Transportation Department wrote the software, which emphasizes the data needs of traffic engineers over the data needs of police. In Lubbock, a systems analyst/programmer hired by the Traffic Safety Section of SDHPT is presently working with the Police Department to develop software of benefit to that department. In Wichita Falls, federal consultants with the Integrated Municipal Information System Project wrote software in the early 1970s. These consultants emphasized the data needs of police more so than the data needs of traffic engineers.

The 7 cities that computerize their accident data vary widely in the overall quality of computer output of accident data. In Lubbock, the output is good for police use. (The researcher has no opinion of its usefulness to traffic engineers, since the systems analyst/programmer had not begun consultation with traffic engineers to design computer output to meet their needs.) In Amarillo, Wichita Falls, and Mesquite, the output is adequate for police use, but poor for traffic engineering use. In Dallas, San Antonio, and El Paso, the output is poor for police use and for traffic engineering use.

The 7 cities that computerize their accident data vary widely on the major obstructions to better use of computerized accident data by police. In Dallas, the major obstructions are the slow retrieval times for data stored on DP's mainframe computer and the lack of a computer terminal (connected to DP's computer) in the Traffic Operations Section of the Police Department. In San Antonio, the major obstructions are inadequate hardware and inadequate software. In El Paso, the major obstructions are the PD's lack of control over the El Paso County computer which is used to process accident data, and the existence of software that is inappropriate for meeting police needs. In Lubbock, the computerized traffic records system was not operational at the time of the site visit, so no major obstruction was identified. In Amarillo, the major obstructions are the existence of outmoded software and the PD's lack of a computer terminal connected to DP's computer. In Wichita Falls, the major obstruction is the PD's lack of trust in the quality of the computerized accident data. (The PD suspects that the keypunchers in the Data Processing Department inaccurately transfer data from code sheets to the computer.) In Mesquite, the major obstructions are inadequate hardware and inadequate software. In Tyler and McAllen, no major obstructions were identified since no computerized accident data are available in these two cities.

The 7 cities that computerize their accident data vary widely on the major obstructions to better use of computerized accident data by traffic engineers. In Dallas, the major obstruction is that the formats of computer output do not satisfy the needs of traffic engineers. The software was designed to benefit police rather than to benefit traffic engineers. In Amarillo, the major obstruction is the outmoded software which produces computer output of little value to traffic engineers. In San Antonio and Mesquite, the major obstructions are inadequate software and inadequate hardware. In Wichita Falls, the formats of computer printouts do not satisfy the needs of traffic engineers and the traffic engineers distrust the quality of the raw data collected by police. For example, the traffic engineers feel that the PD improperly classifies some accidents as "midblock accidents" when they should have been classified as "intersection-related accidents." In El Paso, the traffic engineers are also displeased with the quality of data coded by the PD. In addition, the traffic engineers are displeased that they lack control over data input, data processing, and data retrieval. In Lubbock, the traffic engineers are awaiting the implementation of a new computerized traffic records system, so they had no complaints about the system. In Tyler and McAllen, no major obstructions were identified since no computerized accident data are available in these two cities.

The overall assessments of the manual traffic records systems used by police varied widely across the 9 cities. In El Paso, the manual system used by the PD is excellent; however, too much data is processed by inefficient means such as the use of an antiquated card sorter/counter. In Wichita Falls, the manual system is excellent. In Lubbock, Amarillo, and Mesquite, the manual systems are good. In Dallas, San Antonio, and McAllen, the manual systems are adequate. However, the San Antonio manual system is too extensive. The card-sorting technique for getting frequency counts is extremely inefficient.

Thus, the entire system needs to be streamlined by computerizing most of the summary statistical work. In Tyler, the manual system used by the PD is poor.

The overall assessments of the manual traffic records systems used by traffic engineers varied widely across the 9 cities. In Amarillo, the manual system used by the traffic engineers is excellent. In El Paso and Tyler, the manual systems are good. However, traffic engineers in El Paso must process too much data manually by inefficient means. Much of this data should be computerized and should be easily accessible. In Dallas, Lubbock, and Wichita Falls, the manual systems used by traffic engineers are adequate. In San Antonio, Mesquite, and McAllen, the manual systems used by traffic engineers are poor.

The 9 cities vary widely on the degree of cooperation among the accident data collectors, data processors, and data users at the local level. San Antonio has an excellent working relationship among police, traffic engineers, and other data users; but the city has a poor working relationship between the data users and the data processors, i.e., the City Water Board. Dallas, Lubbock, Tyler, and Mesquite have good working relationships among the data collectors, data processors, and data users. However, the PD and the Traffic and Transportation Department in Tyler are advocating the development of separate in-house systems for computerizing accident data. Amarillo and McAllen have adequate working relationships among the data collectors, data processors, and data users. Wichita Falls has a poor working relationship among the data collectors, data processors, and data users.

The 9 cities vary widely on the reasons for not participating in the Urban Accident Location Coding Project. Dallas participated at first, but dropped out because the PD had no control over the computer in the Data Processing Department. This computer was once used to process accident data contained on monthly computer tapes from DPS-Austin. If the PD gets its own

computer in the future, Dallas may rejoin the UALC Project. San Antonio failed to join because the PD was displeased with the late arrival of the monthly tape from DPS-Austin and the incomplete nature of the data contained on the tapes (due to the \$250 damage rule). The researcher feels that a major reason for San Antonio's refusal to join the Project was that the PD is comfortable with its own traffic records system and is very reluctant to try a new approach unless it has 100% control over the system. El Paso failed to join because the PD was reluctant to accept a new system dependent on El Paso County's computer. (The existing system was dependent on this computer and the system did not work efficiently.) Also, the PD had developed a fairly elaborate manual system and the police relied quite heavily on this system. Thus, the PD saw little advantage in having a new computerized system. Lubbock failed to join because the PD felt it could keep more accurate data locally. The PD was displeased that DPS-Austin would not code private property accidents or PDO accidents below \$250 damage. Amarillo failed to join because the PD was comfortable with the existing computerized traffic records system and was resistant to change (even though the existing system was cumbersome to implement and outmoded software reduced the value of the resulting computer printouts). Wichita Falls failed to join because it was resistant to change. Tyler failed to join because the PD desired to have local control of its traffic records system. Mesquite participated at first, but dropped out because it lost 25% of its accidents due to DPS's \$250 damage rule and because the format of the quarterly printout was not useful.

In retrospect, it appears that the Police Department in each eligible city was given total responsibility for deciding whether the city would join the UALC Project--and that traffic engineers were not consulted on whether the city should participate or not.

TABLE 3: DESCRIPTION OF NONPARTICIPATING CITIES THAT DO NOT RECEIVE MONTHLY COMPUTER TAPES OR QUARTERLY PRINTOUTS FROM DPS

CHARACTERISTIC	CITIES								
	DALLAS	SAN ANTONIO	EL PASO	LUBBOCK	AMARILLO	WICHITA FALLS	TYLER	MESQUITE	McALLEN
1. Population (approximate)	944,000	800,000	420,000	200,000	158,000	100,000	75,000	70,000	63,000
2. Traffic Accidents Investigated Annually (approximate)	53,000	35,000	14,000	10,000	6,100	4,300	3,900	2,000	2,400
3. Type and Location of Computer Used to Analyze Accident Data for Local-Input System	2 ITEL AS/4 computers at DP. PD has 120 terminals connected to DP's computers, 17 of these are CRTs in Reports Div. of PD. Reports Div. has 3 line printers.	IBM 370 at City Water Board. PD has 65 terminals connected to computer. None is used for on-line processing of accident data. Such information is batch processed at Water Board.	Sperry-Univac 94-80 at El Paso County DP. It processes data for city, county, and district depts. 50 terminals are in these depts. 5 of these are in PD but are not used to process accident data.	Honeywell 6605 at DP. PD has 1 terminal connected to computer. This terminal is used to process dispatch information. Traffic Section of PD will get terminal when local-input system becomes operational. A terminal is not planned for TE.	IBM 370 at DP. PD has no terminal connected to computer.	IBM 370-145 at DP. PD has no terminal connected to computer.	No computerized local-input system was operational at time of site visit. Accidents are processed manually by PD and Traffic & Transportation Dept. (T&T).	Data General, Nova System 3 minicomputer at PD. PD has 3 CRTs and 1 line printer connected to minicomputer.	No computerized local-input system was operational at time of site visit. Accidents are processed manually by PD and Traffic Safety Dept.
4. City Department Responsible for Encoding and Inputting Accident Data to Computer	PD	PD encodes. City Water Board keypunches and batch processes accident data.	PD encodes and keypunches IBM cards. Summary IBM cards are produced and sent to El Paso County DP for further processing.	PD, when local-input system becomes operational.	PD encodes and keypunches data onto IBM cards. DP transfers data from cards to magnetic tape which is processed by computer.	PD encodes accident information onto code sheets. DP keypunches data contained on code sheets into the computer.	Not Applicable	PD	Not Applicable
5. Authors of Computer Software	Consultants to PD	Consultants to PD	Former employee of Traffic and Transportation Dept.	Programmer/analyst hired by D18-TS, SDHPT, to work with PD and Traffic Engineering Dept.	Consultant hired 15 years ago. Software revised in 1967 and 1975.	Federal consultants working on the Integrated Municipal Information System Project in the early 1970s.	Not Applicable	Consultant to PD hired in 1978	Not Applicable

TABLE 3: DESCRIPTION OF NONPARTICIPATING CITIES THAT DO NOT RECEIVE MONTHLY COMPUTER TAPES OR QUARTERLY PRINTOUTS FROM DPS (CONTINUED)

CHARACTERISTIC	CITIES								
	DALLAS	SAN ANTONIO	EL PASO	LUBBOCK	AMARILLO	WICHITA FALLS	TYLER	MESQUITE	MCALLEN
6. Major Types of Data Processing Problems	With 500 terminals connected to DP's computers, remote operations lead to slow response times. PD responds slowly to special requests for accident data when new software is needed.	With 392 terminals connected to it, the Water Board's computer is inadequate for handling the data processing load for entire city. Inadequate software forces PD to use card-sorting technique to obtain desired frequency counts.	Inadequate hardware and software. Users have no control over computer. Too few computer programmers in County DP to meet needs of area.	At present, data is only processed manually.	Burdensome data-entry procedures (data keypunched to cards and transferred to magnetic tape). Much hand tallying is required because software is out-of-date.	Inadequate hardware and software. Key punching errors made in DP.	Insufficient manpower in PD to manually process accident data for analysis purposes.	Inadequate hardware due to limited storage capacity on disk. Slow retrieval times when mini-computer is being heavily used. Inadequate software.	Insufficient manpower in PD to manually process accident data for analysis purposes.
7. Overall Assessment of Computer Output	Poor	Poor	Poor	Good for police. No opinion for traffic engineers since output for them has yet to be designed.	Adequate	Adequate for police. Inadequate for traffic engineers.	Not Applicable	Adequate for police. Poor for traffic engineers.	Not Applicable
8. Major Obstructions to Better Use of Computerized Accident Data by Police	Slow retrieval times from DP's computer. Traffic Operations Section has no terminal connected to this computer.	Inadequate hardware and software.	Heavy reliance upon manual system. Lack of control over County DP's computer. Software inappropriate to meet police needs.	No opinion. Computerized traffic records system was not operational at time of site visit.	Outmoded software. PD's lack of a computer terminal connected to DP's computer.	Lack of trust in quality of data. PD suspects key-punchers in DP inaccurately transfer data from code sheets to computer.	Not Applicable	Inadequate hardware and software.	Not Applicable
9. Overall Assessment of Manual Traffic Records System Used By Police	Adequate	Adequate, but it is too extensive. Most of the manual procedures should be computerized.	Excellent, but too much data is processed by inefficient means such as the antiquated card sorter/counter.	Good	Good	Excellent	Poor	Good	Adequate

TABLE 3: DESCRIPTION OF NONPARTICIPATING CITIES THAT DO NOT RECEIVE MONTHLY COMPUTER TAPES OR QUARTERLY PRINTOUTS FROM DPS

(CONTINUED)

CHARACTERISTIC	CITIES								
	DALLAS	SAN ANTONIO	EL PASO	LUBBOCK	AMARILLO	WICHITA FALLS	TYLER	MESQUITE	McALLEN
10. Major Obstructions To Better Use of Computerized Accident Data by Traffic Engineers	Formats were designed to benefit police rather than traffic engineers.	Inadequate hardware and software	Displeasure with quality of data coded at PD. Lack of control over data input, data processing, and data retrieval.	No opinion. Computerized traffic records system was not operational at time of site visit.	Outmoded software	Formats do not satisfy needs of traffic engineers. Displeasure with quality of data coded at PD.	Not Applicable	Inadequate hardware and software	Not Applicable
11. Overall Assessment of Manual Traffic Records System Used by Traffic Engineers	Adequate	Poor	Good, but too much data is processed by inefficient means.	Adequate	Excellent	Adequate	Good	Poor	Poor
12. Degree of Cooperation Among Accident Data Collectors, Data Processors, and Data Users at the Local Level	Good	Excellent between police, traffic engineers, and other users. Poor between users and data processors, i.e. the City Water Board.	Poor	Good	Adequate	Poor	Good, but police and traffic engineers are advocating the development of separate in-house systems for computerizing accident data.	Good	Adequate
13. Reasons For Not Participating in the Urban Accident Location Coding Project	Dallas participated at first but dropped out because PD had no control over computer in DF. If PD gets its own computer, Dallas may rejoin Project.	PD displeased with late arrival of magnetic tape from DPS and incomplete picture presented by DPS data (due to \$250 damage rule).	PD was not interested in another system that relied on the County's overloaded computer. PD relies heavily on its manual system.	PD feels it can keep more accurate data locally. PD displeased that DPS does not code private property accidents or PDO accidents below \$250 damage.	PD comfortable with present system and resistant to change.	PD comfortable with present system and resistant to change.	Desire for local control of traffic records system	City dropped out of UALC Project because quarterly printouts arrived too late and were too difficult to use.	City dropped out of UALC Project because it lost 25% of its accidents due to DPS's \$250 damage rule and because the format of the quarterly print-out was not useful.

CHAPTER V

FINDINGS AND RECOMMENDATIONS

The 25 traffic records systems evaluated for this contract were extremely different from each other. Few commonalities were detected by the researcher.

Apparently, the cities of Texas have received very little guidance on how to develop an effective traffic records system and what types of data should be collected. The systems that evolved were influenced by such factors as:

a) the desires of the city department spearheading the development of the traffic records system, b) the computer network within the city--i.e., what city department houses the computer used to process accident data; what departments have access to accident data via remote terminals; and what factors influence data-entry, data-processing, and data-retrieval procedures, c) the expertise of city employees or consultants who designed the traffic records system, d) the level of cooperation among city departments involved in the traffic records system, and e) the type of accident data analyzed, i.e., DPS-coded data or locally-coded data.

In general, the 25 traffic records systems are not operating very effectively. Numerous problems exist at State and local levels. In this chapter, the researcher has classified these problems into 8 major Problem Areas which prevent the Urban Accident Location Coding Project from meeting its goals. For each Problem Area, a specific recommendation or recommendations have been made on how to alleviate certain problems. The 8 Problem Areas, as well as the 14 Recommendations, have been rank-ordered according to the degree of urgency for corrective action. For example, Problem Area I includes problems whose solutions are most urgently needed and Recommendation #1 is a proposed solution that should be implemented before other Recommendations would be effective.

PROBLEM AREA I

LACK OF LEADERSHIP AND VIABLE POLICIES FOR THE URBAN ACCIDENT LOCATION CODING (UALC) PROJECT

The Urban Accident Location Coding Project has not had adequate leadership since its inception in 1975. No one at the Traffic Safety Section (D18-TS) of the SDHPT or at DPS-Austin was assigned or assumed primary responsibility for insuring that the Project meets the accident data needs of participating cities. A result of this inadequate leadership is that policies and procedures evolved haphazardly, with little concern for the attainment of the most important goal of the Project--providing each participating city with a complete picture of its accident experience, either via easily-used computer printouts or magnetic computer tapes (from which easily-used printouts could be produced). Policies and procedures that would strengthen the UALC Project as a whole were not established. In fact, the inconsistent funding policies of the Traffic Safety Section have discouraged some cities from participating in the UALC Project and have created non-standard data bases across the State. Thus, the Project has tended to benefit only DPS-Austin and traffic safety researchers. DPS-Austin has benefited by having the salaries of several of their coders reimbursed by the Highway Department. Researchers have benefited by having access to information about precisely-located accidents.

The Traffic Safety Section funds various activities within traffic records systems that are totally different from each other. The following are examples of the diverse systems being funded:

- a. the SASS system in Houston, with funding for systems analysts, computer programmers, data-entry personnel, TI Intelligent Terminals, and computer time on Region IV Education Service Center's computer. This system constitutes a duplication of effort in the coding and computerization of accident data, i.e., DPS performs the same tasks.

- b. the Lubbock system, with funding for an analyst/programmer but not for computer time. The system uses the city's computer located in the Data Processing Department. This local-input system is totally different from SASS. The system constitutes a duplication of effort in the coding and computerization of accident data, and in the writing of software.
- c. the Bryan-College Station-Huntsville system, with indirect funding for the computerization of accident data and for the output of data through the Urban Transportation Study Group (UTS) of the SDHPT district office. Police personnel fill out code sheets and send the sheets to UTS, where the accident data are keypunched on remote terminals connected to a SDHPT computer in Austin. Monthly computer printouts are produced via the remote terminals at Bryan and are distributed to the participating cities.
- d. the systems using DPS monthly tapes, with funding for consultants (PAWA, Inc. in Beaumont and Galveston; and Lamar Management and Research Consultants, Inc. in Orange). There was duplication of effort in the writing of software, since there was no carryover from the work of the first contractor to the work of the second contractor.

Some local-input systems are being developed and financed by cities that can afford to do so on their own. Among these systems are the following types:

- a. systems that were totally developed and totally financed in-house (Garland). Garland's system makes use of the Data Processing Department's computer and programmers. Soon, Garland will probably withdraw from the UALC Project and request that DPS stop sending monthly computer tapes to the city.
- b. systems whose software was purchased elsewhere (Tyler, Hurst, Grapevine, and 12 other cities in North Texas). The relatively inexpensive software is contained on cassette tapes and was purchased from Multi-Information Systems of Arlington, Texas. With this traffic records system,

accident data are locally input onto floppy disks using Incoterm terminals connected to the TCIC and NCIC networks. The existence of such software makes participation in the UALC Project less attractive to certain smaller cities in Texas.

Many cities have refused to participate in the UALC Project because they want a system that is autonomous from State guidance. Some of these cities have been able to obtain state/federal funding from the Traffic Safety Section without participating in the UALC Project. In the future, D18-TS should exert more control over the traffic records systems developed with state and federal funds. When a city requests funding for a systems analyst/programmer to develop a customized traffic records system, the Traffic Safety Section should encourage the city to use previously-written software or modified versions of previously-written software. If specialized software is needed, D18-TS should consider funding a programmer. Funding a different programmer in each city to develop a traffic records system from scratch is extremely wasteful of the taxpayer's dollar, however. There is no economy of scale. In all cases, D18-TS should insist that the programmer base his system around DPS-coded data rather than locally-coded data. The benefits of local-entry projects are not worth the costs. Such projects lead to dual coding of accident data (once by local coders and once by DPS-Austin coders). This duplication of effort is too expensive to the taxpayers.

Strong leadership and viable policies in the Traffic Safety Section of the SDHPT are urgently needed. Now is the time to act if comparable traffic records systems are to be developed across the State. As costs for computer hardware and software continue to decline, cities will not have to rely on D18-TS to finance portions of their traffic records systems. Each city will be able to develop its own system which may be independent of, and incompatible with, all other systems including the State system. If incompatible systems develop across the

State, it will be impossible to evaluate traffic safety programs on a statewide basis or on a cross-city comparative basis--using existing data bases.

RECOMMENDATION #1:

The Administrator of the Traffic Safety Section, in coordination with all Group Leaders, should establish and consistently implement policies and procedures designed to provide participating cities with complete and useful traffic accident data. If strong leadership is not provided and viable policies and procedures are not developed by DL8-TS, the Urban Accident Location Coding Project should be discontinued.

RECOMMENDATION #2:

The Traffic Safety Section should discontinue funding local-entry projects (SASS, STARS, Lubbock's system, etc.) which directly compete with the UALC Project.

PROBLEM AREA II

INSUFFICIENT PERSONNEL IN THE DATA AND PROBLEM ANALYSIS SECTION OF THE PROGRAM DEVELOPMENT GROUP, TRAFFIC SAFETY SECTION, SDHPT

The comparative analyses among the 25 traffic records systems evaluated for this contract indicate that most systems function very poorly and are used very sparingly. This problem is statewide, it is severe, and it can only be solved with increased effort on the part of D18-TS. Presently, there is 1 person assigned to the Data and Problem Analysis Section of the Program Development Group. One employee cannot adequately address the multitude of problems associated with Urban Traffic Records, plus the data problems associated with other areas of traffic safety.

Insuring that Urban Traffic Records Systems meet the needs of police, traffic engineers, and other local officials should be a high priority goal of the Traffic Safety Section. If this goal is ever to be achieved, a fulltime advocate of the UALC Project is needed. This person should work exclusively with on-system and off-system accidents that occur within the city limits of participating cities. This person should be adept at computer programming and data-base management. This person should have the personality and temperament necessary to provide guidance to data users, some of whom have little expertise with computers and little experience with using computer printouts of accident data. This person should be a "travelling" advocate of the UALC Project; he/she should not spend the majority of his time in Austin issuing orders to the cities. This approach would not be effective. The cities are in desperate need of an outsider to come in and act as a facilitator of communication and cooperation among city departments having responsibilities in traffic records systems. This person should also work directly with the Traffic Safety Specialists to help them get familiar with how to use accident data for planning purposes.

RECOMMENDATION #3:

The Traffic Safety Section of the SDHPT should hire a technically-trained, data analyst to work exclusively on the Urban Accident Location Coding Project.

PROBLEM AREA III

POOR USE OF QUARTERLY COMPUTER PRINTOUTS FROM DPS: DISPLEASURE WITH FORMAT

DPS quarterly printouts of accident data are not being used by the cities that receive them. The printouts are accident-by-accident computer dumps with most information presented via codes. The data are not presented in summary formats, in singly-classified or cross-classified formats, or in comprehensible prose. To be of use to decision makers, the data would have to be decoded and compiled in numerous ways. The typical Police Department and Traffic Engineering Department do not have the manpower nor the time to further process accident data contained on quarterly printouts. Developing a new format that is acceptable to all 32 recipients of quarterly printouts would be a major undertaking. However, the format used in Texas Transportation Institute's Traffic Accident Profile (TAP) Reports could serve as a beginning model. This model could be altered after feedback is received from the cities on the usefulness of TAP Reports.

RECOMMENDATION #4:

DPS quarterly printouts of accident data should either be reformatted or discontinued. D18-TS should finance the writing of new software to be used with DPS's computer.

PROBLEM AREA IV

POOR USE OF QUARTERLY AND MONTHLY COMPUTER PRINTOUTS: DISPLEASURE WITH QUALITY OF ACCIDENT DATA

Some cities believe that their police officers fail to collect accurate information at accident scenes. Other cities believe that local coders place incorrect 5-digit location codes on accident reports prior to sending the reports to DPS-Austin. Some cities believe that DPS coders incorrectly code accident information in Austin. Other cities believe that DPS's totals are incorrect since DPS's totals do not correspond with locally-tallied totals. Finally, some cities could not care less about who is responsible for all the "bad" data, i.e., these cities are apathetic toward the value of computerized accident data in solving day-to-day problems. For example, police officers frequently make the following comments: "Police should not be investigating accidents, because they are just doing the work that insurance companies should be doing. The State Accident Report Form is too detailed and most of the information does not help police officers do their jobs better."

Some of these criticisms are valid complaints about situations which state agencies have little control over. For example, many cities participating in the UALC Project assign lower-level employees to the task of placing 5-digit location codes on accident reports prior to sending the reports to DPS-Austin. The data returned to the cities from DPS is sometimes suspect because of inaccurate coding of accident locations at the local level. High turnover rates for local coders contribute to this problem. Traffic engineers are especially wary of using accident data if numerous accidents are incorrectly located.

One criticism which state agencies do have control over is the complaint about the discrepancies between DPS's totals and locally-tallied totals. Most cities interpret these discrepancies as being caused by inaccurate DPS data, when the discrepancies are actually caused by incomplete DPS data. For instance,

some cities are unaware that DPS deletes Property-Damage-Only accidents below \$250 damage and adds certain accidents reported only via blue forms. In order to be of maximum value, computer printouts should present a complete picture of a city's accident experience. The arbitrary \$250 damage rule has decreased the usefulness of DPS-coded accident data and has given the participating cities a built-in excuse for not using the resulting computer printouts.

RECOMMENDATION #5:

DPS should code all public-property traffic accidents occurring within the city limits of all cities participating in the UALC Project, i.e., DPS should not implement the \$250 damage rule for the participating cities. The Traffic Safety Section should finance the additional personnel needed at DPS to accomplish the additional coding required. (It is estimated that 3 to 5 new coders would be needed.)

RECOMMENDATION #6:

DPS and the Traffic Safety Section should place more pressure on cities to upgrade the quality of their accident reports.

RECOMMENDATION #7:

A committee composed of D18-TS employees, DPS employees, city officials, city policemen, city traffic engineers, and city data processing personnel should analyze each item on the State Accident Report Form with the following questions in mind: a) Who uses this information? b) What is it used for? c) Is it necessary or nice-to-know information? and d) Should policemen be responsible for collecting it?

PROBLEM AREA V

INEFFICIENT AND INEFFECTIVE USE OF MONTHLY COMPUTER TAPES FROM DPS

Monthly computer tapes are not being used effectively by most of the eight cities receiving them. Some of the factors which hamper the efficient use of the tapes are:

a. Incompatibility between DPS monthly tape and local computer systems. Some cities have no tape drive, so they must transfer accident data from tape to cards (Austin); from tape to floppy disks or diskettes (Corpus Christi, Victoria, Beaumont, Orange); from 9-channel mode, IBM tape to 7-channel mode, NCR tape (Galveston). Having to convert the data from one input medium to another medium is a time-consuming operation, especially if the city must mail the DPS tape to another city to have the data transferred (Galveston, Victoria).

Both D18-TS and DPS should be more concerned with helping the cities to overcome administrative and pre-processing problems which detract from the efficient use of the monthly tape from DPS-Austin. A more flexible approach by these two state agencies would encourage other cities to participate in the UALC Project.

b. Complex software. Consultants in Beaumont, Galveston, and Orange wrote computer programs that require the merging of accident data from DPS tapes with citation data from a local-input system. In each of these cities, the entry of citation data bogged down the entire system. Local support for local input of data is lacking in many city departments, especially in those departments that were excluded from initial planning stages and those departments that fail to see the value of computerized accident data. If these departments are assigned critical tasks to perform (such as the entry of citation data), the traffic records system is probably

doomed from the start.

Some consultants have the mistaken notion that "the more data you have, the better decisions you can make." This is generally not the case in the traffic safety area. In fact, too much data can be just as bad as too little data. Thus, consultants should be encouraged to streamline the volume of computer output they develop so that only the major needs of all users are addressed. The ultimate users should not be frightened by excessive amounts of data.

Some consultants have a tendency to develop computer systems that are extremely difficult to implement at the local level. For example, a computer system that requires the merging of accident data contained on DPS monthly tapes with citation data that has been locally-entered onto computer disks is too complex a system for a small city with limited human resources and limited demand for accident data.

When developing computerized traffic records systems, consultants have a tendency to disregard practical barriers to the successful operation of their system. For this reason, DL8-TS should not allow consultants to escape the implementation phase completely. Consultants could do a lot to enhance interdepartmental communication and cooperation which are essential to the successful operation of a traffic records system.

c. Software designed for police use (Austin, Victoria) or for traffic engineering use (Corpus Christi, Orange) but not for use by both departments. When outside consultants and in-house programmers write computer programs, they are typically concerned with the needs of only one department. Because of this tendency, two entirely different systems may develop in one city. For example, Beaumont will soon have the SASS system for police use and the PAWA, Inc. system for traffic engineering use. Both systems were developed with funds from the Traffic Safety Section.

d. Inadequate hardware. Computer systems in many cities are overloaded with the data processing requirements for all city departments. The departments operating these computers usually place low priority on the analysis of accident data. Also, computer systems within most cities are in a constant state of flux due to frequent changes in hardware. If reprogramming is required after these changes are made, the processing of accident data becomes a low-priority task. Thus, the traffic records system may bog down.

e. Late arrival of DPS monthly tape (a perceived problem). DPS tapes arrive at cities approximately $1\frac{1}{2}$ months after the close of a particular month. Police are especially displeased with this time lag. The police are accustomed to receiving quick feedback of crime and accident data via daily, hand-tallied reports. Most traffic engineers are content with the time lag, because they feel that "time is needed for trends to develop."

No corrective action for the "inadequate hardware" problem is recommended for state agencies, because they have little control over the instability of hardware systems at the local level. No corrective action for the perceived "late arrival" problem is recommended for state agencies, because the researcher feels that police do not need faster feedback of accident data for most enforcement purposes. For special acute problems (such as construction zone accidents), the police do need immediate feedback. Such feedback should come from a local, manual system rather than from a computerized system whose primary value lies in its ability to identify trends over time. The following corrective actions are recommended for the other three problems mentioned above.

RECOMMENDATION #8:

The Traffic Safety Section and DPS should make every effort possible to provide cities with accident data in a medium compatible with local computer systems. To the extent possible, data conversions should be made in Austin prior to sending monthly accident data to participating cities.

RECOMMENDATION #9:

The Traffic Safety Section should take a more active role in guiding the work of consultants hired to develop traffic records systems for cities. For example, D18-TS should discourage consultants from developing complex, computerized systems that are too difficult to implement. D18-TS should also insist that consultants be responsible for the initial operation of the system the consultants develop.

RECOMMENDATION #10:

In its contracts with consultants hired to develop computerized traffic records systems, the Traffic Safety Section should specify that the resulting computer output must be useful to police and to traffic engineers. Additionally, D18-TS should not fund competing traffic records systems within the same city, i.e., one system for the police and one system for the traffic engineers.

PROBLEM AREA VI

SPLINTERED RESPONSIBILITIES AND LUKEWARM SUPPORT FOR THE LOCAL OPERATION OF TRAFFIC RECORDS SYSTEMS

In most traffic records systems, no one official has been granted complete authority to correct any trouble spot in any city department. In many cities, the traffic records system does not even have the active support of the city manager. The problems created by splintered responsibilities and lukewarm support are exacerbated in cities where there is poor cooperation among departments that are responsible for performing critical tasks in the traffic records system. Well-developed traffic records systems can break down because of minor problems in the implementation phase. Progress is stymied when there is no one around to intercede between bickering departments.

The Traffic Safety Specialists would be especially valuable as monitors of the processes of change following the development of new traffic records systems by consultants. The initial stages for implementing any new system are the most difficult and an "outsider" can sometimes remove barriers to progress better than an insider can. This troubleshooting role is compatible with D18-TS's desire to get the Traffic Safety Specialists more involved with the accident data needs of their districts.

RECOMMENDATION #11:

The Traffic Safety Section should get top city officials interested in traffic safety so these officials can put pressure on uncooperative departments within their city governments. These officials should participate in every stage of the contract, especially in the initial contract-writing stage.

RECOMMENDATION #12:

The Traffic Safety Section should utilize the 25 Traffic Safety Specialists as troubleshooters for problem areas in the traffic records systems within the 25 Highway Districts.

PROBLEM AREA VII

POOR COMMUNICATION BETWEEN STATE DEPARTMENTS THAT COMPILE ACCIDENT DATA (DPS AND D18-TS OF SDHPT) AND CITY DEPARTMENTS THAT USE THE DATA

The UALC Project has not met the data needs of the cities. For five years, DPS quarterly printouts have been trashed when received at the local level. Monthly printouts produced from DPS computer tapes are not used much either. City employees are upset because state agencies are unresponsive to their data needs. For example, their requests for special analyses go unheeded by state agencies. State personnel are upset because cities make unrealistic requests which would require special computer programming and time-consuming analyses. At the same time, the cities refuse to use the data they already receive (via quarterly printouts and monthly tapes). Hostilities between the two groups have continued to build and communication has become blunted.

RECOMMENDATION #13:

The Traffic Safety Section and DPS should take a variety of steps to increase communication between state and local agencies concerned with traffic records. Possible steps include: a) establish a Traffic Records Committee composed of representatives of all parties involved in the UALC Project. The committee should discuss problems experienced by all parties, should meet at least once a year in Austin, and should be financed by D18-TS. b) make periodic site visits to participating cities in the UALC Project. The UALC Project coordinators at DPS and D18-TS should make themselves more accessible to the cities so that true feelings can be informally expressed. c) conduct regional traffic records workshops to discuss such topics as the State Accident Report Form, Habitual Violator Statutes and Proposed Legislation, Financial Responsibility Laws, the Uses of Accident Data, and the UALC Project. These workshops should be financed by D18-TS. and d) publish a newsletter to inform cities about the status of the UALC Project, about the results of research and evaluations based on data the cities have collected, and about topics of relevance to traffic safety and traffic records. The newsletter should also be financed by D18-TS.

PROBLEM AREA VIII

ADMINISTRATIVE AND COMPUTER EQUIPMENT BARRIERS MAKING THE STATE ACCIDENT DATA BASE INACCESSIBLE TO LOCAL USERS

The present State Traffic Records System is totally inadequate for meeting local needs for accident data. Not only are the DPS quarterly printouts poorly formatted, but DPS and the Traffic Safety Section of the SDHPT cannot handle special requests from cities for reports derived from the State Accident Data Base. This inaccessibility has caused many cities to shun the state system, and develop their own local-input systems. Several cities have withdrawn from the UALC Project because their needs were not being met. This trend will continue unless drastic improvements (short range and long range) are made. Many of the recommended short range changes were discussed previously, such as the reformatting of quarterly printouts. Although accident data should continue to be coded by DPS-Austin, a long-term change is needed in the method by which DPS-coded data is retrieved for local use. Presently, accident data in the State system can only be retrieved at the State level. Such data should be retrievable at the local (or Highway District) level. A distributive processing system now being evaluated by the SDHPT would allow such local retrieval of accident data.

When the distributive processing system becomes operational, DPS should discontinue sending quarterly computer printouts and monthly computer tapes directly to the cities. Instead, DPS should send monthly computer tapes to D-10 of the SDHPT in Austin. D-10 should enter the data into its computer and should forward (via remote terminals) accident data to each of the 25 district offices of the Highway Department. Standard printouts should be produced at the district offices each month and the computer printouts should be distributed to the cities within each district. With this system, the accident data base would be accessible at the district offices for cities that would like to run

special computer programs in order to receive special reports of accident data.

Each Traffic Safety Specialist should get actively involved in the retrieval of accident data for his district. Familiarity with the accident data base would help each Traffic Safety Specialist identify problems that need to be addressed in his District Highway Safety Plan (HSP), the district's input to the State HSP.

In summary, the Traffic Safety Section should support the centralization of data-entry procedures (via the efforts of DPS's Statistical Services Bureau) and the decentralization of data-retrieval procedures (via a distributive processing system and the efforts of field personnel in each of the SDHPT district offices).

RECOMMENDATION #14:

The Traffic Safety Section should develop a distributive processing system whereby traffic accident data coded by DPS-Austin are available via remote terminals at the 25 Highway District Offices.

APPENDIX A
STRUCTURED QUESTIONNAIRE

Questionnaire for OTS Project (Job 01),
Urban Traffic Record System Development:
Inventory of Current Needs

City _____

Date _____

I. Overall descriptions of city, police department, and traffic engineering department

A. City

1. What is population of city? _____
2. Does the city participate in the Urban Location Project? _____
What does it receive from DPS? monthly tape _____ quarterly print-out _____
3. Describe the accident history within city limits.
_____ accidents per year _____

4. What degree of coordination exists between the police, traffic engineering, and data processing components of the traffic records system?

5. Organizational chart for city government? Yes _____ No _____
Organizational chart for traffic engineering department? Yes _____
No _____
6. Briefly describe the traffic records system by tracing an accident investigation form through the system. (Start with the initial completion of form by policeman, and cover such things as city departments involved in processing the data, personnel, equipment, processing time, experience with DPS, depts. that keep hard copy files, etc.)

B. Police Department

1. How many policemen are assigned to the traffic section of the police department? _____
2. Does the department have special units assigned to traffic control and other units assigned to crime control? _____
3. Do you have STEP programs in operation now? _____ How do you monitor accidents? _____
4. Description of police department's involvement in traffic records system
 - a. Does the department have data processing equipment (i.e., computer, terminals, card punch, etc.)? _____
 - b. What is equipment being used for? _____
 - c. Does the department maintain hard copy files of accident reports? _____
How are they filed (chronologically, by location, or other)? _____
 - d. Are spot maps used? _____
 - e. Are supplementary files maintained on citations and court dispositions for non-DWI traffic offenses? _____
 - f. Are supplementary files maintained on citations and court dispositions for DWI offenses? _____
 - g. Who in the police department uses accident data and how is it used (for what purposes)? _____
 - h. Which municipal offices (besides police and traffic engineering departments) supply information to or make use of information from the city's traffic records system?
Suppliers: _____
Users: _____

i. Is there smooth interplay between local traffic records system and state traffic records system? _____

Describe any problems. _____

C. Traffic Engineering Department

1. What is size of traffic engineering department? _____

2. Does the department have ready access to data in the traffic records system (city P. D., DPS, data processing)? _____

3. What type data is used, who uses it, and how is it used? _____

4. Describe any problems created for your department by the present traffic records system. _____

II. Input Data--Police Department

A. Data from Accident Report Form

1. What type of data is collected? _____

2. What form is used to collect it? _____

3. Should questions be added/deleted to make the form more useful? _____
Specify. _____

4. Is there a quality control system to ensure accuracy of data? (super-
visor check? clerk check?) _____
Describe it. _____

5. What are common errors made by persons collecting initial data? _____

How can these errors be prevented, i.e., change in form, education of
data collector, etc.? _____

6. Do accident investigators receive training (initial and recurring) to
standardize their data collection techniques? _____ Do they
know how data will be used? _____

B. Supplementary Data

1. Besides the Accident Report Form, are separate forms used to make
Fatal Accident Reports, Follow-up Detailed Investigations, Witness
Reports, and reports on saturation enforcements (STEP programs, etc.),
etc.? _____ Specify which are used. _____

What data are acquired on each? _____

III. Filing System - Police, Traffic Engineering, Data Processing

A. General Description of Filing System

1. What filing system is used?
Manual only _____
Manual and Automated _____
If computers are used, describe the system.

Is the capacity of computer adequate for present and future processing of accident data? _____

2. What city departments file the hard copies of accident forms? _____

How are forms filed--by date of accident, location, type of accident (such as injury, fatality, or property-damage only), or by some other category? _____

Are supplemental forms related to each accident filed with or separate from the corresponding Accident Report Form? _____

3. Is an Accident by Location File maintained? _____ What data are contained in this file? _____

How is the file maintained? _____

Is the file beneficial to decision makers? _____

4. Is an Alcohol/Drug Related Accident File maintained? _____
What data are contained in this file? _____

How is the file maintained? _____

Is the file beneficial to decision makers? _____

5. Are spot maps used for quick identification of high accident-frequency locations? _____

Are the pins color-coded to indicate fatality-injury-PDO accidents?

6. What types of tally sheets are maintained to quickly identify problem areas (such as high accident-frequency locations, DWI involvement,)? _____

IV. Output Reports

a. Describe the Accident Summary Report or similar document in terms of items covered, degree of detail, ease of reading, etc. _____

How often is the report prepared? _____

Who gets a copy? _____

Is the report used or ignored? _____ By whom is it used and for what purposes? _____

b. Describe the High Accident Location Summary or similar document. _____

What constitutes a "High Accident Location"? _____

Is ADT taken into consideration when denoting a location as "high accident"?

_____ Is severity of accidents at the location taken into consideration? _____ How often is the Summary prepared? _____

Who gets a copy? _____

Is it used or ignored? _____ By whom is it used and for what purposes? _____

c. Describe the Selective Enforcement Summary or similar document. _____

How often is the Summary prepared? _____

Who gets a copy? _____

Is the summary used or ignored? _____ By whom is it used and for what purposes? _____

d. Describe the Alcohol/Drug-Influence Summary or similar document. _____

How often is the Summary prepared? _____

Who gets a copy? _____

Is the Summary used or ignored? _____ By whom is it used and for what purposes? _____

e. Describe any special reports made from the data filed; _____

f. What improvements could be made to the output reports to make them more useful to decision makers? _____

g. What improvements could be made to the process by which a report reaches a decision maker? _____

h. What impact does the records system have upon agency planning, scheduling, and operations? _____

V. List the names, job titles, and employers of those individuals supplying information for this needs assessment.

	<u>Name</u>	<u>Job Title</u>	<u>Employer</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____

APPENDIX B
SCHEDULE OF SITE VISITS

Schedule of Site Visits

<u>Site Visited</u>	<u>Date of Visit</u>
Corpus Christi	Nov. 1, 1979
Austin	Nov. 15, 1979
San Antonio	Nov. 29, 1979
Victoria	Dec. 13, 1979
Waco	Dec. 18, 1979
Bryan	Jan. 17, 1980
Midland	Jan. 22, 1980
El Paso	Jan. 24, 1980
Houston	Feb. 15, 1980
McAllen	Feb. 20, 1980
Brownsville	Feb. 21, 1980
Ft. Worth	Mar. 19, 1980
Arlington	Mar. 21, 1980
Dallas	Apr. 2, 1980
Garland	Apr. 3, 1980
Mesquite	Apr. 4, 1980
Amarillo	Apr. 10, 1980
Lubbock	Apr. 17, 1980
Laredo	May 15, 1980
Beaumont	May 21, 1980
Orange	May 22, 1980
Tyler	June 4, 1980
Texarkana	June 5, 1980
Wichita Falls	June 13, 1980
Galveston	June 20, 1980

APPENDIX C

SITE VISIT REPORTS FOR CITIES
THAT RECEIVE MONTHLY COMPUTER TAPES FROM DPS-AUSTIN

Houston, Texas (population approximately 1,232,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The Houston Crime Information Center (HCIC) of the Police Department receives monthly accident tapes from DPS-Austin and generates a series of computer printouts. The printouts are distributed to various divisions within the Police Department (PD), the Traffic and Transportation Department (TTD), and other city departments. Additionally, the PD and the TTD receive monthly computer printouts of accident data that have been locally-coded, input, and retrieved via the State Accident Statistical System (SASS). Thus, the city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Traffic and Transportation Department. The District 9 Traffic Safety Office of the SDHPT and the Region IV Education Service Center (ESC) are involved in the SASS system. The PD is currently responding to approximately 70,000 accidents per year. This figure does not accurately represent Houston's accident experience, since police do not respond to certain types of accidents. For example, police do not investigate those accidents which meet all the following criteria:

- 1) each driver has a valid driver's license
- 2) each vehicle can be driven from the accident scene.
- 3) no citizen demands an investigation.
- 4) no injury/fatality is involved.
- 5) no public property is damaged.

Certain accidents that occur within the city limits are investigated by police officers who complete Accident Report Forms. After the accident reports have been checked by police supervisors, they are forwarded to the Accident Division of the Traffic Bureau. A quality control officer in the Accident

Division checks the reports for completeness and accuracy. Clerical personnel in the Accident Division place location codes on the reports and update manual tally sheets used to compile data for the Daily Traffic Summary. The Accident Division keeps special files on accident reports involving fatalities, hit-and-runs, damage to public property, and DWI offenses. Copies of each report are forwarded to DPS-Austin and to the Region IV Education Service Center (for entry into SASS). Original accident reports are forwarded to the Records Division, Technical Services Bureau of the PD. There the reports are indexed via computer and are filed by case number in a location separate from non-traffic cases. The computer index facilitates future retrieval of original reports.

Each month the HCIC of the PD receives an accident tape from DPS-Austin. The Center logs in the tape and submits it to the computer room. A series of Vehicle Accident Monthly (VAM) reports is produced by the Center's Univac computer. VAM's are distributed to several divisions within the PD, to the TTD, and to other city offices. The PD also has access to traffic-related information processed by the Management Information System Department (MISD), the city department that functions essentially as a data processing department. Traffic citations, municipal court cases with their dispositions, and jail statistics are among the types of information processed by MISD's Honeywell computer.

In addition to furnishing accident data to city departments in Houston, the SASS system furnishes such data to other jurisdictions within District 9 of the SDHPT. The SASS system may be described as a "computerized traffic accident data input, retrieval, and analysis system which provides decision-making information to traffic safety education, engineering, and enforcement entities." A more detailed discussion of the SASS system follows.

State Accident Statistical System

The SASS pilot program is being funded with Federal 402 monies channeled through the Office of Traffic Safety, SDHPT. The contractor is the Region IV Education Service Center (ESC) in Houston. (See Appendix C for a description of the SASS system. The description was written by two ESC employees.) The first year's contract was concerned with the establishment of a traffic records system for Harris County; the second year's contract was concerned with the establishment of a traffic records system for all counties of District 9 of the SDHPT.

There are six offices within the Houston area that can input accident data directly to the SASS system via terminals connected to the Education Service Center's CDC Cyber 170, Dual 6400 computer. The following offices have this capability:

- 1) Region IV Education Service Center--7 terminals allow six terminal operators to input accident data from reports written by the Houston PD, the Spring Valley PD, and the Jersey Village PD. Each terminal operator can process between 100-120 accident reports each day.
- 2) Region II Headquarters, Department of Public Safety--1 terminal with 1 terminal operator to input accident data from reports written by State policemen in the Houston region. Participation in the SASS program allows DPS to monitor its STEP programs more effectively, and to identify problems earlier so that preventable measures can be implemented.
- 3) Harris County Sheriff's Office--1 terminal with 1 terminal operator.
- 4) La Porte PD--1 terminal with 1 terminal operator.
- 5) Baytown Planning and Traffic Department--1 terminal with 1 terminal operator.
- 6) Pasadena PD--1 terminal with 1 terminal operator.

The coding system used by SASS terminal operators is identical to the coding system used by the Statistical Services Bureau of the Department of Public Safety in Austin. Terminal operators use TI 770 Intelligent Terminals

to process accident data. The terminal operates in two modes. In the first mode, the data is loaded onto tape cartridges; in the second mode, the data on tape is transferred to ESC's CDC computer and stored on disks. Separate disks are kept for accidents pertaining to each city or jurisdictional unit, so each user can access its own data without searching entire files of county data. Disks contain accident data for the previous two years, plus accident data for the current year. The SASS System is capable of producing 20 types of computer printouts. Each month ESC sends the Houston PD four sets of printouts--one set is distributed to the Community Relations Division-Traffic Safety, one set is distributed to the Accident Division of the Traffic Bureau, one set is distributed to the Planning and Research Division, and one set is distributed to the Enforcement Division. The ESC also sends a monthly set to the Houston Traffic and Transportation Department.

Police Department

The Houston Police Department is organized into 3 major units: the Investigations Command, the Field Operations Command, and the Support Command. Crime control is a major function of the Investigations Command and traffic control is a major function of the Field Operations Command. The Field Operations Command is organized into the Patrol Bureau (North), Patrol Bureau (South), and the Traffic Bureau. The Traffic Bureau is composed of the Point Control Division, the Enforcement Division, and the Accident Division. The Point Control Division has approximately 143 uniformed officers who primarily work downtown. These officers control traffic and pedestrians during marches, riots, sporting events, etc. The Enforcement Division has approximately 190 uniformed officers (including 44 motorcycle officers) who primarily patrol freeways--issuing citations for moving violations. This Division does not

investigate accidents. The Accident Division has approximately 165 uniformed officers who primarily investigate accidents.

The PD does not conduct a STEP program because it is currently experiencing a manpower shortage. According to a Houston police officer, "They have no time for selective enforcement; the traffic problems in Houston are so great that the response time to an accident scene is averaging between 32 and 34 minutes." The PD has its own data processing equipment (two Univac 418-3 computers and one Univac 11-12 computer). The computers are used for processing crime information, as well as accident data from DPS monthly tapes. The Department uses DPS data primarily to answer special requests made by the public, and uses the Daily Traffic Summary (a manual tally of 24-hour statistics) for planning and operational purposes. The Department also has access to accident data through the SASS system. The two primary users of the SASS data within the PD are: 1) the Enforcement Division of the Traffic Bureau--it uses the information to aid the allocation of manpower and 2) the Community Relations Division-Traffic Safety--it uses the information to educate the public via the media, schools, and civic organizations.

The PD would like to continue to receive accident data produced via the SASS system--this is especially true of the Community Relations Division. The police expressed no criticism of the present format of SASS computer printouts, but stated that a weekly summary by district and a weekly detailed listing by district would be useful. (Houston is divided into 20 patrol districts. Software programs for DPS data allow analyses by patrol district, whereas the software for SASS data does not allow this.) A representative from HCIC stated that the PD was currently in no financial position to accept any of the financial burdens for the upkeep of SASS. He stated that additional monies would undoubtedly be used to hire additional enforcement personnel,

rather than used to finance a traffic records system that, in many ways, duplicates a system already in existence (i.e., the in-house system utilizing monthly accident tapes from DPS).

Traffic and Transportation Department

Houston's Traffic and Transportation Department (TTD) is organized into 3 Divisions: the Administrative Division, the Signal Division, and the Design Division. The TTD has 181 employees, 4 of whom are traffic engineers. The employee strength is inadequate when compared with that of traffic engineering departments of other cities in the United States. The TTD currently receives computer printouts of accident data from the Houston PD. These printouts are based on DPS-coded data. TTD also receives computer printouts from the Region IV Education Service Center. These printouts are based on locally-coded SASS data. The Department receives SASS data approximately six weeks earlier than it receives comparable DPS data, so it favors an eventual reliance on SASS data only. TTD does not receive copies of accident reports, so it relies on computer printouts when it identifies traffic-related problems and designs countermeasures to correct traffic engineering deficiencies. TTD has a TI Intelligent Terminal, so the Department has ready access to accident data in the SASS system.

TTD personnel expressed the following needs:

- 1) more personnel to handle the voluminous traffic problems in Houston--the Department especially needs more traffic engineers
- 2) more up-to-date traffic counts
- 3) a better way to prioritize their activities based on accident data and other traffic-related data
- 4) more information on volume of truck traffic and the frequency of hazardous loads in trucks--and the relationship of both of these counts to roadway deterioration and subsequent accidents.

- 5) more information on construction zone accidents.

Input Data

Houston's Accident Report Form includes only those questions required by DPS. Completed forms are checked by police supervisors, as well as a clerk in the Accident Division of the Traffic Bureau. The location codes and the patrol district where each accident occurred are placed on the form before it is sent to DPS-Austin. Copies of accident reports are also sent to the Region IV Education Service Center. There, terminal operators simultaneously encode and enter accident information onto tape cartridges at TI 770 Intelligent Terminals. The contents of the cartridges are later transferred to disks on ESC's CDC computer.

SASS supervisory personnel at ESC are confident that the quality of input data is good. First of all, the TI 770 Intelligent Terminal will not allow a terminal operator to enter illegal codes for specified data fields. If an operator inadvertently enters an illegal code, the terminal buzzes--notifying the operator that a typing error has been made. Secondly, supervisors closely monitor the quality of training the terminal operators receive and the quality of operator performance shortly after each operator is hired. A couple of operators at ESC have not worked out--so they were terminated. When the terminal operators at two small Police Departments were neglecting their coding duties, ESC started coding accident information for these cities. Thirdly, supervisors make random spot checks on the quality of data being entered by the terminal operators. The supervisors compare the coded data with the information appearing on selected accident reports.

Filing System

Original accident reports are filed by case number in the Records Division of the PD. These reports are indexed on the Department's computer, and the index is used when it is necessary to retrieve accident reports. The Accident Division of the Traffic Bureau keeps special files containing copies of accident reports relating to fatalities, hit-and-runs, and DWI/DUID involvement. The Accident Division also keeps manual tallies to compile data for a Daily Traffic Summary. The Traffic and Transportation Department does not receive copies of accident reports.

Output Reports

Numerous computer printouts are produced with DPS-coded data, as well as SASS-coded data.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The most urgent problem in both the Police Department and the Traffic and Transportation Department is insufficient manpower to adequately accomplish the duties traditionally expected of policemen and traffic engineers. Houston is growing at a tremendous rate; however, the PD and the TTD are not being expanded to handle the increase in traffic problems commensurate with rapid growth. A sophisticated traffic records system (such as the SASS system) is ideal for rapidly identifying problems related to traffic control. But one should always ask, "What effect will rapid problem identification have on the system? Can such information lead to the rapid implementation of effective countermeasures?" At the present time, Houston does not have sufficient manpower in the PD or the TTD to make adequate use of available traffic accident data-- either via the DPS system or the SASS system. It is not surprising to the

interviewer that the PD places low priority on their need to fund a new traffic records system, when the police do not make adequate use of accident information available through their existing system.

Fort Worth, Texas (population approximately 424,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Fort Worth Police Department (PD) place location codes on accident reports prior to sending the reports to DPS-Austin. The Data Processing Department in Fort Worth receives monthly computer tapes from DPS-Austin and generates a series of computer printouts which are distributed to the Traffic Division of the PD and to several offices within the Transportation Department (TD). The computer programs used to extract accident data from magnetic tapes were written five years ago by a former employee of the TD. The resulting computer output is formatted for the convenient use of traffic engineers and not for the convenient use of policemen. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Transportation Department, and 3) the Data Processing Department. Fort Worth is currently experiencing approximately 24,000 accidents per year. There were 129 traffic-related fatalities in 1979, compared with 84 fatalities in 1978. This increase in fatalities led to an internal (as well as external) evaluation of the merit of the PD's traffic enforcement program.

An accident that occurs on city streets is investigated by a police officer who completes an Accident Report Form. No private property accidents are investigated, but all public property accidents are investigated. The PD does not follow a "greater than \$250 damage" rule when deciding which public property accidents must be investigated. When an accident report is turned in, it is reviewed by a Sector Supervisor for completeness and accuracy. Each of three sectors keeps monthly and quarterly hand tallies of its accident experience. Accident reports are forwarded from Sector Headquarters to the

PD's Traffic Division. The Traffic Division consolidates the reports received from the Patrol Division with the reports received from officers assigned to the Traffic Division. The Traffic Division keeps hand tallies on certain types of accident information. This data is used to complete monthly reports but is not used to facilitate operational planning. Accident reports are then sent to the Records Division where copies are made, a computerized index is updated, and the original is filed by date of accident. The Records Division places location codes (as well as codes for Police Reporting Areas--PRA's) on one copy and sends it to DPS-Austin to be entered into the State traffic records system. The PD's computerized index is updated with the following information about each accident: case number, location of accident, type of accident, date of accident, and names of drivers/pedestrians involved. Monthly computer printouts of this information facilitate the future retrieval of original accident reports.

The Data Processing Department receives monthly accident tapes from DPS. A series of computer printouts is produced and distributed to various local and State offices.

Police Department

The Fort Worth Police Department is organized into five major units: the Investigative Services Bureau, the Administrative Services Bureau, the Personnel Services Bureau, the Technical Services Bureau, and the Uniformed Services Bureau. The Uniformed Services Bureau consists of two Divisions: the Patrol Division and the Traffic Division. Approximately 300 uniformed officers are assigned to the Patrol Division. These officers work three shifts, providing service 24 hours a day, 7 days a week. Approximately 54

uniformed officers are assigned to the Traffic Division. These officers work two shifts, providing service from 6:00 A.M. to 11:00 P.M., Monday through Friday. Thus, the Traffic Division does not work weekends or graveyard shifts.

The PD conducts a DWI STEP Program and a Comprehensive STEP Program. Both programs are managed by the Traffic Division Commander and are monitored by the Traffic Safety Coordinator of the Transportation Department. The DWI Program is implemented by 8 uniformed officers and a Sergeant who work on an overtime basis from 11:00 P.M. to 4:00 A.M., Friday and Saturday nights. The Comprehensive Program is implemented by 5 uniformed officers who work on an overtime basis from 10:00 A.M. to 11:00 P.M., Monday through Friday. These officers provide increased traffic enforcement at selected trouble spots.

The PD has its own computer, but the equipment is not used to process accident data. Their IBM Series 1 computer is used for a variety of functions, including criminal history, fast fingerprint, crime analysis, and resource allocation. In addition, the PD has terminals and line printers connected to the ITTEL mainframe computer and the IBM 371-45 computer housed in the Data Processing Department. Two of the functions performed by the PD's remote terminals and printers are: 1) a computer-aided dispatch system and 2) a direct-entry, office reporting system for crime data.

The PD maintains files of original accident reports. The reports are filed chronologically. Spot maps are not being used. The PD receives from the municipal court a monthly computer printout that presents summary statistics in the following categories: "Number of Citations Issued" and "Type of Disposition." The PD is skeptical of this data, since the court's definition of "disposition" is different from the Department's definition.

The interplay between Fort Worth's traffic records system and the State traffic records system is not smooth. According to local police personnel, the State is too slow in processing accident data, and the Accident Report Form is inadequate. The following complaints were made about the State Accident Report Form:

- 1) The form does not provide adequate space to enter information for certain items.
- 2) The diagram is hard to use and too small to enter all pertinent information.
- 3) The form requires the police officer to record too much information. This excess information is valuable only to insurance companies. It is not being fed back to police departments and traffic engineering departments so that appropriate countermeasures may be implemented. Police resent having to collect information that will not lead to accident reduction.
- 4) The form does not clearly specify that the accident investigator may check more than one contributing factor for each driver. Many investigators check only one contributing factor, when most accidents result from multiple causes.
- 5) There is no place on the form to indicate that the accident was a "hit and run." A supplemental sheet must be completed for this type of accident.

Transportation Department

The Transportation Department has a Director and two Assistant Directors. The Assistant Director for Transportation Programs is involved with the following functions: grant application, grant monitoring, disposition and control of Federal monies, city bus, mass transit, Ride and Share, Mobility Impaired Transportation Service, and Transportation Services Information Center. The Assistant Director for Engineering Programs is involved with the following functions: traffic engineering and design,

signs and markings, and lights and signals. There are 11 staff members in the traffic engineering and design section--6 function as traffic engineers and 5 function as investigators. An investigator researches each fatal accident by making a site visit and by reviewing the paperwork relating to the accident. The review can be accomplished with relative ease, since the TD receives a copy of the accident report for each fatal accident. An investigator also reviews the paperwork on the accidents that occur at the TOP 20 High Accident Locations. This review may require the investigator to go to the PD to look at the hard copies of relevant accident reports.

The TD makes extensive use of the computer printouts derived from DPS-coded accident tapes. Personnel in the TD noted that these printouts are received 2 or 2½ months following the close of a particular month. These personnel were not upset about this delay, since many of their decisions are based on long-term accident trends. The Department uses the TEAP 15-01 Series, i.e., Accident Ranked by Number Reported, more than any other series. The 15-01 Series yields the number of "before accidents" and the number of "after accidents" relevant to a traffic engineering improvement. These numbers are entered onto a variety of monitoring forms, including the Before and After Analyses of Improvement and the Summary: Signal Timing & Evaluation Data.

Input Data

Fort Worth's Accident Report Form includes only those questions required by DPS. As noted earlier, police personnel are not pleased with the present form. According to these personnel, the form is too lengthy, requires the gathering of information only useful to insurance companies, etc. Common

errors made by police officers who fill out the form are:

- 1) "Under Construction" section left blank.
- 2) "Is this complete?" question left unanswered.
- 3) Damage rating is wrong.
- 4) Injury data on back of form not filled out, when required.
- 5) Diagram drawn incorrectly.

The PD's poor attitude toward the administrative functions associated with accident investigations leads to input data of questionable quality.

Filing System

Original accident reports are filed chronologically in the Records Division of the PD. These reports are indexed via a terminal connected to the Data Processing Department's main frame computer. The Traffic Division of the PD and the TD keep special files containing accident reports involving fatalities. The Traffic Division also keeps manual tallies to compile data for monthly and quarterly activity reports.

Output Reports

The TD uses the computer printouts based on DPS-coded data, but the PD ignores these printouts. Presently, the PD has little faith in the quality of the input data and, thus, the quality of the output reports. Police personnel feel that these problems will continue until the Accident Report Form is changed so that police officers will have to collect only that information which is directly related to the identification of enforcement problems and engineering problems.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Function of City Departments

The traffic records system in Fort Worth has little impact on the planning and operations functions within the Police Department. This situation is a result of several factors, such as:

- 1) the low priority of traffic control as compared with crime control.
- 2) a "seat-of-the-pants" decision-making technique that ignores accident data. Problems are identified only via the aid of "experience"; manpower is allocated and scheduled with the aid of "experience" and an overconcern for the desires of police officers.
- 3) the police are skeptical of the accuracy and usefulness of accident data they are "forced to collect for insurance companies"--so the police make little use of the computer output.
- 4) the computer output is not formatted to meet the needs of the PD. The Department does not have the manpower to further process data presented on computer printouts.

The interviewer feels there is a direct link between the PD's poor use of the traffic records system and the increasing fatality rate currently being experienced in Fort Worth. Recent personnel changes (i.e., a new Chief of Police, a new Director of Traffic, etc.) offer the possibility that the traffic records system may be used as a management tool in the future.

The Transportation Department is pleased with the traffic records system and relies quite heavily on a series of computer printouts derived from DPS monthly tapes. A computer programmer in the TD wrote the software for the computer output, so accident data is presented in formats useful to traffic engineers. Apparently, there was little or no consultation between the TD and the PD to decide what formats would be useful to the police. The interviewer sensed that there is still inadequate cooperation between the two departments.

Austin, Texas (population approximately 300,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Austin Police Department place location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the state traffic records system and sends a magnetic tape containing accident data to Austin each month. Computer printouts are produced which present the data in various formats. The city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Department of Urban Transportation. Austin is currently experiencing approximately 17,000 accidents per year.

An accident occurring within the city limits is investigated by a police officer who completes an Accident Report Form. The accident report is checked by a police supervisor and three copies are made. The original report is filed in the Central Records Office of the PD. One copy is filed at the front desk of the PD and is available for public use; one copy is used for court proceedings if a citation was issued; and one copy is sent to DPS after the PD's Data Processing Division adds location codes to the report. (A four-digit code is added if the accident occurred at mid-block; two four-digit codes are added if the accident occurred at an intersection.) DPS encodes the information contained on accident reports and enters the data onto a magnetic tape. A copy of the tape is sent to the PD each month. The PD makes two additional copies. One copy is sent to the Department of Urban Transportation (DUT), one copy is kept at the PD, and the original copy is returned to DPS. Neither the PD nor the DUT attempts to edit the tape before the data is further processed.

Police Department

The Austin Police Department is organized into 4 major units: the Field

Operations Bureau, the Support Services Bureau, the Administrative Services Bureau, and the Special Investigations Bureau. Approximately 250 uniformed officers are assigned to these bureaus. These officers are responsible for both traffic control and crime control in the five sectors of the city. The PD does not have special units assigned exclusively to traffic control and other units assigned to crime control.

The PD is currently conducting a STEP program which involves the use of motorcycles for traffic control. Two motorcycle officers are assigned to each sector of the city. The STEP grant pays 100% of the salaries of these ten officers, plus one sergeant, during 1980. Step will pay 80% in 1981 and will decrease its support by 20% for each of the remaining years of the five-year grant. No special procedure is used to monitor accidents in STEP areas. Accidents are monitored on a city-wide basis.

The PD has an IBM System 3, Model 10 computer which permits the entry of data via magnetic tapes and disks. The System also allows the entry of data via computer terminal, but the terminals are only being used to enter information from offense reports and information from accident reports that are associated with offense reports. Eventually, the information for all accident reports may be entered via computer terminal before the reports are sent to DPS.

Original accident reports are kept in the Central Records Office and are filed by location (and then by date within each location). Hard copies of accident reports are kept for the current year and the previous year; then they are destroyed. A spot map is used to depict the locations of fatal accidents. Tri-colored pins indicate the locations of fatal accidents that have occurred during the current year and the two previous years.

A statistical clerk keeps a daily count of traffic citations (categorized as "hazardous," "non-hazardous," or "warning") and court dispositions for non-DWI traffic offenses. The clerk also keeps a daily count of citations and court dispositions for DWI and DWLS offenses. This daily information is hand tallied and presented as enforcement statistics in a monthly report: Comparison Summary: Collision/Enforcement. The collision data appearing in this report are compiled by DPS and sent to Austin via a monthly printout, Motor Vehicle Traffic Accidents.

Department of Urban Transportation

The Department of Urban Transportation (DUT) is organized into three major units: 1) the Systems Division, 2) the Safety Division, and 3) the Traffic Operations Division. DUT employs 70 individuals, including six traffic engineers. The department has an IBM 1800 computer which is used for traffic control (i.e., monitoring the timing of 250 traffic lights in Austin) and for data processing. The data processing tasks consist mainly of analyzing accident data, storing volume counts, and storing inventories of traffic control devices. The IBM 1800 computer at the DUT does not have a tape drive, so the system cannot directly handle DPS-coded data on magnetic tape. DUT must take the tape to City Hall where a tape-driven, IBM 370 computer reformats the accident data for a particular month and punches the data onto IBM cards. The cards are returned to DUT where they are run through the IBM 1800 computer. Two computer printouts, TOP 50 Intersections and TOP 50 Midblocks, are produced monthly. Collision inventories are produced quarterly. Copies of these printouts are sent to the Traffic Division of the PD. DUT stores accident data on disks for three consecutive years, with twelve months of data stored on each disk.

DUT personnel are displeased with the 1½-month delay in getting accident tapes from DPS. Another source of displeasure is that the location codes used by the PD are not specific enough and may sometimes be inaccurate. DUT personnel would also like to receive computerized collision diagrams, rather than computer printouts that give only coded information in an accident-by-accident format.

In order to correct engineering defects that may be contributing to the high frequency of accidents at certain locations, DUT initiates work orders that request the Department of Public Works to check these locations for specific hazards and correct existing problems.

Input Data

Austin's Accident Report Form includes the items of information required by DPS, plus a special section for the identification of witnesses, witnesses' descriptions of the accident, and drivers' descriptions of the accident. Police sergeants and a records clerk check the quality of accident reports. The records clerk returns incomplete/inaccurate reports to the investigating officers, through the appropriate Captains for their knowledge and input to the re-education/discipline process.

A PD official recommends that the Factor Contributing to Accident (Officer's Opinion) section be deleted from the form. The official made the following remarks to substantiate his recommendation:

Some insurance companies are using this section to try to avoid paying claims. Accident investigators have to spend too much time in court trying to justify their ratings in this section. A police officer should just be required to record facts about the accident, rather than opinions. This is especially true since there is a fine line between 'who was at fault' and 'who broke the law'.

Filing System

The PD keeps hard copy files of accident reports. These reports are filed first by location, and then by dates within each location. The PD also keeps DPS-coded tapes of summary statistics. The DUT keeps disks containing subsets of the accident data found on DPS tapes.

Output Reports

Each month the PD uses the DPS magnetic tape to produce a computer printout that lists accident-involved drivers by race/sex. The PD sends a copy of this report to the DUT. The Data Processing Division of the PD also handles requests from the DUT for special computer printouts.

The DUT produces several reports using the IBM cards punched at City Hall. (The cards contain accident data automatically transferred from DPS computer tapes.) Among the reports produced are 1) the TOP 50 Intersections having the most accidents for the previous 12-month period and 2) the TOP 50 Midblocks having the most accidents for the previous 12-month period. The reports are produced monthly and copies are sent to the PD. No other city department receives these reports on a regular basis.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Not much overall. The PD places more emphasis on data analysis for crime control than on data analysis for traffic control. The personnel interviewed seemed quite capable of presenting locally-compiled and DPS-compiled accident data in numerous formats, but it appears that mid-management and higher-management places low priority on the analysis of accident data and the use of such data in decision-making processes.

The DUT is making fairly good use of accident data for collision analyses,

engineering modifications, etc. The department would like to do more, but it is hampered by having to use outmoded data processing equipment. DUT has requested a remote terminal so it will have access to the city's IBM 370 computer and, thus, can eliminate the "magnetic tape to IBM card" transfer that is currently a nuisance to the traffic records system.

Corpus Christi, Texas (population approximately 205,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety (DPS). Personnel in the Traffic and Transit Department (T&T) place location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the state traffic records system and sends a magnetic tape containing accident data to Corpus Christi each month. The tape contains monthly and year-to-date information concerning the city's accident history by location. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Department of Traffic and Transit, and 3) the Department of Staff Services, Data Processing Division. Corpus Christi is currently experiencing approximately 7000 accidents per year.

An accident occurring within the city limits is investigated by a police officer who completes an Accident Report Form. The form is checked by a police supervisor, and two copies are sent to T&T. T&T personnel add census tract codes, alcohol involvement codes, and location codes to the forms; file one copy; and send the other copy to DPS. DPS encodes the information contained on accident reports and enters the coded data onto a magnetic tape. (PDO accidents resulting in less than \$250 damage and accidents assigned a TAD damage rating of 1 are not coded by DPS.) DPS also encodes the information received on blue forms that are not accompanied by Accident Report Forms, and enters the blue-form data onto the same magnetic tape. The resulting tape is incorrect/incomplete for several reasons, two of which are 1) DPS often miscodes accident locations derived from imprecise blue-form information and 2) DPS does not code PDO accidents less than \$250 damage or TAD-1 accidents. A copy of the tape is sent to Corpus Christi where it is edited by T&T and Data Processing personnel. The editing process consists of correcting data erroneously entered from blue forms,

adding data that was missing on blue forms, and adding data concerning "less than \$250" PDO accidents not coded by DPS. After the magnetic tape is edited, the Data Processing Division prints a series of reports and distributes the reports to various city departments.

Police Department

Prior to January 1979, 34 uniformed officers were assigned to the traffic section of the PD. These officers were almost totally responsible for the enforcement of traffic laws and the investigation of accidents in Corpus Christi. In January 1979, all uniformed officers were made responsible for issuing traffic citations and investigating traffic accidents. Thus, 180 policemen are presently involved in traffic control. This change created the problem of having to investigate accidents with less experienced investigators, which resulted in the gathering of less accurate data on the Accident Report Form. The PD is presently training its new investigators on how to conduct accident investigations and how to collect accurate data. The PD investigates all accidents resulting in at least \$25 damage.

The PD is currently conducting a STEP program with a special task force. Accident totals are kept manually for each census tract where STEP is deployed. The PD also keeps up-to-date information on accidents occurring during each 24-hour period. This information is kept current by using ten 32-70 remote terminals connected to the IBM 370 computer housed in the Data Processing Division, Staff Services Department. Certain accident information (i.e., location of accident, time of day, investigating officer, and injury classification) is presented daily to beginning shifts via a morning report.

The Traffic Section keeps a spot map that depicts the location of fatality accidents. This section makes little use of accident data received from Data

Processing because "the information is received too late to be of value in planning and scheduling" (i.e., 2 or 3 months late). Also, the section questions the value of computer printouts derived from DPS-coded data since the magnetic tape contains only data on accidents whose damage assessment is \$250 or greater. The PD would like to receive traffic-related information that is not on the magnetic tape, such as the number of citations issued and some measure of traffic volume. This information would help them to better evaluate their performance in accident prevention.

Traffic and Transit Department

The Department of Traffic and Transit has a staff of 45, including four traffic engineers. T&T adds census tract codes, alcohol involvement codes, and location codes to accident reports before the reports are sent to DPS. T&T edits the monthly tape received from DPS and oversees the production of monthly reports and special reports, such as the Skid Number Inventory. T&T uses the reports to monitor ongoing programs, such as the barricade program.

T&T personnel are displeased with the lag time inherent with having DPS and the Data Processing Division in the data processing loop. They would like their own terminals connected to the city's computer so they could encode, enter, and retrieve their own data. This would allow them immediate access to accident information. T&T personnel are aware that this capability would result in a duplication of effort with DPS.

Data Processing Division, Staff Services Department

The Data Processing Division has nine programmers, an IBM 370 computer, and 57 terminals placed in different departments throughout the city. Because the Division also processes information related to utilities, accounting, libraries, taxes, etc., the analysis of accident data is a low priority

activity.

The Department Director originally wrote the computer programs used to access data from DPS tapes and print various reports, such as:

- 1) Accident Location and Analysis by Census Tracts
- 2) Restraining Device Used vs. Damage Scale vs. Severity of Injury
- 3) Pedalcyclist Accidents
- 4) Pedestrian Accidents
- 5) Accidents by Time of Day vs. Day of Week
- 6) Barricade Accidents
- 7) DWI Accidents by Time of Day vs. Day of Week
- 8) Accidents Related to and Influenced by Alcohol
- 9) Intersection Accidents Approaching at an Angle

Input Data

Corpus Christi's Accident Report Form includes only those questions required by DPS. This information, along with the census tract codes, the alcohol involvement codes, and the accident location codes, serves as the input data for the traffic records system. A supervisor in the PD presently conducts a quality control check of the accident reports submitted. Efforts are also being made to train formerly "patrol-only" officers in the methods of accident investigation, including proper data collection techniques.

Filing System

The PD and T&T keep hard copy files of accident reports. The information is also kept in data files on the IBM 370 in the Data Processing Division.

Output Data

The Accident Location and Analysis by Census Tracts report presents year-to-date information in numerous categories for each of the 37 census tracts

in Corpus Christi. Some of the categories are: type of accident, highest degree of injury suffered, violations contributing to accident, driver severity of injury by vehicle classification, vehicle severity of damage by vehicle classification, day of week, time of day, light condition, weather, road surface condition, etc. This report is received by the city manager, the PD, T&T, and the Data Processing Division. T&T uses this, and the other computer printouts previously mentioned, to identify problems that can be solved by the addition/deletion of traffic signals, signs, pavement markings, street lighting, etc. T&T also uses computer printouts to monitor ongoing programs such as the barricade program. The PD makes limited use of computer output of accident data. The interviewer suspects that the police were not consulted during the initial planning stages of the traffic records system and that their needs for accident data were not adequately assessed. The resulting computer printouts are therefore more useful to traffic engineers, than to police.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Not much overall. It appears that most departments make little use of computer output of accident data. The Traffic and Transit Department uses the output more than any other department. However, T&T is displeased with the present procedures for editing and retrieving accident information. T&T does not have remote terminals connected to the IBM 370, so T&T must rely on the Data Processing Division to carry out the editing and retrieval functions identified as necessary by T&T. T&T feels that if remote terminals were located in T&T, some of the cumbersome and inefficient procedures could be eliminated.

Some departments, e.g., the Police Department and the Street Division of the Engineering Services Department, do not trust the accident data from DPS

("not only is it late, but it's inaccurate!"). Consequently, these departments ignore the computer printouts of accident data. Other offices, e.g., T&T and the Data Processing Division of the Staff Services Department, do trust the data. T&T and Data Processing understand what causes the discrepancies between the DPS-compiled data and locally-compiled data. T&T contends that DPS data is sufficient for long-term planning purposes, but that the turnaround time is too great for the data to be useful in spotting short-term problems, such as construction zone accidents. This is probably an accurate assessment of the situation.

Garland, Texas (population approximately 155,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Traffic and Transportation Department place location codes on accident reports prior to sending the reports to DPS-Austin. DPS codes the accident information, enters it into their computer, and produces monthly accident tapes for Garland. These accident tapes are mailed to Garland's Data Processing Department which produces monthly computer printouts of accident information. Thus, the city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Traffic and Transportation Department, and 3) the Data Processing Department. There is excellent coordination among these three components of the traffic records system. Garland is currently experiencing approximately 3600 accidents per year, with 5 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. The officer turns in the form to the Records Section of the PD. A clerk in the Records Section places a local accident number on the accident form and forwards it to the Traffic Supervisor of the Traffic Bureau. The Traffic Supervisor checks the form for completeness and accuracy. An incomplete or inaccurate report is returned to the investigating officer. Complete and accurate reports are returned to the Records Section, after the Traffic Supervisor has updated several manual tallies of accident data. The tallies are later used to complete monthly traffic reports for the Chief of Police and the City Manager. Clerks in the Records Section make copies of original accident reports and forward them to other city departments that have a need for accident information. The original Accident Report Form is kept on file in the Records

Section for 2 years, and then it is microfilmed. The Records Section of the PD forwards a copy of each accident report to the Traffic and Transportation Department (TTD). TTD makes another copy of the report and files it. TTD adds location codes to the other copy and sends it to DPS-Austin. DPS encodes and processes the accident information and sends monthly accident tapes to Garland. Accident data is extracted from these tapes via software written several years ago by programmers in the Data Processing Department.

Because of the delay involved in the use of DPS-coded accident data and the loss of 20-25% of its accidents (due to DPS's failure to code accidents below \$250 damage), Garland has developed its own locally-coded/processed, accident data system. Personnel in the Police Department, the Data Processing Department, and the Traffic and Transportation Department have collaborated in the design of a traffic records system that will more readily meet the city's needs. Computer hardware for the system includes an ITEL ASA 3-5 computer (the city's computer housed in the Data Processing Department) and data entry/retrieval terminals and printers (located in the PD). Computer software for the system was written by a systems analyst and 4 programmer analysts in the Data Processing Department. These five people are concerned exclusively with the data processing requirements of 9 police systems pertaining to such areas as offenses, arrests, Computer Aided Dispatch, police personnel, stolen articles, and accidents. These programmers are currently in the final phase of making the local accident data system operational.

When operational, a data entry clerk in the Records Section of the PD will be able to enter accident data directly to the city's computer via the use of CRT terminals. Several formats will appear on CRT screens and will be used to input and retrieve accident data. The computer programs were written

so that data files can be searched by using 6 different parameters. The keypunch operator specifies the parameter for the search and the CRT/printer presents accident information in one of 6 BROWSE formats:

- 1) Accident Number Browse
- 2) Accidents by Date/Time Browse
- 3) Accident Persons Browse
- 4) Accident Officers Browse
- 5) Call for Service Browse
- 6) Accident Address Search.

Police Department

The Garland Police Department is organized into 4 major units: Staff Services Division, Auxiliary Services Division, Criminal Investigation Division, and Patrol Division. The Patrol Division consists of 5 sections or bureaus: Patrol, Tactical, Traffic Bureau, Warrant Services, and Metro. Seventy (70) uniformed officers and twelve (12) supervisors are assigned to the Patrol Section. Six (6) uniformed officers and one (1) supervisor are assigned to the Traffic Bureau. The officers assigned to the Traffic Bureau investigate all fatal accidents, all hit-and-run accidents, and 50% of all other accidents. The Traffic Bureau supervisor monitors a STEP program which provides selective enforcement for the 10 major arteries in Garland. The program emphasizes DWI arrests at these 10 locations which were identified via the use of DPS coded and compiled accident data. STEP activities are primarily performed by patrol officers working on an overtime basis.

The PD has 15 CRTs and printers connected to the ITTEL ASA 3-5 computer housed in the Data Processing Department. These terminals and printers are used for processing information relevant to 9 police systems. The PD expects

to add 5 more terminals and 1 high-speed printer to its data processing capability.

The PD maintains hard copy files of accident reports. Accident reports are filed numerically by local accident number, stored for 2 years, and then microfilmed. Spot maps are not routinely maintained--however, when a problem location has been identified, a localized spot map may be developed to help clarify the situation. The municipal court enters citation information onto the city's computer and a Distribution of Enforcement by Month printout is received by the PD. The municipal court also enters the disposition of each citation issued. This information is presented on the Disposed Citation Register received by the PD each month.

Four records clerks are assigned to the Records Section of the PD. One of these clerks will be assigned the task of entering accident data via CRT terminals. This clerk will be able to handle the present workload (approximately 10 accidents per day) during her 8-hour work shift. The Records Section does not keep manual tallies of accident data; however, the Traffic Bureau keeps manual counts so that monthly reports can be compiled for the Chief of Police and the City Manager.

The interviewer was very impressed with the Assistant Director of the PD and his extensive use of crime data and traffic data to manage the operations of the Criminal Investigation Division and the Patrol Division. He uses a management-by-objectives approach to determine how projected statistics compare with actual statistics for police operations in Garland's three sectors. The Assistant Director prepares Red-Yellow-Green color charts to graphically emphasize how each sector is meeting its monthly/year-to-date objectives. Citywide color charts are also prepared to brief the Chief of

Police and the City Manager on police activities.

Traffic and Transportation Department

The Traffic and Transportation Department (TTD) has 20 employees; 2 of whom are traffic engineers. The Department is divided into 4 divisions:

- 1) Planning and Design, 2) Signal Operations, 3) Signing and Marking, and
- 4) Transit Operations.

The TTD places location codes on accident reports prior to sending the reports to DPS-Austin. Monthly accident tapes are sent from DPS to Garland's Data Processing Department where monthly computer printouts of accident data are produced. The monthly tape contains data separated into 3 types of records:

- 1) Record A contains General Information.
- 2) Record B contains Driver and Vehicle Information.
- 3) Record C contains Casualty Information.

The software used to access the accident data contained on tape can only extract information from Record A. Therefore, the traffic engineers feel that too much information is being lost under the present traffic records system. Traffic engineers are also displeased with DPS's administrative policy of ignoring PDO accidents involving less than \$250 damage. Traffic engineers feel that problem identification is hampered by the implementation of such an arbitrary policy. One engineer made the following comment:

"20 to 25% of our accident information is lost."

The TTD keeps a hard copy file of the first pages of accident reports. Current year and past year reports are filed by their local accident numbers. Traffic engineers use these accident reports for developing collision diagrams,

because the information contained on monthly computer printouts (DPS data) is insufficient for developing such diagrams. TTD personnel are looking forward to the implementation of the new traffic records system, i.e., a locally-coded and locally-processed accident data system. TTD does not have enough time or personnel to conduct adequate engineering/accident studies--using current printouts and hard copies of accident reports. Therefore, it welcomes a computerized system sophisticated enough to draw collision diagrams upon request.

Data Processing Department

The Data Processing Department has a Director, a Lead Analyst, 4 Systems Analysts, and several programmer analysts. One Systems Analyst and 4 programmer analysts work exclusively with the data processing requirements of 9 police functions, such as Offenses, Arrests, Computer Aided Dispatch, Police Personnel, Stolen Articles, and Accidents. An excellent working relationship exists between the "police" systems analyst and police personnel.

The Data Processing Department has recently increased the capacity of its computer facilities threefold. Its new equipment includes an ITTEL ASA 3-5 mainframe computer (which is equivalent to an IBM 370-158). Software is currently being rewritten for the arrested persons file, the police personnel file, and the Computer Aided Dispatch file. New programs will allow more timely and more efficient use of these files.

Input Data

Garland's Accident Report Form includes only those questions required by DPS. Police, traffic engineering, and data processing personnel are fairly pleased with the substance of the questions asked on the form.

However, data processing personnel commented that the design of the accident form is bad, i.e., the questions do not follow a logical sequence. Thus, the transfer of information to a computer is a cumbersome process. For example, if a driver or owner is injured in an accident, the data entry clerk must flip the page to find out.

The interviewer failed to obtain enough information to make a firm statement about the quality control system used to ensure the accuracy of input data. A patrol supervisor check and a Traffic Bureau Supervisor check are supposedly performed, but the interviewer feels that stricter controls should be implemented. Four of the six uniformed officers assigned to the Traffic Bureau have attended the Accident Investigation School taught by Texas A&M University.

Filing System

The PD files original accident reports numerically (by local accident number) and keeps each report for 2 years. After 2 years, the report is microfilmed. The TTD files the first page of accident reports numerically (by local accident number) and keeps current year and past year reports on file. Other reports are destroyed.

Accident information is filed on computer tape--via the DPS system. Accident information (locally coded and entered) will soon be stored locally on disks.

Output Reports

PD and TTD personnel are generally displeased with the computer printouts derived from DPS-coded accident data. Two factors seriously reduce the usefulness of DPS data: 1) the 1-1½ month delay in receiving

monthly printouts and 2) the incomplete accident histories resulting from the "no PDO less than \$250 damage" rule. The PD hopes that the use of locally-coded and processed data will facilitate a more timely and accurate completion of monthly reports to the Chief of Police and the City Manager, will support a more efficient way of monitoring the accomplishment of crime/traffic goals within each sector, and will support a more effective way of monitoring selective enforcements financed via STEP grants. The PD hopes the new traffic records system will replace most, if not all, of the manual processing of data. The new system will allow searching through accident files using 6 different parameters. This capability will save data clerks countless hours of searching through hard copy files to answer specific questions related to accidents.

Traffic engineers are displeased with the formats of current computer printouts which give no information concerning the driver, the vehicle, or casualties. New software is needed to extract this information from the monthly tapes--if Garland continues to participate in the Urban Accident Location Coding Project. Traffic engineers expect the new traffic records system to furnish this type of information--as well as collision diagrams upon request.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The traffic records system in Garland has substantial impact on the planning, scheduling, and operations functions within the Police Department. The interviewer was impressed with top management's use of accident data, as well as crime data, in a Management-By-Objective approach to leadership. The new traffic records system (with local coding and local processing of accident data) should make the Police Department even more

effective in the future.

The interviewer was also impressed with the expertise of the Systems Analyst in charge of data processing for 9 police functions. He is employed by the Data Processing Department and has an outstanding working relationship with police personnel. He, his 4 programmer analysts, and police personnel have designed the best local-input system the interviewer encountered on his visits to 25 Texas cities.

The Traffic Engineer who was interviewed is quite progressive and is anxious to receive timely and accurate accident data. He is well aware of the deficiencies in the data currently being received--and was eager to point out the sources of these deficiencies.

Beaumont, Texas (population approximately 140,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Urban Transportation Department place location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the State traffic records system and sends monthly computer tapes to Beaumont. The tapes have not been used since early 1978, but computer programs are still available for analyzing the traffic accident data. The programs were written in 1976 by a Dallas consulting firm, Pinnell, Anderson, Wilshire, & Associates, Inc. Beaumont's traffic records system which utilized DPS-coded data bogged down and became inoperative for a variety of reasons, such as:

- 1) The hardware limitations of the Data Processing Department's computer (an IBM 360, Model 20). The computer system has no tape drive, so DPS-coded data had to be transferred from magnetic tape to computer cards, and then to computer disks, before the data could be analyzed. Gulf States Utility Company converted the data from tape to cards. The Data Processing Department converted the data from cards to disk.
- 2) The low priority that the Data Processing Department gave to the entry of citation data onto disks. The original "OTS-Beaumont-Pinnell & Associates" contract required that citation data, as well as accident data, be compiled via computer for comparative purposes. The entry of citation data became a task of the Data Processing Department. This Department delayed the entry of citation data, which in turn delayed the production of computer printouts for the entire system.
- 3) The "unreadable" formats of some of the computer printouts. Some printouts designed by the consultants presented accident data in coded format. This data had to be decoded before it could be used.

For these reasons, the traffic records system based on DPS-coded data is not operational at this time. The traffic engineers are displeased with the consultant-designed system and would like to receive quarterly printouts from DPS until another system is developed. Eventually, the traffic engineers would like to receive DPS-coded data on floppy disks rather than on magnetic tapes. The traffic engineers could process the disks on their in-house computer which is

presently used to monitor the Advanced Automated Traffic Engineering Management System (ATEMS 85). The Assistant Director of the Urban Transportation Department would be able to write the necessary software.

The PD is getting heavily involved with the State Accident Statistical System (SASS) based at the Region IV Education Service Center in Houston. The Department is developing a traffic records system that relies on locally-coded/entered accident data, rather than on DPS-coded/entered data stored on magnetic tape. Police personnel enter accident data onto cassette tapes by using TI Intelligent Terminals furnished by the Houston SASS system. The data is transferred via phone line to Region IV Education Service Center. A printer in the PD is used to retrieve accident data in formats identical to those designed for the Houston SASS operation. Ten STEP officers and 6 cadet volunteers recently completed the entry of 1977, 1978, 1979, and 1980 (to date) accident data into the data base.

Thus, Beaumont is developing entirely different traffic records systems for the Urban Transportation Department and the Police Department--with the former based on DPS-coded/entered data and the latter based on Beaumont Police Department-coded/entered data. The city departments most directly involved with the traffic records systems are: 1) the Police Department, 2) the Urban Transportation Department, and 3) the Data Processing Department. There is inadequate coordination among these components of the traffic records systems, as evidenced by the fact that independent systems are being developed and the fact that individual consultants have been concerned with the needs of either the traffic engineers or the police (but not both!). Beaumont is currently experiencing approximately 6300 accidents per year, with 20 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. The report form is

checked by a police supervisor and forwarded to the Traffic Records Division where it is again checked for completeness and accuracy. A traffic records clerk forwards a carbon copy of each report to the Urban Transportation Department and then numbers each original report with an accident report number. The clerk updates several hand tallies and completes 3x5 cards for entry into a driver's file. The driver's file contains the following information: driver's name, driver's license number, address, date of accident, location, time of accident, severity, type of accident, name of investigating officer, and accident number on the report. The clerk sends reports involving hit-and-runs to a Traffic Sergeant who keeps the reports in a separate file until they are closed out. Other reports are filed in folders according to date of accident. A folder exists for each date of the year. Within each folder, the reports are filed by accident number. STEP officers pull the accident reports from this file when they want to update the accident information in the SASS data base.

The Urban Transportation Department (UTD) receives a carbon copy of each accident report from the PD. A data technician places location codes on the carbon copy, makes another copy, and sends that copy to DPS-Austin. The carbon copy is filed by location in the UTD. It is filed in the Intersection File (alphabetically by "lowest" street name), in the Segments File (alphabetically by street name), or in a special file such as those for major streets, freeways, and service roads. If accident information is needed for the drawing of collision diagrams or for before-after analyses following the placement/removal of traffic controls, the data technician refers to the hard copy files. Thus, the traffic records system used by the traffic engineers is almost entirely manual. UTD would like to use DPS-coded data in the future, but the Department wants more control over the traffic records system. It wants to use its

in-house computer, rather than the Data Processing Department's computer. It wants new computer programs that can extract accident data in formats more useful than the formats of the Top 25 Intersections and Top 25 Segments printouts. It wants computer programs that do not require the input of citation data, because having to input such data bogs down the entire traffic records system.

Police Department

The Beaumont Police Department is organized into 3 major units: the Patrol Division, the Detective Division, and the Services Division. The Department has a fulltime STEP unit assigned to traffic control exclusively. Since there is no Traffic Division, the STEP unit is placed in the Patrol Division under the Patrol Adjutant. The Comprehensive STEP program is conducted by a STEP Lieutenant, a STEP Sergeant, and 8 STEP Patrolmen. The program was initiated in 1974 on an overtime, voluntary basis. Since October of 1978, the program has operated on a fulltime basis.

The Services Division includes the Research and Communications Unit, the Traffic Records Section, and the Identification/Central Records Section. Traffic data is compiled by the Traffic Records Section and crime data is compiled by the Central Records Section. There are four personnel assigned to the Traffic Records Section: a Lieutenant, a Sergeant, a Patrolman, and a civilian secretary. The Traffic Sergeant investigates all hit-and-run accidents and all fatal accidents. The secretary keeps a monthly log on fatal/injury accidents; monthly hand tallies on major/minor accidents, major/minor hit-and-runs, number of injuries, number of fatal accidents, and number killed; monthly hand tallies on the types and numbers of traffic-related citations issued; and a driver's file. Statistics from the hand tallies are

used to complete monthly, quarterly, and yearly summaries of traffic-related information. Two TI Intelligent Terminals belonging to the Houston SASS operation are presently located in the Traffic Records Section. One terminal will soon be returned to Houston since the 3-year data base is up-to-date. The PD's in-house computer is not being used to process accident data or keep a computerized index file.

There are 23 personnel assigned to the Identification/Central Records Section--a Lieutenant, 2 Sergeants, 6 patrolmen, a civilian computer programmer, a civilian technician, a senior clerk/typist, and 11 clerk/typists. This section uses a Data Point 5500 computer, 2 disk drives, disks, 3 terminals, and 1 printer to process information related to criminal records, minor arrests, Part I offenses, Part II offenses, calls for service, and response times. One terminal is located in the dispatcher's office, one is located in the Detective Division, and one is located in the computer room of Central Records. The computer can be used to search for specific information about a particular crime or it can be used to provide crime statistics, such as monthly summaries of crime experience and average response times for certain types of calls. Most of the data contained in the PD's Annual Law Enforcement Activity Report were compiled via the in-house computer.

The PD does not keep a spot map, nor does the Traffic Records Section file accident reports by location of occurrence. These two facts make it difficult for the PD to pinpoint their high accident locations, determine predominant causal factors, and determine the appropriateness of enforcement/engineering/education countermeasures. Police personnel are expecting the SASS system to identify high-accident locations and other factors pertinent to the problem identification process.

Urban Transportation Department

The Urban Transportation Department (UTD) consists of a Director, an Assistant Director, and personnel assigned to two major divisions:

1) Transportation Operations and 2) Transportation System Development. The Transportation Operations Division is primarily responsible for the installation and maintenance of signs, markings, and signals. The Transportation System Development Division is primarily responsible for transportation planning, geometric design, operation of transit system, analyses of traffic volumes and accidents, parking control, and administration of lease and construction contracts at airport. The Department has two personnel who function as traffic engineers, 1 of whom is registered.

The UTD receives a copy of all accident reports from the PD. A traffic technician places location codes on the accident reports, sends one copy to DPS-Austin, and files a copy in the Intersection File, the Segments File, or one of several special files. Special files are maintained on accidents that occur on freeways, service roads, and major streets. Most of the accident data currently used by the UTD are manually processed by the traffic technician. Beaumont stopped using the DPS monthly computer tapes early in 1978. The Department recently procured a new computer system (ATEMS 85) that will be used to conduct volume and delay studies, signal timing studies, etc. The UTD would like to use this in-house computer to process monthly accident data from DPS. New computer programs could be written by the Assistant Director. The traffic engineers do not want to rely upon SASS data, because the data is presented in formats designed for police use rather than for traffic engineering use.

Input Data

Beaumont's Accident Report Form includes only those questions required by

DPS. The police made few suggestions about how the form could be improved; however, they stated that the front needed more space for the diagram. A common error on the form is the lack of correspondence between the narrative description of an accident and its accompanying diagram. The PD's quality control system for accident reports includes reviews by police supervisors and Traffic Records personnel. Police recruits receive some training on accident investigation at the Regional Police Academy at Lamar University, but most training in this area is received on-the-job.

Filing System

Hard copies of accident reports are filed manually by both the PD and the UTD. The PD files accident reports by date and then by accident number, and the UTD files reports by location. The PD keeps an accident log and numerous hand tallies related to accident data. Spot maps are not kept by the PD or the UTD.

Output Reports

Presently, accident information is compiled manually at the PD via daily hand tallies and a fatal/injury accident log. The PD will soon be receiving accident data via computer printout--due to its participation in the Houston SASS system. The UTD will not be receiving these printouts. The UTD wants to develop its own traffic records system, using its in-house computer, DPS-coded data on magnetic tape, and computer programs designed to extract data in formats that are useful to traffic engineers.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Although the Police Department and the Urban Transportation Department are interested in improving their traffic records systems, there is little

coordinated effort between the two departments. Consequently, Beaumont is on the verge of establishing two entirely different traffic records systems--one for police use and one for traffic engineering use. Rather than salvage the previous inefficient system which compiled citation data as well as accident data, the Police Department and the Urban Transportation Department dumped the system and began independent searches for a better one.

The Police Department is bearing the following costs related to its participation in the Houston SASS system: 1) maintenance and upkeep of data-processing equipment, 2) cassette tapes, 3) data entry personnel, 4) rent on telephone lines to transfer data, and 5) computer paper. The Houston SASS system is bearing the following costs for the Beaumont operation: 1) software, with no additional software being necessary for the analysis of Beaumont data, 2) computer time on the Region IV Education Service Center's computer, and 3) use of a TI Intelligent Terminal. The cost allocations seem reasonable, but the interviewer questions the propriety of using STEP officers to enter accident data into the SASS system.

In summary, the traffic records systems in Beaumont are in a state of flux, so they have very little impact on the planning, scheduling, and operations functions of city departments.

Victoria, Texas (population approximately 60,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Victoria Police Department place location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the state traffic records system and sends a magnetic tape containing accident data to Victoria each month. The city's Data Processing Department receives the tape and sends it to Corpus Christi where the accident information is transferred to diskette. The diskette is then returned to Victoria and is used to update the accident file. Computer programs extract data from the file in various formats for monthly and special reports. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Data Processing Department, and 3) the Department of Transportation and Urban Development. Victoria is currently experiencing approximately 1600 accidents per year.

When a police officer responds to an accident occurring within the city limits, he notifies the dispatcher of the situation. The dispatcher assigns a case number to the accident and the officer records this number on the accident report form. Accident report forms are turned in daily and checked by police supervisors and records clerks. A records clerk completes a 3x5 card for each accident. The card (containing case number, date of accident, location, and name of driver) is placed in a master index file. The master index file is used to retrieve hard copies of accident reports, as well as hard copies of offense reports and incident reports. The original copy of each accident report is filed by case number in the master file located in the Records and Communications Section. Copies of the original are made and distributed to appropriate city departments. One copy is also sent to DPS, after a records clerk has written on it the 3-digit street codes representing

the primary and secondary streets where the accident occurred. DPS encodes the information contained on accident reports and enters the coded data onto a magnetic tape. Each month a copy of the tape is sent to Victoria. Victoria, in turn, sends the tape to Corpus Christi where the accident data is transferred to diskette. (This transfer is necessary because Victoria's IBM System 3, Model 8 computer does not have a tape drive. The computer can only process data contained on cards, disks, or diskettes.) After the diskette is returned to Victoria, the Data Processing Department produces monthly accident summaries for the PD. These summaries are similar to those prepared by the Data Processing Division of the Austin PD. Computer programs written for the Austin PD have been modified for Victoria's use. The Data Processing Department can also handle special requests for accident data made by PD personnel, the Director of Transportation and Urban Development, and other city officials.

In addition to having access to computerized accident data, the PD has access to manually-tallied data compiled from accident information appearing on the dispatcher's daily log. The log contains information on every call made by a uniformed officer to the dispatcher. This information is used to compile offense totals, citation totals, and accident totals for a daily morning report.

Police Department

The Victoria Police Department is organized into 4 major units: the Services Division, the Research and Planning Division, the Operations Division, and the Investigations Division. The PD employs 105 individuals, 50 of these are uniformed officers. Three uniformed officers are assigned to the Traffic Safety Section, which is part of the Operations Division. These officers attempt to investigate all traffic accidents which occur while they are on duty.

When they are off duty, traffic safety officers are called in to investigate only major collisions.

Traffic accident data are used primarily by the Traffic Safety Section for conducting its STEP program. This comprehensive selective enforcement program has been in effect for several years, and all uniformed officers are eligible to participate on an overtime basis. A daily STEP log is kept by each participating officer. The log is pre-printed with the names of high accident roadways and intersections in Victoria. STEP officers choose which locations they want to concentrate on during their shifts. Their activities are monitored via the STEP logs which specify the locations and times worked, as well as the citations issued. Records of STEP activities are compiled into monthly reports which present the following: 1) distribution of fatal and injury accidents, 2) traffic accident statistics, 3) distribution of traffic arrests, and 4) adjudication results of court proceedings. These summaries are delivered to the Traffic Safety Coordinator who oversees the STEP contract for the Traffic Safety Section, SDHPT.

A spot map is maintained within the PD. It is color coded by type of accident (e.g., rear-end and left-turn) and by severity of accident (e.g., fatality, injury, or PDO). This map provides a quick means for identifying hazardous locations within the city of Victoria, and is frequently used by the supervisor of the Traffic Safety Section for selecting STEP locations.

The PD's data processing equipment includes a "key to diskette" data entry system. This remote equipment is used to process citation data and crime data. The diskettes are sent to the Data Processing Department when citation or crime statistics are needed. The PD does not use this equipment to process information related to traffic accidents.

Data Processing Department

The Data Processing Department employs three individuals: the Manager, a computer operator, and a keypunch operator. The Manager provides programming services to some city departments. For example, the Manager used his programming skills to modify Austin PD's software so that Victoria's accident data could be analyzed in a manner similar to Austin's.

The city's IBM System 3, Model 8 computer is housed in the Data Processing Department. Data is entered into the computer via cards, disks, and diskettes. Data is retrieved via computer printouts. The existing system is utilized for a variety of purposes, such as the processing of utility billings, accounting information for the city, crime information for the PD, payroll and personnel information, moving and parking citations, paving assessments and billings, ambulance billings, accounting information for the city's credit union, and accident information. Although the System 3 can adequately perform these tasks, an IBM System 38 has been ordered. The new System will have considerably more memory and storage capacity than does the present System. Also, the System 38 will have on-line capability, i.e., it will allow the direct entry of data via computer terminals and the direct retrieval of data via CRT.

Transportation and Urban Development Department

The Department of Transportation and Urban Development (T&UD) is organized into three sections: 1) Signs and Striping, 2) Engineering, and 3) Signals. The Department employs 9 personnel, one of whom is a traffic engineer (the Director). The Director responds to citizen complaints concerning traffic engineering hazards and responds to information from the PD concerning high accident locations. The Director periodically requests from the Data Processing Manager special reports concerning the accident histories at specific

intersections. This information is used to prepare collision diagrams and condition diagrams. These diagrams are two of the primary tools for conducting engineering analyses. Normally the information contained on computer printouts, collision diagrams, and condition diagrams is sufficient for identifying traffic engineering problems. However, the Director must occasionally refer to copies of pertinent accident reports. The nature of the problem determines what countermeasure is appropriate, and thus whether the countermeasure should be implemented by the T&UD Department, the PD, or the Public Works Department.

Input Data

Victoria's Accident Report Form includes only those questions required by DPS. Police and traffic engineering personnel are satisfied with the state form. The PD's quality control system for accident reports includes reviews by police supervisors and records clerks. The records clerks check 4 or 5 major items, including whether the diagram of the accident matches the description of the accident. If errors are found, the accident report is returned, through channels, to the investigating officer. Common errors found on the form are:

- 1) diagram does not match the narrative description of the accident,
- 2) blanks are not filled in,
- 3) the time the investigating officer states he arrived at the scene is before the accident actually occurred, and
- 4) driver license number is missing, or there are too few or too many digits in the number.

Filing System

Accident reports are filed manually by case number at the PD. A master index file is used to retrieve hard copies of reports from the master file. Accident reports are not kept on file at the T&UD Department. Accident data

is also filed via an automated Traffic Records System in Victoria. Diskettes are used to store accident data originally coded by DPS-Austin. Spot maps are kept at the PD to give police officers visual feedback concerning the high-accident locations.

Output Reports

Monthly computer printouts of accident data are prepared by the Data Processing Department for the City Manager and the Chief of Police. These printouts include an urban detail listing which identifies high accident roadways and intersections. In addition, detailed summaries are provided in the following categories:

- 1) on-roadway vs. off-roadway accidents
- 2) accidents by time of day and day of week
- 3) pedestrian and pedalcyclist accidents
- 4) driver characteristics
- 5) type of vehicle
- 6) contributing factors
- 7) roadway and weather conditions.

Separate printouts for offenses and arrests are also prepared monthly by the Data Processing Department.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Victoria is making adequate use of accident data from its traffic records system. The excellent cooperation which exists between the PD, the Data Processing Department, and the T&JD Department is noteworthy. Special requests for traffic-related information have been readily attended to, and each department does not hesitate to ask other departments for special assistance.

The time delay involved with sending the DPS magnetic tape to Corpus Christi (and receiving the diskettes back) is a slight inconvenience, but the individuals involved with the traffic records system are not anxious to change the situation. The most apparent problem is the manpower shortage within the Records and Communications Section of the PD. At present, two clerks are responsible for checking all accident reports, offense reports, etc. The high volume of paper work prevents them from doing a thorough job.

Orange, Texas (population approximately 30,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Orange Police Department place location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the State traffic records system and sends monthly computer tapes to Orange. Orange transfers the accident data from magnetic tape to disk, since the computer in the Data Processing Department does not have a tape drive. Police personnel use a floppy disk system to edit the accident data contained on diskpack and to add citation data to the diskpack. A series of computer printouts is run after search parameters are specified at one of the terminals. The computer software for the Traffic Safety Information System was written by two programmers from Lamar Management and Research Consultants, Inc., of Beaumont, Texas. The system appears to be good on paper; however, it is not properly utilized at this time. Computer printouts of accident data have not been produced by the Data Processing Department since October 1979.

Police personnel in Orange are responsible for placing location codes on accident reports, editing DPS's monthly computer tapes, and entering citation data. These tasks are not being performed expeditiously because the police do not support the Traffic Safety Information System and because the police are experiencing a manpower shortage. The police are unaware of how the system can benefit them, so their tasks in the system are given low priority. The interviewer suspects that the consultants failed to get adequate police participation in the planning and design phases of the project. Police needs were probably ignored and traffic engineering needs were probably overemphasized.

The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Traffic Engineering Section of the Public Works Department, and 3) the Data Processing Department. There is inadequate

coordination among these components of the traffic records system, and there is friction between the police and the traffic engineer. Orange is currently experiencing approximately 1400 accidents per year, with 9 fatalities in 1979.

An accident that occurs within the city limits is reported to the desk officer at the PD. The desk officer assigns a case number to the accident, updates a log book, and completes a card containing information related to the accident. The officer also completes an IBM Locator card for each call for service. The card is sent to the Records Section to be filed by date. The card may be used later to facilitate the retrieval of accident reports. The desk officer dispatches a police officer to the scene of the accident. The police officer conducts an accident investigation and completes an Accident Report Form. The accident report is checked by a police supervisor and is forwarded to the Records Section. A records clerk checks the report for completeness and accuracy, and writes 5-digit location codes on the report. Two copies of the report are made. The original is sent to DPS-Austin for entry into the State traffic records system, a copy is sent to the traffic engineer, and a copy is retained in the Records Section of the PD. Records clerks update a spot map in the Patrol Captain's office (the clerks are three months behind with this task). The clerks also update several hand tallies related to traffic accidents and citations. These hand tallies are used to compile summary statistics for the following reports: 1) Traffic Division Monthly Report, 2) Investigative Summary, 3) the daily Investigations Report, and the 4) Traffic Enforcement Report. The Records Section files accident reports in monthly folders. Within each folder the reports are filed numerically by case number. Written on the cover of each folder are monthly totals in the following categories: Accidents, Tickets Issued, Injured, Pedestrian, Killed, and Leaving Scene.

Police Department

The Orange Police Department is organized into 3 major units: the Patrol Division, the Detective Division, and the Support Services Division. There is no Traffic Section, but one officer per shift is assigned (on a rotation basis) the specific duties of accident investigation and traffic control. The Support Services Division consists of a Major, an Identification Officer, 8 dispatchers, and 4 records clerks. The PD no longer conducts a STEP program because of the administrative hassles associated with the program.

The PD has an Incoterm terminal connected to the TCIC and NCIC systems. The system is used to check drivers license numbers, license plates, criminal histories, etc. The Department has no other data processing equipment. When a records clerk wants to edit accident data and enter citation data for the Traffic Safety Information System, she must use computer terminals located in the Data Processing Department, the Tax Office, or the Water Department. This inconvenient setup contributed to the breakdown of the Traffic Safety Information System.

The police have not received (nor have they requested) copies of computer printouts from the system. The police are dissatisfied with some of the formats--especially those presenting accident totals by planning zone. Police operations are monitored within 29 reporting districts whose boundaries are different from those of planning zones. The PD would like to receive statistics on all cases, not just traffic accidents. In addition, the PD would like for these statistics to be presented in the form of citywide totals and reporting district totals.

Traffic Engineering Section, Public Works Department

Traffic engineering functions are performed by the following personnel in

the Public Works Department: the Director of the Department, the Assistant City Engineer, 4 fulltime employees in engineering planning, 1 fulltime employee in sign maintenance, 1 halftime employee in signal maintenance, 1 Secretary, and 1 CETA employee. The Assistant City Engineer is a traffic engineer. He closely monitored the development of the Traffic Safety Information System and is disappointed that the system has fallen apart. He is waiting till the Data Processing Department gets its new IBM 34 computer into operation before he tries to salvage the Traffic Safety Information System. Another problem he must deal with is that Sabine Industries is getting another computer system and, thus, will be unable to transfer DPS-coded data from magnetic tape to disk.

There is friction between the traffic engineer and the police. The traffic engineer is frustrated because he has no line control over the records clerks in the PD who enter location codes onto accident reports sent to DPS, enter citation data locally, and edit DPS-coded accident data. The traffic engineer is dissatisfied with the quality of the data base. He stated that "too many unknowns appear in the location arrays received from Austin--which probably means that many locations are not coded properly in the first place." The traffic engineer is dissatisfied with the low priority given to the edit/entry tasks which are crucial to the successful operation of the Traffic Safety Information System. According to the traffic engineer, the records clerks of the PD are a year behind on entering citation data and they need to edit nearly 100 accidents that occurred in 1978 and 1979. The traffic engineer stated that he thought the major problem with the traffic records system in Orange was insufficient personnel to accomplish required tasks.

Input Data

Orange's Accident Report Form includes only those questions required by DPS. The police suggested that the State Accident Report Form provide a larger space for the accident diagram. When filling out the form, police investigators frequently make three types of errors: 1) miscopying VINs, 2) attributing accident to wrong cause, and 3) failing to list the property damaged. Police officers receive training in accident investigation at the Regional Police Academy held at Lamar University and at courses taught at Sam Houston State University.

Filing System

Hard copies of accident reports are filed manually by both the PD and the Traffic Engineering Section. The PD files accident reports by month, then by case number. The Traffic Engineering Section files reports by primary street. The PD keeps a case log which gives a chronological order of events that occur each day. The records clerks of the PD keep a spot map which shows the location of fatal accidents, major accidents, and minor accidents.

Accident data is also stored on disk packs at the Data Processing Department. A local construction firm, Sabine Industries, transfers DPS-coded data from magnetic tape to disk pack. A floppy disk system is used to edit accident data on the disk pack and to enter citation data. The automated filing system in Orange is presently not operational--due to a variety of personnel and administrative problems.

Output Reports

The output reports used by the PD at present are based on hand tallied data, rather than on computer printouts from the Traffic Safety Information System. The police do not understand how the Traffic Safety Information

System can be of value to them, so they are not supporting it. They agreed to support it at first--without realizing how much effort and time would be involved with the edit/entry tasks.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Not much overall. The Traffic Safety Information System is a fairly good system, on paper. A major drawback, however, is that it does not meet the needs of the police as closely as it should. The two consultants (professors at Lamar University) probably worked too closely with the traffic engineer and not close enough with the police. They failed to get a police advocate for the system, i.e., an insider who could instigate and manage the process of change within this bureaucratic organization. Consequently, the edit/entry responsibilities assigned to the police are considered low priority tasks. The police are not interested in receiving any computer printouts either.

Other barriers to the efficient operation of the traffic records system in Orange are:

- 1) the hassles involved with transferring DPS-coded data from magnetic tape to disk
- 2) the hassles involved with editing accident data and entering citation data via a floppy disk system
- 3) the hassles involved with using computer terminals located outside the Police Department
- 4) insufficient personnel to simultaneously operate the old traffic records system and the new traffic records system
- 5) poor coordination between the Police Department and the Traffic Engineering Section of the Public Works Department.

APPENDIX D

SITE VISIT REPORTS FOR CITIES
THAT RECEIVE QUARTERLY COMPUTER PRINTOUTS FROM DPS-AUSTIN

Arlington, Texas (population approximately 181,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Police Department (PD) place location codes on accident reports prior to sending the reports to the city's Traffic and Transportation Department (TTD). After extracting certain types of information, TTD forwards the reports to DPS-Austin. DPS encodes the accident information, enters it into a computer, and produces quarterly printouts of accident data for Arlington. Copies of the quarterly printouts are received by the PD and the TTD. Thus, the city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Traffic and Transportation Department. There is a high degree of coordination between these two departments. Both departments are displeased with the present status of the traffic records system in Arlington. The PD would like to get its own computer, so it can process its own accident data and produce computer printouts whose formats are more useful than is the format of the DPS quarterly printout. The TTD would like to get monthly accident tapes from DPS so its information could be more timely and useful. Arlington is currently experiencing approximately 9000 traffic accidents per year, with 27 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. The form is checked by the Report Review Section for completeness and accuracy, and is then forwarded to the Records Section. The Records Section makes copies of the accident report, and places the original in a file where it is kept for 9 months and then destroyed. Copies of accident reports involving fatalities are kept in special folders for the Chief of Police and the Director of Research and Planning. The Records Section places appropriate location

codes on a copy of each report and sends the copy to the TTD. TTD verifies the location codes, updates a spot map, completes a collision diagram for all accidents that occurred within 100 feet of an intersection, and forwards the accident report to DPS-Austin. There the accident information is encoded and entered into the State traffic records system. Quarterly computer printouts of accident data are produced by DPS and sent to Arlington's Traffic and Transportation Department. TTD retains a copy and forwards a copy to the PD. TTD seems to be making fairly good use of the quarterly printouts--using them for the following purposes: 1) to obtain statistical justification for making roadway improvements, 2) to obtain "before-after" data to judge the effectiveness of engineering countermeasures, and 3) to provide accident data to traffic engineering consultants for the city of Arlington. The PD makes very little use of the quarterly printout because its format requires further processing of accident data, and the PD does not have the manpower to complete this task. The PD keeps numerous manual and automated tallies via their in-house record keeping functions and their connection with external computer systems. The PD uses 2 minicomputers for filing/indexing purposes, 6 terminals connected to the computer housed in Arlington's Data Processing Department, and terminals connected to the NCIC system.

Police Department

The Arlington Police Department is organized into two major units: the Administration Bureau and the Operations Bureau. The Operations Bureau consists of two Divisions: the Criminal Investigations Division and the Traffic and Patrol Division. The Traffic Section of the Traffic and Patrol Division includes 9 motorcycle units (which work daytime shifts) and 2 STEP units (radar patrol cars which work 3-11 shifts). These units are citation-oriented

and do not investigate accidents. The STEP units keep manual tallies of their activities, including DWI processing.

The PD has a variety of data processing equipment, i.e., 2 minicomputers which are used for filing and indexing, and terminals/printers connected to the city's computer and the NCIC system. The PD plans to get its own IBM 370 computer so it can process much of the police data now being processed by the computer housed in the city's Data Processing Department. The PD is displeased with their current dependence on the Data Processing Department which shuts its computer down from midnight to 8:00 A.M. each day. The PD feels that with its own computer it can become semi-independent of other agencies. The Department would eventually like to analyze its accident data on an in-house IBM 370 computer--using either locally-coded data or DPS-coded data contained on monthly accident tapes. The PD already has 1 systems analyst, 3 computer programmers, and 2 data entry clerks on its staff.

The PD maintains files of original accident reports--each accident report is filed chronologically, kept for 9 months, and then destroyed. Index cards are completed for each accident report so the report can be readily retrieved. An index card contains the call-sheet number, date/time of accident, and name of individual involved in the accident. The Records Section forwards copies of accident reports involving hit-and-runs to the "Hit-and-Run" Officers of the Traffic Section. When hit-and-run cases are closed, the reports and other supplementary forms are forwarded to the Records Section for filing. Spot maps are not being kept by the PD. The Detective Division logs all DWI citations issued and receives a weekly summary of dispositions from the County Court.

The interplay between Arlington's traffic records system and the State traffic records system is not smooth. The DPS quarterly printouts are

received too late to provide the police with information that can be used to deploy personnel on a monthly basis. Also, further processing of the data on quarterly printouts is required for the information to be of operational value. Additional processing is too costly in terms of time and manpower. The police expressed great displeasure with the State Accident Report Form. The major complaint was that police have to collect accident information that will only be used by insurance companies.

Traffic and Transportation Department

The Traffic and Transportation Department has 39 employees, 4 of whom function as traffic engineers. TTD is experiencing numerous traffic-related problems due to the fact that Arlington's roads were not designed to handle the volume of traffic they are currently handling. Two traffic-related problems of major concern are: 1) speeding in residential areas and 2) run-off-road incidents/accidents.

The TTD makes better use of accident data than does the PD. Spot maps, collision diagrams, and manual tallies are derived from either accident reports or quarterly computer printouts from DPS. The Department plans to get a computer terminal (CRT) connected with the city's computer. With this terminal and DPS monthly tapes, TTD could analyze accident data in formats of greater benefit to traffic engineering functions.

Input Data

Arlington's Accident Report Form includes only those questions required by DPS. Additionally, the PD uses a Continuation Sheet, a Hit and Run Supplement, a Delayed Accident Report, a DWI/DUID Traffic Case Report, and a DWI/DUID Supplement. The police are displeased with the State form, as evidenced by the following complaint: "too much information is being collected

and much of it is only being used by insurance companies."

Filing System

The PD files original accident reports chronologically by call-sheet number and keeps each report for nine months. A manual index of 3x5 cards is used for the retrieval of accident reports. The TTD does not file copies of accident reports, but does file its collision diagrams for intersection accidents. TTD seldom finds it necessary to return to original accident reports filed in the PD.

Output Reports

DPS quarterly printouts of accident data are used very little by the PD, and used somewhat by the TTD.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The traffic records system in Arlington has little impact on the planning and operations functions within the PD. However, the interviewer was very impressed with the Department's potential for improving its use of accident data. Police personnel seemed energetic, determined, and knowledgeable--traits that will be invaluable when the PD starts overhauling its present traffic records system.

The traffic records system has some impact on the operations of TTD, but there is much room for improvement. The interviewer was impressed with TTD's current use of an awkward system and its forethought on how the system could be improved.

Waco, Texas (population approximately 100,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Waco Police Department (PD) place location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the state traffic records system and sends a computer printout of accident data to Waco each quarter. The printout gives accident-by-accident information grouped by specific intersections or midblocks. Much of the information is in coded format, so it must be decoded locally before it is useable. Although the city participates in the Urban Accident Location Coding Project, Waco has developed its own system for encoding, computerizing, and analyzing traffic accident data. Personnel in the Transportation Department (TD) encode accident information onto code sheets and send these sheets to the Data Processing Department (DP). Personnel in DP keypunch the data onto computer cards and enter the data into a Honeywell 6440 computer. Utilizing computer programs written by consultants (i.e., Pinnell-Anderson-Wilshire and Associates, Inc.), DP produces monthly computer printouts of accident data. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Transportation Department, and 3) the Data Processing Department. Waco is currently experiencing approximately 6000 accidents per year.

When a police officer responds to an accident which occurred within the city limits, he notifies the dispatcher of the situation. The dispatcher assigns a case number to the accident and the officer records this number on the accident report form. The officer also records 4-digit location codes on the form. (The location codes are provided by the TD and are used to pinpoint the locations of accidents for the Urban Accident Location Coding Project.) Accident reports are turned in daily and are checked by police supervisors.

Records clerks file original reports by case number in the master file, send a copy to DPS-Austin, and send a copy to the TD. TD encodes accident information onto code sheets and forwards the sheets to DP, where the data are keypunched. Approximately two to four weeks later, the punched cards and a computer printout are received by a traffic analyst in the TD. The printout presents all the coded data for each accident containing at least one incorrect/incomplete item. Necessary corrections are made by TD personnel and the cards are returned to DP. Within two weeks, a series of monthly reports of accident data is produced by DP.

Police Department

The Waco Police Department is organized into 4 major units: the Patrol Division, the Criminal Investigations Division, the Administrative Services Division, and the Crime Information Division. Approximately 164 uniformed officers are assigned to these divisions. No special unit is assigned exclusively to traffic control; however, a selective traffic enforcement program (STEP) is conducted by the Special Operations Section of the Patrol Division. The Sergeant who oversees STEP operations receives three reports regularly from the TD: 1) a statewide accident summary; 2) a listing of the number of accidents at specific intersections in Waco; and 3) a listing of the top 23 high accident locations in the city. The latter two reports were originally used to select STEP locations; now they are only used to prepare the monthly STEP reports. STEP is currently being deployed at five selected locations (i.e., arterial complexes) with high accident frequencies.

The PD has six on-line terminals (CRT's and line printers) connected to the Honeywell computer at the Data Processing Department. The terminals are used for the entry of offense/crime data, but not used for entry of traffic

accident data. At one time, the PD employed computer programmers to work with crime statistics, but this arrangement failed due to a lack of supervision.

The PD's involvement in the traffic records system is very limited. The department provides the initial input to the system in the form of accident reports, but makes little use of manual tallies, computer printouts of locally-compiled data, or computer printouts of DPS-compiled data. Spot maps were once kept by the PD, but such filing systems are no longer utilized. Thus, the processing of accident data is almost completely the responsibility of TD and DP in Waco.

Citations issued by the PD are sent directly to the Municipal Court where citation data are entered via terminals to the city's computer. The Municipal Court files hard copies of citations by case number.

Transportation Department

The Transportation Department is organized into 3 division: 1) Engineering, 2) Shops, and 3) Municipal Transportation. The Director is a traffic engineer. Five (5) personnel are employed in the Engineering Division which handles signal design and operations; transportation planning and surveys; and signal/markings design.

The TD is primarily responsible for the traffic records system based on locally-compiled data. TD personnel encode accident data onto code sheets, send the code sheets to DP for keypunching onto computer cards, edit the computer cards, and distribute monthly printouts to PD and the SDHPT district office.

Copies of accident reports are filed in monthly folders by case number in the TD. The reports are retained for five years. Occasionally, the traffic analyst refers to the diagrams and narratives on accident reports in order to

draw collision diagrams. Data for the previous three years are included in these analyses. Hazardous situations may also be identified by checking the contributing factors noted by the investigating officer.

In addition to keeping accident reports and computer printouts of accident data, the TD keeps manual tallies on pedestrian, bicycle, and fatal accidents. A log book contains the following information: location of accident, distance from intersection, date and time of accident, age, sex, date of death, type of injury, etc. These data are used primarily for completing an annual report for AAA (American Automobile Association). The data also provide accident-by-accident information not received in the monthly summaries prepared by DP.

Data Processing Department

The Data Processing Department currently employs 25 individuals. In addition to processing traffic accident data, the department processes information related to water and utilities, taxes, finances, payroll, the Waco Independent School District, and McClennan County government. DP utilizes a Honeywell 6440 computer which the Director feels is adequate for present data-processing needs. The computer also has expansion capabilities for accommodating future needs commensurate with population growth.

The major problem with the processing of accident data is the time delay associated with data conversion, i.e., transferring encoded data from code sheets to computer cards. This problem will be eliminated, however, when the code sheets are replaced by a mark reader system. The system, scheduled for implementation in March 1980, will eliminate the keypunching step. Accident information contained on mark reader sheets will be transferred directly onto computer tapes. The new system will be faster and more accurate in that keypunching errors will be eliminated. The TD will be responsible for entering

accident data onto the mark reader sheets. The TD would also like to receive a dial-up terminal connected to DP's computer so that faster retrieval of accident data would be possible.

Input Data

Waco's Accident Report Form includes only those questions required by DPS. Police and traffic engineering personnel are satisfied with the state form. The PD's quality control system for accident reports includes reviews by police supervisors. A common error is the diagram not matching the narrative description of the accident.

The input data may also be erroneously encoded by TD or erroneously keypunched by DP. An editing routine helps the computer to identify some of these errors prior to the production of computer printouts.

Filing System

Accident reports are filed manually by case number at the PD. A master index file is used to retrieve hard copies of reports from the master file. Accident reports are filed by month, and then by case number, at the TD. Accident data is also filed via an automated traffic records system in Waco. The data is locally encoded, locally entered into a computer, and locally retrieved from the computer. Spot maps are not kept at the PD or the TD.

Output Reports

Monthly computer printouts of accident data are produced by the Data Processing Department for the TD, the PD, and the district office of the SDHPT. The following printouts are produced: 1) high frequency accident list, 2) intersection recap, 3) listing of city streets and respective street codes, 4) intersection rankings, 5) accident tally sheet, and 6) accident narrative.

The "high frequency accident list" identifies all locations experiencing two or more accidents in a particular month. This report is not used as frequently as the "intersection recap" which lists every intersection which has experienced an accident during the current calendar year. (Note: all accidents in the local traffic records system are linked to an intersection-- the accident report includes an estimation of the distance in feet between the actual accident and the intersection, up to 999 feet.)

The "listing of city streets and their respective street codes" is primarily an update of coding assignments, i.e., the list is a record of those city streets which have been assigned a 4-digit code, to date. Previously, locations which never experienced an accident were not assigned street codes. However, a new coding system was initiated early in 1980 whereby all city streets, some outlying streets, and all creek beds were assigned 4-digit codes. This new coding system will be used by all city departments to standardize the location of incidents across departments.

The "intersection rankings" printout lists the 23 locations experiencing the most accidents. Two criteria are used to identify these high accident locations. They are: 1) cumulative accident totals for the current year and 2) the "accident-by-average daily traffic" ratio. In addition, information comparing current year's accidents-to-date with previous year's accidents-to-date, and information comparing current year's accidents-to-date with previous year's total, are provided for approximately 300 intersections.

The "accident tally sheet" does not present location information, but it does present a breakdown of total accidents by type, time of day, day of week, etc.

Finally, the "accident narrative" is a non-coded description of each accident, and includes the following types of information:

- 1) accident case number
- 2) location variables, such as street, intersecting street, direction, distance
- 3) time variables, such as date, day of week, time of day
- 4) condition variables, such as classification, traffic control, light condition, weather, surface, road characteristics
- 5) accident description, such as severity, type of accident
- 6) pedestrian involvement, such as car path, pedestrian action.

Information is also provided about each vehicle and driver, including damage rating, violations involved, and number of occupants.

According to the traffic analyst in the TD, the "intersection recap" and the "accident narrative" are the most beneficial reports provided by DP. As indicated previously, the quarterly printout from DPS is rarely, if ever, used. No checks are made to compare DPS-compiled data with Waco-compiled data.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Not much overall. The Police Department needs to get more involved with the traffic records system. After the PD has provided initial data to the system, it takes no further responsibility for the analysis of accident data. Consequently, the PD makes very little use of the resulting computer printouts. The interviewer suspects that the police are unaware of the benefits of a good traffic records system. The interviewer also suspects that the consultant programmers overemphasized the data needs of the TD and underemphasized the data needs of the PD when they wrote the existing software.

The TD is making fairly good use of accident data for making collision analyses and traffic engineering modifications. The department is very conscientious about their tasks in the traffic records system and would like to accomplish these tasks more efficiently. The department feels that the use of mark reader sheets and a remote terminal will enhance, respectively, the data-entry and data-retrieval procedures.

The Data Processing Department is providing adequate support to the traffic records system. However, there needs to be better communications among the PD, the TD, and the DP Department. For instance, DP personnel were unaware that Waco has the option of using DPS-coded data or Waco-coded data in their traffic records system.

Laredo, Texas (population approximately 85,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The city recently became a participant in the Project--viewing it as a means for upgrading the city's traffic records system, identifying target areas in need of increased enforcement, and justifying STEP grants to finance increased enforcement along certain target areas. Consultants from Traffic Engineers, Inc. (Houston) developed a street coding system for Laredo and placed location codes on 1978 and 1979 accident reports. Using copies of these accident reports, consultants from TTI updated the location information stored on DPS computer tapes--changing the "first five letters of street" codes to the five-digit codes developed by Traffic Engineers, Inc. TTI wrote computer programs to extract accident information from the updated computer tapes in such a manner as to identify 10 target areas experiencing the most traffic accidents. TTI also wrote computer programs to extract data from magnetic tapes so that numerous cross-tabulations (such as target area by time of day, target area by day of week, etc.) could be produced from DPS data. TTI used the cross-tabulations to determine possible strategies for dealing with traffic problems in Laredo. (New formats were needed because DPS quarterly printouts present data only via accident-by-accident computer dumps for each primary street.)

Under the present traffic records system, personnel in the Police Department place 5-digit location codes on accident reports prior to sending the reports to DPS-Austin. DPS encodes the accident information, enters it into its computer, and produces quarterly computer printouts for Laredo. The city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Traffic Department. There is excellent coordination between these two components of the traffic records system.

The city is currently experiencing approximately 3800 accidents per year, with 8 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. Field Sergeants collect the reports after each shift and check them for completeness and accuracy. Then, shift commanders (i.e., Lieutenants) review the reports and forward them to the Records/Identification Section of the PD. The Records Sergeant checks the reports and assigns accident numbers to them. A civilian records clerk enters the following information about the accident into a log book: accident number, date, time, location, and parties involved. The clerk adds to the reports the 5-digit location codes for primary/secondary streets where the accidents occurred. She updates hand tallies used to complete daily/monthly summaries of accident experience. She xeroxes each accident report and forwards a copy to the Director of Traffic; then, she files original reports in folders, according to month of accident. Within each folder, the reports are filed numerically according to their assigned accident numbers. The log book is used to aid the retrieval of original reports from the monthly folders. The copies sent to the Director of Traffic are checked and forwarded to DPS for entry into the State traffic records system. DPS produces a quarterly computer printout for Laredo. The printout is an accident-by-accident computer dump, separating accidents by coded street locations.

Police Department

The Laredo Police Department is organized into 3 major units: the Patrol Command, the Investigative Command, and the Support Command. The Department does not have special units assigned to traffic control exclusively, i.e., there is no traffic section. Since February 1980, the PD has operated a

Comprehensive Increased Traffic Law Enforcement (ITLE) program on an overtime voluntary basis. Heretofore, approximately 25 officers have provided increased traffic law enforcement for a 14-hour period each day. Two 3-hour shifts and two 4-hour shifts are being worked, with four units working each shift. Four target areas are worked on a daily basis, four target areas are worked periodically, and two target areas are not being worked so they can be used as control areas. The activities of ITLE officers are monitored closely via the use of several daily activity logs and reports.

The PD does not use any data processing equipment for processing accident data. Numerous hand tallies are being kept for crime statistics, as well as traffic statistics. DPS quarterly printouts do not provide information in summary form, nor do the printouts provide information about property-damage-only accidents below \$250 damage. Therefore, it is likely that Laredo will continue to monitor its accident experience via hand tallies. The ITLE program may use the DPS quarterly printout--but only as a check against the accident totals from their hand tallies. Spot maps were used at one time, but are no longer being used.

Traffic Department

There are 17 employees in Laredo's Traffic Department. The Director of Traffic (a Traffic Safety Coordinator) and his secretary are presently being funded through the Traffic Safety Section of the Highway Department. The Traffic Department is divided into the following three sections: 1) the Administrative Section with 3 personnel, 2) the Sign Maintenance Section with 11 personnel, and 3) the Traffic Signal Maintenance with 3 personnel. Eight of these personnel are presently being funded through a Federal manpower program. They will be placed on the city payroll on July 1, 1980.

Laredo has 172 traffic signals; 82 of these are located downtown and are controlled via computer. The Traffic Director may vary the timing on these lights in three different ways--depending on which of three software programs he chooses. His choice depends on expected traffic flow during specific times of day, days of week, and events occurring in Laredo and Nuevo Laredo.

The Traffic Director receives accident reports from the PD on a weekly basis. He checks and copies the reports for accidents that occurred at specific locations he is monitoring. He forwards a copy of all reports to DPS-Austin and files his copies by primary street location. He uses these reports for problem identification purposes; he also uses collision/condition diagrams drawn by a traffic engineering consulting firm from Houston. No spot maps are kept by the Traffic Department. The Traffic Director stated that Laredo's main traffic engineering need is the modernization of its traffic signals.

Input Data

Laredo's Accident Report Form includes only those questions required by DPS. The police and traffic engineer are satisfied with the State form. The quality control system for accident reports includes reviews by police supervisors, Records Section personnel, and the city traffic engineer. Common errors made on the form include the following: omission of disposition of injured, omission of damage rating or wrong damage rating, mismatch between day of week and date, and unclear narrative--poor description of accident.

Filing System

Hard copies of accident reports are filed manually by both the Police Department and the Traffic Department. The PD files accident reports by month, then by accident number, and the Traffic Department files reports by

location. No data processing equipment is being used to store accident information locally. The PD keeps an accident log and numerous hand tallies of accident data. (Previously, the Records Section filed reports by location of accident, but a TCLOSE consultant recommended that the Section change to its current "log/monthly folder" type of filing system. A Records Section Sergeant stated that it is more difficult to retrieve accident reports with the new filing system than with the old one.) Spot maps are not being kept by the police or the traffic engineer.

Output Reports

Presently, accident information is compiled manually at the PD via daily reports and other hand tallies. The Department is now receiving quarterly printouts from DPS. The police and the traffic engineer are not satisfied with the format of the quarterly printout. Both departments would like to receive cross-tabulations of accident data, rather than computer dumps of accident-by-accident information. TTI consultants wrote computer programs that extracted DPS-coded data in formats more useful to the police and the traffic engineer. Laredo would like to receive printouts in this format, rather than in DPS's standard format for quarterly reports.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The Police Department and the Traffic Department are very interested in improving Laredo's traffic records system. Laredo recently joined the Urban Accident Location Coding Project, so it is too early to tell whether the Departments will derive benefits from the quarterly computer printouts received from DPS. The printouts are being used primarily by police supervisors who monitor a STEP program. However, it is questionable whether these printouts

will ever be of much value to the Police Department as a whole or to the Traffic Department. Personnel are not available in either department to analyze accident-by-accident information.

There is excellent rapport between the Police Department and the Traffic Department. Both the Chief of Police and the Traffic Director are fairly new to their jobs and both are eager to make improvements to old methods and procedures. The STEP program is well administered.

Midland, Texas (population approximately 80,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Police Department (PD) place location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the state traffic records system and sends a computer printout of accident data to Midland each quarter. The city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Traffic Engineering Division of the Public Works Department. Midland is currently experiencing approximately 3500 accidents per year.

An accident occurring within the city limits is investigated by a police officer who completes an Accident Report Form and a short Incident Form. The forms are turned in daily to police supervisors who check them for completeness and accuracy. Both types of forms are forwarded to the Traffic Section of the PD. A Traffic Section secretary rechecks the forms for completeness and accuracy, writes on each accident report the location codes for primary and secondary streets, updates tally sheets for manual processing of data for monthly and yearly reports, and files the short Incident Form by case number. (The Incident Form file is kept in the Traffic Section and is readily available to citizens who need to know assigned case numbers in order to retrieve accident reports from the microfilm files in the Identification and Records Section--ID&R.) The Traffic Section forwards the original accident report to the ID&R Section, where two copies are made. One copy is forwarded to DPS-Austin, and one copy is forwarded to the Traffic Engineering Division of Midland's Public Works Department. The ID&R Section uses information from accident reports to update 3x5 cards in a driver/offense record file. This section places the accident report on microfilm, files the microfilm by case

number, and destroys the original accident report. Requests for copies of the accident report are handled by making photostatic copies of the information on microfilm.

The Traffic Engineering Division of the Public Works Department receives a copy of each accident report. The copy is used for the following purposes: 1) to update tally sheets from which data are compiled for monthly and yearly reports, 2) to update a spot map, and 3) to draw a collision diagram. Each diagram is filed in appropriate binders according to year of accident, type of accident (intersection or midblock), and initial letter of primary street where accident occurred. The spot map is used to identify problem locations. Once a particular location is identified, appropriate collision diagrams are reviewed to determine common types of accidents and common causal factors. If further information is needed, appropriate accident reports are reviewed. Accident reports are kept on file in the Traffic Engineering Division for three years and then they are destroyed.

Police Department

The Midland Police Department has officers assigned to a Patrol Division and officers assigned to a Traffic Division. The Patrol Division is concerned mainly with crime control and the Traffic Division is concerned mainly with traffic control. An officer in one division may perform functions relevant to the other division, if circumstances warrant. The Traffic Division has an authorized strength of 16 sworn officers, 15 school crossing guards, 5 parking control attendants, and 1 secretary. Sworn officers consist of 1 Lieutenant, 2 Sergeants, and 13 patrolmen. The Traffic Division is equipped with 13 marked patrol cars and 3 3-wheel Cushman motorcycles. Five of the patrol cars are equipped with radar sets and may be operated by the Patrol Division when the

Traffic Division officers are not on duty, giving the PD radar coverage 24 hours a day, 7 days a week. The PD does not have a STEP program in progress.

The PD does not have data processing equipment to compile and analyze traffic accident data, nor does it use the Burroughs 1855 computer in the Data Processing Department. The PD relies on hand-tallied data to complete monthly and yearly reports; to provide information for speeches, queries, and surveys; and to plan/schedule police operations. The quarterly printout received from DPS is not being used. The quarterly printout presents data in an accident-by-accident format, with no groupings by type of accident or any other variable. No totals are given, so additional processing of data would be required to answer specific questions of interest to the PD. The PD does not keep a spot map, nor does it keep hand-tallies concerning the accident experience at high accident locations. Their hand-tallies only reveal citywide totals.

There is little interplay between Midland's traffic records system and DPS's traffic records system. The PD feels that the only advantage of Midland's participation in the Urban Accident Location Coding Project is that DPS completes the National Safety Council reports for Midland. The PD considers the quarterly printout to be worthless in its present format, and would like to receive frequency counts in several cross-classified and singly-classified schemes, such as severity by location, contributing factor by location, time of day totals, high accident location totals, citation and conviction totals, etc. The PD favors an increased reliance upon accident data coded by DPS-Austin. Such a change is being spearheaded by the Traffic Engineering Division, which hopes to get Midland's Data Processing Department involved in the extraction of accident data from monthly, magnetic tapes produced by DPS-Austin.

Traffic Engineering Division, Public Works Department

The Traffic Engineering Division has a staff of 4 personnel, with no registered traffic engineer. Traffic engineering duties are performed by 3 individuals on the staff, however. The Division handles such functions as signal installation and design, subdivision plans and review, street design, pavement markings and signs, parking meter location and installation, and accident data analysis. Although accident data analysis is a low priority function, the Division seems quite conscientious about doing the best it can with a cumbersome system. The Division receives a copy of each accident report and logs it on an index containing the following information: case number, location of accident, number of injuries, and date of accident. The Division completes a collision diagram on each accident and keeps several hand-tallies of information needed for monthly and annual reports. The Division keeps a spot map depicting the location of all motor vehicle accidents, fatal accidents, pedestrian day-accidents, and pedestrian night-accidents. Special requests for accident data are made from other city departments to the Traffic Engineering Division, rather than to the PD. These requests, as well as ongoing analyses performed by the Division, are handled via reference to the collision diagram file. If needed, additional information may be retrieved from the Division's hard copy file of accident reports.

The Traffic Engineering Division is displeased with the present traffic records system. The hand-tallying of accident data for monthly and yearly reports is too cumbersome. Having to refer to collision diagrams for every analysis is also an inefficient procedure. The spot map is of limited use, since it does not depict such things as type of accident, causal factors, etc. The Division is especially displeased with Midland's minimal use of accident data coded by DPS, so it is supporting the hiring of a computer programmer

to write the software necessary to extract accident data from DPS tapes-- using the Burroughs 1855 computer housed in the Data Processing Department. The Division wants the data presented in formats useable by both the police and the traffic engineers. According to traffic engineering personnel, the format of the quarterly printout from DPS is not useable by either.

Input Data

Midland's Accident Report Form includes only those questions required by DPS. The form is apparently satisfactory to the police since they made no recommendations for additions or deletions. Police supervisors and the Traffic Section secretary check accident reports for completeness and accuracy. The quality control system appears adequate; however, the Traffic Engineering Division noted that errors do occur in the location of accidents. Two common errors are: 1) placing a wrong street name on the report and 2) classifying certain intersection-related accidents as "midblock" accidents. The PD follows a very rigid procedure for determining whether an accident is classified as "intersection," "intersection-related," or "midblock." If the point of impact was in an intersection, the accident is classified as an intersection accident; if the point of impact was outside an intersection, the accident is classified as a midblock accident. Very few accidents are classified as "intersection-related" by the police. The Traffic Engineering Division changes the classification of some accidents that are labeled "midblock" by the police, but are caused by situations within intersections (such as a faulty stop light causing rear-end collisions outside an intersection). Such classifications are changed to "intersection-related." This change in classification affects how certain collision diagrams are filed and ultimately how the accident data are used in the problem identification process.

Policemen in Midland receive initial training in accident investigation during the 480-hour basic course at the Permian Basin Police Academy. Thirty-two hours are devoted to traffic control and accident investigation. Some officers receive additional training in accident investigation during a 3-week advanced course taught by Texas A&M University.

Filing System

Accident reports are filed on microfilm at the PD. This method saves storage space since it allows the original reports to be destroyed. Each accident report on microfilm is filed by case number, so retrieval requires knowledge of particular case numbers. These numbers may be obtained from the Incident File located in the Traffic Section of the PD.

The Traffic Section keeps daily manual tallies on a Traffic Accident Analysis sheet. The sheet gives up-to-date, monthly frequency counts in such categories as Number Persons Killed, Number Persons Injured, Number Pedestrians Killed, Number Pedestrians Injured, Number Hit and Run Accidents, Drivers Under Influence--Alcohol, Drivers Under Influence--Drugs, etc. These totals give citywide data only. No analysis of accident-by-location data is kept in the PD.

The Traffic Engineering Division files a hard copy of each accident report, as well as a collision diagram associated with each accident. Manual tallies are kept on information needed for the monthly and yearly reports produced by the Division.

Output Reports

The output reports produced and used on a regular basis are those compiled from the hand tallies kept by the PD and the Traffic Engineering Division. The quarterly printout received from DPS is not used.

Requests for special reports (such as a pedestrian accident summary, a bicycle accident summary, a motorcycle accident summary, or an accident by specific location summary) are made to the Traffic Engineering Division. These special reports require a tedious search through collision diagrams, and possibly a search through pertinent accident reports.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Midland is making adequate use of accident data from its traffic records system. The Traffic Engineering Division is making much better use of hand-tallied data than is the PD. There seems to be excellent cooperation between the Traffic Engineering Division and the PD, so the planned changes to the traffic records system have a better chance of being accepted and implemented. The movement toward increased reliance on DPS-coded data is a step in the right direction. Much thought is needed about what computer output would be of maximum value to the PD and to the Traffic Engineering Division.

Brownsville, Texas (population approximately 76,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Personnel in the Traffic Department (TD) place location codes on accident reports prior to sending the reports to DPS-Austin. The TD receives quarterly printouts from DPS and the Director of Traffic assimilates the data. The Director would like for the city's Data Processing Department to become involved in the traffic records system. He would like to receive monthly accident tapes from DPS, instead of quarterly printouts. He would like for the city's Data Processing Department to use these tapes to produce monthly computer printouts of accident data. The city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Traffic Department. Brownsville is currently experiencing approximately 3000 accidents per year.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. When the form is turned in, it is checked by the Traffic Sergeant for completeness and accuracy. It is then reviewed by a secretary/data clerk in the Operations Division. She keeps hand tallies related to citywide accidents and STEP accidents--for later completion of monthly STEP reports. The form is reviewed by the Operations Captain and is then sent to the Records and Communications Section (R&C). R&C logs the accident in either the Private Parking Book or the Public Streets Book. Index cards are typed for each first-offense driver associated with the accident. Cards are typed for guilty drivers as well as innocent drivers. Data for non-first-offense drivers are placed on previously typed cards. The cards are filed alphabetically by name of driver. Thus, a driver history file is readily available to the PD. R&C makes a copy of each accident report and files it by location of accident, i.e., alphabetically by major street.

Accident reports are filed in a separate file from crime reports. The original accident report is forwarded to the TD. The TD places street codes on the original report and forwards it to DPS-Austin for entry into the State traffic records system. The DPS quarterly printouts are received by the TD and the PD approximately 6 weeks after the end of each quarter.

Police Department

The Brownsville Police Department is organized into 3 major units: the Administrative Services Division, the Staff and Community Services Division, and the Operations Division. The Operations Division consists of the Criminal Investigation Division and the Uniformed Patrol Division. The 60 uniformed officers in the Patrol Division work three shifts and are involved in both crime control and traffic control. The PD investigates all traffic accidents, including those resulting in less than \$250 damage and those occurring on private property.

The PD conducts a STEP program which is monitored by the Director of Traffic, Traffic Department. The Director chooses the enforcement sites by referring to DPS quarterly printouts and by conferring with police. Uniformed officers having at least one year of experience may participate in the STEP program on an overtime basis. Approximately 45 officers participate. Two new cars are purchased each year with STEP monies. The cars are specially marked ("Traffic Safety") and are used only for STEP operations. The Director of Traffic hopes that Brownsville's participation in STEP will eventually lead to the formation of a Traffic Division in the PD.

The PD does have data processing equipment, but it is used exclusively to process crime data. The two terminals (a Hewlett Packard CRT and a 2645A

printer) are connected to the Hewlett Packard 3000 computer housed in the Data Processing Department. Spot maps are not used to identify high accident locations. The Records and Communications Section keeps a special log on DWI citations and the court dispositions of DWI cases. The PD uses accident data only to answer specific questions asked by insurance companies, citizens, and the Chief of Police. No analysis of accident data is made for the planning and scheduling of police operations.

Traffic Department

The Traffic Department (TD) has 38 employees, none of whom is a traffic engineer. The Director of Traffic is a former Traffic Safety Coordinator funded by SDHPT. His department is divided into the following five divisions:

- 1) Graphics Division, which handles street signs and street markings
- 2) Electric Division, which handles traffic signals and fire alarms
- 3) Parking Division, which handles parking meters and parking tickets
- 4) Civil Defense Division, which handles plans and preparations for civil defense maneuvers
- 5) Administration Division, which handles coding of traffic accident information, traffic planning, and grant writing.

Traffic engineering functions are performed by outside consultants. A consulting firm from Houston is currently working on plans for the modernization of traffic signals, sidewalks, and intersections. Other transportation functions (such as Brownsville's bus system and Public Works street construction) are being performed by the Department of Transportation.

The TD has 2 terminals connected to the city's computer: one terminal is used for keeping a sign inventory and the other is used for processing parking ticket information. The Traffic Director would like to start using the city's computer for the processing of traffic accident data. This change would

require the reception of monthly accident tapes from DPS and the hiring of consultant programmers to write the necessary software to access the data. The Traffic Director would like to receive monthly computer printouts that present accident data in specialized formats such as:

- 1) a detailed listing of accident data for all accidents which occurred at each of the 25 worst intersections
- 2) a detailed listing of accident data for all accidents which occurred at each of the 25 worst midblocks
- 3) a summary listing of accidents categorized by location and time of day
- 4) a summary listing of accidents categorized by location and day of week.

The Director of Traffic uses the DPS quarterly printout to spot high accident locations. He visits each location and confers with police to decide if enforcement or engineering countermeasures should be initiated. This procedure results in frequent changes to the locations patrolled by STEP officers. The Traffic Director keeps a separate folder containing information relating to each fatal accident--such as a copy of the accident report, newspaper clippings about the accident, the National Safety Council's Motor-Vehicle Fatality Report, etc.

Data Processing Department

The Data Processing Department has 9 employees: 7 city employees and 2 CETA employees. The city employees include the Manager of Management Information Services, 2 programmer analysts, 1 computer operator, 1 data entry operator, 1 data control clerk, and 1 half-time data clerk. The Data Processing Department houses a Hewlett Packard 3000, Series 2 computer. Presently, there are 25 on-line terminals connected to it:

- 1) 10 at the Data Processing Department
- 2) 7 at the Tax Department
- 3) 2 at the Police Department
- 4) 2 at the Traffic Department
- 5) 2 at the Planning Department
- 6) 1 at the Accounting Department
- 7) 1 at the City Health Clinic.

The Manager of MIS stated that his department's computer system has the capacity to process traffic accident data--now and in the future. He plans to expand the data processing capabilities of the computer, so the only limitations will be due to inadequate programming skills. He stated that the low salary structure in the Rio Grande Valley made it hard for him to compete with larger cities for competent programmers.

Input Data

Brownsville's Accident Report Form for public street accidents includes only those questions required by DPS. Completed forms are checked by the Traffic Sergeant. Three common errors are: 1) not entering the names of persons injured, 2) failing to complete required supplements, and 3) entering wrong date. A special Accident Report Form is used to investigate private property accidents.

Filing System

The PD's filing system includes two logs, a driver index file, and a hard copy file. Numerous hand tallies are kept to complete STEP reports and Monthly Activity Reports. The TD's filing system includes a hard copy file of all accident reports--filed by location. These reports are used to draw collision diagrams for special projects.

Output Reports

The PD does not use any computer printout to analyze traffic data. The TD uses the DPS quarterly printout.

The monthly and yearly summaries compiled by the PD are laboriously tabulated by hand and only citywide data are presented.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The traffic records system in Brownsville is used very little for the analysis of traffic problems. The Traffic Director uses it more than does police personnel. The Traffic Director reviews DPS quarterly printouts to detect high accident locations, but in-depth reviews of all accidents that occurred at specific locations are not made. (This is partly due to the inconvenience associated with decoding accident information presented in coded format on the DPS quarterly printout.) The Traffic Director hopes to remedy this situation in the future by relying on monthly accident tapes from DPS and computer software that produces "readable" computer printouts.

The Police Department's involvement in the traffic records system is almost entirely concerned with administrative functions (tallying, logging, indexing, filing, and retrieving). Few analyses of traffic accident data are performed for planning and operational purposes. One of the most obvious problems faced by the PD is the lack of adequate space in the police building.

Galveston, Texas (population approximately 61,000) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. A records clerk in the Galveston Police Department places location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the State traffic records system and sends quarterly computer printouts of accident data to Galveston. Galveston originally received only monthly computer tapes from DPS, but the traffic records system based on this data never became operational. The following two factors contributed to this failure:

- 1) The Finance Department (where the city's computer is housed) was going through a changeover of computer hardware and software at the time the traffic records system was scheduled to be implemented. Because the changeover required new programming for the data systems of all city departments, the development of the traffic records system was given low priority.
- 2) A 6-month delay was experienced in the conversion of accident data from IBM-mode magnetic tape to NCR-mode magnetic tape. The NCR Regional Center in Houston failed to provide prompt conversion service, i.e., the Center kept the tapes for 6 months. No one in Galveston placed pressure on the Center to provide prompt service.

Because the new traffic records system failed to yield monthly computer printouts, the PD requested quarterly printouts from DPS-Austin. Personnel in the STEP program wanted to use quarterly printouts to help identify problem locations. Thus, the PD presently receives quarterly printouts from DPS, but the printouts are not being used as planned. STEP personnel found that the printout required too much additional processing to be useful. DPS stopped sending monthly tapes to Galveston after the city failed to return numerous reels to Austin so that accident data could be updated.

The city departments most directly involved with the existing traffic records system are: 1) the Police Department, 2) the Department of Urban Planning and Transportation, Traffic Engineering Section, and 3) the Finance

two of which were mentioned earlier. Thus, the police and traffic engineer are presently relying solely on hand-tallied data.

The traffic engineer receives a copy of each accident report. Manual tallies are kept daily, and monthly totals are compiled by hand. Accident reports are filed by location, i.e., urban accidents are filed by nearest intersection, and rural accidents are filed by street and estimated block number. No spot map is kept by the Department of Urban Planning and Transportation.

Police Department

The Galveston Police Department is organized into 3 major units: the Patrol Division, the Criminal Investigations Division, and the Administrative Support Division. A Traffic Enforcement Section (i.e., a STEP program) is located within the Patrol Division and consists of 3 patrolmen and 1 Sergeant. These officers implement a fulltime STEP program, in addition to each patrolman's working 2 hours of overtime per week. STEP officers use radar on a citywide basis, with emphasis being placed on high accident locations identified via hand tallies made by the STEP statistician and the STEP Sergeant. The STEP Sergeant keeps a daily log on the activities of STEP patrolmen. When the STEP contract expires at the end of September 1980, it will not be renewed because the SDHPT wants the PD to assume more of the costs for the program. The police feel that they cannot afford to assume these costs since Galveston recently passed a "Proposition 13" Amendment.

The PD has data processing equipment for processing crime data, i.e., terminals connected to the NCIC and the TCIC networks. No in-house computer or terminal exists for processing accident data, however. The city's computer is housed in the Finance Department. This setup is creating problems for the

PD, especially in the area of accident data analysis. The police are displeased that their efforts at helping the consultants develop a traffic records system have not produced tangible results. The PD has continued to place location codes on accident reports, but is currently receiving only the quarterly printout. The police would like to receive consultant-designed computer printouts each month, so they can spot trends better. The police did not know why the computerized traffic records system never became operational.

The Chief of Police and the city traffic engineer are ex-officio members of Galveston's Traffic Commission, a 7-member citizen board that reviews matters of policy, traffic control regulation, and enforcement. The Commission makes recommendations to the City Council.

Department of Urban Planning and Transportation

The traffic engineering section of the Department of Urban Planning and Transportation is composed of the following personnel: a traffic engineer, a field superintendent with 2 electricians, 3 laborers, 1 parking meter repairman, 4 meter maids, 1 warehouse clerk, an inspector, and a field investigator. The traffic engineer shares a departmental secretarial pool and has administrative control over the city bus company.

The traffic engineer uses accident data in the performance of his duties. He also provides accident information to the city manager, the Traffic Commission, attorneys, complainants, and the news media. This information is presently extracted from hard copies of accident reports which are filed by nearest intersection (if urban), and by street and estimated block number (if rural). The traffic engineering section manually processes accident data and does not use spot maps.

The traffic engineer is concerned that the traffic records system developed by consultants is not operational. He is also concerned about the following problems:

- 1) manpower shortage.
- 2) inability to get computerized data from the traffic records system or accurate hard-copy data from the PD. Police reporting is sometimes incomplete or inaccurate. Accident reports sometimes contain little or no information about what happened and what caused it to happen.
- 3) inability to read poorly-reproduced copies of accident reports received from PD.
- 4) inefficiency inherent with the manual processing of accident data.

Input Data

Galveston's Accident Report Form includes only those questions required by DPS. No suggestions were made by the police or the traffic engineer on how to improve the form. However, one police officer suggested that the whole form be deleted because "police officers should not have to investigate accidents since their investigations are only beneficial to insurance companies." Although accident reports are supposedly checked by police supervisors and a records clerk, the quality of Galveston's accident data should be improved.

Filing System

Accident reports are filed manually by both the PD and the Urban Planning and Transportation Department. The police file their hard copies by serial number, and the traffic engineer files by location. The automated traffic records system is not operational at this time; however, progress is being made toward solving major problems with the system. The new NCR computer at the Finance Department is adequate for the present and future processing of accident data. Spot maps are not used by the police or the traffic engineer.

Output Reports

No computer printouts of accident data are being produced in Galveston at this time. The quarterly printout received from DPS is not being used.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The computerized traffic records system that was developed for Galveston has not been implemented because an efficient way to convert IBM-mode data to NCR-mode data has not been found and because data users (police and traffic engineer) do not have authority over data providers (Finance Department). The Finance Department was allowed to set its own priorities during a hardware and software conversion period, and accident data analysis became a low-priority task. No city official higher than departmental level, such as City Manager or City Councilman, was concerned enough about traffic safety and accident data analysis to put pressure on the data providers. The interviewer recommends that higher city officials become involved in the SDHPT contract planning, implementation, and monitoring stages. High city officials are especially needed during the implementation stage. It is extremely difficult to implement new procedures which require the coordinated performance of new tasks by several departments. Sometimes a high city official is needed to get departments to cooperate or to get a particular department to place emphasis on a particular problem.

Bryan, Texas (population approximately 45,000) participates in the Urban Accident Location Coding Project and receives a quarterly printout from the Department of Public Safety (DPS). The city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Traffic Engineering Department. Also, the State Department of Highways and Public Transportation has a three-person group in Bryan, called the Urban Transportation Study (UTS), which processes accident data for Bryan, College Station, and Huntsville. Bryan is currently experiencing approximately 1600 accidents per year.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. The form is checked by a police supervisor, and errors are corrected. Two copies are made of accident reports filed by STEP officers; one copy is made of reports filed by non-STEP officers. The original report is sent to DPS for entry into the State traffic records system. A copy of all reports goes to the Records Section of the PD. The Records Section updates an index card file; each card contains all the accident/offense information pertaining to a particular citizen. Then the Records Section updates a manual tally sheet containing monthly accident frequencies in several categories of information; codes the accident information on a Bryan-C/STA Accident Worksheet (which is later sent to the Urban Transportation Study group for processing); and files the report by date of occurrence. Also, a copy of reports written by STEP officers is sent to the STEP Sergeant. The Sergeant uses these reports to keep hand tallies necessary to complete monthly reports for the SDHPT.

The Urban Transportation Study Group uses a remote terminal to keypunch the coded data onto a tape at a SDHPT office in Austin. The Mark IV File Management System is used to store the data. Hard copies of monthly, yearly,

and special reports are output at the Bryan SDHPT office. These reports contain accident by accident information presented by location of occurrence-- i.e., the data for all accidents that occurred at a particular intersection are grouped together; no totals are given. These reports are distributed to the Police Department and the Traffic Engineering Department.

Police Department

The Bryan Police Department has officers assigned to a Detective Section and officers assigned to a Patrol Section. Thirty-three non-STEP officers and five STEP officers are assigned to the Patrol Section which is primarily responsible for traffic control. Non-STEP patrol officers may investigate offenses, as well as accidents--but STEP patrol officers may only investigate traffic accidents. STEP patrol officers keep daily log books containing information on the accidents they investigate at high accident locations.

The PD does not have its own data processing equipment to compile and analyze traffic accident data, nor does it use the equipment in the city's Data Processing Department. The PD codes accident information onto code sheets and sends these sheets to the Urban Transportation Study Group (SDHPT) who processes the data and sends the PD monthly, yearly, and special reports. The PD uses numerous hand tallies to keep up-to-date information about citywide and STEP programs. STEP officers keep a spot map on a yearly basis. The map is used by patrol supervisors to identify problem areas where enforcement should be upgraded. The STEP officers also keep a log containing information about the citations they issue at STEP sites. Regular patrol officers keep a log on citations they issue. The citations are sent to municipal court. No citation file is maintained within the PD.

The interplay between Bryan's traffic records system and DPS's traffic records system is not smooth. The two systems operate independently of each other and result in duplicated effort. The PD makes little use of the quarterly printout it receives from DPS. The local coding system does not work well either. The coding of accident data at the PD is a low priority function of one records clerk. The code sheets may be up to 6 months late getting to the Urban Transportation Study Group (SDHPT) for entering onto computer tapes. Frequent personnel changes in the clerical positions at the PD lead to inconsistent and inaccurate coding techniques. The coder does not see the results of her work, i.e., computer printouts. Therefore, it is difficult for her to develop a sense of responsibility for the accuracy of the printout. Also, having the SDHPT in the records system loop makes the system awkward.

The PD investigates all traffic accidents, except those that occur on private property and in parking lots. Dollar damage is not a determination of which accidents get coded. All streets in Bryan are numbered. Accidents are located in the traffic records system via a primary street number and a secondary street number. For an intersection accident, the street representing direction of travel of violator is coded as the primary street, and the other street is coded as the secondary street. For a midblock accident, the street representing direction of travel of violator is the primary street, and the nearest cross street is the secondary street. The distance to this cross street is coded so analysts will know whether it is an intersection or nonintersection accident.

Traffic Engineering Department

The Traffic Engineering Department has a staff of 5, including one

traffic engineer. The Department is currently heavily involved in a sign replacement program. Other functions (such as striping, installing reflector buttons, marking streets, and cutting limbs) are receiving less emphasis at this time. The Department receives "monthly" printouts from the Urban Transportation Study (UTS) group, but these reports are received so late that little use is made of them. On the other hand, special requests for intersection analyses are received promptly from the UTS group. The traffic engineer uses these intersection analyses to identify traffic problems and to compose collision diagrams.

The traffic engineer has ready access to data in the traffic records system; however, he is concerned about the accuracy of some of the data and about the advisability of having a State agency in the processing loop for city accident data. The traffic engineer is a non-voting member of Bryan's Traffic Safety Commission. Other members include the Brazos County Judge (Chairman), the city attorney, a city planner, a policeman, the Director of Public Works, and 5 citizens. The Commission meets monthly to discuss traffic problems and makes recommendations to the City Council.

Urban Transportation Study (SDHPT)

The Bryan-College Station Urban Transportation Study was developed as a joint effort of the two cities, the county, the Texas Highway Department, and the Federal Highway Administration, with the cooperation of Texas A&M University and the Brazos Valley Developmental Council. The purpose of this study is to make available to all planning agencies a detailed inventory of existing transportation facilities and to set forth the basic plan for improvements which become necessary through the year 1990. The transportation planning was based on collection, analysis, and evaluation of data on existing

and past conditions within the Study Area. Ten basic elements were studied:

- 1) economic factors
- 2) population
- 3) land use
- 4) transportation facilities
- 5) travel patterns
- 6) terminal and transfer facilities
- 7) traffic engineering features
- 8) community controls
- 9) social and community values
- 10) financial resources.

The "transportation facilities" element included the determination of capacities, inadequacies, and shortcomings of the Study Area Transportation System. Capacity studies, travel time studies, public transportation studies, and accident studies were made in order to formulate the 1970-1990 Transportation Plan. The present traffic records system in Bryan (with UTS of the SDHPT in the data processing loop) is a result of UTS's need for accident data. At one time, UTS did its own coding of accident information. Now, the Police Departments of Bryan and College Station code the information and send the code sheets to UTS for further processing. This procedure is not very effective, as exemplified by the fact that the Bryan PD is currently 6 months behind in sending its code sheets to UTS. UTS personnel are not satisfied with the quality of input data (i.e., the information the police enter on accident report forms), nor are they satisfied with the quality of coded data (i.e., the data the PD records clerk enters on code sheets). A major problem with the current system is that the accident location is sometimes miscoded.

Input Data

Only that information required by DPS is collected on Bryan's Accident Investigation Form. The form is apparently satisfactory to the police since they made no recommendations for additions or deletions. Police supervisors

check completed forms for accuracy when the forms are turned in by subordinates. Policemen in Bryan receive initial training in accident investigation during a basic 6-week extension course they receive at Texas A&M University. Some officers receive additional training in accident investigation during a 3-week advanced course at A&M.

There seem to be problems with the accuracy of raw data (inaccurate damage rating, no violation cited, etc.); however, the major problem seems to be with the accuracy of coded data (inaccurate coding of accident location, etc.) and with the long delay between date of accident and date that code sheets reach UTS for processing.

Filing System

The raw data is filed manually at the PD. Hard copies of the investigation reports are filed by date of accident in the Records Section. Manual tallies are kept daily on an Accident Summary Sheet which gives up-to-date, monthly frequency counts in such categories as time of day, day of week, light conditions, driver violations, manner of collision, surface conditions, and injuries.

Coded data is stored on tape through the use of the SDHPT computer system. The data is keypunched via remote terminal in Bryan, stored on tape in Austin--using the Mark IV File Management System, and retrieved via printouts at a remote terminal in Bryan.

Output Reports

The only output report scheduled for production on a regular basis is a High Accident Location Listing. The listing presents accident-by-accident information grouped by intersection of occurrence. Monthly and yearly reports

are supposed to be produced, but delayed coding of accident information makes this schedule impossible to meet. These reports do not give totals, so additional computation is needed when special questions must be answered.

Requests for special reports (such as a pedestrian accident summary, a bicycle accident summary, a motorcycle accident summary, or an accident by specific location summary) are sent to UTS by the PD, the Traffic Engineering Department, and other city departments interested in traffic safety. A SDHPT programmer writes programs to extract this information from the tapes. Output reports are received and distributed promptly.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

Not much overall. The traffic records system in Bryan has numerous inadequacies. The data gathering, coding, and processing functions are too decentralized. The result of this decentralization is that no department feels totally responsible for the accuracy and usefulness of the data. Bryan's Police Department and Traffic Engineering Department seem to be functioning fairly well in the traffic safety area--considering the inadequacies of the traffic records system. However, these departments will probably function much more poorly as Bryan's population and accident frequencies increase. The present system, with its de-emphasis on the coding function, will be totally inadequate for handling the traffic problems of a "large" city. Bryan should seriously consider using DPS-coded data. This would eliminate the problems created by the PD's placing low priority on the administrative/coding functions of the traffic records system.

Texarkana, Texas (population approximately 37,200) participates in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. A Records Clerk in the Texarkana Police Department (PD) places location codes on accident reports prior to sending the reports to DPS-Austin. DPS enters the accident information into the State traffic records system and sends computer printouts of accident data to Texarkana each quarter. These printouts are used primarily by the Traffic Section of the Police Department to aid personnel assignment and scheduling.

Texarkana also has an automated, local-entry system for analyzing traffic accident data. The system has been in operation since January of 1980, but numerous problems have prevented its smooth operation. Five of these problems are listed below:

- 1) The system relies on the Water Company's computer (an IBM 1403) which is inadequate for handling the data processing load for the city.
- 2) The Water Company shuts its computer off at night; thus, stored information is not available to the police during downtime. Also, data cannot be entered during these times.
- 3) At present, the police can only retrieve accident information via CRT screen. Computer printouts cannot be produced because the PD's line printer was improperly installed.
- 4) There is little coordination between the PD and the Public Works Department, the two potential users of accident data. There is no consensus between the two departments about who is responsible for coding and inputting accident data to the system. Both were attempting to accomplish these tasks, but each department thought it was the only department entering accident data to the system.
- 5) No one person or office seems to be totally dedicated to the smooth operation of the traffic records system, so the system is floundering.

Thus, the city departments most directly involved with the existing traffic records system are: 1) the Police Department, 2) the Public Works Department, and 3) the Water Company. Texarkana is currently experiencing approximately

1300 accidents per year, with 3 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. Accident reports are turned in after each shift and are checked by police supervisors for completeness and accuracy. The reports are forwarded to the Records Section where they are logged in and copied. A copy is sent to the Public Works Department. A copy is sent to DPS-Austin, after 5-digit location codes are placed on the report. The original is sent to the Chief of Police's secretary who updates hand tallies used to determine monthly accident totals in several categories. The original accident report is returned to the Records Section where a records clerk uses a CRT terminal to input certain accident information into the local traffic records system. After the data is entered, the report is assigned a control number for indexing purposes in a microfilm filing system. The original report is microfilmed and then filed in the Records Section by month and by day of occurrence. The microfilmed copy is filed by control number.

The Public Works Department receives a copy of all accident reports, but very little use is made of these copies. There is no traffic engineer in the Department, and no system has been set up to routinely glean information from accident reports. Traffic engineering duties have been assumed by a variety of personnel within the Public Works Department. Somehow the Public Works Department was made responsible for encoding certain accident data for entry into the local traffic records system. The task of filling out code sheets (eventually sent to the Water Company for entry into the computer) has been passed around to several individuals within the Department. Now, the task is being handled (sporadically) by a secretary in the Construction Inspection Division of the Public Works Department. Needless to say, the local traffic records system is inoperative at this time due to numerous personnel,

administrative, and hardware problems.

Police Department

The Texarkana Police Department is organized into 3 major units: the Patrol Division, the Criminal Investigation Division, and the Special Services Division. The Traffic Section is part of the Patrol Division. Eight (8) officers are assigned fulltime to this section: 1 Lieutenant, 1 Sergeant, and 6 patrolmen. Presently, there are two authorized positions vacant. Some of the tasks performed by traffic officers are: provision of massive and selective traffic programs, investigation and prevention of traffic accidents, development of selective traffic enforcement programs, operation of radar and other speed controls, promotion of traffic safety programs, enforcement of traffic and criminal laws, and enforcement and control of vehicular parking. Traffic officers investigate approximately 70% of the accidents that occur in Texarkana. They are concerned with all phases of traffic control, except the disposition of abandoned cars.

The Traffic Section is currently funded solely with local monies; however, the Section was initially funded through SDHPT STEP grants. The Comprehensive STEP program began in 1973 on an overtime basis, in 1974 it began operation on a fulltime basis, in 1975 additional personnel (a Sergeant and 2 patrolmen) were funded, and in 1979 State funding ended and local funding began. The PD has also participated in a DWI ITLE program for the past three years. Monies from SDHPT are being used to finance the overtime work of 1 supervisor and 3 patrolmen who cover 5-hour periods on Friday and Saturday nights.

The PD has a CRT terminal connected to the Water Company's computer. The terminal has been in operation since the beginning of the year, so all of

1980's accident data have been entered into the system. At present, accident data can only be retrieved visually (via CRT). However, a line printer will soon be connected to the computer.

Two hard copies of each accident report are maintained in the PD. The original is filed in the Records Section by month and day of occurrence. A copy is filed by complaint control number (CCN). Spot maps are not kept by the Traffic Section.

Public Works Department

The Public Works Department is divided into 5 major divisions: 1) Vehicle Maintenance Division, 2) Street Division, 3) Engineering Division, 4) Construction Inspection Division, and 5) Inspection Division. The Engineering Division consists of 2 sections: 1) the Design Section and 2) the Sign and Signal Section. An Associate Engineer and 6 other employees are assigned to the Design Section. An Associate Engineer, a Foreman, and 8 other personnel are assigned to the Sign and Signal Section. There is no traffic engineer employed in the Public Works Department. One is especially needed in the Engineering Design Section, and efforts are underway to hire such an individual. Most of the analyses of accident data, traffic volumes, and sign/signal systems have been accomplished via consultants hired by SDHPT to conduct Traffic Engineering Surveys.

The city engineer indicated that the main problem in the Public Works Department was a shortage of personnel. The Department does not have the personnel to assimilate accident data, regardless of what form it is in. A traffic engineer is needed to monitor the input of accident data to the traffic records system and to use computer output effectively.

Input Data

Texarkana's Accident Report Form includes only those questions required by DPS. Police and Public Works personnel are fairly well satisfied with the State form; however, they do feel that more space is needed for the narrative and the diagram. The PD's quality control system for accident reports includes reviews by police supervisors and records clerks. Common errors found on the form are: 1) information is omitted, such as damage rating, business address, and disposition of injured, and 2) information is incorrect, such as wrong day of week, wrong date, and wrong block number.

Filing System

Accident reports are filed manually by both the PD and the Public Works Department. Both departments have responsibilities for coding and/or inputting accident information into an automated, local-entry traffic records system. At present, this system is bogged down due to hardware and personnel problems. The PD also has a microfilm filing system, but the system receives limited use because the equipment malfunctions frequently. No spot maps are used by either department.

Output Reports

No computer printouts of accident data are available from the local traffic records system at this time. When the line printer becomes operational at the PD, printouts will be available. Accident information is presently available via CRT at the PD. Quarterly printouts of accident data are received from DPS, but the printouts are used very seldom.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The local traffic records system has very little effect on the operations of the Police Department or the Public Works Department. The system is floundering for a variety of reasons, such as:

- 1) the unreliability of certain CETA employees assigned administrative duties in the Police Department,
- 2) the lack of a traffic engineer in Texarkana to monitor the processing and use of accident data, and
- 3) the inconvenience and inefficiency of having accident data processed on the Water Company's computer. The processing of accident data is apparently a low priority function, and the computer is not available for data input and data retrieval on an after-hours basis (i.e., the computer is shut down at night).

The interviewer was impressed with the Police Department's desire to receive more accurate and more timely accident data. The Chief of Police is very knowledgeable of the administrative procedures involved in the local traffic records system, and he is genuinely concerned about how personnel and hardware limitations are affecting the quality of the system. He would like to get an in-house computer so the Police Department could process its own accident data.

A factor which probably leads to a temporary toleration of the inefficient, local traffic records system is the bi-State project sponsored by the IACP and the LEAA. A feasibility study is being conducted to determine the effects of combining the law enforcement functions of Texarkana, Texas; Texarkana, Arkansas; Bowie County, Texas; and Miller County, Arkansas. Under a proposed reorganization, the four police agencies would be housed in one building. Texarkana, Arkansas police would be in charge of communications for the four agencies; Texarkana, Texas police would be in charge of records keeping for the four agencies; and the county sheriffs would be in charge of

detention for the four agencies. An in-house computer for processing crime data and traffic data would accompany this change.

More accurate and timely accident data will be of little benefit to the Public Works Department until the Department hires a traffic engineer or someone who actively supports the use of accident data for making traffic engineering decisions.

APPENDIX E

SITE VISIT REPORTS FOR CITIES
NOT PARTICIPATING IN THE URBAN ACCIDENT LOCATION CODING PROJECT

Dallas, Texas (population approximately 944,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Even though Dallas is a nonparticipant, the city does code the primary and secondary streets prior to sending accident reports to DPS. The city does not receive monthly accident tapes or quarterly printouts from DPS, however. The accident data used by Dallas are locally-coded and locally-processed. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Streets and Sanitation Services Department--Traffic Operations Section, and 3) the Data Processing Department. There is good coordination between the police, traffic engineering, and data processing components of the traffic records system. Dallas is currently experiencing approximately 53,000 accidents per year. The city experienced 207 traffic-related fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. The officer identifies a particular accident with a 7-item alphanumeric service number assigned by the dispatcher. The service number is used to follow the accident report through the traffic records system. The number is later used to access accident data by entire city, by patrol division, by Sergeant Sector, or by individual patrol beat. After the accident report is checked by a police supervisor, it is forwarded to the Staff Review Unit of the Reports Division. The Staff Review Unit consists of 9 police officers (3 per shift) who check accident reports for completeness and accuracy. These officers forward complete and accurate reports to the data entry clerks of the Reports Division. These clerks enter certain types of information (coded and noncoded) to the traffic records system, via 10 terminals connected with the

Data Processing Department's ITTEL mainframe computer. The Reports Division makes copies of each accident report and forwards the copies to several outside agencies. DPS, Municipal Court, and Dallas' Streets and Sanitation Department get copies of all accident reports. Copies of certain reports are sent to the city's Public Works Department and the Turnpike Authority. Also, the Traffic Division of the Police Department receives a copy of each accident report involving a fatality. The Reports Division files the original accident report by service number and uses a computerized indexing system to facilitate the retrieval of accident reports. The original report is kept on file for 12 months and is then placed on microfilm.

Monthly computer printouts containing monthly and year-to-date accident information are produced at the Data Processing Department, and forwarded to the Police Department (Reports Division and Traffic Division) and the Streets and Sanitation Services Department (Traffic Operations Section).

Police Department

The Dallas Police Department is organized into 3 major units: the Patrol Bureau, the Special Services Bureau, and the Support Services Bureau. There are approximately 1200 uniformed officers assigned to the Patrol Bureau. The operations of the Patrol Bureau are carried out in five locational divisions, i.e., Central, Northeast, Northwest, Southeast, and Southwest. The Special Services Bureau is involved with the following functions: criminal investigation, community services, legal liaison, vice control, intelligence, and traffic. The Traffic Division consists of three sections: the Investigation Section, the Enforcement Section, and the Traffic Control Section. Ninety-two (92) sworn police officers and seventeen (17) nonsworn

public service officers are assigned to the Traffic Division. Twelve (12) police officers (plainclothes investigators) are assigned to the Investigation Section. These officers investigate all accidents involving fatalities, all hit-and-run accidents, 85% of the accidents involving injuries, and 40-45% of the accidents involving property damage only. Two investigators are primarily concerned with filing cases with the Dallas County court system-- e.g., cases involving DWI, driving while license suspended, reckless driving, involuntary manslaughter, reckless conduct, aggravated assault, and failure to stop and render aid. These two investigators filed 1337 such cases in March, 1980. The Enforcement Section consists of 30 police officers who operate solo motorcycles and several police officers who operate radar patrol cars. The Enforcement Section is primarily concerned with the issuing of citations for moving traffic violations. The Traffic Control Section consists of 17 nonsworn, public service officers and several sworn police officers. These officers are primarily concerned with directing traffic, issuing parking citations, supervising school crossing guards, etc.

The PD operates a DWI STEP program which is managed by a Captain in the Traffic Division. Two (2) Sergeants and ten (10) officers implement the program 5 days a week. The officers work a regular 8-hour shift for 2 days a week and work a regular 8-hour shift plus 4 hours overtime for three days a week. The STEP grant from the SDHPT pays the salaries of these 12 officers.

The PD presently has 120 terminals connected to the two ITEL AS/4 computers housed in the Data Processing Department. Seventeen (17) video terminals, plus three line printers, are housed in the Reports Division of the PD. The Reports Division expects to add 5 more video terminals in the near future. Terminals are also located in the Traffic Division where they

are used to retrieve information concerning vehicle registrations and accidents. The Traffic Division receives a copy of each accident report involving a fatality, files the report by service number, and destroys the report after it has been on file for 12 months. The Traffic Division keeps a spot map showing the location where fatal accidents occurred. The map also shows running totals in the following categories: Traffic Deaths per Division, Traffic Deaths Citywide, and Fatal Accidents Citywide.

The Municipal Court also has terminals connected to the Data Processing Department's computers. With these terminals, the Municipal Court enters information concerning moving traffic arrests and dispositions. Monthly and yearly computer printouts concerning these arrests and dispositions are received by the Traffic Division of the PD.

The Traffic Division uses monthly computer printouts to provide data for their monthly Motor Vehicle Accident Experience Report. Monthly computer printouts are also used to monitor accidents for the STEP program. Personnel in the Traffic Division are satisfied with the present traffic records system; however, personnel in the Reports Division are not satisfied. The Reports Division noted the following problem areas:

- 1) remote operations via terminals/telephone lines lead to slow response times. Five hundred terminals, scattered throughout city departments in Dallas, are connected to 2 ITEL AS/4 computers housed in the Data Processing Department.
- 2) the data entry clerks are duplicating what is being done in Austin by DPS. The only types of information that should be entered locally (before an accident report is sent to DPS) are service number, name of driver, date/time of accident, and location of accident. This information could be used as an index for the retrieval of hard copies/microfilm of accident reports.
- 3) the PD cannot handle special requests for accident data in a timely fashion. New computer programs must be written to

produce special printouts--such as a printout of all the accidents which occurred between the 900 and 1200 blocks of Preston Boulevard for 1979.

Traffic Operations Section, Streets and Sanitation Services Department

Traffic safety functions have been delegated to several departments within the city government of Dallas. Various functions have been assigned to the Transportation and Planning Department, the Public Works Department, the Emergency Preparedness Department, and the Streets and Sanitation Services (SSS) Department. The Traffic Operations Section of the SSS Department performs more traffic engineering tasks than does any of the other city departments, so the Traffic Operations Section will be described here.

Eight (8) traffic engineers are employed at the Traffic Operations Section of the SSS Department. They are concerned with the installation and repair of signals, signs, and parking meters. They are concerned with accident patterns at high-accident intersections and non-intersections. After receiving a request for a collision diagram from an engineer, a data clerk researches accident reports and computer printouts to compile the necessary information for the diagram.

Seventeen (17) administrative/support personnel are employed at the Traffic Operations Section. These personnel conduct surveys (ADT counts, citizen preference, pedestrian counts for possible sidewalk installation, etc.); investigate citizen complaints and requests; and analyze accident data. Two clerks (one a permanent city employee and one a CETA employee) read all accident reports to determine if damage to city property occurred (and if it did, the clerks bill the responsible party). The clerks file the hard copies of accident reports received from the PD, file the monthly/

yearly computer printouts of accident data received from the Data Processing Department, and complete collision diagrams requested by traffic engineers. The Traffic Operations Section has no computer terminal connected to Data Processing's computer, so a manual search through hard copy files is necessary when an answer to a specific question is needed. This process is tedious and time consuming. Many questions can be answered by referring to computer printouts concerning intersection accidents, computer printouts concerning non-intersection accidents, and monthly Motor Vehicle Accident Experience Reports received from the PD. There is no set rule as to how long the hard copies are kept on file--but a Traffic Operations clerk indicated that accident reports would be kept for at least 3 years, if space permitted.

Personnel in the Traffic Operations Section had few complaints about the current traffic records system. This office does not keep a spot map.

Input Data

Dallas' Accident Report Form includes only those questions required by DPS. The quality control checks (supervisory plus Staff Review) are very good. Errors usually involve one of the following:

- 1) wrong date or wrong day of week
- 2) diagram does not match narrative description of accident
- 3) omissions by accident investigator.

Incorrect or incomplete forms are returned to the accident investigator involved.

Filing System

The PD has both a manual and a computerized filing system. Manual files of original accident reports and manual files of microfiched reports are maintained. A computerized indexing system is used to retrieve original accident reports which were filed by service number. This indexing system and the entire accident information file stay on-line for only 2 months, then the information is transferred to tape, microfiche, or computer printout. The PD is displeased with the service it is receiving from Data Processing's computer. The PD would like its own computer, so it could computerize its crime and traffic data and have ready access to such data.

The Traffic Operations Section, Streets and Sanitation Services Department has a manual filing system for copies of accident reports.

Output Reports

Each month the following computer printouts of accident data are produced by the Data Processing Department:

- 1) Report of All Intersection Accidents--which gives year-to-date, accident-by-accident information grouped alphabetically by primary street name.
- 2) Report of All Non-Intersection Accidents--which gives year-to-date, accident-by-accident information grouped alphabetically by street name.
- 3) Report of Multiple Non-Intersection Accidents of 05 or More--which gives only monthly accident-by-accident information grouped alphabetically by street name.

The Traffic Division of the PD and the Traffic Operations Section of the SSS Department were satisfied with the format of these computer printouts.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The Police Department and the Streets and Sanitation Services Department

make adequate use of accident data. Each month the Traffic Division of the Police Department prints a Motor Vehicle Accident Experience Report which highlights factors about fatal accidents and freeway accidents. The Traffic Division also keeps a spot map concerning fatalities. Better analyses are needed for accidents involving injuries. Such analyses are not feasible at this time because of the manpower shortage in the Traffic Division and the volume of injury accidents in Dallas.

The advantages gained by having access to locally-coded and locally-processed accident data are offset by the disadvantages of having to rely on the central computer housed in the Data Processing Department. Dallas may eventually participate in the Urban Accident Location Coding Project, sponsored by DPS, even though the Police Department has a lot invested in its own accident data system. If the city joined this project, the Police Department would need new computer programs to access accident data on DPS monthly tapes. If the Police Department had its own computer, it would be more willing to join the DPS system.

San Antonio, Texas (population approximately 800,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Thus, the city does not receive monthly computer tapes or quarterly computer printouts of accident data from DPS. Accident data is compiled exclusively via local manual tallies and local computer processing.

San Antonio is divided into 10 sectors for police patrol purposes. The sectors are further divided into 84 primary districts. Monthly accident totals for each sector-district are kept by the Police Department (PD). The Traffic Analyst Section of the PD's Accident Prevention Bureau encodes the information from accident reports so the information can be keypunched onto IBM cards and entered into a computer housed at the City Water Board. The Traffic Analyst Section also keeps tally sheets on certain types of information from the accident reports. With this locally-compiled input data, regular and special reports are made. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Department of Traffic and Transportation, and 3) the City Water Board. Also, the San Antonio district office of the State Department of Highways and Public Transportation uses the accident data compiled by the PD and the City Water Board. San Antonio is currently experiencing approximately 35,000 accidents per year.

Police Department

Most of the uniformed policemen in the Police Department are assigned to either the Patrol Division or the Traffic Division. Approximately 550 uniformed officers are assigned to the Patrol Division which carries out the basic police functions of crime prevention, crime repression, protection of life and property, preservation of community peace, apprehension of criminals, and regulation of non-criminal conduct. In addition to these functions, patrol officers may

investigate traffic accidents, thus providing data to the traffic records system. Approximately 100 uniformed officers are assigned to the Traffic Division which carries out the basic police functions listed above, as well as the following specialized functions: traffic control, expressway control, investigation of accidents, accident prevention, analysis of traffic statistics, helicopter patrol, driver training, school safety, pedestrian safety, and alcohol safety.

The Traffic Division keeps manual tallies on all accidents occurring within the city limits. The following information is kept daily on the Motor Vehicle Accident Log: Date, District, Case Number, Intersection/Non-Intersection, Location (street names), Hour of Accident, Type of Accident, Fatality/Injury/PDO Involvement, Type of Violation, Direction of Approach, and Location (coded intersection, arterial, or expressway--if applicable). These tallies are used for back-up research purposes.

The PD is currently conducting a STEP program which is implemented in six geographical regions of the city. Manual tallies are kept for each STEP site and the following information is retained: date of accident, time of day accident occurred, and type of violation.

The Traffic Division encodes most of the information contained on each accident report form and sends this form (with codes written above the information) to the City Water Board. Key-punchers at the City Water Board place the coded information on IBM cards and enter the data into their IBM 370 computer. Monthly reports, as well as the IBM cards, are sent back to the PD for their use. These monthly reports are of limited use because the reports only give accident totals in one-way classification schemes (such as the totals for Ran-Off-Road Accidents, Motor-Vehicle-In-Traffic Accidents, etc.) and accident totals for each coded intersection. A "type of accident x location code"

analysis or any other special cross-tabulation must be performed by a laborious card-sorting technique. Also, the data file on arrests and the data file on accidents are separate, so the computer cannot compare the arrest history for a certain location (sector, district, subdistrict, etc.) with the accident history for that location. The PD would like ready access to this type of information.

The data processing section of the PD has on-line capability for entering certain types of accident information directly to the Water Board's computer. This information (such as case number, location of accident, names of individuals involved in accident, etc.) is entered directly from the accident report forms and becomes part of an indexing system. The index facilitates the retrieval of accident reports filed by case number. Thus, a split system for monitoring traffic accidents (batch processing for detailed information and on-line processing for synopsis information) is used by the PD.

Department of Traffic and Transportation

The Department of Traffic and Transportation (T&T) employs 140 personnel, including eight traffic engineers. T&T receives from the PD a monthly printout concerning accidents occurring at coded intersections. (At least five accidents must have occurred at a coded intersection during the calendar year before the location will appear on the printout.) From this information, a directional analysis diagram is constructed for certain high-frequency intersections. T&T also receives monthly accident summaries and summaries of special police programs (i.e., STEP, Expressway Enforcement Program, Special Enforcement Group).

T&T is displeased with the type of information they are getting from the computer. They get nothing concerning intersection-related accidents occurring outside the square area of each intersection; they get nothing concerning

mid-block accidents; they get nothing to indicate whether the accident occurred at a signalized intersection, what the physical/environmental conditions surrounding the accident scene were, what the traffic count is at a particular intersection, what the primary cause of the accident was, etc. Furthermore, when they become aware that a particular intersection is experiencing a rash of accidents, they must make a special request to the PD to get copies of accident reports pertinent to that intersection. Getting the reports from the PD and extracting the desired information from the reports are time-consuming and laborious tasks. T&T would like to receive detailed, computerized collision diagrams to include information about traffic counts, speed studies, terrain features, presence of buildings, location by mile number, arrest history eastbound/westbound on east-west roads, width of road, direction of approach, type of collision, time of day, weather conditions, presence of traffic control devices, presence of sight obstructions, etc.

T&T personnel feel that reliance on the Water Board's computer contributes greatly to the inefficiency of the traffic records system in San Antonio. Thus, the department is supporting the implementation of a SASS System, with a computer housed at the PD to process data for the entire San Antonio metropolitan area-- which includes several small municipalities with their own police departments.

There seems to be excellent cooperation between the traffic engineering sections of the State Department of Highways and Public Transportation (San Antonio district), the City Department of Traffic and Transportation, and the San Antonio Police Department. The SDHPT district office gets annual printouts of accident data from DPS and monthly accident summaries from the San Antonio PD. The district office also receives copies of accident reports for accidents involving fatalities, construction sites, and damage to state property on expressways and state-maintained roads within city limits.

Input Data

The police officer collects accident information on an Accident Report Form and turns in the form at the end of each tour of duty. The Traffic Service Bureau (TSB) screens, sorts, checks for completion, and counts the forms each day. TSB segregates and marks copies for accidents involving city vehicles, pedestrians, taxis, fatalities, hit-and-runs, etc. TSB determines if an accident/offense involves certain city agencies and, if so, these agencies receive copies of the accident report. TSB determines if a hit-and-run was involved and, if so, a hit-and-run follow-up unit is notified. Then, the Records Bureau reproduces enough copies of the original so that concerned agencies (such as the City Public Service Board, City Water Board, San Antonio Fire Department, San Antonio PD, the district office of the State Department of Highways and Public Transportation, and DPS) may become aware of the accident. The original report is filed by case number in the Records Bureau and copies are sent to outside agencies, as well as to the Accident Prevention Bureau (APB) and the Data Processing Bureau of the San Antonio PD. The APB encodes the information on the report forms and sends these coded forms to the City Water Board. The data is keypunched onto IBM cards at the Water Board for eventual entry to an IBM 370 computer. After the data is entered, the Water Board sends APB a computer listing of all errors/rejects. The APB corrects these errors and notifies the Water Board of the corrections. The Water Board enters the corrections into the computer. Then, the Water Board sends the APB a monthly printout, as well as a set of corrected cards. APB uses the cards to conduct subsequent analyses via a card sorter.

The Data Processing Bureau of the PD also receives copies of accident reports. The Bureau, via remote terminals, enters a few items of information directly to the IBM 370. This information (case number, unit badge number of

investigating officer, time-date-place-type of accident, names of individuals involved, etc.) facilitates the retrieval of accident reports filed by case number.

The PD has 65 terminals connected to the City Water Board's computer. The terminals housed in the Data Processing Bureau have entry and retrieval capability; whereas, the terminal housed in the APB has retrieval capability only.

According to personnel in the Traffic Division, the PD does not use DPS-compiled data because the magnetic tapes would arrive too late to be of benefit and the tapes do not show accurate figures (i.e., accident frequencies derived from monthly computer tapes are substantially lower than actual frequencies). This Division would like for the PD to have its own data entry/retrieval system.

Filing System

The Records Bureau files the original forms by case number and keeps them for a period of three years subsequent to reported year. APB keeps numerous manual tallies and an elaborate spot map. The spot map is maintained for accidents which occur at coded intersections and accidents which involve fatalities. The PD, T&T, and the district office of the SDHPT use these maps to aid the planning and scheduling of operations, and the conducting of surveys. Accident data are also filed on an IBM 370 computer at the City Water Board.

Output Data

The Traffic Analyst Section of the APB uses data from several sources to produce Monthly Summary Reports. The accident data appearing in these reports are either obtained from the City Water Board's computer printout, obtained via card sorts using cards punched by City Water Board personnel, or obtained via

manual tally sheets kept by the Traffic Analyst Section. The accident data for the three federal programs (STEP, Expressway Enforcement, and Special Enforcement Group) are kept manually and reports are produced monthly. The arrest data appearing in these reports are derived from manual tally sheets.

The PD and T&T seem to be making adequate use of existing reports; however, they would like a more efficient system for answering special questions. The card sorting technique, the identification of case numbers for accidents falling in special categories of interest, and the extraction of information from the identified reports are inefficient and time-consuming methods of data retrieval. In addition, such methods are less accurate than a completely automated system.

The PD is displeased with the limited on-line capability they have with the IBM 370 computer. Among their concerns are the long retrieval time for information requested and the limited amount of data they can retrieve. The delayed access time is a direct result of there being 392 terminals connected to the City Water Board's computer.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

It appears that city departments are making adequate use of the accident data available to them, but the PD and T&T would like to be able to analyze accident data in more ways than they now are able to. They would like more efficient computer hardware and software to accomplish this. The interviewer was impressed with the high degree of cooperation among the primary users of accident data in San Antonio: the PD, T&T, and the State Department of Highways and Public Transportation. This cooperation is enhanced by the periodic Corridor Management Team Meetings which are attended by members of numerous city/state agencies concerned with traffic-related problems in San Antonio.

El Paso, Texas (population approximately 420,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. Nevertheless, the city forwards copies of all accident reports to DPS for entry into the state traffic records system. As a nonparticipant, El Paso does not code the primary and secondary streets prior to sending accident reports to DPS. El Paso does not receive monthly magnetic tapes or quarterly printouts from DPS. The accident data used by El Paso is locally-coded and locally-processed. The city departments most directly involved with the local traffic records system are: 1) the Police Department and 2) the Traffic and Transportation Department. The El Paso County Data Processing Department is also involved, since the county's computer is used to process the city's accident data. El Paso is currently experiencing approximately 14,000 accidents per year.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. After the form is checked by a police supervisor, it is forwarded to the Traffic Records Section of the Traffic Division. The Traffic Records Section completes a series of 3x5 cards, with each card giving the name of a person involved in the accident and the case number. There is a card for each driver involved, a card for each passenger involved, a card for each pedestrian involved, a card for each owner of damaged property, etc. These cards are filed alphabetically by name and are used for the retrieval of accident reports filed by case number. The Traffic Records Section logs the accident into a ledger which gives the case number, the primary street, the secondary street, the number of injuries, the number of fatalities, and a classification for each accident ("hit-and-run" or "non hit-and-run"). The ledger is used primarily for two purposes: 1) to compile daily accident summaries of injuries, fatalities,

and hit-and-run accidents and 2) to coordinate the quality control system recently established by the Traffic Records Section. The Traffic Records Section makes copies of original accident reports and distributes them to appropriate offices/agencies. A copy is sent to the Identification and Records Division (ID&R) of the PD; a copy is sent to each police officer who investigated a hit-and-run accident; a copy is sent to the Department of Traffic and Transportation (T&T); a copy is sent to municipal court if the case is to be tried there; and a copy is sent to DPS. Original accident reports are filed by case number in the Traffic Records Section and are kept for two years.

The Data Processing Section of the ID&R Division is responsible for coding certain information contained on accident reports. After several types of code sheets are completed, an ID&R clerk keypunches an IBM summary card for each traffic accident, a card for each accident location, a card for each driver, a card for all parked vehicles involved in the accident, a card for each injured person, and a card for each fatality. After these cards are verified, multiple runs through ID&R's 402 card sorter are made. Then, summary cards are keypunched which give monthly totals for various categories of information. These totals are used to prepare monthly reports for the National Safety Council.

The Data Processing Section of the ID&R Division forwards the summary cards to the El Paso County Data Processing Department. The accident data on the cards are stored in a Sperry-Univac 94-80 computer. Computer programs written by a former employee of the city Traffic and Transportation Department are used to extract accident data for monthly, biannual, and annual printouts. These printouts give accident-by-accident information, as well as totals, for specific street locations. The PD, T&T, the district office of the SDHPT, and

Fort Bliss receive copies of the two types of monthly reports. T&T uses the computer printouts to identify possible problems at intersections, to aid the drawing of collision diagrams, to monitor accident experience following engineering improvements, and to justify the need for federal/state funds for engineering improvements. After using the printouts to identify high accident locations, T&T refers to appropriate accident reports to identify specific causes of accidents, to draw collision diagrams, and to determine possible solutions.

Police Department

The El Paso Police Department is organized into 4 major units: the Administrative Bureau, the Services Bureau, the Criminal Investigations Bureau, and the Uniform Operations Bureau. There are approximately 110 plainclothes officers assigned to the Criminal Investigations Bureau, which is exclusively concerned with crime control in the areas of auto theft, burglary, crime prevention, narcotics, forgery, and crimes against persons. The Uniform Operations Bureau consists of the following divisions: the Traffic Division, the Community Service Division, the Northeast Patrol Division, the East Valley Patrol Division, and the Central Patrol Division. The 93 uniformed officers assigned to the Traffic Division are primarily responsible for traffic control. The 325 uniformed officers assigned to the Patrol Divisions are primarily responsible for crime control. Crossover of functions is permitted between divisions in the Uniform Operations Bureau; however, the Traffic Division investigates approximately 85% of the accidents that occur in El Paso.

The PD conducts STEP programs in four geographical areas. Enforcement is concentrated at the 5 highest accident locations in each area. The STEP

task force consists of 16 motorcycle officers, 1 radar patrol officer, 2 Sergeants, and 1 traffic analyst. The traffic analyst monitors accidents that occur in the four areas by tediously perusing monthly printouts. These printouts present accident-by-accident information that is grouped by location of accident. He hand tallies the totals needed to complete monthly STEP reports.

The PD has a small Hewlett Packard 2100 computer. It is used to process crime data, but not traffic accident data. This computer is not large enough to handle the processing of both types of data. ID&R has keypunch machines, verifiers, and a card sorter/counter. This equipment is used each month to compile accident data for National Safety Council reports. The keypunch machines are also used to prepare computer cards for the entry of accident data into the county's Sperry-Univac computer. The PD is currently planning the purchase of a new computer which would be compatible with its Hewlett Packard 2100. Bids have been received from Hewlett Packard and IBM. Increased computer capabilities would enable the PD to process crime data and traffic data more efficiently. The department would no longer be dependent on the county's computer and the antiquated card sorter/counter in the ID&R Division.

The PD keeps a spot map on fatalities only. It does not keep records of citations and court dispositions for either non-DWI or DWI traffic offenses. The municipal court keeps non-DWI data on the county's computer, but the PD does not have ready access to this information. The county court processes DWI cases, and keeps records of DWI citations and dispositions.

There is little interplay between El Paso's traffic records system and the state traffic records system, since El Paso does not participate in the Urban Accident Location Coding Project. DPS has experienced problems with El Paso, in that many accident reports have been late and/or incomplete upon

arrival in Austin. Consequently, the Traffic Records Section of the PD has implemented a stricter quality control system which has improved the situation considerably.

Traffic and Transportation Department

The Traffic and Transportation Department (T&T) has a staff of 60, with 7 traffic engineers. Five of the traffic engineers are certified. The department handles such functions as signs and markings, signal and street lighting, parking meter placement, street planning and design, and traffic accident data analysis. The department is displeased with the present traffic records system in El Paso, but seems quite conscientious about doing the best it can with a cumbersome system. T&T receives copies of accident reports, files the reports by location of occurrence, and later reviews these copies to draw collision diagrams for high accident locations. Special files are maintained for accident reports involving fatalities and for reports involving damage to city property. High accident locations are identified via use of monthly, biannual, and annual printouts of data coded by the PD. T&T is not impressed with the quality of information on accident reports, nor the quality of coded data used to develop computer printouts. For example, T&T is concerned that the PD's working definition of an "intersection-related accident" is different from the definition held by T&T and DPS. According to T&T, the PD classifies many accidents as "non-intersection" when they should be classified as "intersection-related." The PD practically ignores the "intersection-related" classification, as evidenced by the scarcity of code 2's under the location classification column of monthly printouts.

T&T would like for El Paso to join the Urban Accident Location Coding Project sponsored by DPS. The department feels that accident data from this

system would be more reliable than that received from the present system. The department would be able to simplify its filing system for accident reports, i.e., it could file reports by case number rather than by location. It would be able to get new software to extract data from DPS tapes in formats that would decrease its reliance on manual processing of data. Presently, T&T cannot respond quickly to special requests for accident data, since manual searches through numerous printouts and accident reports must be accomplished.

El Paso County Data Processing Department

The County Data Processing Department has a staff of 14, which includes 6 computer programmers, 3 systems analysts, 1 computer operator, and 4 keypunch operators. The department uses a Sperry Univac 94-80 computer to process data for city departments, as well as data for county and district offices.

Twenty-one terminals are located in the following city departments or offices:

- 1) The Police Department has 5 terminals--2 in dispatch section, 1 in bond office, 1 in auto theft section, and 1 in hit-and-run office.
- 2) The Tax Office has 6 terminals.
- 3) The Comptroller's Office has 1 terminal.
- 4) The Planning Department has 2 terminals.
- 5) The Human Development Department has 2 terminals.
- 6) The Personnel Department has 3 terminals.
- 7) The Municipal Court has 2 terminals.

Twenty-nine terminals are located in the following county and district offices: county tax office, county court, district clerk, county clerk, district attorney, county attorney, probation department, license and vehicle registration, voter registration, and payroll office.

The Sperry Univac 94-80 is not adequate for handling all the data processing needs for the city, the county, and the district. Additionally, there are too few programmers in the County Data Processing Department to handle the voluminous needs for this area. Because several city departments have been moving toward obtaining their own computers, the County Data Processing Department has not replaced programmers who have resigned. Thus, it takes the department 1 to 7 months to complete special requests which require the writing of new computer programs. When city departments get their own computers and the County Data Processing Department gets the larger one it is presently negotiating for, the data processing systems in El Paso will be much less congested.

Input Data

El Paso's Accident Report Form includes questions to collect information required by DPS, as well as an 8" x 11" drawing not required by DPS. The drawing is larger and more detailed than is the collision diagram required by DPS. The drawing is not forwarded to DPS, but is kept in El Paso for use in court testimony. PD personnel are not entirely satisfied with the state form--"more space is needed to write in the charge under the 'Police Activity' section"; "injury codes are too ambiguous and rely too heavily on subjective judgment"; "a police officer's duty is to collect facts about an accident--not to express opinions which lawyers can use to rake the officer over the coals in a court case"; and "insurance companies had too much input to the design of the form."

DPS has criticized the PD on several occasions for forwarding incomplete and inaccurate reports to Austin. Common errors have been: wrong location, wrong date, omission of vehicle description, omission of disposition of injured,

and inaccurate collision diagram. A new quality control system has recently been implemented by the Records Section of the Traffic Division. This system has resulted in a reduction of the error rate for accident reports. According to a Records Section official, "in the past, at least 50% of the accident reports had at least one major error; now about 10% have." Under the present quality control system, each report is checked by the investigating officer's supervisor. The supervisor initials the report when he is satisfied with its accuracy and completeness. The report is forwarded to the Records Section of the Traffic Division, where it is logged and rechecked. If errors are found, an interoffice memorandum is sent from the Traffic Division Captain to the investigating officer, through the officer's Captain. Corrections must be made within five days of the memorandum, and must be made while the investigating officer is off-duty.

The coding of the accident information by the Data Processing Section, ID&R Division of the PD, should be improved also. T&T was critical of how accident data is coded prior to entry into the county's computer. Since T&T has little faith in the accuracy of some coded data, the department relies heavily on hard copy files to answer certain questions.

Filing System

Copies of accident reports are filed in two locations in the PD, i.e., in the Records Section of the Traffic Division and in the Data Processing Section of the Identifications and Records Division. The Records Section keeps an index file to facilitate retrieval of accident reports, and keeps a ledger to monitor the quality control system and to keep tallies on fatalities, injuries, and hit-and-runs. The Records Section also keeps manual tallies to compile data for a Daily Summary report.

The Data Processing Section, ID&R Division, encodes the information on accident reports and keypunches computer cards. This section uses a card sorter/counter to compile data for National Safety Council monthly reports. The section forwards some of the cards to the County Data Processing Department for entry into its Sperry-Univac computer. The County Data Processing Department produces monthly, biannual, and annual printouts, and forwards these printouts to the PD, T&T, the district office of the SDHPT, and Fort Bliss.

T&T files hard copies of accident reports by location of occurrence. T&T also keeps a special file for accidents involving fatalities and a special file for accidents involving damage to city property.

Output Reports

The County Data Processing Department produces 2 types of monthly reports involving accident data:

- 1) a summary of accident experience (i.e., totals) at top locations
- 2) an accident-by-accident listing for top locations.

The department produces 9 types of biannual reports, each presenting accident-by-accident data for specific locations:

- 1) Top location accidents
- 2) Nighttime accidents
- 3) Yield sign accidents
- 4) Fatal accidents
- 5) Railroad crossing accidents
- 6) Uncontrolled intersection accidents
- 7) Four-way stop accidents
- 8) Pedestrian accidents

9) Wet, snow, or icy traffic accidents.

The department produces 2 types of annual reports:

- 1) an accident-by-accident report by location
- 2) a totals report by location, which includes a "top accident locations by cost" analysis and a "top accident locations by cost total" analysis.

The latter type of report rank orders the most costly intersections based on insurance company estimates of costs of fatalities, injuries, and property damage. Frequency data are given in the following categories--fatalities, injuries, property damage, light, dark, wet, and dry. Dollar value cost data are also given. These reports are used to substantiate El Paso's need for federal/state highway monies earmarked for engineering improvements.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The Police Department does not seem to be making good use of accident data in the traffic records system. This is understandable, considering the past problems created by inaccurate and incomplete accident reports, and inaccurate encoding of accident information. The PD is performing numerous tasks for the traffic records system (such as monitoring the quality of reports, coding accident information, keypunching computer cards, sorting cards for monthly National Safety Council reports, etc.) However, this effort does not lead to computer output that is used extensively for planning, scheduling, and implementing operations within the PD. This effort leads to monthly reports for the National Safety Council and periodic computer printouts, which are used mainly by the Traffic and Transportation Department. T&T designed the formats for these periodic reports, so the data are presented in a manner most useful to T&T. The PD receives no printout designed exclusively for its own use, such as a printout to help monitor accidents in STEP areas. When the PD

needs accident data, it must hand tally information contained on T&T-designed printouts and on hard copies of accident reports.

T&T is genuinely concerned about the poor quality of input data to the traffic records system. The department feels that, to alleviate this problem, El Paso should participate in the Urban Accident Location Coding Project sponsored by DPS. Several things need to occur before this participation would be advantageous: 1) the PD should get adequate computer hardware for processing its own data, 2) the PD and T&T should decide what computer output each department needs to address department-specific problems, and 3) computer programmers should be hired to write the software necessary to extract data from DPS computer tapes--reducing, as much as possible, the need for hand tallies and hard copy searches.

Lubbock, Texas (population approximately 200,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The city relies on manually-processed accident data, spot maps, and hard copies of accident reports to identify traffic problems. A computerized system for processing accident data is being developed, with financial assistance from the SDHPT. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Traffic Engineering Department, and 3) the Data Processing Department. There is good coordination among these three components of the traffic records system. Lubbock is currently experiencing approximately 10,000 accidents per year.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form (original plus a carbon copy). After the report form is checked by the officer's supervisor, it is forwarded to the Records Section of the PD. Records clerks assign local accident numbers to the reports; make copies for the STEP Section and the Traffic Engineering Department; and file the original reports numerically by accident number. The carbon copy is sent to the Accident Investigation Office of the Traffic Section. There, the reports are reviewed for completeness and accuracy, follow-up investigations are initiated if required, and entries are made in the Daily Traffic Accident Log. Accidents in Lubbock are categorized into two types: intersection accidents and control section accidents. Intersection accidents are defined as those accidents that occur at or within 70 feet of major intersections. Control section accidents are defined as those accidents that occur on street segments and those accidents that occur at minor intersections. Hand tallies representing accident histories at certain intersections and control sections are kept by the Traffic Section

and are used to complete tables and diagrams in a yearly report, Accidents in the Lubbock Urban Area. After the Traffic Section extracts the information it needs from the carbon copies, the Section forwards the copies to DPS-Austin. DPS enters the accident information into the State traffic records system and produces a monthly National Safety Council Summary for Lubbock.

A computerized Accident Report System is currently being developed by a programmer/analyst whose position is funded by the Traffic Safety Section, SDHPT. The system calls for local coding and entry of accident information via a terminal located in the Traffic Section of the PD. Data initially stored at a Level 6 minicomputer in the PD will be transferred to the Honeywell 6605 computer housed in the city's Data Processing Department. Accident report files will be maintained on the 6605, with accident information being accessible through a video terminal as well as through line printers. Initial coordination has been between the programmer/analyst and police personnel to determine how the traffic records system can best meet the needs of the PD. Similar coordination between the programmer/analyst and traffic engineering personnel will occur in the future.

Police Department

The Lubbock Police Department is organized into 5 major units: the Detective Division, the Juvenile Division, the Service/Budget Division, the Training Division, and the Uniform Division. The Uniform Division is comprised of four sections: the Uniform Patrol Section, the Canine Section, the Traffic Section, and the Selective Traffic Enforcement Section.

The Traffic Section has one Lieutenant, one Sergeant, two Corporals, eight Patrolmen, six Parking Control Officers (civilians), and 37 School Crossing Guards. The unit has one Corporal and one Patrolman assigned to

accident follow-up. One Patrolman is assigned to walking patrol duty in the downtown area; this officer also serves as a relief person for accident follow-up officers. One Sergeant and six Patrolmen are assigned to motorcycles. They perform traffic control functions, act as escorts, and are available to handle any type of emergency call. Six civilians are assigned to three-wheel motorscooters as Parking Control Officers.

The Selective Traffic Enforcement Section has one Sergeant, two Corporals, 6 patrolmen, and one secretary. The Sergeant monitors a Comprehensive ITLE program and a DWI ITLE program. The Comprehensive ITLE (formerly STEP) program was initiated in 1978, after Lubbock had experienced 51 traffic fatalities in 1977. In 1978, the fatalities were down to 38 and in 1979 they were down to 23. The Comprehensive Program is executed on a full-time basis by the 2 corporals and 6 patrolmen mentioned above. These officers work from 10 A.M. to 6 P.M., five days a week. The DWI ITLE program is executed on a volunteer, overtime basis and provides increased traffic law enforcement for 65 hours each weekend (on Friday, Saturday, and Sunday nights). The DWI ITLE program was initiated in 1979. The STEP Sergeant receives a copy of each Daily Traffic Accident Log and copies of all accident reports. This information is used to update a spot map for monitoring the Comprehensive Program. The locations of injury and fatal accidents are plotted on the map. A spot map is also updated for monitoring the DWI program. The locations of DWI arrests and accidents are plotted on the map. A driver/owner indexing system (i.e., a card file) is maintained and is used to facilitate the retrieval of accident reports. The daily log is used as a back-up aid to retrieval. The STEP Sergeant uses manually-processed accident information to determine where to assign police officers in both ITLE programs.

Presently the PD has one terminal connected to the Data Processing Department's computer. The terminal is used to process dispatch information about all calls for service. The PD also has terminals connected to the TCIC and NCIC networks. Negotiations are underway to procure a terminal for the Traffic Section so this office can begin inputting accident data for Lubbock's Accident Report System.

Accident reports are filed numerically by accident number in the Records Section of the PD. Hard copies of current-year reports and previous-year reports are on file; earlier reports are on microfilm. For instance, hard copies of all 1979 and 1980 reports are available; however, 1978 and earlier reports are on microfilm. Efforts are underway to establish a 3-year data base for the Accident Report System. Data entry clerks are working "backward"-- getting 1980 data entered, then 1979, etc. The projected date for completion of the 3-year data base is September of 1981.

The PD receives requests for accident data from numerous city officials and offices, such as the Mayor, the City Manager, the City Council, the Citizens Traffic Commission, the Municipal Court, Texas Tech, and the Emergency Medical Service. The present traffic records system is too inefficient to answer these special requests in a timely manner. It is apparent that the PD has emphasized the processing of crime data and de-emphasized the processing of accident data.

Traffic Engineering Department

The Traffic Engineering Department (TED) has 28 employees; 1 of whom is a traffic engineer. The Department is divided into the following 3 divisions: 1) Administrative/Engineering Design, 2) Signs and Markings, and 3) Traffic Signals.

The TED receives a copy of all accident reports from the PD. The TED maintains separate, hard copy files of reports related to fatalities, pedestrians, motorcycles, bicycles, and railroad crossings. If the Department needs an accident report not in its files, it goes to the Records Section of the PD to have a copy made from the original. The TED keeps an accident-by-accident record/collision diagram for each intersection where accidents have occurred. The Department does not keep hand tallies on midblock accidents, and the accident data currently being received from the PD does not give compiled, midblock information either. TED would like to know certain types of information about midblock accidents, such as 1) which direction were the vehicles going and 2) was the continuous left-turn lane affected in the accident? The Department is looking forward to the implementation of the Accident Report System because the system will allow analyses of both intersection and midblock data. These analyses will be accomplished via the use of computer printouts, since no video terminal will be placed in the TED. The programmer/analyst will consult with the traffic engineer to determine what computer output will be useful to his department. Previous consultation has dealt mainly with police needs.

The TED also receives from the PD a copy of the Daily Traffic Accident Log. The log is used to update a fatality spot map and to ascertain whether causal factors are related to engineering problems.

Input Data

Lubbock's Accident Report Form includes only those questions required by DPS. A Diagram Supplement and a Witness Statement Supplement are used. The police and traffic engineers are satisfied with the State form. The PD's quality control system for accident reports includes reviews by police

supervisors and Traffic Section personnel. Common errors made on the form are: 1) omitted information such as date, day of week, ticket number, alcohol involvement, contributing factors, 2) wrong information such as location, date, day of week, and 3) back of form not filled out or incomplete. When asked why DPS-coded data was not being used, the police responded that they could keep more accurate statistics locally. Police personnel were displeased that DPS does not code private property accidents nor PDO accidents involving less than \$250 damage.

Filing System

Presently, accident information is compiled manually at the PD and the TED. The PD's Daily Traffic Accident Log and TED's Intersection Record are the two primary tools for the manual processing of accident data. When the comprehensive on-line computer system becomes operational, the PD will have immediate access to accident data via its video terminal. A data entry clerk in the Traffic Section will be responsible for entering and retrieving accident data via a CRT terminal. The TED will be able to receive quick responses to its requests for computer printouts.

Output Reports

Presently, no computer printout is available for analyzing traffic problems. After the new Accident Report System becomes operational, a series of approximately 15 printouts will be available for police, traffic engineers, and other interested departments. Load reports will be produced daily and edited by the Traffic Section of the PD. Other regular reports will be generated on a monthly or quarterly basis. Special reports can be generated so that yearly, year-to-date, monthly, month-to-date, or quarterly data are presented.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The Police Department and the Traffic Engineering Department make adequate use of accident data--considering that 10,000 accidents per year are being manually processed and considering the low priority given to traffic functions relative to crime functions in Lubbock. The new computerized system will alleviate many of the present problems associated with traffic accident data analysis.

There is good rapport between the programmer/analyst and a Police Sergeant in the Traffic Section. Both men have collaborated on the design of computer output that will be of special use to the PD. Similar collaboration will be needed between the Traffic Engineering Department and the programmer/analyst.

Amarillo, Texas (population approximately 158,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The city codes and processes its own accident data. The city departments most directly involved with the traffic records system are: 1) the Police Department, 2) the Traffic Engineering Department, and 3) the Data Processing Department. There is adequate coordination among these three components of the traffic records system. Amarillo is currently experiencing approximately 6100 accidents per year, with 22 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. The officer identifies the accident report with a unique incident report number which is assigned by the dispatcher. Report forms are turned in daily. Supervisors check the reports for completeness and accuracy, and then forward the forms to the Traffic Section. The Traffic Section checks the forms again and logs the accidents into a log book. The log book contains the following information: names of persons involved, date of accident, location of accident, number and types of injuries, need for follow-up investigation, and incident report number. The log is used to retrieve accident information for citizens and to locate the original accident report filed in the Records Section. After logging each report, the Traffic Section updates tallies used to complete the 24-Hour Traffic Summary, a daily report reviewed by the Chief of Police and the three shift commanders. Traffic citations are also routed through the Traffic Section on a daily basis. Hand tallies are updated, and the data is used to complete the Daily Traffic Enforcement Summary.

After the Traffic Section has extracted certain information from the accident reports, the reports are forwarded to the Records Section. There, hand tallies are updated so that the "Traffic Analysis" portion of the

Consolidated Daily Report may be completed on a daily basis. After these preliminary tallies are made, the reports are returned to the Traffic Section where copies are made of reports involving fatalities, hit-and-runs, incomplete cases, etc. The reports are then returned to the Records Section where copies are made and forwarded to DPS-Austin, to Amarillo's Traffic Engineering Department, and to other city departments if a city vehicle was involved in the accident. (Accident reports involving serious injuries are kept on file for 15 days before they are copied and further processed. This procedure reduces the number of times paperwork must be changed, i.e., changing a "serious injury" to a "fatality." The Records Section also keeps a Hit-and-Run file where reports are stored for 15 days, or less, before the reports are further processed.)

Two data entry clerks in the Records Section are responsible for entering accident data into the local traffic records system. One clerk encodes 44 items of information from each accident report. The clerk encodes the primary and secondary streets involved, using the street codes provided by the Traffic Engineering Department. The two data entry clerks use a keypunch machine to transfer coded data to IBM computer cards. Each month the clerks take the punched cards to the city's Data Processing Department where the data on cards are transferred to magnetic tape. The data clerks try to get the computer cards to the Data Processing Department within the first two weeks following the end of each month. The magnetic tape is used to produce computer printouts of monthly and year-to-date accident data for the Police Department and the Traffic Engineering Department. The software for analyzing accident data on the Data Processing Department's IBM 370 computer was written approximately 15 years ago and was revised in 1967 and 1975.

Police Department

The Amarillo Police Department is organized into 2 major units, with an Assistant Chief of Police heading each unit. Although not named on the organization chart, one unit could be called the "Operations Bureau" and the other unit could be called the "Administrative Bureau." Patrol officers, traffic officers, and detectives are all assigned to the Operations Bureau. There was once a sharp distinction between the duties of a patrol officer and the duties of a traffic officer, but in 1964 the PD determined it was better to have well-rounded officers than to have specialized officers. Consequently, patrol officers and traffic officers are capable of switching their duties if the situation demands. An organization chart indicates that the Traffic Section is not autonomous from the patrol section. In fact, the Traffic Lieutenant reports directly to the 2nd Shift Patrol Captain.

The Traffic Section consists of a Lieutenant; a Sergeant (who monitors a comprehensive STEP program); 4 patrolmen (who investigate hit-and-run cases, fatal cases, junk-car cases, and other traffic-related cases); 6 solo motorcycle patrolmen (who implement the STEP program); and 3 civilian parking enforcement personnel. The STEP Sergeant closely monitors the activities of his 6 motorcycle officers. These officers turn in daily activity sheets to the Traffic Sergeant who keeps a log book on all citations issued by STEP officers. Amarillo has applied for a DWI STEP program, and is awaiting its approval.

The PD does not have an in-house computer, nor does it have terminals connected to the Data Processing Department's IBM 370 computer. The PD does have a terminal connected to the NCIC and TCIC systems and a keypunch machine. The keypunch machine is used to transfer information from crime reports, accident reports, and officer worksheets to IBM computer cards. One problem noted in the coding procedure is that crime locations are coded by 58 census

tracts, whereas accident locations are coded by patrol beats. Confounding the situation even further is the fact that beat boundaries are not the same across shifts, so accident totals by beat are inaccurate indexes of accident experience within geographical boundaries.

IBM cards are taken to the Data Processing Department where the data are transferred to magnetic tape and then to computer printouts. Three years ago, the PD conducted a feasibility study for an in-house computer. No action has been taken on the recommendations of this study.

Original accident reports are filed by incident report number in the Records Section of the PD. The Traffic Sergeant keeps a spot map depicting the location of all fatal accidents. The Traffic Section secretary keeps hand tallies on DWI arrests, DWI accidents, and non-DWI traffic offenses.

Traffic Engineering Department

The Traffic Engineering Department (TED) has 46 employees; 2 of whom are traffic engineers. The Department is divided into the following five divisions: 1) Transportation Planning, 2) Signal Maintenance, 3) Sign Fabrication/Maintenance, 4) Design and Operations, and 5) Computerized Traffic Control.

The TED receives copies of all accident reports from the PD. If the accident occurred on the expressway/connector system, the TED also receives a pre-printed diagram that has been X'd by the investigating officer to indicate the accident location. The TED keeps a spot map which graphically presents accident experience via color-coded pins and flags. The hard copies are then filed by location, i.e., they are filed in specific intersection and midblock folders.

Each month the TED receives a Traffic Engineering Accident Report, a computer printout based on accident data coded by the PD. The printout presents year-to-date information on individual accidents, grouped by specific intersection or midblock. The TED uses the December printout, plus ADT information, to determine accident rates per MVM for high-accident intersections in Amarillo. The TED presents this information in two year-end analyses, Year End Accident Report and Top 10 Accident Locations by Accident Rate. The TED draws collision diagrams for the TOP 10 Intersections--using information from the December printout and information from hard copies of accident reports. The TED also uses information from the December printout and ADT counts to determine Link Accident Rates for 258 sections of roadway within the city.

The traffic engineers are fairly satisfied with the quality of accident information they receive. However, they would like the police to make more thorough investigations into the causal factors of each accident. Such investigations would help the engineers determine whether engineering, enforcement, or education countermeasures are needed.

Input Data

Amarillo's Accident Report Form includes those questions required by DPS, plus the following items desired for local use: 1) offense code, beat number, and incident report number, 2) weather, road and surface conditions, light condition, and type of traffic control, 3) violations associated with accident, and 4) hit-and-run information. In addition, accident investigators must complete a number of supplemental forms, if required. Four of these supplemental forms are: 1) Texas Peace Officer's Accident Casualty Supplement, 2) Statement--Traffic, 3) Scale Diagram and Measurement Form, and 4) Traffic Engineering Expressway/Connector Diagrams.

The Police Department and the Traffic Engineering Department are satisfied with the types of information being collected on traffic accidents. Both departments are satisfied with the overall quality of the information, with the exception that the TED thinks the PD should search more thoroughly for real causal factors. The Traffic Section is the most effective quality control point in the PD. Incomplete and incorrect accident reports reaching the Traffic Section are returned to the investigating officer, through his Sergeant.

Filing System

Original accident reports are filed in the Records Section of the PD. The reports are filed by incident report number. Reports involving fatalities are also filed in the Traffic Section. Copies of accident reports are filed in the TED. There, the reports are filed by location of accident, i.e., they are filed into intersection and midblock folders. Coded information from accident reports is stored on magnetic tape at the Data Processing Department. Accident information is presented pictorially via spot maps in the PD and the TED.

Output Reports

Monthly computer printouts of citywide statistics and beat statistics are received by the following offices: Traffic Section of the PD, Records Section of the PD, Patrol shifts of the PD, and Traffic Engineering Department. Monthly computer printouts that give more detailed accident-by-accident information, grouped by accident location, are received by the Traffic Engineering Department and the Traffic Section of the PD. The police and the traffic engineers are satisfied with the formats of these printouts, even though the existing traffic records system requires much hand tallying of data.

Dissatisfaction was expressed with the present data-entry procedure, i.e., keypunch to cards to magnetic tape. Therefore, hardware deficiencies are of more concern than are software problems. The PD also stressed that it relied too heavily on the services of its only data encoder. When she is sick or takes a vacation, the PD gets behind with its data-entry tasks. In such cases, computer output reaches decision makers considerably later than normal.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The traffic records system in Amarillo operates as well as could be expected, considering the following conditions:

- 1) the Police Department's deemphasis of traffic-control functions and overemphasis of crime-control functions.
- 2) the antiquated data-entry procedures for computerizing accident data.
- 3) the antiquated software used to retrieve accident information. (The software was written 15 years ago. Much of the information being encoded is not being retrieved.)

With no terminals connected to the city's computer, the Police Department is having a difficult time batch-processing data related to crimes, traffic accidents, and general police activities. The Department's keypunch operation should be replaced by a more efficient system.

The Traffic Engineering Department makes good use of accident data. They use spot maps, hard copy files, intersection/link accident rates, computer printouts, expressway/connector diagrams, collision diagrams, and on-site inspections to aid the problem identification process.

Wichita Falls, Texas (population approximately 100,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The city relies on manually-processed accident data, spot maps, hard copies of accident reports, and a local input-output computerized system to identify traffic problems. The computerized system was developed by consultants associated with the Integrated Municipal Information System project in the early 1970s. Wichita Falls, Texas; Charlotte, North Carolina; and Long Beach, California were chosen as three pilot cities to receive HUD and LEAA grants for the development of integrated municipal data systems. The programmers who worked on police data systems were supposed to write programs for processing information related to crimes, citations, accidents, and other police functions. Planned output included a computerized Uniform Crime Report (UCR), as well as computerized accident summaries. The consultants abandoned the project in Wichita Falls before it was completed. They left no documentation of their work, so local authorities are quite disappointed with the venture. The PD's UCR report is still being compiled manually, but computer printouts of accident data are being received by the police and the traffic engineer. The city's computer (housed in the Data Processing Department) is being used to process accident data that are encoded onto code sheets by a records clerk in the PD. The code sheets are forwarded to the Data Processing Department where the information is keypunched.

The city departments most directly involved with the existing traffic records system are: 1) the Police Department, 2) the Traffic and Transportation Department, and 3) the Data Processing Department. Wichita Falls is currently experiencing approximately 4300 accidents per year, with 21 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. Every accident is investigated,

including PDO accidents below \$250 damage and private property accidents. Reports are turned in daily and checked by patrol supervisors for completeness and accuracy. Then, the reports are forwarded to the Records Section where a records clerk logs in each report, types a driver's card for each driver involved, makes and distributes copies of the accident reports, encodes accident information onto code sheets, forwards code sheets to the Data Processing Department, microfilms each report, and files original accident reports by case number in the Records Section files. A records clerk manually compiles information from the log sheets to complete a Weekly Accident Report and a Weekly Activity Report. Monthly reports are later compiled from information contained on weekly reports. The code sheets are forwarded to the Data Processing Department where accident data are keypunched into an IBM 370-145 computer. The following computer printouts are received by the Police Department and the Traffic and Transportation Department:

- 1) Standard Summary of Motor Vehicle Traffic Accidents which is received monthly and annually.
- 2) Traffic Egr. and Enforcement--Report #3, Total Accident History By Intersection which is received monthly, quarterly, and annually.
- 3) Traffic Egr. and Enforcement--Report #10, Summary and Analysis: Intersections which is received quarterly and annually.
- 4) Traffic Egr. and Enforcement--Report #10, Summary and Analysis: Midblocks which is received quarterly and annually.

The Traffic and Transportation Department (TTD) receives a copy of each accident report 2 or 3 days after an accident occurs. The secretary makes a cursory inspection of each report to see if damage to public property was involved. If it was, she completes a damage report. Then, the accident report is filed by location in one of four files: 1) Signalized Intersection, 2) Unsignalized Intersection, 3) Midblock, or 4) Private Property/Parking Lot. The traffic engineer reads pertinent accident reports when he has to draw

collision diagrams to support the need for traffic control devices. The TTD does not keep hand tallies regarding accidents which occur at high-frequency accident locations, nor does the Department code or input any data to the local traffic records system. The Department relies solely on accident data from computer printouts, traffic counts from SDHPT-sponsored Traffic Engineering Surveys, and traffic counts from local surveys. These data are used to compile an annual Accident Report.

Police Department

The Wichita Falls Police Department is organized into 2 major bureaus: the Field Services Bureau and the Support Services Bureau. There are 129 sworn personnel in the PD; 85 of these are uniformed patrol officers. The Traffic Section is part of the Patrol Division of the Field Services Bureau. The Traffic Section consists of the following two units:

- 1) the motorcycle unit--1 Sergeant and 4 patrolmen investigate accidents, issue traffic citations, and perform several patrol functions. The motorcycle unit has been in operation since February 1980 and is locally financed.
- 2) the STEP unit--1 Sergeant and 4 patrolmen work fulltime implementing an ITLE Comprehensive program. The officers do not investigate accidents, but concentrate mainly on issuing citations for moving traffic violations. The unit is funded by the SDHPT and has worked on a fulltime basis since January 1979.

The STEP Sergeant uses the log book in Central Records to monitor the activities of his patrolmen. From the log book, the Sergeant obtains such information as: day citation was issued, time, location, and type of violation. Weekly and monthly activity reports are derived from log-book information. Each quarter the Sergeant prepares a high accident location summary that is based on accident data received from the local traffic records system. The Sergeant uses this information when deciding how to deploy his STEP officers. Also, the STEP Sergeant uses quarterly printouts to update a "year-to-date" spot map

and a "last quarter" spot map.

The PD has data processing equipment (i.e., 3 video terminals and 1 line printer), but the equipment does not provide on-line connection to the city's computer housed in the Data Processing Department. Thus, the equipment cannot be used for processing accident data. The equipment is used mainly to make inquiries relating to criminal activity. Among such NCIC, TCIC, NLETS, and TLETS inquiries are: drivers license requests, car tag requests, stolen articles inquiries, and requests for information on "wanted" persons.

Most of the accident data used by the PD have been manually processed. The police do not trust the quality of accident data received via the computer, so they seldom use the computer output. The police believe the keypunchers in the Data Processing Department inaccurately transfer data from code sheets to the computer. This belief stems from the fact that hand-tallied totals based on log-book information seldom correspond with computerized totals based on "PD-encoded/DP-keypunched" data. (Incidentally, the PD has confidence in the accuracy of its encoded data, i.e., accident data encoded onto code sheets that are forwarded to the Data Processing Department.)

Traffic and Transportation Department

The Traffic and Transportation Department (TTD) is divided into 3 major Divisions: 1) Traffic Engineering, 2) Public Transportation, and 3) Aviation. The Department has one traffic engineer, a traffic superintendent, 5 personnel in the Parking Meter Section, 6 personnel in the Signs and Markings Section, and 7 personnel in the Signals and Street Lights Section.

The TTD does not encode or input any accident data for the local traffic records system, it does not keep a spot map, and it does not keep hand tallies on accident data for high accident locations. Accident totals used by the TTD

are derived solely from monthly computer printouts. Personnel in the TTD are not satisfied with the format of the computer printouts. They have to search in too many places to get a total picture of what is happening at a particular intersection or midblock. For instance, an accident that occurred at the intersection of Kell Boulevard and Kemp Boulevard may appear in the accident totals for Kell and Kemp or in the totals for Kemp and Kell. Furthermore, TTD personnel have to read accident reports classified as "midblock" in order to determine whether the accidents should have been classified as "intersection-related." This procedure is too time-consuming and inefficient. TTD would like the city to adopt a "within 80 foot rule" for classifying "intersection-related" accidents.

TTD personnel are not satisfied with the quality of information appearing on accident reports. They feel that police accident investigators are sometimes lax in their duties. An example of a police error is: stating that "no traffic control exists at scene of accident," when a control obviously exists.

Input Data

Wichita Falls' Accident Report Form includes only those questions required by DPS. PD and TTD personnel are fairly well satisfied with the State form. They are especially pleased with the addition of the following items to the revised form: business address, business phone number, and section for indicating if damage was less than \$250.

Although accident reports are checked by police supervisors, the quality of accident data has room for improvement. A records clerk indicated that typical errors include: 1) noncorrespondence between narrative description and diagram, 2) day of week and date of year do not correspond, and 3) omissions of

several items of information.

TTD personnel stated that police investigators often do not use correct names of streets. This problem is partly due to the fact that some streets have changed names 5 times in recent years. Also, TTD personnel feel there is too much human error involved with the accident data on computer printouts. For this reason, they use the printouts only to make initial identification of problem areas. They use hard copies of accident reports to gain a more in-depth understanding of the problem. TTD feels that more time should be spent in the training of accident investigators.

The amount of accident information encoded for each accident by a records clerk in the PD is quite extensive. One records clerk is responsible for encoding this information onto code sheets. She has been doing this task for 6 years, so she is fairly efficient at this task. (She can code an accident report in 5 minutes.) Problems arise, however, when she is on vacation or on sick leave. Police personnel feel that the code sheets sent to the Data Processing Department are fairly accurate, but that DP keypunchers make numerous errors in transferring the data to the computer.

Filing System

Accident reports are filed manually by both the PD and the TTD. The police file their hard copies by case number and the traffic engineer files by location. The police retrieve hard copies of accident reports via the use of either the daily log or the driver card file. In addition, the police file accident reports via a microfilm system. (A report is kept on microfilm for 5 years, and then the film is destroyed.) The STEP Sergeant files accident information via spot maps. Accident data are also filed via the computer located in the Data Processing Department. The data processing capacity of

the computer is inadequate; the computer is 10 to 12 years behind in its ability to meet the needs of city departments. However, the Data Processing Department is getting a new computer with greater storage capacity.

Output Reports

The computer printouts produced by the local traffic records system include a Standard Summary of Motor Vehicle Traffic Accidents which is received by the PD and the TTD monthly and annually. Summary statistics are presented in the following categories: Type of Accident, Street Classification, Age of Casualty, Time, Directional Analysis, Pedestrian Action by Age, Age of Driver, Sex of Driver, Type of Motor Vehicle, Residence of Driver, Contributing Circumstances Indicated, Road Surface Condition, Kind of Location, and Light Condition.

Another computer printout, entitled Total Accident History by Intersection, is received monthly, quarterly, and annually by the PD and the TTD. TTD would like for this printout to also contain year-to-date information for each intersection, and the Department would like for these monthly and year-to-date totals to be available each month. Two other printouts (Summary and Analysis: Intersections and Summary and Analysis: Midblocks) are received quarterly and annually by both departments. TTD would like to receive these two printouts on a monthly basis, in addition to receiving them quarterly and annually.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The computerized traffic records system in Wichita Falls has very little impact on the operations of the Police Department, with the exception of the operation of the Traffic Section's STEP unit. Most of the accident data used for internal planning and operations are derived from a manual system based on

information contained in a daily log. The police have little faith in the accuracy of the computerized data, so they seldom use it.

The Traffic and Transportation Department would like to receive more accurate data, too. The Department also expressed a desire for the data to be presented in formats more useful to decision makers. According to the traffic engineer, the Department does not have the manpower needed to further process accident data after the data are received via computer printout.

On the surface, the local traffic records system appears to be an efficient system; however, personnel, administrative, hardware, and software problems are making the system ineffective. The Police Department, the Traffic and Transportation Department, and the Data Processing Department must become jointly responsible for the quality of the input data. With the present system, it is too easy for one department to lay the blame elsewhere (i.e., the Police Department accuses the Data Processing Department for the ills of the system, and the Traffic and Transportation Department accuses the Police Department).

Tyler, Texas (population approximately 75,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The city relies on manually-processed accident data, spot maps, and hard copies of accident reports to identify traffic problems. The Police Department (PD) and the Traffic and Transportation Department (TTD) are both interested in getting computer equipment which can be used for processing accident data. The two departments are not coordinating their efforts, however. In October of 1980, the PD will receive an Incoterm computer, two terminals, and computer software which can be used to process accident data. The local input-output system will utilize software from Multi-Information Systems, marketed by a firm in Arlington, Texas. The TTD hopes to obtain an in-house computer soon, so it can process accident data via a link-node system designed 3 years ago by programmers in the city's Data Processing Department (DPD). The link-node system did not become operational because of the limited processing capacity of DPD's computer three years ago and because of certain manpower and administrative problems. The TTD hopes to get an in-house computer compatible with DPD's computer, so TTD can transfer the software written for the earlier external system to its new in-house system. The city departments most directly involved with the existing traffic records system are: 1) the Police Department and 2) the Traffic and Transportation Department. Tyler is currently experiencing approximately 3900 accidents per year, with 15 fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who calls in (via radio) his reports which are recorded on cassette tape at the PD. The police investigate all accidents they are aware of, including private property accidents and "below \$250 damage" accidents. Twelve clerk/typists in the Records Section transfer accident information from

cassette tapes to accident report forms. Abbreviated field reports are completed by investigating officers at the accident scene and are turned in daily to shift sergeants. Shift Sergeants post accident information to their daily shift logs, and provide the Patrol Commander with monthly activity totals. These totals include crime data as well as "car wreck" data. Each month the patrol commander consolidates 3 monthly shift reports into a Patrol Production report.

After police supervisors have checked the accuracy and completeness of accident reports, Records Division clerks make 2 copies of each report. One copy is forwarded to DPS-Austin, and the other copy is forwarded to Tyler's Traffic and Transportation Department. Records clerks in the PD file original reports in monthly folders; reports are filed by date of occurrence within these folders. Between 1971-1975, the Records Division had an extensive indexing system for locating information pertaining to traffic accidents. IBM cards for "call for service," for location of accident, for each driver, for supplementary information, etc. were typed and placed in separate files. The cards were used to facilitate the retrieval of accident reports. Due to the increasing numbers of accidents and personnel shortages, the indexing system became unwieldy and, thus, was simplified considerably. When the current indexing procedures are completed, the clerks file original accident reports in the monthly folders. Additional copies of reports for major-injury accidents and fatal accidents are placed in special files.

The PD forwards a copy of each accident report to the TTD. There, two technicians update a hand-tally sheet and a current-year spot map (the previous-year spot map is retained for comparative purposes). The technicians also update collision diagrams for intersections experiencing 5 or more accidents per year. Accident reports are then placed in one of three files:

- 1) Intersection Accidents. Folders are alphabetized by primary street name. Each collision diagram is placed in the front of the appropriate Intersection Accident folder.
- 2) Midblock Accidents. Folders are alphabetized.
- 3) Private Parking Accidents. One folder is maintained.

Police Department

The Tyler Police Department is organized into 3 major units: the Patrol Division, the Detective Division, and the Staff Services Division. There are 68 uniformed patrol officers, 12 detectives, 4 ID officers, 2 Records officers, 1 Public Information officer, 4 Vice officers, and 2 Animal Control officers. There is no Traffic Division, but some of the traffic duties normally performed by Traffic personnel are being performed by 2 motorcycle patrol officers. These officers work primarily in the congested downtown area where it is hard to use patrol cars. Beginning in July of 1980, other traffic functions will be performed by 3 STEP officers working on an overtime basis. Moving radar will be used to detect violations of speed limits.

The PD presently has no data processing equipment for processing accident data. Accident data for monthly reports are compiled manually. However, the PD will soon purchase an Incoterm computer, 2 terminals, and software marketed by Multi-Information Systems. This computer system will allow the local coding and processing of accident data. One of the terminals will be located at the dispatcher's station, and the other terminal will be located in the computer room. Spot maps are not being kept at the PD, nor are hand tallies kept for high accident locations. Patrol officers occasionally visit the TTD to determine high accident locations from the spot maps being kept there.

The police feel that the major problem with the traffic records system is insufficient manpower to manually process accident data. They feel the new

computer system will help alleviate this problem.

Traffic and Transportation Department

There are 51 employees in Tyler's Traffic and Transportation Department. The Department is divided into the following 4 Divisions: 1) Public Transportation, 2) Traffic Engineering, 3) Airport, and 4) Street Lighting. Presently, the Director of Traffic and Transportation is the only traffic engineer in the Department. For some time, Tyler has been advertising for a traffic engineer to head the Traffic Engineering Division.

There is good rapport between the TTD and the PD. Police officers drop by the TTD to look at TTD's spot maps. TTD is pleased with the promptness in which it receives accident reports from the PD, i.e., TTD receives a copy of most accident reports 1 or 2 days after the accident occurred. The TTD foreman reads all accident reports before they are filed by administrative technicians. Spot maps, collision diagrams, hand-tallied categorical data, hand-computed accident rates, hard copies of accident reports, and site visits are used during the problem identification process.

The Director feels that collision diagrams (used in conjunction with hard copies of accident reports) are just as valuable as computer printouts for making engineering evaluations related to specific intersections or midblocks. However, the Director feels that a computerized system is better than a manual system for compiling statistical summaries of citywide accident experiences. The TTD will soon purchase a Data General-Nova II computer which will be used to computerize signal timing and to perform other traffic engineering functions. The software is designed to control the signals at a maximum of 110 intersections, and Tyler already has 94 signals in operation. The Director hopes to eventually use this in-house computer to process accident data, with

data being entered by TTD personnel.

Input Data

Tyler's Accident Report Form includes only those questions required by DPS. The police and the traffic engineer are fairly well satisfied with the State form with the following exceptions: 1) there is not enough space for the narrative or the diagram, and 2) there are not enough blanks for occupants of vehicles. The police stated that it was good to have blanks for both the residence and business phones. The PD's quality control system for accident reports includes reviews by police supervisors and records clerks. Common errors found on the form are: 1) information is omitted such as time of day and day of week, and 2) narrative description of accident does not correspond with diagram of accident.

Filing System

Accident reports are filed manually by both the PD and the TTD. The PD keeps accident reports for previous three months at the front desk, so that reports can be easily retrieved for individuals desiring copies. Earlier reports are kept in monthly folders and stored in a closet in the Records Section. The TTD keeps hard copies for 6 years, and then the Department microfilms the accident reports. The PD files by month, then by day. The TTD files by location. Currently, no computer is being used by either department to compile accident data. However, spot maps are used by the TTD.

The PD has an extensive filing and retrieval system for crimes or offenses. A series of IBM cards is typed and filed. The cards give information concerning the complainant, the location of offense, the reporting person, and the suspect. The actual offense report is filed by report number. The PD also keeps special files related to DWI offenses and hit-and-run accidents.

Output Reports

No computerized output of accident data is available in Tyler at this time. This situation will probably change in the near future. The manually-compiled output of TTD is more extensive and is used more for operational planning than is the manually-compiled output of the PD.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The traffic records system has very little effect on the operations of the Police Department. The Police Department overemphasizes the processing of crime data and underemphasizes the processing of traffic data, a trait which is characteristic of most police departments without a Traffic Division. The Traffic and Transportation Department makes reasonably good use of accident data, considering the fact that all its data are manually processed. The proposed computerized systems will alleviate many of the problems now being faced in analyzing traffic accident data. However, the interviewer questions the efficiency of developing two separate traffic records systems-- one for the Police Department and one for the Traffic and Transportation Department.

Mesquite, Texas (population approximately 70,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The city participated at first, but withdrew from the UALC Project on Oct. 1, 1980 because the quarterly printout did not satisfy the data needs of the police and the traffic engineer. These personnel felt that the quarterly printouts arrived too late from DPS-Austin to be of value and were too cumbersome to use. At present, the city relies totally on its local-input system. The computer equipment for this system includes the following: data entry/retrieval terminals, a minicomputer, and a line printer (all of which are located in the Police Department). The city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Community Development Department, Traffic Safety and Maintenance Division. There is good coordination between these two components of the traffic records system. Mesquite is currently experiencing approximately 2000 accidents per year, with 17 traffic-related fatalities in 1979.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. Reports are turned in daily to the Traffic Operations Division of the PD, where they are checked for completeness and accuracy. Traffic citations are also routed through the Traffic Operations Division daily. Accident reports and citations are used to update a series of spot maps, i.e., an accident spot map, an activity spot map, a DWI spot map, and a fatality spot map. The information is also used to complete a daily Traffic Enforcement Summary. The Traffic Sergeant completes a Motor Vehicle Accident Report Supplemental Data sheet for each accident report, and forwards these code sheets and accident reports to the Records Section. The Records Section Sergeant enters data from the code sheets and accident reports directly into the local traffic records system--

by approximately 22 police officers.

The PD has 3 CRT terminals and 1 line printer connected to its minicomputer, a Data General Nova System 3. The Department uses this equipment primarily to process criminal history information, offense/arrest reports, and traffic accident reports. Retrieval of stored information is slow at certain times during the day when the computer is being used most heavily. The PD also has an Incoterm terminal that connects Mesquite to the NCIC and TCIC Systems. The PD does not have its own computer programmer; a consultant wrote the programs for the existing local system in 1978.

The PD uses the computer printouts derived from locally-coded data to schedule and assign officers (patrol, traffic, and STEP) more effectively. The Department is not totally pleased with its local traffic records system, however. The PD would like to store accident data longer, to retrieve it faster, to obtain a computer terminal in the Traffic Operations Division, and to obtain an additional line printer. The PD would like to expand its computer capability. Under the current system, the PD can store only one year's data on a disk. At the end of that year, the PD must transfer this information to a computer printout and use the cleared disk to store the following year's data. Thus, compiling accident data for time periods exceeding 1 year is very time consuming. Police personnel feel that one solution is to purchase additional disks and to hire a consultant to write new software for accessing more than one year's data. Monies are not available for these purchases at this time.

Traffic Safety and Maintenance Division, Community Development Department

Traffic engineering functions are performed by the Traffic Safety and Maintenance Division (TS&M) of the Community Development Department. This

division consists of 1 traffic engineer; 1 traffic safety specialist (a former police officer); 5 employees in the shops, signs, and signals sections; and 1 secretary. Specific duties of the traffic engineer include the design, operations, and maintenance of traffic safety systems (i.e., signals, signs, and markings). Specific duties of the traffic safety specialist include conducting a driver improvement program, making traffic counts, making on-site inspections, and writing reports.

The traffic engineer is displeased with the current traffic records system in Mesquite. He is concerned that the Nova computer in the PD has insufficient storage capacity, i.e., the computer can keep only 1 year of accident data on-line. Due to this limited storage capacity, TS&M's secretary has to manually search through hard copy files to compile accident data for time periods that include months not in current year. With greater storage capacity, the computer could yield this information. The traffic engineer would also like the computer to draw collision diagrams. He would like for accident data to be retrieved in formats more useful to traffic engineers. Under the present system, if the traffic engineer wants to know how many accidents involving protected left-turn signals occurred for a 3-year period, he has to pull hard copies of all accidents involving signals and run a hand tally on the accidents he is interested in. TS&M does not routinely receive copies of accident reports from the PD--so the traffic engineer relies on the police files of accident reports.

Input Data

Mesquite's Accident Report Form includes only those questions required by DPS. Police and traffic engineering personnel are fairly pleased with the substance of the questions asked on the form. They have no qualms about the

\$250 damage rule. The PD has an adequate system for checking the completeness and accuracy of accident reports.

A Sergeant in the Traffic Division fills out all code sheets, and a Sergeant in the Records Section enters (via terminals) all data into the local traffic records system. The PD minimizes the number of people involved in the coding and data-entry processes, and thus increases the consistency and accuracy of stored data. Common errors found on accident reports are: 1) failing to fill in blanks, 2) reversing Vehicle 1 and Vehicle 2 in the narrative description, 3) writing in incorrect day of week or date, and 4) failing to specify proper contributing factors.

Filing System

Accident reports are filed manually in the PD, but are not filed in the Traffic Safety and Maintenance Division. Current-year accident data are also filed on a disk in the PD. The PD's minicomputer is inadequate for the present and future processing of accident data. Spot maps are used in the PD but not used in the Traffic Safety and Maintenance Division.

Output Reports

Computer printouts based on locally-coded accident data are being used by the police, but it is doubtful whether the traffic engineer uses these printouts to aid routine decision-making. The local traffic records system can provide computerized analyses of accident histories for the current year only. Multi-year analyses require a great deal of hand tallying.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The traffic records system in Mesquite is not providing adequate information to decision makers in the Police Department or the Traffic Safety

and Maintenance Division. Personnel in both of these departments are eager to receive more useful and more timely accident data. Too much hand tallying is required with the present system. The hardware and software should be upgraded. New hardware is needed so that more than 1 year of accident data can be kept on-line. New software is needed so that traffic engineers can receive information in formats that meet their needs. The traffic records system in Mesquite could be upgraded with little effort and monetary outlay.

McAllen, Texas (population approximately 63,000) does not participate in the Urban Accident Location Coding Project sponsored by the Department of Public Safety. The city withdrew from the project in January of 1980 because it was losing 25% of its accidents due to DPS's "above \$250 damage" coding rule. Also, the city was displeased with the format of the quarterly printout received from DPS--"the printout gives too much information in a coded format that is too difficult to analyze." The city departments most directly involved with the traffic records system are: 1) the Police Department and 2) the Traffic Safety Department. McAllen is currently experiencing approximately 2400 accidents per year.

An accident that occurs within the city limits is investigated by a police officer who completes an Accident Report Form. At the accident scene, the investigating officer gives a "preliminary citation" to each driver involved. This citation requests that each driver appear in municipal court approximately one week after the accident. When the accident report is turned in, it is checked by police supervisors who forward the report to the Records Section, Data Services Bureau of the PD. A records clerk in the Records Section types index cards to be filed in three index files:

- 1) Index by Name of Driver. This cross reference file contains 3x5 cards listing the name of driver, the location of accident, the date of accident, and the Accident Report Number. An entry is made in this file for each driver involved and each owner of damaged property (other than vehicles). The cards are filed alphabetically.
- 2) Index by Day of Week. This cross reference file contains carbon copies of the 3x5 cards used in the "Index by Name of Driver." The cards are filed chronologically by day of week.
- 3) Index by Location. This cross reference file contains carbon copies of the 3x5 cards used in the "Index by Name of Driver." The cards are filed by location of accident.

These three indexes are used to obtain Accident Report Numbers, so that original accident reports may be retrieved from rotary-type files. The indexes are also used to develop hand-tallied data concerning McAllen's accident experience. Before filing original accident reports by Accident Report Numbers, the records clerk makes several copies to be used by various State and local offices. The following offices receive copies of accident reports:

- 1) State Department of Public Safety. Copies are sent to DPS for use in preparing statistical reports for highway safety programs, driver improvement programs, highway patrol manpower allocations, police equipment dispersal, etc.
- 2) State Department of Highways and Public Transportation, District Office. Copies of reports concerning accidents that occurred on State highways and Farm-To-Market roads are sent to the State Highway Department for use in planning new highway construction, determining the need for additional traffic control devices, etc.
- 3) Municipal Court. The Municipal Court receives copies of accident reports that were written in conjunction with citations. The Court uses these copies in its prosecution of charges and in its program for dispersing blue forms to drivers. After the charges have been adjudicated and the blue forms have been dispersed, citations (with adjudications indicated) and accident reports are returned to the Records Section of the PD.
- 4) McAllen Traffic Safety Office. The Traffic Safety Coordinator receives copies of accident reports for use in the planning and implementing of traffic engineering countermeasures, and use in the development of needed traffic ordinances.
- 5) McAllen Police Department. Original accident reports are filed numerically by Accident Report Number in the Accident Report File. Also, copies of accident reports are filed chronologically in the Monthly Accident File. The file consists of twelve folders, one for each month of a particular year. Each folder contains accident reports for that month.

Police Department

The McAllen Police Department is organized into 4 major units: the Auxiliary Services Division, the Investigations Division, the Uniformed Services Division, and the Administration Division. The Uniformed Services Division is composed of 44 uniformed officers--13 are assigned patrol duty for each of three eight-hour shifts and 5 are assigned to control downtown parking and traffic. Thus, uniformed officers are involved in both crime control and traffic control. The PD investigates all accidents in McAllen, including those involving less than \$250 damage and those occurring on private property.

The PD conducts a STEP program which is monitored by the Traffic Safety Coordinator of the Traffic Safety Department. The Coordinator chose the selective enforcement sites by referring to historical accident data and by conferring with police. Five city streets were chosen and STEP officers patrol these streets at various times during the week. Two STEP motorcyclists work 9-hour shifts, Tuesday through Saturday. Two STEP officers work overtime on Saturday and Sunday--each driving a patrol car and working strictly traffic for two hours. The Coordinator receives a copy of each accident report, and uses this information to update hand tallies related to accidents at STEP sites. He uses this data, as well as other data, to complete monthly STEP reports required by the Traffic Safety Section, SDHPT.

The PD does not have data processing equipment, but it has recently requested funds from LEAA for the purchase of such equipment. The PD does not use spot maps to identify high accident locations, nor did it use DPS's quarterly printouts it received at one time. Police experience and intuition play a great role in determining where the police concentrate their enforcement effort. Accident statistics are kept manually, but few analyses

are performed with the data. The Records Section keeps manual tallies concerning monthly and yearly trends for accidents, and monthly and yearly trends for citations. The Records Section keeps a DWI arrest log and monitors the disposition of DWI cases. The Records Section keeps hard copy files on all fatalities, and on all accidents where special objects were struck (i.e., pedestrians, bicyclists, poles, public property, etc.). To answer questions concerning these types of accidents, a records clerk must refer to original accident reports. It is estimated that records clerks spend 50% of their time trying to locate accident reports that have been filed.

The PD is displeased with its present traffic records system. The Department feels that DPS-coded data is useless since it fails to portray an accurate picture of what is going on in McAllen (a result of DPS's failure to encode accidents involving less than \$250 damage). The Department feels that DPS's quarterly printout presents too much data in an unuseable format. The PD feels that the local traffic records system is too burdensome, with too much time required for the filing and retrieval of accident reports, and too little time available for the analysis of accident data.

Traffic Safety Department

The Traffic Safety Department is composed of the Traffic Safety Coordinator, a part-time secretary, and 10 personnel in the Traffic Signs and Signals Section. The Coordinator is not a traffic engineer. He reports directly to the city manager. The Coordinator's duties seem to be ill-defined; thus, he has assumed many clerical functions which should be performed by others. For instance, he previously placed accident location codes on accident reports prior to sending them to DPS, and he keeps manual tallies on accidents so he can complete monthly STEP reports. He receives numerous

complaints from citizens and from personnel in other city departments. Some of these complaints should be directed toward the Streets and Alleys Section and the Engineering Section of the Public Works Department, and toward the local Power and Light Company. His secretary works for other departments 75% of the time.

After the Coordinator reads his copy of each accident report, he files it in one of the 25 high-accident location folders or files it in a citywide folder by date of accident. Based on his reading of accident reports, the Coordinator makes recommendations to the PD concerning their enforcement efforts and makes recommendations to the Public Works Department concerning changes in road construction. The Coordinator was displeased with DPS's quarterly printout, as well as most facets of the traffic records system in McAllen.

Input Data

McAllen's Accident Report Form includes only those questions required by DPS. Completed forms are checked by police supervisors. Two common errors are: 1) diagram does not include enough information and 2) narrative description of accident does not match the diagram of accident.

Filing System

The PD has an elaborate indexing and filing system for accident reports. The Department desires a minicomputer (Dec 1170 VAX) to aid the indexing and retrieval processes.

The Traffic Safety Department files some accident reports by location of accident. This filing system facilitates the review of accidents reports related to specific trouble spots.

Output Reports

No computer printout is being used to analyze traffic data. The PD and the Traffic Safety Department no longer receive quarterly printouts from DPS. The PD hand tallies accident data and presents it in monthly and yearly summaries. These summaries only present citywide totals.

General Observations by Interviewer Concerning the Impact of the Traffic Records System on the Planning and Operations Functions of City Departments

The traffic records system in McAllen has very little impact on the planning and operations functions of city departments. The system is concerned almost entirely with the filing and retrieving of accident reports. Analyses of traffic problems must be performed via the manual processing of accident data. McAllen withdrew from the Urban Accident Location Coding Project before the city had a viable alternative to its traffic records system. Now the city is in desperate need of an efficient way to identify enforcement and engineering problems. The city's reliance on "experience and intuition" may be appropriate for a town of 5,000 residents, but it is not appropriate for a city of 63,000 residents.