



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

DOT HS 808 058

December 1992

Final Report

Evaluation of the Impact of the Drug Evaluation and Classification Program on Enforcement and Adjudication

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' name or products are mentioned, it is because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

1. Report No. DOT HS 808 058		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Evaluation of the Impact of the Drug Evaluation and Classification Program on Enforcement and Adjudication				5. Report Date December 1992	
				6. Performing Organization Code	
7. Author(s) D.F. Preusser, R.G. Ulmer and C.W. Preusser				8. Performing Organization Report No.	
9. Performing Organization Name and Address Preusser Research Group, Inc. 2962 Main Street Bridgeport, CT 06606				10. Work Unit No. (TRAIS)	
				11. Contract or Grant No. DTNH22-91-C-05007	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh Street, S.W. Washington, D.C. 20590				13. Type of Report and Period Covered Final Report September 1991-December 1992	
				14. Sponsoring Agency Code	
15. Supplementary Notes Dr. Richard P. Compton served as the NHTSA Contracting Officer's Technical Representative for the study. We appreciate the guidance, support and encouragement he provided. Special thanks are also due to Dr. David Shinar for his efforts on behalf of the study.					
16. Abstract This study examined the effect of the Drug Evaluation and Classification (DEC) Program on impaired driving (DWI) enforcement and adjudication. Drug Recognition Experts (DREs) in DEC programs evaluate suspects when drugs other than alcohol are suspected of contributing to driver impairment. Eleven police agencies in five states with DEC were compared with similar police agencies without DEC. Results varied considerably across DEC agencies. Some DEC agencies showed lower overall mean alcohol levels (BACs) in DWI arrests, fewer low BAC suspects "not booked" for DWI and more DWI convictions for suspects at low BAC. The number of DRE evaluations conducted by the DEC agencies tended to peak at about two to four percent of all DWI arrests during the first one to two years of DEC and decline thereafter to about one and one half percent. Overall, 1842 suspects were evaluated; most of the DRE drug opinions were confirmed by chemical tests; and most of the confirmed suspects were convicted.					
17. Key Words Drug Evaluation Drug Recognition Expert DWI DWID			18. Distribution Statement Document is available through the National Technical Information Service Springfield, VA 22161		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 59	22. Price

Acknowledgements

During the course of the study, numerous individuals involved in law enforcement and highway safety provided us with data and insights regarding the Drug Evaluation and Classification Program. We thank them all, collectively, for the help they provided to us.

We wish to thank the DEC Program Coordinators for the States of Arizona, California, Colorado, Florida, Indiana, Nevada, New York and Texas for describing DRE developments in their States and providing us with points of contact within appropriate law enforcement agencies.

Finally, we are grateful to the following law enforcement agencies for their assistance:

Adams County Sheriff's Department
Arapahoe County Sheriff's Department
Arizona Highway Patrol
Arvada Police Department
Aurora Police Department
Boulder County Sheriff's Department
Dallas Police Department
Denver Police Department
Douglas County Sheriff's Department
Flagstaff Police Department
Houston Police Department
Lodi Police Department
Nassau County Police Department
New York State Police
Phoenix Police Department
Riverside Police Department
Roseville Police Department
Texas Highway Patrol
Tucson Police Department
Westchester County Police Department

Table of Contents

	<u>Page</u>
I. INTRODUCTION	1
II. METHODS	4
Site Selection Overview	4
Arizona	6
California	10
Colorado	11
New York	14
Texas	16
III. DRE CASE RESULTS	18
DRE Case Volume	18
DRE Evaluation Results	19
Laboratory Results	20
Blood Alcohol Concentrations	21
Suspect Gender and Age	23
Case Disposition	23
Summary	24
IV. OVERALL RESULTS	26
Arizona	26
California	31
Colorado	34
New York	39
Texas	43
DEC Sites Combined	45
V. DISCUSSION	48
DEC Activity	48
System Level Variables	49
DRE Cases	50
Drugs Found	51
Recommendations	52
Conclusion	54
REFERENCES	55

I. INTRODUCTION

The Drug Evaluation and Classification (DEC) Program has developed a standardized, systematic method for law enforcement personnel to determine whether observed impairment of drivers (or others) is due to drug use, and if so, to identify the class or classes of drugs involved. The present DEC methods and procedures are an outgrowth of work carried out by the Los Angeles Police Department (LAPD) during the 1970s. At that time, police officers were frequently encountering situations where they suspected that driver impairment was due to drugs other than alcohol but lacked the tools to articulate this suspicion or to prove the offense. A common scenario was for an officer to detect and apprehend an obviously impaired driver and then obtain a blood alcohol test result which was incompatible with the extent of behavioral impairment. While it was logical to assume other drug involvement, there was no legally acceptable way to support this conclusion.

By the early 1980s, LAPD had developed and implemented a program to deploy Drug Recognition Experts (DREs) -- police officers trained to recognize the behavioral and physiological symptoms associated with major classes of psychoactive drugs. DREs were soon accepted as offering expert testimony by the Los Angeles court system.¹

In the early 1980s, the National Highway Traffic Safety Administration (NHTSA) began supporting research, development and implementation activities relating to the DEC program. In 1984, NHTSA and the National Institute on Drug Abuse sponsored a laboratory study which showed that LAPD DREs were highly accurate in identifying drug-dosed subjects as impaired and in identifying the class of drug involved. A subsequent field evaluation in Los Angeles showed that DREs were almost always correct (94 percent) when they judged that a suspect had used drugs other than alcohol and were able to correctly identify at least one drug class in 87 percent of the persons they evaluated.¹

These positive findings led NHTSA, in conjunction with the LAPD, to develop and pilot test a standard curriculum to train DREs. In 1987, NHTSA began to expand the program on a pilot basis. Also that year, the International Association of Chiefs of Police (IACP) became the national certifying agency for DREs and instructors. IACP subsequently developed and issued interim standards for certification and recertification. In 1989, NHTSA and IACP efforts led to the creation of a National Technical Advisory Panel responsible for updating the national program standards and ensuring proper training of officers.²

In expanding the DEC program, NHTSA adopted a formal set of criteria for site/state participation. These included establishing the programs in relatively small geographical areas (i.e., metropolitan areas) in order to concentrate resources and permit rapid responses by DREs; selecting agencies with high levels of DWI enforcement so that each DRE would average at least one investigation per week; and requiring that there be reasonable assurance that suspects would comply with DRE requests for urine or blood samples under the States' Implied Consent Laws.

NHTSA also established prerequisites regarding law enforcement agency operations and prosecutorial and systems support. Among the law enforcement requirements are: adequate facilities for DRE examinations; centralized processing of DWI arrests; employing breath testing procedures which provide immediate results; and maintaining accurate and timely records regarding alcohol and drug related arrests and prosecutions, DRE examinations and toxicological results. Among the prosecutorial support requirements are: a commitment to actively pursue drugged driving cases; qualifying DREs as experts with the courts; and ensuring that the program meets defense challenges. System support requirements include endorsement by the applicable NHTSA Regional Office, the backing of the State highway safety office, willingness by the courts to entertain evidence provided by DREs and access to laboratories that can provide admissible evidence to corroborate DRE conclusions.³

Initial program expansion, outside of California, took place in the Phoenix metropolitan area; Denver and Boulder, Colorado; Nassau County, New York and Virginia Beach, Virginia followed shortly by programs in Indiana, Texas and Utah. As of mid-1992, DEC programs existed in one or more law enforcement agencies in 23 States and the District of Columbia.

A DRE evaluation consists of a standardized 12 step process which provides careful observation of the suspect's appearance, behavior, performance of psychophysical tests, eyes and vital signs. Based on the totality of these observations, the DRE reaches an opinion about whether the suspect is impaired and if so, whether the impairment is drug or medically related. If the opinion of drug impairment is reached, the DRE determines the category or categories of drugs causing the impairment. These drug categories are Central Nervous System Depressants, Central Nervous System Stimulants, Hallucinogens, Phencyclidine (PCP), Narcotic Analgesics, Inhalants and Cannabis.

Police officers are trained and certified as DREs by participating in a standard three-phase program of instruction consisting of a two-day preschool, 56 hours of classroom work and on-the-job certification training involving the conduct of supervised evaluations of persons actually suspected of drug impairment. Because of the time and expense associated with certification training and questions regarding the number of evaluations to be conducted and observed, NHTSA sponsored a 1991 study to determine the minimum number of evaluations required in the certification phase. Another NHTSA-sponsored study to evaluate aspects of DRE training is an effort to improve and validate the knowledge test which is the final examination given at the conclusion of the classroom portion of training.

The Drug Evaluation and Classification Program, thus, has evolved and expanded under a carefully controlled process of standards, pilot testing and evaluations of procedures and training. Data are becoming available from individual sites regarding performance indicators such as DRE opinions versus toxicological findings, conviction rates, etc. Such data and the opinions of those involved in the program have contributed to the perception that the DRE approach has been successful in improving impaired driving enforcement and adjudication. The relatively rapid expansion of the program also suggests that it is viewed positively within the law enforcement community.

The present study is part of NHTSA efforts to address the issues of DEC program efficiency, impact and internal structure. Specifically, the study's overall objective was to evaluate the direct and indirect impact DEC has on the enforcement/adjudication system. The program has reached

sufficient size and maturity to support a comprehensive evaluation so that further program development and dissemination can be justified or refocused.

Impaired driving arrest and conviction data from multiple law enforcement agencies were compared before and after the initiation of each agency's DEC program. Similar data from matched agencies which had not adopted DEC during the time frame of the study were also collected.

One of the expectations of the DEC program was that DREs would be available, or on-call, at central processing stations to act as expert resources and thereby encourage other officers to take suspected drug impaired drivers into custody and to continue with the processing of low BAC cases. Thus, DREs may contribute their own drugged driving arrests and stimulate related enforcement actions among other officers.

Direct measures of impact were sought based on drugged driving arrests and convictions. Comparisons were made pre and post the introduction of DREs, and compared with similar data in the matched locales during these time periods. Indirect effects, or overall system impact, was measured by examining arrests and convictions for all DWI charges and the subset of charges involving low BAC cases during the same time periods.

In formulating the evaluation design, it was postulated that possible program effects would develop gradually in each agency as the initial cadre of DREs was deployed; operating procedures became established; other officers, prosecutors and the courts became familiar with the DRE capability; further officers were trained; etc. That is, "steady state" performance was expected only after the program had been in operation for an extended period of time. This suggested that the sites sought for participation in the study should be among the earliest of the DEC programs so that both the developmental and "steady state" phases could be examined.

Throughout this report, impaired driving arrests are denoted as DWI, DWID, DWAI and DWAIID. DWI, covers both "driving while intoxicated" and "driving under the influence" (typically denoted as DUI). Some of the locations studied in this evaluation have laws which establish DWI; others have laws which establish DUI. However, for simplicity, DWI is used to cover both types of laws despite the fact that the two terms are not the same. Similarly, DWID is used to refer to both DWID and DUIID charges related to drugs other than, or in addition to, alcohol. DWAI and DWAIID are used to cover alcohol and non-alcohol drug driving charges, respectively, in the two states included in this study which have "ability impaired" charges as lesser included offenses of the more serious DWI and DWID. Lastly, as noted above, DEC is used to indicate the Drug Evaluation and Classification Program. DRE denotes the Drug Recognition Expert who works within these programs.

The next section of this report describes the site selection process and the methods and constraints of the evaluation. Section III examines the results of DRE cases in the study sites. Section IV presents the overall results of the study. Section V contains a discussion, conclusions and recommendations based on the study's findings.

II. METHODS

The present study is a large-scale effort to identify, collect and analyze existing data sets covering impaired driving enforcement and adjudication. The first step in this process was to identify sites, i.e., police jurisdictions, that could supply the required data. The second step was to access and code the data and the third step was data analysis. Results cover numbers of DWI arrests, numbers of DWID arrests, BAC at time of arrest, DRE involvement in the arrest process and adjudications. The collected data sets typically cover the period from about 1987 or 1988 through 1991.

Data are generally, though not entirely, complete with respect to numbers of arrests and DRE involvement. DWID information varies by jurisdiction as a function of state statute. Some states do not have separate charges for impaired driving related to alcohol versus impaired driving related to the use of other drugs. BAC data often required sampling of the total arrest population. Adjudication results were, by far, the most difficult of the data items to obtain. While most jurisdictions did provide adjudication results, some cover only a portion of all DWI cases and some cover only annual summaries as opposed to case by case information.

A total of twenty jurisdictions, including municipal, county and state level police agencies participated in this study. Eleven of these jurisdictions implemented a DEC program before or during 1990. The paragraphs which follow detail the site selection process and each of the data sets collected. The selected jurisdictions were in the states of Arizona, California, Colorado, New York and Texas.

Site Selection Overview

The primary study requirement which governed the site selection process was that at least 10 law enforcement agencies be included which were actively involved in the DEC program. Sites were sought, therefore, which had an operational DEC program for approximately two years or longer; were willing to participate in the study; and which had adequate and accessible record systems for all DRE cases and all DWI arrests. Preference was also given to potential sites which had more than one or two certified DREs.

Programs which met the length of operation criterion were located in Arizona, California, Colorado, Indiana, Nevada, New York, Texas, Utah and Virginia. The NHTSA Regional Offices for these states were contacted regarding program status and to identify state contacts. Utah was eliminated from consideration at this point because of its small number of certified DREs and Virginia was eliminated because of apparent programmatic difficulties concerning laboratory testing.

DRE Coordinators in the remaining states were then contacted to obtain program information for specific sites as well as local points of contact. Indiana was eliminated from consideration because of data system concerns and Nevada was eliminated because of possible divergence from NHTSA program standards. Some individual sites within particular states were also eliminated during this process. New York City, for instance, was eliminated because of reported difficulties in obtaining case adjudication information. Los Angeles was eliminated because the long duration of their program precluded establishing a baseline (pre-program) period.

Local contacts were then made to refine the selection criteria data and to obtain initial indications of possible interest in participation. Site visits were then completed to determine the availability (and media) of specific data elements and to identify the local approval process that would be required for participation. Contacts with possible comparison sites (i.e., similar agencies which had not, or had only recently entered the DEC program) also commenced during these site visits.

Overall, data systems were sought which could provide case-by-case information on all DWI arrests made by the agency covering a period from two years prior to the initiation of the DEC program and extending through the end of 1991. The particular data items of interest for each arrest were: arrest date; age and sex of the person arrested; Blood Alcohol Concentration (BAC) or notation of test refusal; and case disposition. Similar data were also sought for all traffic-related DRE cases plus the DREs' opinions and laboratory findings in these cases.

Site selection proceeded iteratively based on the responses received from agencies and the comprehensiveness of the data that could be provided. In some instances, agencies initially indicated an ability to provide requested data, only to discover on further examination that data systems were incomplete or had been purged for some of the years in question. Alternative sites were substituted when possible. Ultimately, however, the requirement regarding the number of study sites led to compromises in the scope of the data collected. These included:

- Retaining sites with many thousand DWI cases per year with only hard copy or partially automated record systems. Sampling of DWI case details (but not of DRE cases) was employed in these instances.
- Retaining sites which could not provide DWI arrest information for a full two years prior to the implementation of the DRE program.
- Retaining sites which could not provide case by case information on adjudication outcomes.

Comparison (non-DEC) sites were recruited after the DEC site selection was essentially completed. The criteria employed were that the comparison be in the same state (i.e., subject to the same laws), be geo-politically the same (i.e., city for city, county for county and State Patrol Troop or sub-station for troop or sub-station) and be as demographically similar as possible. Compromises were also necessary when potentially desirable comparison sites were unable to participate.

The final study design was based on eleven DEC jurisdictions and nine comparison sites. These are shown in Table 1. Remaining paragraphs provide descriptions of the individual sites and the data collection methods.

Table 1. DRE and Comparison Sites.

DRE Site	Comparison Site
Arizona:	
Phoenix Police Department Tucson Police Department	Flagstaff Police Department --
California:	
Roseville Police Department	Lodi Police Department
Colorado:	
Arapahoe County Sheriff Aurora Police Department Boulder County Sheriff Denver Police Department	Adams County Sheriff Arvada Police Department Douglas County Sheriff --
New York:	
Nassau County Police Department State Police-Nassau County	Westchester County Police State Police-Westchester
Texas:	
Houston Police Department Highway Patrol-Baytown	Dallas Police Department Highway Patrol-Galveston

ARIZONA

Under Arizona law it is unlawful to drive or be in physical control of any vehicle while under the influence of intoxicating liquor, any drug, a vapor releasing substance containing a toxic substance or any combination of liquor, drugs or vapor releasing substances if the person is impaired to the slightest degree; with a BAC of 0.10% or more (illegal per se); or while there is any drug or its metabolite scheduled in the criminal code in the person's body.

First and second offenses are misdemeanors while a third arrest following two convictions within five years or a DWI arrest while driving under suspension or revocation from a previous DWI conviction are felonies. Misdemeanors are adjudicated at the municipal court level while felonies are adjudicated in higher level courts. DWI felony adjudication data were not available for the Arizona study sites.

The three Arizona Departments were the municipal police agencies in Phoenix, Tucson and Flagstaff. Phoenix began DEC in late 1987. Tucson, which started some operations as early as 1987, began more slowly and did not have a full program until late 1989. Flagstaff was the control or comparison for the other two Arizona sites.

Phoenix:

Population:	983,403
Area:	420 sq.mi.
Household Income:	\$30,277
Sworn Police:	1,940
Certified DREs:	39
First DRE Case:	11/21/87

Data System and Collection

The Phoenix data collection involved a relatively complicated assembly process with information concerning DWI, DWID and DRE cases coming from four different sets of records.

First, the Phoenix Police Department maintains monthly summary sheets for DWI/DWID activity. Tabulated for each month are the number of suspects brought in for testing, the number actually booked for DWI, the number booked for DWID and the number not booked for either DWI or DWID. These monthly sheets were available for the years 1985 through 1991. They are the primary source of information for the total number of arrests and the number of suspects who were not booked.

The primary reason for a suspect being "Not Booked" is a BAC test result below the 0.10% limit. The low BAC test result could indicate that the suspect was not drug impaired. Alternatively, the drug impairment could have been caused by some substance other than alcohol. As such, the presence of a DEC program should reduce the number of under 0.10% suspects not booked while at the same time increasing the number booked on DWID. Phoenix was the only agency in Arizona that provided this data item.

Second, it was of interest to determine the age, sex, BAC and adjudication for the DWI (not DWID) arrested drivers in Phoenix. This was accomplished by taking a sample of approximately 50 DWI arrested drivers per month from among the 600 to 900 arrested drivers each month for the period 1987 through 1991. Police and municipal court records were checked for each sampled driver. The data items collected were: month of violation, day of week of violation, sex, age, BAC test results, and adjudication results. Adjudication status was recorded as the "highest" adjudication for the case. In Arizona, suspects are typically charged with both DWI and 0.10% illegal per se at the time of arrest. Most commonly, one charge is dismissed and the suspect is convicted on the remaining charge. In these instances, the conviction was coded and the dismissal ignored. The resulting data set (N = 3,053) was the main source of information for the characteristics of the Phoenix DWI arrest population.

Third, the DEC program maintains logs for all DRE evaluations conducted. These logs were made available to the project. The logs show the date of the DRE evaluation, DRE opinion and laboratory finding. The DRE evaluation form was accessed for each case shown on the log (training and non-traffic evaluations were excluded). The evaluation form provided subject date of birth, sex and BAC test results. This information was appended to the log.

Fourth, the Phoenix Prosecutor's Office maintains a computer file covering the results for all DRE cases submitted to Municipal Court on a DWID charge (i.e., excludes juveniles and felonies). A copy of the Prosecutor's file was obtained and adjudication results were appended to the DRE logs. The logs, with all appended information described above, were key entered. The resulting data set (N = 547) was the main source of information for the DRE cases.

Tucson:

Population:	405,390
Area:	156 sq.mi.
Household Income:	\$24,792
Sworn Police:	757
Certified DREs:	13 (9 became active in December 1991)
First DRE Case:	3/28/87

Data System and Collection

The Tucson Police Department generated a disk showing all DWI incidents in the city for the period 1987 through 1991 (excludes DWI related cases involving higher ranking felonies such as manslaughter or drug possession). The printout showed the case number and date of the incident as well as the age, sex and charge(s) issued for all drivers involved. The printout covered 15,185 incidents in which at least one driver was charged with DWI or DWID. These data, provided to the project in machine readable form, were the main source of information for the Tucson arrest population.

The printout did not include BAC test results at the time of the arrest. To obtain BAC data, a sample of approximately 35 DWI arrested drivers per month was selected from the printout. The original arrest record was accessed and the BAC information was appended to the printout and then key entered into the basic arrest file.

Also provided to the project in machine readable form were the 1987 through 1991 adjudication findings from the Tucson Municipal Court. The police "incident" record and the court "finding" record for an individual event carried the same case number. They were computer matched and the "highest" adjudication finding (and date of adjudication) from the court record were appended to the incident record. Matching was achieved in 80 percent of the cases. The non-matched cases, for the most part, represented cases for which no "final" adjudication was achieved. Matching was substantially less successful for 1991 incidents where it might be expected that more cases would still be pending. Also not matched were cases involving juveniles, cases not filed with the court (i.e., dismissed by prosecutor), situations where the defendant failed to appear, and DWI felony charges which were not adjudicated in Municipal Court.

The last step in Tucson was to assemble the DRE cases. The Tucson DRE coordinator identified those cases on the DWI incident printout with DRE involvement. Information covering the BAC test results, DRE opinion (i.e., drugs thought to be present) and laboratory findings (i.e., drugs found) was appended.

A separate file was created containing all known Tucson DRE cases (N = 231). The majority of these cases (N = 161) were DWI incidents resulting in a DWI or DWID arrest and thus were drawn from the main "incident" data set described above (including adjudication information when available). A few cases (N = 9) were on the incident file printout but did not result in a DWI or DWID arrest and thus were not included in the main file. The remaining cases (N = 61) were either higher ranking felonies or otherwise not included in the DWI incident printout.

Flagstaff:

Population:	45,857
Area:	63 sq.mi.
Household Income:	\$25,264
Sworn Police:	73
Control Site	

Data System and Collection

The Flagstaff Police Department obtained a computer printout listing all DWI and DWID arrests filed with the Municipal Court for the years 1987 through 1991.

This printout included all non-felony DWI and DWID charges. Felonies are filed in state court. Not shown was information concerning DWI related incidents where the primary or highest ranking charge was something other than DWI (e.g., manslaughter).

The printout showed the name and date of birth of the defendant, charge and current status of the case. Typically, current status represented the final adjudication at the Municipal level (i.e., without regard to the status of any appeal). In some cases, current status was listed as "Trial Date Set" or "Fail to Appear, Warrant Issued," and thus did not represent the "final" adjudication. Juveniles were shown on the printout as "Released to Other Court," and thus no adjudication results were provided.

Each case on the court printout was searched in Flagstaff Police Department Records. The original arrest report was found in nearly all cases. From the arrest report, police personnel appended, to the court record, the date of the arrest and the BAC test results at the time of arrest. The court printout, with date of arrest and BAC added manually, was provided to the project.

Arrest date, BAC, adjudication status and suspect date of birth were key entered. As in Phoenix and Tucson, the "highest" adjudication result was recorded.

The resulting Flagstaff data set covered 3,690 arrests. Suspect date of birth, date of arrest, charge, BAC test results and adjudication were known for most cases.

CALIFORNIA

In California, it is illegal to operate a motor vehicle under the influence of an alcoholic beverage; with a BAC of 0.08% or more (illegal per se); or under the influence of any drug or a combination of alcohol and any drug. The 0.08% BAC level for illegal per se replaced a 0.10% level on January 1, 1990. The California Health and Safety Code (11550) also makes it illegal to be under the influence of scheduled controlled substances. DWID and 11550 have been held as separate crimes and may be charged in the same incident.

Roseville:

Population:	44,685
Area:	30 sq.mi.
Household Income:	\$31,628 (County)
Sworn Police:	53
Certified DREs:	6
First Case:	2/18/90

Data System and Collection

DRE case data were compiled from the logs of each DRE. Adjudication information was obtained from the courts and appended to the compilation provided to the study. A total of 49 traffic related DRE cases were obtained.

DWI case data were retrieved and compiled from the Department's record system for the years 1989 through 1991. The resulting data set covered BAC and adjudication results for the 2,104 DWI charges made during the period.

Lodi:

Population:	51,874
Area:	11 sq.mi.
Household Income:	\$27,291
Sworn Police:	69
Control for Roseville	

Data System and Collection

Clerical personnel compiled DWI case details for the 1987-1991 period by retrieving each case file from the Department's hard copy record system. Data items cover arrest date, date of birth and sex of the person arrested and BAC. The Department's files do not contain case adjudication data and this information could not otherwise be obtained. The resulting data set contains 2,913 cases.

COLORADO

In Colorado, it is illegal to operate a motor vehicle under the influence of alcohol; with a BAC of 0.10% or higher (illegal per se); any drug; or a combination of alcohol and drugs. The state also has a lesser offense, Driving while Ability Impaired, which has a presumptive BAC threshold of 0.05%. Injury related DWI is a felony; other DWI and DWAI charges are misdemeanors.

Arapahoe County:

Population:	391,511
Area:	803 sq.mi.
Household Income:	\$48,300
Sworn Police:	315
Certified DREs:	3
First Case:	4/7/90

Data System and Collection

The Arapahoe County Sheriff's Department generated a printout of all DWI/DWID charges for 1987-1991 from its computerized record system (N = 1,736). (DWAI is not charged by the Department but DWI charges may be reduced to DWAI by prosecutors.) The printout included arrest date, date of birth and sex of each person, and case identifying information. The case identifying information was then used to locate the hard copy case folder for each arrest. These folders were then accessed to record BAC information for each case.

In order to obtain disposition data, court case logs were manually matched to arrest records based on common identifying information. Court case numbers were recorded from the case logs. A 10 percent sample of the cases was then retrieved from the County Court hard copy files based on these case numbers. Disposition information was recorded for this sample. Disposition information for felony charges was not obtained as these cases are heard in District Court rather than County Court.

DRE case data was provided in hard copy form based on DRE logs (N = 29). Disposition data for each DRE case was sought following the same general procedures employed for the overall arrest listing.

Aurora:

Population:	222,103
Area:	133 sq.mi.
Household Income:	\$40,480
Sworn Police:	382
Certified DREs:	6
First Case:	1/10/90

Note: The population of the City of Aurora includes 194,352 (50 percent) of the population of Arapahoe County and 27,747 (10 percent) of the population of Adams County.

Data System and Collection

Aurora provided computer printouts covering all DWI arrested drivers for the years 1990 and 1991. The printouts showed suspect date of birth and sex and date of arrest. Hard copy records were accessed for one driver in six from these printouts for the purpose of determining driver BAC. BAC data could not be obtained for periods prior to 1990. However, summary data covering annual arrest figures for the period 1988 through 1991 (approximately 2,500 DWI arrests per year) were provided. Information concerning the DRE cases was obtained from the DRE computer "spreadsheet" log. The data covered 73 cases for the year 1990. Data for 1991 DRE cases were fragmentary and thus not included in the current effort.

Boulder County:

Population:	225,339
Area:	742 sq.mi.
Household Income:	\$40,409
Sworn Police:	153
Certified DREs:	2
First Case:	1/8/89

Data System and Collection

The Boulder County Sheriff's Department provided computer readable records of all impaired driving arrests made during the period from November 1, 1986 through the end of 1991. A total of 1,694 cases make up this data set. Data items are arrest date, subject age, sex, BAC and case disposition.

DRE case information was provided in hard copy form based on compilations from DRE logs. A total of 52 traffic related cases were provided.

Denver:

Population:	467,610
Area:	153 sq.mi.
Household Income:	\$32,892
Sworn Police:	1,302
Certified DREs:	18
First Case:	1/4/89

Data System and Collection

The Denver Police Department provided summary data which indicated the total number of DWI arrests made by month during the 1987-1991 period. Total arrests during this period were 26,226. In order to provide case details, the Department sampled cases from its hard copy files. The resulting data set (N = 4,084) includes arrest date, subject date of birth, charge, BAC and other identifying information. A computer readable file of DWI case adjudications was obtained from the Colorado District Attorney's Association (CDAC). Identifying information in the arrest sample was used to access a sample of case dispositions in the adjudication file involving suspects with BACs less

than 0.10%. The full file was processed to provide overall annual summaries of DWI case dispositions.

DRE case information was provided to the study in hard copy form. Disposition information was retrieved via the Denver Court's on-line computer system for the 322 DRE cases.

Adams County:

Population:	265,038
Area:	1,192 sq.mi.
Household Income:	\$34,522
Sworn Police:	230
Control	

Data System and Collection

The Adams County Sheriff's Department produced a computer printout of its DWI arrests for 1989 (the earliest year automated), 1990 and 1991. A total of 1,518 arrests appeared on this printout. Reported case numbers were then employed to locate the hard copy arrest records so that subject age, sex and BAC could be obtained. Disposition information for felony charges was not obtained as these cases are heard in District Court rather than County Court.

Arvada:

Population:	89,235
Area:	22 sq.mi.
Household Income:	\$44,399
Sworn Police	114
Control	

Data System and Collection

The Arvada Police Department generated a computer based printout of its DWI arrests for 1987 through 1991. Department clerical personnel then searched hard copy arrest reports and recorded the case BACs on the printout. A similar printout was provided to the Jefferson County Court where clerical personnel retrieved disposition information for each case. Data from the two printouts were key entered to create the Arvada data set (N = 4,410).

Douglas County:

Population:	60,391
Area:	840 sq.mi.
Household Income:	\$56,503
Sworn Police:	72
Control	

Data System and Collection

The Douglas County Sheriff's Department provided a computer printout of all DWI arrests during 1988-1991 (N = 1,288) which included arrest date; subject date of birth, sex and BAC; and citation number. The County Court provided a printout containing adjudication data for all DWI charges disposed during the same years. Data from the two printouts were merged, case-by-case, based on citation numbers. Records were then key entered to create the Douglas County data set.

NEW YORK

In New York it is illegal to operate a motor vehicle while in an intoxicated condition; with a BAC of 0.10% or more (illegal per se); or while impaired by a drug listed in the state's Public Health Law. Like Colorado, New York has a lesser offense of Driving while Ability Impaired (DWAI). BACs of more than 0.07% but less than 0.10% are prime facie evidence of DWAI while BACs of more than 0.05% to 0.07% are considered as relevant evidence of DWAI. First offense DWI (alcohol and other drugs) and illegal per se are misdemeanors. Subsequent offenses within 10 years are felonies. DWAI is a traffic infraction.

Nassau County:

Population:	1,287,348
Area:	287 sq.mi.
Household Income:	\$50,701
Sworn Police:	
- Nassau County PD	3,030
- State Police	N/A
Number of DREs:	
- Nassau County PD	17-35 (1988-1991)
- State Police	16
First Case:	
- Nassau County PD	3/2/88
- State Police	4/8/88

Located on Long Island, just east of New York City, Nassau County is a generally affluent suburban area. The large majority of county residents receive primary police services from the Nassau County Police Department. Traffic law enforcement is conducted primarily by the Department's Highway Patrol Bureau. The cities of Glen Cove and Long Beach, as well as some villages, have retained their own police departments. These agencies serve about 5 percent of the county's population.

State Police presence in the county was brought about by the merging of the Parkway Police, which operated in several New York counties, into the State Police in the 1970s. Primary State Police patrol areas are the county's parkway system.

Officers from the Nassau County Police Department's Highway Patrol Bureau and the State Police barracks in Nassau were the first New York officers trained and certified as DREs. The program subsequently expanded into New York City, Suffolk County and other State Police areas.

Data System and Collection: Nassau Police Department-- The Nassau County Police Department provided monthly DWI arrest totals covering 1987-1991. A random sample of approximately 20 arrests per month was then drawn from hard copy arrest files and the arrest date, date of birth and sex of the person arrested, BAC, charge and disposition were recorded. All DWID arrests during 1988-1991 were retrieved from hard copy files and the same information was recorded for these cases along with toxicology results. In addition, when the DWID cases involved a DRE, the DRE's findings were recorded. The DWI and DWID files were provided in machine readable form. The DWID file included 518 arrests and the DWI sample included 1,375 cases.

Data System and Collection: State Police

The New York State Police provided computer printouts of all DWI arrests made in Nassau County in 1988 (the first year automated), 1989, 1990, and 1991. The data set (N = 3,746) included arrest date; subject date of birth and sex; initial and disposed charge; and disposition date. BAC data was also included but only for a sub-set of the records.

DRE cases conducted by the State Police in Nassau County were also provided as computer printouts. In addition to the data items just noted, these records included DRE findings and laboratory test results. This data set, covering 1988-1991, contained 133 cases.

Westchester County:

Population:	874,866
Area:	433 sq.mi.
Household Income:	\$51,167
Sworn Police:	
- Westchester County PD	273
- State Police	N/A
Controls for Nassau	

Data System and Collection: Westchester County Police

The Westchester County Police Department provided monthly DWI arrest totals for the 1986-1991 period and average BAC levels for these months. No individual case records or data regarding case adjudications could be obtained.

Data System and Collection: State Police

The New York State Police provided computer based printouts of all DWI arrests made in Westchester County for the years 1988-1991. The data set (N = 3,554) included arrest date; subject date of birth and sex; initial and disposed charge; and disposition date. As with the Nassau State Police data, BAC is included for a sub-set of the records.

TEXAS

In Texas, it is illegal to operate a motor vehicle while intoxicated by alcohol, a controlled substance, a drug, or a combination of these substances; or with a BAC of 0.10% or more (illegal per se). First and second offenses are misdemeanors. Third and subsequent offenses within 10 years are felonies.

Baytown:

Population:	63,850
Area:	31 sq.mi.
Household Income:	\$34,341
Sworn Police:	12
Certified DREs:	5
First Case:	4/20/90

Data System and Collection

Personnel from the Texas Highway Patrol, Department of Public Safety assigned to the Baytown sub-station, located east of Houston, were among the first Texas law enforcement officers to be trained and certified as DREs. DRE case data, provided from officer logs, cover 16 DRE involved DWI arrests for the period 1990 through 1991. The Department of Public Safety compiled monthly DWI arrest totals for troopers assigned to the sub-station for 1988-1991 (approximately 30-40 arrests per month). No individual arrest or adjudication records were obtainable.

Houston:

Population:	1,630,553
Area:	540 sq.mi.
Household Income:	\$34,742
Sworn Police:	4,104
Certified DREs:	15
First Case:	January 1989

Data System and Collection

The Houston Police Department provided monthly computer listings for all traffic enforcement "holds" during the period 1987 through 1991. In most cases, a person is "held" for suspicion of DWI, though some persons are "held" for other charges including driving without a valid license. The listings indicated the total number of DWI and DWID charges and the number of "held" drivers who were not booked on any charge. Approximately 8,000 to 12,000 drivers were "held" in each year. Information on DRE evaluations could not be obtained.

The Texas Office of Court Administration provided annual summaries for DWI adjudication in Harris County during the period 1987 through August, 1991. The Houston Police Department is the primary, though not the only, agency conducting DWI enforcement in the county.

Dallas:

Population:	1,006,877
Area:	342 sq.mi.
Household Income:	\$34,782
Sworn Police:	2,747
Control for Houston	

Data System and Collection

The Dallas Police Department provided monthly DWI arrest totals covering 1987-1991 along with monthly distributions of breath test results for these arrests. Annual summaries of DWI case dispositions in Dallas County covering primarily, but not only, the City of Dallas were obtained from the Texas Office of Court Administration.

Galveston:

Population:	59,070
Area:	46 sq.mi.
Household Income:	\$28,305
Sworn Police:	N/A
Control for Baytown	

Data System and Collection

The Department of Public Safety compiled monthly DWI arrest totals for troopers assigned to the Galveston sub-station of the Texas Highway Patrol for 1988-1991. No individual arrest or adjudication records were obtainable.

III. DRE CASE RESULTS

As described in the previous section, the evaluation of the impact the DEC program has had on enforcement and adjudication was carried out employing data from 11 law enforcement agencies with DEC programs. These agencies are located in states which were among the earliest to implement DEC. Comparison data were also obtained from nine non-DEC agencies in these states and were as similar as possible to the DEC sites.

The DEC sites included six municipal departments, three county level departments (e.g., sheriffs) and two troop areas of State Police/Highway Patrol organizations. The populations served by these agencies ranged from approximately 45,000 to more than one million residents. The number of trained DREs in the departments ranged from two to 39. Two of the agencies (Phoenix and Tucson) began DRE operations in 1987, two (Nassau Police and New York State Police) began in 1988, three (Boulder, Denver and Houston) commenced in 1989, and four (Roseville, Arapahoe County, Aurora and the Texas Highway Patrol) implemented DEC in early 1990. The present section presents results describing DRE evaluations performed in the DEC program sites. The next section of the report presents the overall study results.

DRE Case Volume

The details of all DRE evaluations conducted in traffic cases were obtained from 10 of the DEC sites. A total of 1,842 cases were involved, distributed as shown in Table 2.

Table 2. DRE Case by Site and Year.

	1987	1988	1989	1990	1991	Total
Phoenix	11	111	136	154	132	547*
Tucson	16	17	56	87	55	231
Roseville				19	30	49
Arapahoe				16	13	29
Aurora				73	N/A	73
Boulder			30	10	12	52
Denver			149	93	79	322*
Nassau PD		86	141	106	58	391
Nassau SP		43	33	21	35	133*
Baytown				3	12	15
TOTAL	27	257	545	582	426	1,842*

* Total includes cases with date unknown.

DRE Evaluation Results

In 92.9 percent (1,711) of the 1,842 evaluations conducted, DREs reached the opinion that suspects were under the influence of one or more of the seven drug classes. The remaining 7.1 percent involved "rule-outs" (e.g., for medical reasons), suspects found fit or who completely refused to participate in the evaluation.

In the 1,711 evaluations where the DRE reached an opinion involving drugs, a single drug class was named in 69.4 percent of the cases, two classes were named in 28.7 percent of the cases and three classes were named in 1.9 percent of the cases. Thus, a total of 2,268 drug class opinions resulted. The distribution of these opinions was:

<u>Drug Class</u>	<u>N</u>	<u>Percent of 2,268 Opinions</u>	<u>Percent of 1,842 Cases</u>
Cannabis	857	37.8	46.5
CNS Stimulants	546	24.1	29.6
CNS Depressants	431	19.0	23.3
Narcotic Analgesics	285	12.6	15.5
PCP	109	4.8	5.9
Inhalants	26	1.1	1.4
Hallucinogens	14	0.6	0.8

Among the 524 evaluations in which more than one drug class was named, the most common combinations were Cannabis and CNS Stimulants (22 percent of the multiples), Cannabis and CNS Depressants (16 percent), Narcotic Analgesics and CNS Stimulants (13 percent) and Narcotic Analgesics and CNS Depressants (11 percent).

DRE opinions were found to vary from site to site. As shown in Table 3, opinions regarding Cannabis ranged from a high of 74.5 percent of Denver cases to a low of 27.6 percent of Phoenix

Table 3. DRE Opinions by Site.

	Phoenix PD	Tucson PD	Denver PD	Nassau PD	Other	All
Cannabis	27.6%	49.4%	74.5%	44.5%	50.7%	46.5%
CNS Stimulants	33.6%	25.5%	27.3%	25.3%	33.0%	29.6%
CNS Depressants	28.2%	26.4%	18.0%	23.3%	18.8%	23.3%
Narcotic Analgesics	22.9%	11.7%	12.7%	12.8%	12.3%	15.5%
PCP	4.4%	0.9%	0.3%	20.2%	0.9%	5.9%
Inhalants	2.2%	0.4%	3.1%	0.0%	0.9%	1.4%
Hallucinogens	0.5%	0.9%	0.6%	0.5%	1.4%	0.8%
Rule Out/Other	11.9%	3.9%	2.5%	4.3%	9.1%	7.1%
Suspects	547	231	322	391	351	1,842

cases. PCP was named in a sizeable percentage by Nassau County P.D. DREs and to a modest extent in Phoenix. Each of the other sites named PCP in less than one percent of their cases. It can also be seen that Inhalants were named almost exclusively in Denver and Phoenix. Site-by-site differences may be reflecting different drug use patterns across the country and the capabilities of individual laboratories to detect and report particular drug classes. That is, it is believed unlikely that DREs will continually name drugs which will not be confirmed by their laboratories.

Laboratory Results

Among the 1,711 evaluations where a DRE named one or more drug classes, 43 laboratory test results were pending at the time of data collection, 181 suspects refused to provide a specimen for laboratory testing (a 10.6 percent refusal rate), and 18 tests were not completed because of technical problems. Laboratory test results were available, therefore, for 1,469 cases. In 15.9 percent (233) of these cases, no drugs were found. Thus, when DREs evaluated that drugs were present and laboratory testing was done, one or more drugs were found 84.1 percent of the time.

Table 4 compares DRE opinions with laboratory findings. The table shows that the overall result of an 84 percent confirmation of drug presence held when the five most commonly named drug categories were involved. That is, for example, when the DRE's opinion included Cannabis, laboratory testing found one or more of the drug categories 83.2 percent of the time. Similarly, when the DRE opinion included Narcotic Analgesic, one or more drugs were found by the laboratory 95.9 percent of the time. The finding of any drug was less common when the DRE's opinion included Inhalants or Hallucinogens. It can be seen, however, that these drug classes were rarely employed by the DREs.

Table 4. DRE Opinion and Laboratory Findings.

Drug Class	DRE Opinion	Lab Test Known	Found Any Drug	Percent Found Any Drug	Confirm Specific Drug	Percent Confirm
Cannabis	857	715	595	83.2	489	68.4
CNS Stimulants	546	444	373	84.0	302	68.0
CNS Depressants	431	326	269	82.5	157	48.2
Narcotic Analgesics	285	220	211	95.9	148	67.3
PCP	109	78	68	87.2	55	70.5
Inhalants	26	20	12	60.0	10	50.0
Hallucinogens	14	12	9	75.0	2	16.7
TOTAL	2,268	1,815	1,537	84.7	1,163	64.1

In terms of laboratory confirmation of specifically named drug classes, it can be seen in Table 4 that the confirmation rate among the five most commonly named classes ranged from a high

of 70.5 percent for PCP to a low of 48.2 percent for CNS Depressants. The overall confirmation rate was 64.1 percent. It can be seen in the table that the confirmation rate for Hallucinogens was especially low. Again, however, this class along with Inhalants was rarely used by the DREs.

As noted, DRE opinions may involve more than one drug class in a particular evaluation. Across all the DRE cases where a laboratory test was reported, DREs were found to be correct in judging at least one drug class in 74.4 percent of the cases.

Data on the accuracy of DRE identification of individual drug classes are presented in Table 5. Following the method employed by Compton¹, DREs had the opportunity to judge the presence of a drug class in 1,469 evaluations which yielded laboratory test results. That is, in each case, the DRE may or may not have named each drug class and the laboratory may or may not have reported its finding. It can be seen in the table that for Cannabis, the DREs were correct 68.4 percent of the time when they named its presence and incorrect 31.6 percent. Also for this drug class, its presence was laboratory reported in 17.9 percent of the cases when the DRE did not judge its presence. Table 5 indicates that CNS Stimulants was the most frequently found drug class not identified by DREs (21.9 percent of cases). CNS Depressants, Narcotic Analgesics and PCP were found in lab results in six percent or less of the cases when the DREs did not indicate their presence. These data should be interpreted with care as they may be reflecting differential omissions by DREs as a function of drug class or may be reflecting differential assay methods employed by the laboratories servicing the DRE sites.

Table 5 does not show DRE accuracy results for Inhalants or Hallucinogens as there were too few cases to permit meaningful analysis. For Inhalants, the ten confirmations shown earlier in Table 4 were the only laboratory findings for this drug class. That is, this drug class was never found by a laboratory in a case where it was not offered as a DRE opinion. Hallucinogens were found by a laboratory five times. Two times, as shown in Table 4, consistent with a DRE opinion for this drug class plus three additional times with no DRE opinion for Hallucinogens.

Blood Alcohol Concentrations

BAC test results were known in 1,722 (93 percent) of the DRE cases. These results were:

<u>BAC</u>	<u>N</u>	<u>Percent</u>
0	848	49.2
.01-.04	323	18.6
.05-.09	354	20.6
.10- Up	175	10.2
Refused	22	1.3

The BAC data show that almost one-half of the DRE evaluations followed from cases where a zero BAC reading was obtained, and only 10 percent of the cases followed BAC results of 0.10% or higher. It can also be seen that DRE cases rarely followed refusal of chemical testing for alcohol. A comparison of DRE opinions when alcohol was and was not found showed that Cannabis was more likely to be named in positive BAC cases than in zero BAC situations (45.5 percent of opinions

Table 5. DRE Accuracy for Specific Drug Classes.

		Cannabis Judged Present		
		Yes	No	
Detected by Laboratory	Yes	489 (68.4%)	135 (17.9%)	624
	No	226 (31.6%)	619 (82.1%)	845
		715 (100%)	754 (100%)	1,469
		CNS Stimulants Judged Present		
		Yes	No	
Detected by Laboratory	Yes	302 (68.0%)	224 (21.9%)	526
	No	142 (32.0%)	801 (78.1%)	943
		444 (100%)	1,025 (100%)	1,469
		CNS Depressants Judged Present		
		Yes	No	
Detected by Laboratory	Yes	157 (48.2%)	72 (6.3%)	229
	No	169 (51.8%)	1,071 (93.7%)	1,240
		326 (100%)	1,143 (100%)	1,469
		Narcotic Analgesics Judged Present		
		Yes	No	
Detected by Laboratory	Yes	148 (67.3%)	47 (3.8%)	195
	No	72 (32.7%)	1,202 (96.2%)	1,274
		220 (100%)	1,249 (100%)	1,469
		PCP Judged Present		
		Yes	No	
Detected by Laboratory	Yes	55 (70.5%)	18 (1.3%)	73
	No	23 (29.5%)	1,373 (98.7%)	1,396
		78 (100%)	1,391 (100%)	1,469

versus 32.2 percent). Conversely, PCP was more likely to be named in the zero BAC cases than when alcohol was found (16.8 percent versus 8.0 percent of the opinions). The frequencies of opinions in the other drug classes did not vary with the presence or absence of alcohol.

Suspect Gender and Age

Approximately 85 percent of the persons evaluated by the DREs were males and 15 percent were females. DRE opinions regarding two of the drug classes were found to vary with gender: 40.3 percent of the opinions for males involved Cannabis as compared with 24.9 percent of the opinions for females; 30.8 percent of the opinions for females involved CNS Depressants as compared with 16.8 percent of the opinions for males.

It was found that suspect age was strongly related to DRE opinion. As shown in Table 6, the percentage of suspects for whom the DREs held opinions of CNS Depressants increased steadily with suspect age. Only 10 percent of those under age 21 were thought to be using depressants as compared with 45 percent for those aged 40 and older. Similarly, only 3 percent of the under 21 year old suspects were thought to be using Narcotic Analgesics as compared with 28 percent for those 40 and older. The reverse was true for Cannabis with 68 percent of the under 21 age group thought to be using this drug as compared with only 22 percent for those 40 and older. It can also be seen in the table that opinions regarding PCP were rarely made among the 40 and older suspect group and that opinions regarding CNS stimulants were more likely for those in the 21 to 39 age range than for younger or older suspects.

Table 6. DRE Opinion by Suspect Age.

	Age Group				
	Under 21 (N = 297)	21-24 (N = 326)	25-29 (N = 389)	30-39 (N = 527)	40-Up (N = 220)
Cannabis	68.9%	57.7%	49.4%	39.1%	22.3%
CNS Stimulants	24.9%	32.5%	37.3%	30.6%	19.5%
CNS Depressants	10.4%	14.4%	17.2%	27.7%	45.0%
Narcotic Analgesics	3.4%	6.1%	12.6%	25.8%	27.7%
PCP	7.7%	10.7%	7.5%	4.0%	0.5%

NOTE: Data excludes 83 cases where suspect age was unknown.

Case Disposition

DRE data obtained from seven sites were sufficiently detailed to permit examination of dispositions. These sites provided 88 percent of the total 1,842 cases. Among these records, there were 1,508 evaluations where a DRE reached an opinion that drugs were present. Adjudications were known in 68 percent of these cases. Unknown adjudications included pending court cases,

suspects who failed to appear, transfers to other courts (e.g., juveniles, felony charges, etc.) and cases where adjudication outcomes were unknown in the record systems.

DREs generally indicated that they are rarely required to testify in court. In the present data set, one site had a contested case rate of approximately 18 percent (with an 86 percent conviction rate), two sites reported no contested cases, and in the remaining four sites, the adjudication forum could not be determined. Overall, 54 percent of the sustained charges resulted from guilty pleas or findings for DWI/DWID and 46 percent were guilty pleas to lesser offenses (e.g., DWAI, "wet" reckless and non-alcohol/drug violations).

Guilty findings were more likely when the laboratory confirmed the presence of drugs; less likely when the presence of drugs was not confirmed. Based on known adjudications from seven sites, a finding of guilty (includes guilty of a lesser offense) was obtained for 88.4 percent of the cases where the DRE felt that the suspect had used drugs and the presence of one or more drugs was confirmed by the laboratory. This compares with guilty findings in only 52.6 percent of the cases where no drugs were found by the laboratory.

The guilty rates (including lesser offenses) when particular drug classes were named and drugs were confirmed are shown below. Recall that the incidence of each of these drugs varies as a function of jurisdiction, suspect age and suspect gender.

PCP	98.2%
Cannabis	89.6%
CNS Stimulants	89.6%
CNS Depressants	88.1%
Narcotic Analgesics	84.1%

Summary

- An opinion of drug use was reached in 92.9 percent of the DRE evaluations while 7.1 percent of the suspects were "ruled out" or found fit. On a department by department basis, the median percent of cases ruled out was 4.1 percent; the range was from 0 percent to 27.6 percent.
- Among the suspects judged to have used drugs, 10.6 percent refused to provide a specimen for testing. Based on known adjudications available from seven of the ten jurisdictions, there was a guilty outcome of 91.1 percent for these refusals. The median refusal rate among the departments was 5.8 percent. The range was from 0 percent to 33.3 percent. The median percentage of guilty outcomes among refusals was 89.5 percent; the range was from 44.4 percent to 100 percent.
- Laboratories failed to confirm drugs in 15.9 percent of the tests completed; 52.6 percent of these cases had a guilty outcome.

Department by department, the median value was 16.3 percent of tests not confirming drugs; the range was 0 percent to 35.7 percent. The median percentage of guilty outcomes was 24.0 percent; the range was from 0 percent to 81.6 percent.

- Finally, in cases where laboratories confirmed drugs, and adjudication outcomes were known, 88.4 percent had a guilty result. The median department by department percent of guilty outcomes in these cases was 92.3 percent; the range was from 57.3 percent to 100 percent.

IV. OVERALL RESULTS

This section presents the overall results of the project. Each of the data sets described in Section II will be summarized. Results for Arizona are presented first followed in alphabetical order by California, Colorado, New York and Texas.

The reader is cautioned against comparing individual data items (e.g., percent guilty) across state lines. State-to-state variation in impaired driving and other laws leads to varying processing procedures and adjudication results. Also, within states, there is jurisdiction-to-jurisdiction variation in the ways in which data are captured. In the paragraphs that follow, the only data which are compared both across jurisdictions and across states are related to total numbers of impaired driving arrests and to the DRE evaluations. DRE follows relatively standard procedures from place to place.

The primary objective of this project was to assess the impact of the DEC program on impaired driving arrest and adjudication. One of the principal findings is that DRE evaluations are actually being performed on only about one to four or five percent of all impaired driving suspects (1.9 percent across the sites). At this level, it is not clear how or if the results of the DEC program would be reflected in overall or "system level" variables such as the total number of arrests or total number of guilty findings. Such overall measures vary as a function of many factors of which DEC is typically only a small part.

The paragraphs which follow report overall or "system level" measures, often without comment, and then proceed to describe DEC and DRE activity as part of this total system. System level variables include total arrests, mean BAC for impaired driving suspects, percent guilty findings and the percentage of suspects testing at BACs below 0.10% (referred to as "low BAC"). Only a few analyses (e.g., Phoenix percent not booked) attempt to relate DEC to overall system performance. However, even these few analyses should be viewed with some caution.

Arizona

The selected DEC sites in Arizona were Phoenix and Tucson with Flagstaff as the control or comparison community. The Phoenix and Tucson DEC programs were two of the first such programs outside of California. They began in 1987 and were followed by many of the suburban communities around Phoenix and the Arizona Highway Patrol.

Phoenix is, by far, the largest city in Arizona; Tucson the second largest. Flagstaff is considerably smaller, but nevertheless, does represent an "urban" environment. Data collected for all three locations cover municipal police agencies only. The first DRE case in Phoenix was recorded on November 21, 1987. The first DRE case in Tucson was recorded on March 28, 1987.

Table 7 shows the "system level" variables for each of the three Arizona cities. The first group of data cover total number of impaired driving arrests. The results indicate three very different patterns in each of the three cities. In Phoenix, total annual arrests were in the 10,000 plus range for the period 1985-87; less than 8,000 in 1989 and 1990; then more than 9,000 in 1991. Tucson

Table 7. Arizona - System Level Variables.

	1985	1986	1987	1988	1989	1990	1991
Impaired Driving Arrests							
Phoenix	10,299	10,292	10,294	9,009	7,751	7,914	9,416
Tucson			2,772	3,231	2,976	3,071	3,135
Flagstaff			956	737	679	692	626
Mean Age (years)							
Phoenix*			30.6	32.2	32.1	32.0	32.3
Tucson			31.7	31.2	31.5	31.8	32.1
Flagstaff			29.7	30.4	30.8	30.6	30.5
Mean BAC (exclude unknown)							
Phoenix*			.171	.172	.172	.164	.168
Tucson*			.176	.159	.159	.164	.165
Flagstaff			.168	.165	.161	.162	.162
Percent Guilty (exclude unknown)							
Phoenix*			81%	84%	91%	85%	92%
Tucson			77%	73%	74%	76%	80%
Flagstaff			84%	84%	75%	79%	86%
Percent BAC <.10							
Phoenix*			5%	5%	4%	7%	5%
Tucson*			8%	13%	12%	9%	7%
Flagstaff			3%	4%	5%	7%	7%
Percent Guilty <.10 (exclude unknown)							
Phoenix*			17%	28%	60%	35%	39%
Tucson*			3%	2%	0%	0%	0%
Flagstaff			46%	35%	21%	19%	47%
DWID Arrests							
Phoenix	62	72	73	85	92	114	n.a.
Tucson (Guilty)			0	7(0)	2(0)	29(18)	26(14)
Flagstaff (Guilty)			0	9(1)	4(1)	2(0)	0

*From monthly sample (see text).

 DEC Program in operation for all, or most, of year.

remained relatively constant at about 3,000 per year for the 1987 to 1991 period. Flagstaff showed more than 900 in 1987 versus just over 600 in 1991.

The mean age of impaired driving suspects in Phoenix was relatively constant at about 32 years. In Tucson, mean age was relatively constant at about 31 to 32 years. In Flagstaff, mean age was relatively constant at about 30 years.

In Phoenix, mean BAC of arrested suspects ranged from 0.172% in 1988 and 1989 to 0.164% in 1990. In Tucson, mean BAC ranged from 0.176% in 1987 to 0.159% both in 1988 and 1989. In Flagstaff, mean BAC ranged from 0.168% in 1987 to 0.161% in 1989.

Most of the DWI arrested suspects in all three cities were found guilty of the charge. Percent guilty peaked in Phoenix during 1989. There was a second peak, this time for all three cities, during 1991. However, in all three cities, many of the 1991 contested cases were still in the system and many suspects who had "failed to appear" were still being sought. As such, the number of cases with unknown adjudication tends to be higher in Arizona and elsewhere for the more recent years. The percent guilty figures, which exclude adjudication unknown, pending etc., thus have an upward bias in the more recent years since they include proportionately more suspects who simply pled guilty to the initial charge and fewer suspects who contested the charge and/or fled.

In general, both in Arizona and elsewhere, adjudication results are highly related to the suspect's BAC. High BACs, say above 0.15%, are routinely found guilty. Low BACs, say below 0.10%, are routinely dismissed or pled to a lesser charge. One important measure of adjudication is how the system deals with the "low BAC" (i.e., <0.10%) cases.

In Phoenix, the number of cases involving low BAC ranged from 5 percent to 7 percent of those arrested for the period 1987 through 1991. The comparable figures for Tucson ranged from 7 percent to 13 percent. (Phoenix and Tucson data are samples which do not include the DRE involved cases.) In Flagstaff, the figures show a steady rise from 3 percent in 1987 to 7 percent in 1991.

Adjudication of these cases varied widely in each of the three cities. In Phoenix, many were convicted with a peak conviction rate of 60 percent in 1989. In Tucson, virtually none were convicted on the DWI charge. In Flagstaff, many were convicted with the peak years being 1987 and 1991 which is virtually the opposite pattern as seen in Phoenix.

The last block of data shows the DWID charges as they were captured in "system level" data collection. These are not all of the DWID charges during this period. For instance, drivers charged with Manslaughter and DWID, just as drivers charged with Manslaughter and DWI, would enter the system with the higher ranking Manslaughter charge and not the impaired driving charge.

Prior to DEC, Phoenix had about 70 DWID charges per year. For the period 1988 through 1990, after DEC, DWID charges ranged from 85 (in 1988) to 114 (in 1990). Tucson showed no DWID charges in 1987, prior to DEC, versus 29 and 26 DWID charges in 1990 and 1991,

respectively. Flagstaff showed none in 1987, nine in 1988, followed by four, two and zero for the years 1989 through 1991, respectively.

Table 8 shows the relationship between the DWID charges and the total number of impaired driving charges in both Phoenix and Tucson. In the two cities combined, DWID accounted for 0.6 percent of all charges in 1987 doubling to 1.3 percent in 1990.

Table 8. Arizona DWID, DRE as Percent of Arrests.

	1985	1986	1987	1988	1989	1990	1991
ARRESTS							
Phoenix	10,299	10,292	10,294	9,009	7,751	7,914	9,416
Tucson			2,772	3,231	2,976	3,071	3,135
ARREST SUM			13,066	12,240	10,727	10,985	12,551
DWID							
Phoenix	62	72	73	85	92	114	n.a.
Tucson			0	7	2	29	26
DWID SUM			73	92	94	143	n.a.
DWID as percent of ARRESTS			0.6%	0.8%	0.9%	1.3%	n.a.
DRE							
Phoenix			11	111	136	154	132
Tucson			16	17	56	87	55
DRE SUM			27	128	192	241	187
DRE as percent of ARRESTS			0.2%	1.0%	1.8%	2.2%	1.5%

Note: ARRESTS include all suspects booked on an impaired driving charge (alcohol and/or other drugs).

 DEC Program in operation for all, or most, of year.

The last block of data in Table 8 shows the number of traffic related DRE evaluations done in Phoenix and Tucson during the 1987 to 1991 period. In both cities, the number of evaluations peaked in 1990. It should be noted that in Arizona and elsewhere the number of DRE evaluations and the number of DWID charges need not be the same. DWID charges can be made by non-DRE officers. Further, DRE evaluations may result in no drugs found and thus no charges being filed. Or, even when drugs are indicated, the "highest ranking" charge may be manslaughter or some other

felony and thus the DWID aspect of the case would not necessarily be captured by the data system. Or, as was the case in Tucson particularly during the early years of the DEC program, the DWI charge was preferred over DWID in those cases where DWI, possibly in association with other drugs, was a viable option.

In Phoenix, the mean age of the suspects who were evaluated by a DRE was 30.9 years. Males accounted for 80 percent of the DRE cases. The mean BAC for the DRE evaluated suspects was 0.029%.

In Tucson, the mean age of the suspects evaluated by a DRE was 28.5 years. Males accounted for 86 percent of the DRE cases. The mean BAC for the DRE evaluated suspects was 0.066%. Unlike Phoenix, most of the Tucson DRE evaluated suspects (61 percent) were actually charged with DWI and not DWID (24 percent). The remaining suspects were either not charged, charged with some other offense or their charge was unknown (15 percent).

Table 9 shows the adjudication results for all cases involving a DRE evaluation in Phoenix and Tucson. Guilty refers to convictions for either DWI or DWID. Not charged and unknown includes those who "failed to appear" and for whom warrants have been issued. Not guilty includes suspects convicted of lesser charges. In Phoenix, most of the adjudicated suspects were charged with DWID and were found guilty. In Tucson, most of the suspects were not found guilty for the period 1987 through 1989. However, for 1990 and 1991, the majority of the findings were Guilty.

Table 9. Arizona DRE Case Adjudication.

	Phoenix			Tucson		
	Guilty	Not Guilty	Unknown/ Not Charged	Guilty	Not Guilty	Unknown/ Not Charged
1987-88	55	18	49	5	18	10
1989	65	17	54	14	24	18
1990	67	27	60	29	24	34
1991	50	7	75	15	12	28
ALL	237	69	238	63	78	90

In Phoenix, overall arrest numbers were generated on the basis of police monthly summary reports which cover the number of impaired driving suspects for whom "implied consent" was invoked for the purpose of obtaining a breath test. Of these, most were eventually charged or booked on DWI, some were booked on DWID and some were either not booked or were charged with some lesser offense. Typically, a suspect is not booked for DWI if the BAC test results are low.

Presumably, a DEC program would allow an impaired driving investigation to continue despite low BAC test results. That is, the officer could look for drugs other than alcohol as the cause of the observed impairment and possibly book the suspect on DWID as opposed to DWI. As such, the percentage of impaired driving suspects not booked might be expected to decline with the introduction of a DEC program.

The percentage of Phoenix impaired driving suspects not booked was examined for the 1985 through 1991 period. The monthly average was 6.6 percent in 1985; 6.1 percent in 1986; and 5.6 percent in 1987. This compares with 6.0 percent in 1988; 5.2 percent in 1989; 3.9 percent in 1990; and 3.5 percent in 1991. Time series analysis was applied to the monthly data for 1985 through 1987 (pre-DEC) and the results were used to produce forecasted or predicted values for 1988 through 1991 (post-DEC). The forecast values for percent not booked were significantly higher than the actual values ($t = 7.02$ $p < .001$ with 47 degrees of freedom). Obviously, many factors are involved in determining whether or not an officer will invoke implied consent and whether or not a suspect will be booked irrespective of BAC and the availability of DREs. Nonetheless, these results are in the direction that would be predicted from the presence of a DEC program.

California

The DEC program began in California, and including the California Highway Patrol, there are more trained DREs in this state than in all other states combined. Nevertheless, the present evaluation was more concerned with the transfer of DEC beyond California than the California experience per se. Thus, the present study included only one California DEC site.

The selected DEC site was Roseville. The selected control for Roseville was Lodi. Both Roseville and Lodi are municipal police agencies located in the greater Sacramento area. Roseville is just to the north of Sacramento; Lodi to the south. As shown earlier, both have similar populations (about 45,000 to 50,000); similar family incomes and similar numbers of sworn personnel. Roseville, however, covers considerably more land area than Lodi (30 sq. miles versus 11).

The first DRE case in Roseville was recorded on February 18, 1990. By 1991, the Department had six certified DREs of a total sworn force of 53 officers. Available data from Roseville cover total DWI arrests and adjudications for the period 1989 through 1991. DRE evaluations were performed in 49 traffic related cases during the 1990-91 period of which 35 resulted in a "most serious" charge of DWI. Data from Lodi cover all DWI arrests for the period 1987 through 1991. Lodi did not provide adjudication results.

Table 10 shows the "System Level" comparisons between Roseville and Lodi. Data for Roseville do not include the 35 DRE cases which are discussed below. Total DWI arrests in Roseville were 582 in 1989; 848 (plus 12 DRE) in 1990; and 639 (plus 22 DRE) in 1991. The arrest pattern in Lodi was somewhat different. The total number of arrests remained relatively constant at just over 500 per year for the years 1987 through 1989. The number of arrests was more than 600 in 1990 and more than 700 in 1991. The mean age of those arrested remained relatively constant in both cities at about 32 to 33 years of age for the entire period.

Table 10. California - System Level Variables.

	1987	1988	1989	1990	1991
Impaired Driving Arrests					
Roseville			582	848	639
Lodi	527	502	508	629	747
Mean Age (years)					
Roseville			32.8	32.8	32.4
Lodi	33.1	32.6	32.4	32.1	32.6
Mean BAC (exclude unknown)					
Roseville			.156	.153	.155
Lodi	.176	.172	.176	.177	.162
Percent Guilty (exclude unknown)					
Roseville			87%	92%	94%
Lodi	n.a.	n.a.	n.a.	n.a.	n.a.
Percent BAC <.10					
Roseville			14%	14%	14%
Lodi	6%	7%	6%	9%	13%
Percent Guilty <.10 (exclude unknown)					
Roseville			56%	58%	59%
Lodi	n.a.	n.a.	n.a.	n.a.	n.a.

Note: Roseville data do not include 35 DRE cases.

 DEC Program in operation for all, or most, of year.

The mean BAC of those arrested in Roseville remained at just over 0.15% for the entire period. In Lodi, the mean BAC was between 0.17% and 0.18% from 1987 through 1990; 0.16% during 1991. In Roseville, the number of drivers testing at BACs below 0.10% remained constant at 14 percent of all arrests throughout the period. In Lodi, the number of drivers testing at below 0.10% was only 6 percent in 1987 rising to 13 percent in 1991.

Roseville adjudication data indicated that the large majority of those arrested for DWI were convicted of DWI. These results exclude cases for which the adjudication was unknown (505 of the 2,069 cases). Unknown, tends to be higher in the more recent years since the contested cases are still in the system and those that "failed to appear" are still be sought. Thus, as was suggested earlier for the Arizona data, the increase in percent guilty during later years may be an artifact of the data collection system. This percentage may drop as pending cases are finally adjudicated. Drivers not convicted of DWI were most often convicted of "Wet Reckless" or some other lesser charge. Also, as shown in the table, more than half of those drivers testing at BACs below 0.10% were found guilty of DWI.

Table 11 shows the total number of Roseville DWI arrests including the 35 DRE cases. DRE, as a percent of all DWI, was 1.5 percent in 1990 and 3.3 percent in 1991. The 35 DRE cases had a mean BAC of 0.025% (only one case above 0.10% BAC) as compared with 0.154% for the non-DRE cases shown in Table 10. For the year 1991, the mean BAC for all Roseville DWI arrests would have been 0.152%, as compared with the 0.155% shown in Table 10, had the 22 DRE cases for that year been included.

Table 11. California - DRE as Percent of Arrests.

	1989	1990	1991
Arrests (Roseville)	582	861	661
DRE Cases* (Roseville)	0	13	22
DRE as percent of all ARRESTS	0%	1.5%	3.3%

*Does not include 14 traffic related DRE cases that did not result in an initial "most serious" charge of DWI.

 DEC Program in operation for all, or most, of year.

The suspects in the 35 DRE cases had a mean age of 29.2 years; they were 80 percent male. Adjudication results for 28 (of the 35) cases were known: 18 guilty of DWI (64 percent of all DRE cases with known adjudication); three guilty of Wet Reckless; and seven dismissed.

It should also be noted that the 35 DRE cases cover only those cases for which the initial "most serious" charge was DWI. There were also an additional 14 DRE cases during the period of

which: four eventually resulted in a DWI guilty finding; one guilty of Wet Reckless; three guilty of an 11550 Health and Safety violation; three failed to appear; and three unknown or dismissed.

Colorado

Colorado was one of the first states to participate in the DEC expansion beyond California. The program began in Denver and spread to many departments throughout the state.

The selected DEC sites were the municipal departments in Denver and Aurora; and county level Sheriff's departments in Arapahoe and Boulder. Denver is, by far, the state's largest city. Arapahoe County is located just to the east of Denver. Boulder County covers an area well to the north of Denver. Aurora, a major suburb of Denver, provided only partial data to this project and is only briefly mentioned in the remainder of this section.

The selected control or comparison agencies in Colorado were the Arvada Police Department, Adams County Sheriff and Douglas County Sheriff. Arvada is a major suburb of Denver located just to the northwest of the city. Douglas County covers a wide area located to the south of Denver. It is both rural and Denver suburban. The same may be said for Adams County located just to the north of Arapahoe and northeast of Denver. Arapahoe, Aurora and Boulder among the DEC sites; and Arvada and Douglas among the comparisons, all have relatively high median family incomes.

The first reported Denver DRE-involved impaired driving arrest occurred on January 4, 1989. By 1991, there were 18 certified DREs in Denver. The first DRE case recorded by Arapahoe occurred on April 7, 1990. By 1991, the Arapahoe Sheriff's Department had 3 certified DREs. The first DRE case recorded in Boulder occurred on January 8, 1989. By 1991, the Boulder County Sheriff's Department had 2 certified DREs. Available data from Denver, Boulder and Arvada cover the period 1987 through 1991. Arapahoe and Douglas data cover 1988 through 1991. Adams data cover 1989 through 1991.

Table 12 shows the "System Level" comparisons between each of the Colorado DEC and comparison sites. Total impaired driving arrests in Denver were well under 5,000 for 1987 and 1988; well over 5,000 for 1989 through 1991. Arrest rates in Arapahoe ranged from 352 in 1989 to 470 in 1990, while Boulder ranged from 178 in 1987 to 483 in 1989. Similar levels of variation can be seen in the comparison sites of Arvada, Adams and Douglas. Also shown are the number of arrests statewide as provided by the Colorado Uniform Crime Reports.

Also, in the Denver DWI sample, it was possible to compute "percent not booked" of all DWI suspects as was done earlier in Phoenix. This percentage was 4.0 and 4.1 for the years 1987 and 1988, respectively, prior to DEC. The percentage was 3.4 in 1989, the first year of the DEC program, and 2.6 percent for both 1990 and 1991.

The mean age of those arrested ranged from about 29 to 33 years for each year in each DRE and comparison agency. The age data in each of the departments suggest that mean age was increasing, slightly, throughout the period.

Table 12. Colorado - System Level Variables.

	1987	1988	1989	1990	1991
Impaired Driving Arrests					
Denver	4,655	4,486	5,884	5,534	5,667
Arapahoe		375	352	456	470
Boulder	178	349	483	287	337
Aurora		2,405	2,532	2,631	2,167
Arvada	660	937	1,013	953	845
Adams			461	459	598
Douglas		171	348	355	414
STATEWIDE	35,429	31,820	38,579	38,988	37,557
Mean Age (years)					
Denver*	32.2	32.5	32.4	32.0	33.2
Arapahoe		31.6	31.2	31.7	31.9
Boulder	30.2	28.7	30.4	29.6	30.7
Arvada	30.0	31.4	30.7	31.4	31.3
Adams			32.5	33.1	33.2
Douglas		31.2	32.1	32.8	32.7
Mean BAC (exclude unknown)					
Denver*	.152	.149	.140	.148	.150
Arapahoe		.158	.154	.148	.151
Boulder	.152	.151	.142	.151	.145
Arvada	.139	.127	.141	.144	.135
Adams			.157	.153	.154
Douglas**		.146	.118	.120	.136

*From DWI sample (see text).

**Majority of cases were unknown and excluded.

▨ DEC Program in operation for all, or most, of year.

Table 12 (Continued). Colorado - System Level Variables.

	1987	1988	1989	1990	1991
Percent Guilty (DWI + DWID + DWAI) (exclude unknown)					
Denver	94%	94%	93%	94%	93%
Arapahoe**		93%	97%	96%	98%
Boulder	77%	79%	81%	83%	82%
Arvada	86%	87%	86%	88%	87%
Adams			n.a.	n.a.	n.a.
Douglas**			88%	92%	98%
Percent BAC <.10 (exclude unknown)					
Denver*	15%	19%	18%	14%	16%
Arapahoe		12%	15%	19%	17%
Boulder	12%	14%	18%	17%	21%
Arvada	14%	13%	17%	17%	20%
Adams			13%	14%	13%
Douglas**		13%	33%	40%	29%
Percent Guilty <.10 (DWI + DWID + DWAI) (exclude unknown)					
Denver*	62%	77%	75%	60%	70%
Arapahoe		n.a.	n.a.	n.a.	n.a.
Boulder	20%	21%	27%	57%	39%
Arvada	68%	71%	61%	66%	70%
Adams			n.a.	n.a.	n.a.
Douglas		n.a.	n.a.	n.a.	n.a.

*From DWI sample (see text).

**Majority of cases were unknown and excluded.

 DEC Program in operation for all, or most, of year.

In Denver, mean BAC of those arrested was 0.152% in 1987. Mean BAC was 0.140% during 1989 which was the first year of DEC. However, mean BAC was 0.150% during 1991. In Arapahoe, mean BAC was 0.148% in 1990; then 0.151% in 1991. Boulder showed a mean BAC of 0.142% in 1989; then 0.151% in 1990. Arvada varied between 0.127% and 0.144% throughout the period. Adams varied only between 0.157% and 0.153%. The data for Douglas are based on small numbers of known BACs (i.e., BAC data not available for most cases) and should be treated with some caution.

The next block of data shows adjudication results for impaired driving cases. These results indicate high conviction rates across all of the sites. However, these high rates should not be compared with conviction rates in other states since, in Colorado, most of these convictions were for the lesser included charge of DWAI. This lesser impaired driving charge is not available in all of the states included in this study. In practice, most offenders in all of the Colorado sites were charged with DWI and actually convicted on the lesser charge of DWAI.

Table 12 also shows the percentage of cases in each agency for which the BAC was less than 0.10%. For some of the agencies, it was possible to determine the adjudication results for these low BAC cases. The results showed lower conviction rates than reported above for all impaired driving charges. In Denver, impaired driving convictions ranged from 60 to 77 percent. Boulder showed an increasing conviction rate through the second year of their DEC program. In Arvada, the conviction rate for these low BAC cases was relatively stable at about 60 to 70 percent throughout the period.

Table 13 shows the total number of impaired driving arrests for the Colorado DEC agencies, Denver, Arapahoe and Boulder. Also shown are the number of DRE evaluations conducted by each

Table 13. Colorado - DRE as Percent of Arrests.

	1985	1986	1987	1988	1989	1990	1991
ARRESTS							
Denver	5,279	4,818	4,655	4,486	5,884	5,534	5,667
Arapahoe				375	352	456	470
Boulder			178	349	483	287	337
ARREST SUM				5,210	6,719	6,277	6,474
DRE Cases							
Denver					149	93	79
Arapahoe					0	16	13
Boulder					30	10	12
DRE SUM					179	119	104
DRE as percent of ARRESTS					2.7%	1.9%	1.6%

Note: ARRESTS include all suspects booked on an impaired driving charge (alcohol and/or other drugs).

 DEC Program in operation for all, or most, of year.

agency. Denver had 321 traffic related evaluations from 1989 through 1991. Arapahoe had 29 evaluations for 1990 through 1991. Boulder had 52 between 1989 and 1991. The last row of Table 8 expresses the number of DRE evaluations as a percentage of all impaired driving arrests. This percentage peaked in 1989, the first year of the Denver and Boulder programs. It declined in 1990, despite the addition of Arapahoe, and declined further in 1991.

The mean age for the 321 Denver DRE suspects was 28.1 years; the mean BAC was 0.031%. The mean age for the 29 Arapahoe DRE suspects was 27.8 years; mean BAC was 0.051%; males accounted for 83 percent of the DRE suspects. The mean age of the 52 Boulder DRE evaluated suspects was 29.6 years; mean BAC was 0.044%; males accounted for 87 percent of the DRE suspects.

Table 14 shows the adjudication results for the DRE cases in each of the Colorado DEC agencies. In Denver, most of the suspects were charged with DWI. Adjudication results (excluding those for which adjudication was unknown and/or suspects who were not charged) showed that most were convicted of DWAI (or DWAIID). Of the 64 cases shown as not guilty in the Table, 46 were convicted of some non-drug/alcohol charge and only 18 were dismissed. In Arapahoe, all 11 convictions were for DWAI, one of the not guilty cases was dismissed and the remaining not guilty was convicted on a non-alcohol/drug charge. In Boulder, most of the convictions were for DWAI, four of the seven not guilty cases were dismissed and the remaining three not guilty cases were convicted on a non-alcohol/drug charge.

Table 14. Colorado DRE Case Adjudication.

	Denver			Arapahoe			Boulder		
	Guilty	Not Guilty	Un-known	Guilty	Not Guilty	Un-known	Guilty	Not Guilty	Un-known
1989	70	34	45	-	-	-	7	4	19
1990	51	14	28	8	1	7	3	1	6
1991	26	16	37	3	1	9	2	2	8
ALL	147	64	110	11	2	16	12	7	33

The results for the DRE cases clearly indicated that each of the Colorado DEC programs arrested DWI suspects at low BACs. The mean BAC for the Denver, Arapahoe and Boulder programs was 0.031%, 0.051% and 0.044%, respectively, as compared with 0.148%, 0.152% and 0.146% for DWI suspects. Also, excluding adjudication unknown and/or suspect not charged, the majority of the DRE evaluated suspects were convicted on an impaired driving charge.

Colorado also provides evidence that DEC had an impact on "system level" variables. In all three Colorado DEC agencies, mean BAC for DWI suspects was lower in the first year of the DEC

program (1989 in Denver, 1990 in Arapahoe and 1989 in Boulder) than during any other year for which BAC data were available. The probability of obtaining this result by chance is only one in one hundred (exact probability). However, following this first year, mean BAC rises while, as shown in Table 13, the number of DRE evaluations declines.

New York

New York was one of the first states to participate in the DEC expansion beyond California. The program began in Nassau County with involvement from both the County Police and State Police. It later expanded to New York City and elsewhere. Both the County Police and the State Police provided data for this project.

Nassau County is located on Long Island just to the east of New York City. The selected control or comparison agencies for the Nassau County Police and the State Police in Nassau were the County and State Police operating in Westchester County. Westchester is located just to the north of New York City. Both Nassau and Westchester may be considered as primary suburbs to the City. Both have comparably high median family incomes and both are a mixture of suburban towns and smaller, satellite, urban centers.

The primary distinction between the two counties, at least for the purposes of this study, is the organization of county and local police services. In Nassau, there are very few municipal police agencies and thus the County Police provide nearly all of the "local" police services. Westchester, which is spread across a larger land area than Nassau, has several municipal police agencies. The Westchester County Police are a much smaller police agency than the Nassau County Police.

The first County Police DRE involved impaired driving arrest occurred in Nassau on March 2, 1988. The number of certified DREs in the County Police agency ranged from 17 to 35 during the 1988 through 1991 period. The first DRE case recorded by the State Police in Nassau occurred on April 8, 1988. By 1991, the State Police in Nassau had 16 certified DREs. Available data from the County Police cover the period 1986 through 1991 and include 391 impaired driving DRE evaluations. Available data from the State Police cover the period 1988 through 1991 including 132 impaired driving DRE evaluations.

Table 15 shows the "System Level" comparisons between Nassau and Westchester. Total impaired driving arrests by the Nassau County Police, including DWI, DWID and the lesser charge of DWAI (driving while ability impaired) stood at about 4,000 in 1986; about 5,000 in 1990 and 1991. Comparable figures for the Westchester County Police ranged from 200 arrests to more than 300 arrests during the period. The State Police in Nassau had more than 600 arrests in 1988; more than 1,200 in 1990; less than 1,000 in 1991. The State Police in Westchester had about 800-900 arrests during the 1988 through 1991 period.

The mean age of those arrested ranged from about 31 to 33 years for the entire period for the Nassau County Police and both State Police units. Mean BACs also tended to be constant across

the period at about 0.150% for the Nassau County Police and both State Police units. In Westchester, mean BAC was above 0.160% for 1986 and 1987; below 0.160% for the remainder of the period.

Complete adjudication results were available only for the "DWI sample" (about 20 arrests per month) conducted by the Nassau County Police. The data indicate that approximately 90 percent of those arrested were convicted of impaired driving. The most common arrest charge was DWI. The most common conviction was for DWAI, followed by DWI, followed by DWID. Conviction data were also provided by the State Police (not shown). However, in the State Police data, it was not possible to separate not guilty findings from unknown adjudication.

Table 15 also shows the percentage of cases from the Nassau County Police sample for which the BAC was less than 0.10%. This percentage varied from 11 percent to 19 percent for the 1986 through 1991 period. In 1986 and 1987, only 19 percent and 6 percent of these cases, respectively, were convicted of an impaired driving charge (primarily DWAI). In 1988, the first year of the DEC program in Nassau, this percentage increased to 30 percent and remained above 30 percent for the 1988 through 1991 period.

The last set of data shown in Table 15 covers DWID charges. The Nassau County Police were making slightly more than 60 of these charges per year during 1986 and 1987. This figure was 150 in 1988, the first year of the DEC program, and 175, 125 and 97 for the years 1989 through 1991, respectively. Data for the State Police begin in 1988 which was the first year of the DEC program. In each of the year's, 1988 through 1991, State Police in Nassau made more DWID arrests than the State Police in Westchester. The number found guilty of the DWID charge is shown in parentheses. The remainder were found guilty, typically, of DWAI or had an unknown adjudication.

Table 16 shows the total number of impaired driving arrests for both the Nassau County Police and the State Police in Nassau County. Next, the DWID arrests are shown and expressed as a percentage of all impaired driving arrests. This percentage was highest in 1988, the start of DEC in the County. Also shown are the number of DRE evaluations conducted by the County and State Police for each year beginning in 1988. DRE evaluations, expressed as a percentage of arrests, peaked in 1989.

The Nassau County Police reported 391 traffic related DRE evaluations during the period 1988 through 1991. The mean age for the suspects in these cases was 28.4 years; mean BAC was 0.028%; males accounted for 91 percent of the suspects.

The Nassau County State Police unit reported 132 DRE evaluations during the 1988 through 1991 period. The mean age for the suspects in these cases was 29.5 years; mean BAC was 0.019%; males accounted for 95 percent of the DRE sample.

Table 15. New York - System Level Variables.

	1986	1987	1988	1989	1990	1991
Impaired Driving Arrests						
Nassau County	4,052	3,619	4,110	4,796	5,280	5,027
Nassau County State Police			627	925	1,252	937
Westchester County	284	200	258	329	274	207
Westchester County State Police			868	934	929	823
Mean Age (years)						
Nassau County*	32.5	31.2	31.0	32.1	32.6	32.3
Nassau County State Police			32.5	32.1	33.0	32.6
Westchester County	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Westchester County State Police			32.0	32.7	33.7	33.5
Mean BAC (exclude unknown)						
Nassau County*	.147	.152	.142	.150	.150	.146
Nassau County State Police			.152	.147	.143	.146
Westchester County	.165	.166	.159	.156	.151	.159
Westchester County State Police			.149	.153	.147	.147
Percent Guilty (DWI + DWID + DWAI)						
Nassau County*	87%	90%	89%	94%	90%	88%
Nassau County State Police			n.a.	n.a.	n.a.	n.a.
Westchester County			n.a.	n.a.	n.a.	n.a.
Westchester County State Police			n.a.	n.a.	n.a.	n.a.
Percent BAC <.10 (exclude unknown)						
Nassau County*	18%	11%	16%	12%	17%	19%
Nassau County State Police			n.a.	n.a.	n.a.	n.a.
Westchester County			n.a.	n.a.	n.a.	n.a.
Westchester County State Police			n.a.	n.a.	n.a.	n.a.
Percent Guilty <.10 (DWI + DWID + DWAI)						
Nassau County*	19%	6%	30%	41%	35%	34%
Nassau County State Police			n.a.	n.a.	n.a.	n.a.
Westchester County			n.a.	n.a.	n.a.	n.a.
Westchester County State Police			n.a.	n.a.	n.a.	n.a.
DWID Arrests						
Nassau County	65	63	150	175	125	97
Nassau State Police (Guilty)			130(21)	82(17)	107(9)	106(10)
Westchester County	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Westchester State Police (Guilty)			38(2)	80(0)	82(7)	90(13)

*From DWI sample (see text).

▨ DEC Program in operation for all, or most, of year.

Table 16. Nassau, New York - DWID, DRE as Percent of Impaired Driving Arrests.

	1986	1987	1988	1989	1990	1991
ARRESTS						
County	4,052	3,619	4,110	4,796	5,280	5,027
State Police			627	925	1,252	927
ARREST SUM			4,737	5,721	6,532	5,964
DWID						
County	65	63	150	175	125	97
State Police			130	82	107	106
DWID SUM			280	257	232	203
DWID as percent of ARRESTS			5.9%	4.5%	3.6%	3.4%
DRE						
County			86	141	106	58
State Police			43	33	21	35
DRE SUM			129	174	127	93
DRE as percent of ARRESTS			2.7%	3.0%	1.9%	1.6%

Note: ARRESTS include DWI, DWID and DWAI (see text).

▒ DEC Program in operation for all, or most, of year.

Table 17 shows the adjudication results for the DRE cases in Nassau County. The left half of the Table shows the 391 cases from the County Police. Of the 390 cases for which adjudication was known: 176 (45 percent) were convicted of DWID or DWI; 51 (13 percent) were convicted on the lesser charge of DWAI; and 163 (42 percent) were dismissed or found not guilty. These figures can be compared with the adjudication results from the Nassau County Police DWI sample for the 1988 through 1991 period. This sample contained 907 cases with known adjudication: 39% DWID or DWI conviction; 51% DWAI conviction; 10% dismissal or not guilty finding.

The right half of the table shows the adjudication results for the DRE cases from the Nassau unit of the State Police. The State Police only reported convictions thus not guilty and dismissed are included with the unknowns. The results indicated that 30 of the 132 DRE cases resulted in a known guilty finding for DWI, DWID or DWAI.

Table 17. Nassau DRE Case Adjudication.

	Nassau County Police				Nassau State Police			
	Guilty DWID/DWI	Guilty DWAI	Not Guilty/Dismissed	Unknown/Other	Guilty DWID/DWI	Guilty DWAI	Not Guilty/Dismissed	Unknown/Other
1988	33	6	47	0	5	4	0	34
1989	63	19	58	1	4	10	0	19
1990	58	12	36	0	2	1	0	18
1991	22	14	22	0	2	2	0	31
ALL	176	51	163	1	13	17	0	102

The results for the DRE cases clearly indicate that the program arrested DWI suspects at very low BACs. The mean BAC for the County and State Police DRE cases was 0.028% and 0.019%, respectively. Also, at least for the County Police, the majority of these suspects were convicted on an impaired driving charge (DWID, DWI or DWAI).

Texas

The selected DEC sites in Texas were Houston and the Baytown sub-station of the Texas Highway Patrol. The respective control or comparison sites were Dallas and the Galveston sub-station of the Patrol.

Houston and Dallas are two of the largest cities in Texas. Both have comparable household incomes. Houston, however, is somewhat larger in terms of population, size of the police force and land area covered.

The Baytown and Galveston sub-stations of the Texas Highway Patrol are located to the east and southeast of Houston, respectively. While Baytown household incomes are somewhat higher than Galveston, the Patrol works largely on the Interstates which should carry a mix of drivers and not just local residents.

The first DRE case in Houston was done in January, 1989. Houston had 15 certified DREs by the summer of 1991. The first impaired driving arrest with DRE involvement in Baytown occurred on April 20, 1990. Five certified DREs were assigned to Baytown during 1991.

In general, data provided by the Texas sites was incomplete. Houston and Dallas provided information on the total numbers of DWI and DWID arrests for each year 1987 through 1991. The Texas Judicial Council provided annual summaries for DWI adjudications county-wide for the counties in which Houston and Dallas are located. The Texas Highway Patrol provided the numbers

of DWI arrests for Baytown and Galveston for the period 1988 through 1991. DRE case information was not obtained for Houston. DRE case information, including case adjudications, was obtained for Baytown.

Table 18 shows the data for each of the Texas sites. In Houston, the total number of DWI arrests ranged from 10,530 in 1987 to 6,930 in 1991. Dallas ranged from 8,654 in 1987 to 5,822 in 1988. Also in Dallas, for the year 1991 only, the mean BAC for the approximately one third of the suspects who agreed to a breath test was 0.159% (remaining suspects either refused or requested a blood test).

Table 18 also shows adjudication data for the counties in which Houston and Dallas are located. In each, the municipal police departments of Houston and Dallas, respectively, account for

Table 18. Texas - System Level Variables.

	1987	1988	1989	1990	1991
Impaired Driving Arrests					
Houston	10,530	7,201	8,422	7,446	6,930
Dallas	8,654	5,822	6,388	7,718	7,799
Percent Guilty					
Harris County	79%	76%	76%	77%	76%
Dallas County	84%	64%	68%	66%	56%
DWID Arrests					
Houston	19	12	11	14	17
Dallas	0	0	0	0	0
Impaired Driving Arrests					
Patrol - Baytown		558	518	352	378
Patrol - Galveston		350	436	423	403
DRE Cases					
Patrol-Baytown (Guilty)		0	0	3(3)	12(12)

 DEC Program in operation for all, or most, of year.

well over half of the cases. The data indicate a relatively stable conviction rate in Harris County (Houston) of about 77 percent for the court calendar years ending in August of 1987 through August

of 1991. Dallas County showed a declining conviction rate of from 84 percent in 1987 to 56 percent in 1991.

The next set of data in Table 18 shows the number of DWID arrests in Houston and Dallas for the 1987 through 1991 period. In Houston, the numbers shown represent 0.18 percent of all impaired driving arrests in 1987; 0.13 percent in 1989; 0.25 percent in 1991. Dallas did not report any DWID arrests during the 1987 through 1991 period.

Total impaired driving arrests for Baytown and Galveston for 1988 through 1991 are shown next in Table 18. In Baytown, the number of arrests ranged from more than 500 during 1988 and 1989 to less than 400 in 1990 and 1991. In Galveston, the number of arrests ranged from less than 400 in 1988 to more than 400 in each of the succeeding years.

The last line of data in Table 18 shows the Baytown DRE cases, each of which resulted in an impaired driving charge, each of which resulted in a guilty finding. BACs for these 15 cases ranged from 0.00% to 0.093% with a mean BAC of 0.020%. The cases shown represent 0.9 percent of all impaired driving arrests in 1990 and 3.2 percent in 1991. These data indicate that low BAC drivers were arrested and convicted on drug driving charges following the implementation of DEC at the Baytown substation.

DEC Sites Combined

Previous material in this report provided a composite description of DRE cases and combined data across DEC programs operating within the same state. Combinations across state lines, with varying legal environments, are more problematical. Nevertheless, there are two data items for which varying state to state legal and definitional factors would appear to be less of a factor and thus combinations may be appropriate. The first is the total number of impaired driving arrests (DWI, DWID, DWAI plus DWAIID); the second is the total number of traffic related DRE evaluations. Arrests are currently being combined across states as part of the Uniform Crime Reports. DRE evaluations, following NHTSA guidelines, are sufficiently standardized such that they should be very similar across all DEC programs.

The first full year of operation for four of the DEC programs covered in this evaluation was 1988. The four programs were Phoenix, Tucson, Nassau County Police and Nassau County State Police. The total number of impaired driving arrests and the total number of DRE evaluations are summed below for these four programs.

	1988	1989	1990	1991
Arrests	16,977	16,448	17,517	18,515
DRE Evaluations	257	366	368	280
DRE as % of Arrests	1.5%	2.2%	2.1%	1.5%

The number of DRE evaluations, expressed as a percentage of all impaired driving arrests, was 1.5 percent during the first full year for the four programs combined. This percentage was 2.2 percent during the second year. Each of these programs were developing and adding certified DREs during the 1988 to 1989 period. In 1990, the percentage was 2.1 percent; it was 1.5 percent in 1991.

The first full year of operation for two of the DEC programs covered in this evaluation was 1989. The two programs were Denver and Boulder. Impaired driving arrests and DRE evaluations for these two programs are summed below.

	1989	1990	1991
Arrests	6,367	5,534	5,667
DRE Evaluations	179	103	91
DRE as % of Arrests	2.8%	1.8%	1.5%

In these sites, the results suggest a strong start followed by a gradual decline. As with the sites that started in 1988, the percentage for 1991 was 1.5 percent.

During the 1988 to 1990 period, DEC programs tended to start in the larger more central police agencies and later move out to smaller departments or units. Three of the DEC programs covered in this evaluation were smaller departments or police units that did not begin their programs until 1990. The three departments or units were Roseville, the Arapahoe Sheriff's Department and the Baytown substation of the Texas Highway Patrol. Results for these three smaller units are summed below.

	1990	1991
Arrests	1,669	1,509
DRE Evaluations	32	48
DRE as % of Arrests	1.9%	3.2%

In these sites, the results suggest program growth between 1990 and 1991. Results for subsequent years are not known. However, if they follow the pattern found in DEC programs started in 1988 and 1989, they will show declines in 1992 and/or 1993.

The present results do not provide sufficient information to determine what the "baseline" or continuing number of DRE evaluations will be per year across these nine DEC programs. The peak year in the present data set was 1989 with 545 DRE evaluations (sum across the six programs in operation during that year). This figure dropped in 1990 despite the fact that the three smaller programs began operations (i.e., sum across all nine programs). By 1991, the number of traffic

related DRE evaluations was 1.6 percent of the 26,028 impaired driving arrests in the nine agencies during that year.

This concludes the presentation of the results for this study. The next section will discuss these results and offer some recommendations for DEC.

V. DISCUSSION

DEC adds a set of skills to officers already trained in traffic and DWI enforcement. One qualitative effect of these added skills is to increase the professionalism, self perception and departmental perception of traffic and/or DWI units. Another effect is to make use of these skills in a variety of non-traffic situations. One common application is with prison work release programs whereby inmates are screened by DREs as they return to jail after some hours in the community. In California, DREs are involved in enforcement of the State's 11550 Health and Safety Code which makes it illegal to possess controlled substances in ones body. Some California departments have indicated that the majority of DRE cases stem from "bodily possession" situations unrelated to driving. In some locales, DREs have been called upon to assist narcotic units by screening apprehended drug dealers. DREs have also been credited with saving lives by quickly recognizing cases such as insulin shock and drug overdoses.

While some effects of DEC are difficult or impossible to measure, other effects can be tabulated within arrest and adjudication systems. These measurable aspect of the program were the focus of the present study.

DEC Activity

The first objective of the present study was to determine whether or not DEC can identify, charge and prosecute drivers impaired by drugs other than alcohol. The answer is yes.

For most jurisdictions, few if any drivers were being arrested and convicted on drug impaired driving charges prior to DEC. After DEC, drugged driving charges and convictions increased with no comparable increases in the comparison communities. On a relative basis, the increases were typically on the order of several hundred percent or more. However, on an absolute basis, the actual increases were from, say, 5 or 10 DWID arrests to 40 or 50 in agencies that arrest thousands of impaired drivers each year.

These increases were most apparent during the first one to two years of the DEC program. By the third and fourth year, in those programs that provided three and four years of operational data, much of the increase dissipated. In general, the number of DRE evaluations, expressed as a percentage of all impaired driving arrests, tended to peak early in the program at about 3-4 percent and then decline to about 1.5 percent.

The 3-4 percent peak figure may represent a theoretical maximum for DEC. That is, only about 3-4 percent of all DWI suspects are candidates for a DRE evaluation regardless of DRE availability and the propensity of officers to hand-off "low BAC" suspects to an officer with DRE certification.

Such an interpretation is supported by pre-DEC data from Phoenix which showed that approximately 6 percent of all DWI suspects were "not booked" on an impaired driving charge,

typically because of a low BAC. Similarly, in Denver which has the DWAI charge available for BACs of 0.05% to 0.09%, approximately 4 percent of DWI suspects were "not booked" prior to DEC. After DEC was implemented, the 6 percent figure in Phoenix dropped to about 4 percent and the 4 percent figure in Denver dropped to about 2.5 percent. These results are seen as generally consistent with both the level of DRE activity in both cities and the suggested "theoretical maximum" for the number of suspects who would be candidates for a DRE evaluation.

This theoretical maximum may indicate that only 3-4 percent of the impaired driving population is drug impaired. Alternatively, there may actually be more non-alcohol drug impaired drivers on the road but current on-road impaired driving detection strategies, developed primarily to deal with alcohol, are not finding these drivers for the DREs to evaluate.

Peak or maximum levels of DRE activity are typically followed by a decline in the number of DRE cases in subsequent years. This finding could simply represent an end to the period of initial enthusiasm leading to some "steady state" level in the number of DRE evaluations per year. However, the present data do not cover a sufficient amount of post-peak time to determine what this "steady state" will be.

Alternatively, the DEC programs themselves could be designed in such a way that they have difficulty perpetuating themselves. It is known, for instance, that the first officers trained in any department tend to be the "best of the best" from the DWI squads. These seasoned and accomplished professionals often move up or move on such that their tenure as a working DRE may be limited. Thus, the number of DREs actually available for evaluations could be declining even though the listed number of certified DREs in the department could be remaining constant or even growing. Or, in some but certainly not all departments, the decline could be related to officer dissatisfaction with the ability of the "system" to obtain DWID convictions and/or meaningful sanctions following conviction. Or, it is conceivable that the number of non-alcohol drug impaired drivers declined following the full implementation of these DEC programs and thus there were fewer drug impaired drivers to find. The present data do not allow for the separation of these and other possible explanations.

System Level Variables

The present study attempted to capture information concerned with "system level" or system-wide impaired driving enforcement variables. The objective was to determine whether or not the DEC programs affected overall impaired driving enforcement and adjudication in their respective communities.

In retrospect, most of the DEC programs for most of the years covered in this study actually performed relatively few DRE evaluations. Thus, it is not clear what could reasonably be expected in terms of overall system level changes. Nevertheless, there were some findings that suggested system change during the early and/or "peak" years of DEC.

The first system level variable tabulated was the total number of impaired driving arrests. The results indicated that total arrests went up from the time just prior to DEC to just after DEC in

Denver, Arapahoe and Nassau. They also went up in Roseville, Boulder and Houston but soon fell back to previous levels. Total arrests went down in Phoenix and Baytown and remained relatively unchanged in Tucson. Similarly, in the comparison communities: arrests went up in Lodi, Adams, Douglas and Dallas; up and down in Arvada and Galveston; down in Flagstaff; and remained relatively unchanged in Westchester. This pattern of results does not suggest an effect of DEC on the total number of impaired driving arrests.

Another system level variable was mean BAC for DWI suspects. The results indicated a trend toward slightly lower mean BACs in nearly all sites, DEC and comparison, across the 1987 or 1988 through 1991 period. Nevertheless, there was evidence that lower mean BACs were associated with DEC. Seven of the DEC sites provided mean BAC data for years both before and after the implementation of the DEC program. In six of these sites, the lowest mean BAC occurred during the first full year of DEC (Denver, Arapahoe, Boulder, Nassau County, Roseville and Tucson). Such a result occurring by chance is highly unlikely suggesting that the onset of DEC is associated with lower mean BACs. However, these lower mean BACs were not maintained in subsequent years.

Adjudication data were difficult to obtain. Data that were available generally did not show an impact of DEC on impaired driving conviction rates. However, three of the DEC sites showed a marked increase in convictions following DEC for those cases involving BACs below 0.10%. The three sites were Phoenix, Boulder and Nassau County. In Phoenix, the percentage of under 0.10% BAC suspects convicted on an impaired driving charge jumped from 17 percent in 1987 (prior to DEC), to 28 percent in 1988 (first DEC year), to 60 percent in 1989 (second DEC year). In Boulder, the percentage jumped from 20 and 21 percent in 1987 and 1988 (prior to DEC) to 27 percent in 1989 (first DEC year) to 57 percent in 1990 (second DEC year). In Nassau, for the years 1986 through 1991, percent convicted under 0.10% BAC rose from 19 and 6 percent prior to DEC to 30, 41, 35 and 34 percent after DEC. These results suggest, at least in these communities, that the presence of a DEC program was associated with major change in low BAC impaired driving prosecution and adjudication. Note that in both Phoenix and Nassau, these data were derived from DWI "samples" which specifically excluded the DRE cases. Thus, low BAC convictions from DRE cases would be in addition to the figures shown above.

DRE Cases

The present results clearly indicate that those impaired driving suspects who were evaluated by a DRE comprise only a small subset of all impaired driving suspects. Moreover, this subset is unique.

As expected, and in some ways demanded by the design of the DEC program, the DRE suspects had BACs which were remarkably below the BACs of the general arrest population. Mean BACs for DRE evaluated suspects ranged from a low of 0.019% for the New York State Police in Nassau to 0.066% in Tucson. The average across the DEC programs was 0.035% as compared with a typical BAC average for all DWI suspects of about 0.150%.

Suspect ages for both the DRE evaluated cases and for the general DWI population were known for eight of the DEC departments. In all eight, the mean age for the DRE cases was lower

than for the general DWI population. Typically, the DRE suspects were about two to three years younger (late twenties for DRE versus early thirties for DWI).

Suspect sex was known for both the DRE evaluated cases and for the general DWI population for seven of the DEC departments. Averaged across the seven departments, both the DRE suspects and the general DWI population were 86 percent male.

Adjudication data suggested that DRE cases typically result in a conviction on an impaired driving charge. There were six DEC departments for which impaired driving conviction rates could be computed for: the DRE cases (65 percent average conviction rate across the six departments); the general DWI population (87 percent average conviction rate for comparable years); and that subset of the general DWI population with BACs less than 0.10% (40 percent average conviction rate for comparable years). In every department, the conviction rate for DRE evaluated suspects was higher than the conviction rate for low BAC suspects. Moreover, it should be noted that the mean BAC for the DRE cases was only 0.035% which is substantially lower than the 0.05% to 0.09% range common for the low BAC group. Absent DEC, many of the DRE evaluated suspects would not have been booked let alone convicted.

Drugs Found

The present results do not, directly, answer the question as to the extent of non-alcohol drug impaired driving or the specific drugs involved. Each of the suspects covered in this study was arrested using DWI enforcement strategies designed, primarily, for finding alcohol impaired drivers. It is possible that a characteristically different group of drivers might be apprehended should techniques be developed to find non-alcohol suspects. Further, the variation in the DRE drug opinions across the DEC programs would appear to go beyond simple regional variation in drug use patterns and thus program variation itself could be a factor in forming DRE opinions. Nonetheless, when a DRE had an opinion that a specific drug was involved, that opinion was usually confirmed by laboratory testing. Thus, the range and distribution of drugs found is likely indicative of at least a portion of the non-alcohol drug impaired driving problem.

As discussed above, the drug impaired arrest population is primarily male, typically twenty or thirty years old, and likely accounts for about 3-4 percent of all current impaired driving arrests. It is likely that many more suspects, beyond the 3-4 percent, had also been using non-alcohol drugs plus alcohol. However, they were not DRE evaluated since the alcohol alone provided the basis for an impaired driving charge.

Overall, as indicated by both the DRE opinions and the laboratory findings, the most common drug used was Cannabis followed by Stimulants, Depressants and Narcotic Analgesics. However, the drugs used varied as a function of suspect age. For the youngest impaired driving suspects, the most common drug by far was Cannabis followed by Stimulants. Cannabis and Stimulants remained the two most common drug groups through the 30-39 year old age group. However, with increasing age, came increasing incidence of both Depressants and Narcotic Analgesics such that these were the two most common drugs for drivers ages forty and over.

Only 13 percent of all DRE evaluations led to a lab test with a finding of no drugs detected. Most evaluations led to some drug being found and most DRE opinions as to drug class were confirmed.

Recommendations

1. Current DRE Activity Levels

DEC programs were developed with the expectation that each trained DRE, on average, would evaluate at least one impaired driving suspect per week. The DEC programs covered in this study had more than 110 trained DREs. If each had evaluated one suspect per week, then there would have been more than 5,000 evaluations per year and more than 10,000 evaluations summed across the two to four years of operation for each of the programs. The actual number of reported traffic related DRE evaluations was 1,842. The expectation of one evaluation per DRE per week has not been realized.

Not all DREs trained by a department necessarily were active over the full time periods examined in the study. Nevertheless, none of the departments approached the evaluation levels suggested by the "one-per-week" expectation in any operational year. Only limited data were obtained on case volumes on a DRE by DRE basis. In the four agencies supplying this information, one DRE was found who conducted 50 evaluations in a year and there may have been others in the remaining agencies. However, "typical" evaluation levels appear to be on the order of less than one per month.

It is suspected that the evaluation levels actually achieved are due to factors such as underlying drug impaired driving and its detectability, and to inabilities to generate significant case inputs from non-DREs. It is recommended that methods to increase case inputs from other officers be examined in detail. It is also recommended that case level expectations be reduced in selecting future departments for the DEC program. An important issue to be examined is: for departments of varying sizes and impaired driving arrest volumes, how many DREs should be trained and available. In any department, there will be some minimum number which is essential to providing DRE availability on a peak, nighttime or 24-hour per day basis. This minimum will be related to the extent to which DREs will be called into cases begun by other officers.

Beyond a minimum essential number, departments may find it desirable to train additional DREs because of possible overall positive benefits to the department. As in some of the sites included in the study, DRE training could be extended to the majority of traffic or DWI officers. Such decisions should recognize that increasing the numbers of trained DREs will not necessarily result in proportionate increases in the number of drug impaired driving arrests that are made. Moreover, such a decision may result in fewer cases per trained DRE with possible implications for maintenance of skills.

2. Future DRE Activity Levels

An unexpected finding for the DEC programs covered in this study was that they tend to have peak activity within the first one to two years, with declining activity thereafter. It is believed that a part of declining activity is due to a waning of officer enthusiasm as they experience relatively low case volumes and their rare involvement as experts testifying in court. Another major factor is attrition involving both losses in the total DRE cadre and of key officers who are promoted, transferred or who retire. It is recommended that the topic of DRE turnover and replenishment be considered an integral part of establishing DEC programs. While the present study data are sparse on the attrition issue, some DREs are known to have remained active throughout their programs' operations while others appear to leave the programs after about two years of service. Some departments have been able to replace their losses and others have not. Whether officer quality can be retained over the long term cannot be determined from present data nor can a forecast be made regarding the long range trends in evaluation levels. Both of these issues may warrant future examination.

3. Seven Drug Classes

The present study indicates that only four of the current seven drug categories occur with any real frequency in the drug impaired arrest population. The four classes are: Cannabis; Stimulants; Depressants; and Narcotic Analgesics. A fifth class, PCP, is found by some DEC programs and not others. Hallucinogens and Inhalants are rarely found. It is recommended that Hallucinogens and Inhalants be re-examined as to their cost/benefit utility for inclusion in the DEC program.

4. Laboratory Confirmation

As discussed earlier, laboratories either confirm or do not confirm the presence of any given drug. Non-confirmation does not mean that the drug was not there. It only means that the presence of the specific drug, or one or more specific drugs within a drug category, could not be confirmed. The drug could have been present in small quantities (i.e., below the sensitivity threshold for the test performed). Alternatively, the specific drug within the class could be some less common substance or its metabolite which is not routinely captured by the laboratory procedures.

In the present study, the distribution of laboratory findings across the DEC programs varied considerably. Some of this variation is likely related to regional differences in the drugs impaired driving suspects used. However, it is also felt that some of this variation is related to different laboratory methods and/or test criteria. Moreover, one cannot rule out the possibility that DRE opinions were in some way affected by laboratory testing procedures. That is, if the lab only confirms a given drug class when it is present in quantity and/or present in its original form and not only as a metabolite, then DREs may be more careful in the number of times they offer an opinion for that drug class.

It is recommended that future research consider the role of the laboratory in DEC. The first step would be to determine whether or not different laboratories are or are not confirming

standard samples with known amounts of given drugs at different rates. While it is highly unlikely that a laboratory would confirm something that is not there, it is entirely possible that low levels of a given substance or different metabolites or different drugs from the same general class would be confirmed at different rates across the many labs. Next, if different confirmation rates are found, it would be of interest to consider the relationship between confirmation rate and the drug opinions of DREs providing samples to the respective laboratories.

5. Prosecution

While some DRE cases are going forward in the criminal justice system, many DREs with several years of service report that they have never been called to testify in court on a drug impaired driving case.

Largely anecdotal evidence in many, but certainly not all, jurisdictions suggests that prosecutors are reluctant to take a DRE case forward when the defendant pleads not guilty. Some prosecutors may be concerned with the possibility of creating "bad" case law. Others may be concerned with the time and special knowledge needed to successfully pursue a DRE case. Anecdotal, in one case that was presented by a prosecutor before a jury, it was reported that the jury entered deliberations thinking that cocaine had a presumptive or legal threshold not unlike the threshold for alcohol. Needless to say, the defendant was found not guilty. Failure to vigorously and/or effectively prosecute DRE cases can be a source of frustration for DRE officers in many communities.

There is likely no simple answer to this problem. It is also likely that no one answer will be appropriate for every state with a DEC program. Nonetheless, it is recommended that case law be monitored and that DRE involved prosecutions be documented such that both positive and negative experiences can be shared across the many DEC programs.

Conclusion

The present results show that DEC programs are associated with a marked increase in impaired driving charges against suspects whose impairment is related to one or more drugs other than alcohol. These suspects are typically convicted of an impaired driving charge. However, the actual numbers of DRE cases are far below expectations and trained DREs may not be getting enough cases to maintain their skills and enthusiasm.

REFERENCES

1. Compton, R.P. *Field Evaluation of the Los Angeles Police Department Drug Detection Program*. National Highway Traffic Safety Administration Technical Report, DOT HS 807 012, December 1986.
2. Oates, J. *A short history of DRE*. In, C.J. Vanell (Ed) *The DRE*, 1991, 3(1), 8-9.
3. National Highway Traffic Safety Administration, *Drug Evaluation and Classification Program Briefing Paper*, U.S. Department of Transportation, Washington, D.C., July 1992.