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December 1984

An Evaluation of Washington State's 1979 Driving While Intoxicated (DWI) Laws

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16. Abstract: In 1979 Washington State passed legislation establishing several new provisions for dealing with the drinking driver. Among these were the establishment of a 'per se' definition of DWI as driving or being in physical control of a motor vehicle with a BAC of .10 or higher, a mandatory one day jail sentence for first-time DWI offenders and 7 days for repeat offenders and mandatory attendance at an Alcohol Information School for all first offenders.

To evaluate the effectiveness of these laws as a specific and a general deterrent to driving after drinking, two investigations were performed. General deterrence effects (Study 1) were explored by a time-series analysis of monthly alcohol-related accident data from 41 cities and 15 counties for the time-period 1977 through 1982. Specific deterrence effects (Study 2) were investigated by a pre-/post- legislation comparison of recidivism rates from samples of first, repeat, and non-DWI offenders.

From the sample of counties and cities in Study 1 there is evidence that the law, as implemented in these sites, has initiated a general deterrence that resulted in a significant downturn in alcohol-related accidents. In 1981, approximately one year after an increase in the number of arrests, convictions, and mandatory jail terms served, there has been a 25 percent decrease in the number of alcohol-related accidents. In the year immediately following the implementation of the new laws no deterrence was identified. There is no evidence in Study 2 that the new laws, as implemented, were effective in dissuading convicted DWI offenders from repeating their offenses or reducing accident involvement. Deficiencies in the "system" responsible for implementing the new laws may have limited the deterrence impact (Study 3).

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PREFACE

This study was conducted in part under a 403 contract with the National Highway Traffic Safety Administration, DTNH-22-82-C-05144, "Analysis of Washington's Mandatory Jail Sentence Law", by the Washington Traffic Safety Commission, Olympia, Washington.

The Principal Investigator on this project was Carl L. Klingberg, Ph.D., a program evaluator with the Commission, with contract administration and supervision provided by William R. Lathrop, Director, and Charles F. Hayes, Assistant Director. The investigation of general deterrence effects was performed by John P. O'Connell and John R. Chadwick, Forecasting and Estimation Division of the Office of Financial Management. The investigation of specific deterrence effects was conducted by Philip M. Salzberg, Ph.D. and Stephen P. Paulsrude, Driver Services Division of the Department of Licensing.

Arrest data was provided by the U. S. Department of Justice, Federal Bureau of Investigation, Uniform Crime Reporting System and the Washington State Uniform Crime Reporting System under the auspices of the Washington Association of Sheriffs and Police Chiefs. Traffic accident data was supplied by the Washington Department of Transportation and the Washington State Patrol. The Washington State Department of Licensing provided the data on driver recidivism rates while the State Administrator for the Courts supplied court activity data and the Washington State Corrections Standards Board made available their records on the composition of jail populations. The Bureau of Alcohol and Substance Abuse, Department of Social and Health Services provided information relating to attendance at Alcohol Information Schools.

Special thanks are in order for authorization to use the Ertel-Fowlkes time-series analysis technique which was made available through the Illinois Criminal Justice Information Authority largely through the assistance and cooperation of Dr. Carolyn Block. The transformation of the technique and the translation of the computer program for our use was made possible by the efforts of Doris Steingraber of Washington State University's Data Processing Center.

Sincere appreciation is expressed to Ms. Twila Brewer for the extensive clerical and editorial support effort performed in the preparation of this report.

The valuable counsel, support, and understanding provided by the NHTSA personnel associated with this project, particularly that of George Anikis, Delmas Maxwell Johnson, Paul Levy, and Perry Yarrington, is gratefully acknowledged and appreciated.

The conclusions, interpretations, and opinions expressed in this report are those of the authors and do not represent official positions taken by the National Highway Traffic Safety Administration, the State of Washington or any of its agencies or officials.

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I. INTRODUCTION

Increased public awareness of the seriousness of the drinking driver problem has over the past few years led to a number of new, renewed, and/or increased pressures on legislators, law enforcement personnel, the judiciary, and other elected officials to take positive steps to ameliorate the impact of this condition. In response to these pressures a substantial number of activities have been initiated on national, State and local levels. The formation of the Presidential Commission on Drunk Driving, Federal incentive grants for States implementing various laws and activities, increased severity in the legal sanctions applied to convicted drinking drivers, the formation of a citizen activist group such as MADD, and increased enforcement activities via "special DWI emphasis patrols" are examples of the emergence of forces directed at solving some of the recognized deficiencies in the existing drinking-driver control system.

The activities arising from these often emotionally charged efforts all have one common objective, that of reducing the probability that an individual who has been consuming intoxicating beverages will get behind the wheel of a motor vehicle and place that vehicle in motion on a public thoroughfare. The end product thus becomes one of reducing deaths, the number and/or severity of injuries, and property damage attributable to the drinking driver.

As economically desirable and humanitarian as this objective may be, it still remains to be empirically demonstrated that the specific activities undertaken do IN FACT result in the sought-after changes. Even more elusive and challenging is the attempt to establish, with quantitative precision, the specific relationship between the countermeasure activities and the effects observed, particularly within the context of a complex social environment where several potential contributing activities are ongoing concurrently and are continuously being modified.

Washington State is no less sensitive to this resurgence in public opinion than any other state and its reactions and responsiveness is perhaps also typical. On May 14, 1979 the Governor of the State of Washington signed into law the provisions contained in Substitute House Bill 665 (SHB-665). This bill made several substantive changes in the definition of and sanctions applied to drivers convicted of

operating or being in actual physical control of a motor vehicle while under the influence of intoxicating liquor and/or drugs. Among the changes made by that piece of legislation were the following:

1. A driver is guilty of the offense of driving or being in physical control of a vehicle while under the influence of intoxicating liquor or any drug if his blood/alcohol concentration (BAC) is .10 percent or more as shown by chemical analysis of his breath, blood, or other bodily substance;

2. Repealed previously existing provisions establishing presumptive BAC levels at levels lesser than .10% but retains that BACs less than .10% may be evidentiary and considered with other competent evidence in determining whether the person was under the influence of intoxicating liquor or any drug;

3. The potential term of imprisonment for a first DWI violation was extended from "not less than 5 days nor more than one year" to "not less than 1 day nor more than one year", however one day of the jail sentence may not be suspended or revoked unless such imprisonment constitutes a risk to the defendant's physical or mental well-being.

4. The potential imprisonment for a second or subsequent conviction was extended from "not less than 30 days nor more than one year" to "not less than seven days nor more than one year", with the proviso that the jail sentence shall not be suspended or deferred unless such a jail sentence constitutes a risk to the mental or physical health of the defendant.

5. The minimum fines of $50 for first offenders and $100 for repeat offenders were repealed but the maximum fines of $500 and $1,000 for first and repeat offenders, respectively, were retained.

6. Also added to Section 46.61.515 of the Revised Code of Washington (RCW) was the following: "In addition to any nonsuspendable and nondeferrable jail sentence required by this subsection, the court shall sentence a person to a term of imprisonment not exceeding one hundred eighty days and shall suspend but shall not defer the sentence for a period not exceeding two years. The suspension of the sentence may be conditioned upon nonrepetition, alcohol or drug treatment, supervised probation, or other conditions that may be appropriate. The sentence

may be imposed in whole or in part upon violation of a condition of suspension during the suspension period."

7. Persons convicted for the first time of driving or being in actual physical control of a vehicle while under the influence of intoxicating liquor shall in addition to other penalties be required to complete a course at an alcohol information school approved by the Department of Social and Health Services.

8. The Department of Social and Health Services was instructed to "Organize and sponsor a state-wide program to help court personnel, including judges, better understand the disease of alcoholism and the uses of alcoholism treatment programs."

9. The Division of Criminal Justice (Office of Financial Management) was instructed to conduct and report the results of a study to determine the impact of the sentencing provisions on jail conditions and bed space, state and local government costs and the existence of alternative incarceration facilities prior to the next legislative session (12/31/80).

All the provisions of SHB-665 became effective September 1979 except the provisions limiting the authority of a court to defer or suspend the minimum jail sentence which did not take effect until January 1, 1980.

The objectives of this legislation were:

1. General Deterrent - to dissuade drivers from drinking intoxicating beverages prior to driving a motor vehicle, or conversely, to dissuade drinkers from attempting to operate a motor vehicle after doing so;

2. Specific Deterrent - to effectively discourage drinking drivers who have been apprehended and convicted of operating a motor vehicle while under the influence of intoxicating liquors from ever repeating that behavior.

To the extent that this legislation has been effective in achieving its objectives, the incidence of alcohol-related collisions should decrease as should the frequency with which DWI offenders repeat the offense after having been convicted previously. The purpose of the present investigation is to assess

the effectiveness of the 1979 DWI laws in deterring drinking drivers, now that these laws have been operational for a few years.

II. METHODOLOGY

A. General Deterrence

One of the provisions set forth in Substitute House Bill 665 was that: "The division of criminal justice, no later than December 31, 1980, shall submit a study to the house of representatives and to the senate which details the impact of the sentencing provisions established by this section. The impact study shall include, but shall not be limited to, the following information: The impact of the provisions upon county jail conditions and bed space, the cost impact of the provisions upon local and state governments, and the existence of alternative facilities to which individuals sentenced under this section may be committed." The required study was performed by the Division of Criminal Justice, Office of Financial Management and the report (entitled "Assessment of the Implementation and Impact of SHB-665: The New Driving While Intoxicated Law") delivered to the legislature prior to the December 31st deadline.

The very severe time and resource limitations permitted only an investigation involving a sampling from within 7 of Washington's 39 counties and comparing measures obtained from these sites during the first four to six months of 1980 with comparable data for the same time period in 1979. One of the preliminary conclusions drawn by the authors of that report was that, "Early indications, as measured by the percentages of DWI related accidents and the percentage of DWI injury and fatal accidents per the number of reported DWI arrests, are that the new law is not having the desired deterrent effect." The authors were quick to point out, however, that, "More time and better analysis are needed before the deterrent outcome can be more accurately assessed."

In order to capitalize on the efforts already initiated by the Office of Financial Management and to most efficiently utilize the analytic and evaluation expertise developed within that agency, an Interagency Support Agreement was negotiated between the Washington Traffic Safety Commission and the Office of Financial

Management. The terms, conditions, and support requirements of that Agreement are presented in Appendix A. Briefly summarized it arranges for professional and technical support in conducting a study to, ". . . . examine the general deterrence effect of the law by pre-post comparisons of alcohol and non-alcohol-related injury and fatal accidents. In addition, pre-post comparisons of DWI arrests and convictions will be included. The analysis will utilize time series intervention analysis techniques for the time period 1977 to 1982 to identify changes attributable to the implementation of the law . . . . "

B. Specific Deterrence

A similar Interagency Agreement was negotiated between the Washington Traffic Safety Commission and the Department of Licensing (Appendix B) to perform a study to, ". . . . examine the specific deterrence effect of the law for individuals convicted of DWI under the new law compared to individuals convicted under the old law. The Driver Record System of the Washington State Department of Licensing will be accessed to provide a pre- and post-sample of DWI offenders. Driving records for these samples will be tracked for one year from the time of arrest. The pre-sample will consist of drivers arrested for DWI in 1978 and 1979. The post-sample will consist of individuals arrested during 1980 and 1981. As a baseline for comparison, a sample of non-DWI offenders will be compared on the following dependent variables: the number of subsequent DWI violations, the number of injury and fatal accidents, and the number of non-alcohol-related violations. In addition, the analysis will control for the number of prior DWI offenses. Controlling for prior offenses will allow for an assessment of the possible differential impact of the law on first offenders and repeat offenders."

C. System Impact

It is obvious that the mere passage of legislation which establishes a specific act as being illegal and sets penalties for the commission of the act in no way guarantees that the full deterrent potential intended by the legislation will be realized. The extent to which the law is fully implemented and is being properly executed is a necessary precondition for achieving the desired deterrent effect.

The "system" which is given the responsibility for implementing and executing drinking-driver control legislation is composed of a number of components. Among these are at least (1) enforcement, (2) prosecution, (3) adjudication, (4) diagnosis and referral, (5) education/treatment/rehabilitation, (6) driver licensing, (7) public information/education, and (8) program coordination/management. It is imperative that component performance measures be obtained and analyzed in order to adequately describe the "system" and its operations, to aid in the establishing of cause and effect relationships and to facilitate the development and postulation of explanatory hypotheses for any observed differences in the primary criteria measures.

III. RESULTS

A. An Evaluation of the General Deterrence Effect of the 1979 DWI Laws

1. Purpose: The purpose of this study is to assess whether or not the implementation of the more stringent DWI laws in Washington State resulted in a general deterrence that has reduced the frequency of alcohol-related traffic accidents.

2. Research Strategy: In order to assess the effects of a major social and legal change, it is necessary to examine the desired effect, namely, changes in traffic safety due to fewer alcohol-related accidents. It is also desirable to analyze the components of that change to identify those factors which directly affect the desired result. In this case, the questions are: were there more DWI offenders arrested and incarcerated after the law went into effect? and what change, if any, was experienced in highway safety?

The basic hypothesis adopted at the outset of this investigation was that:

- an equal or increasing number of DWI arrests with a more certain process of proof -- illegal per se -- leads to
- an equal or increased number of DWI convictions, which, in turn, leads to
- an increased number of persons sentenced to jail.

The combination of these three factors provides:

- a deterrence to driving under the influence of alcohol, which can be measured by
- a decrease in the number of DWI or alcohol-related driving accidents.

Implicit in the enactment of this law is a modification of existing social policy, viz., a change in emphasis from alcohol education and rehabilitation to one of punishment and deterrence. (See Appendix C for the legislative antecedents prior to the passage of SHB-665.) The new emphasis shifted the target population from the previous small group of drivers who got caught, to a new broader population of anyone drinking and driving. The effectiveness of the law may be measured in operational terms but the application is as much psychological as literal. In other words, the threat of arrest and incarceration must be perceived as real and credible in order to deter. This introduction of increased threat of certainty and severity of punishment for a DWI offense represents the "experimental treatment" in the research design. A major assumption for this study as to the potential effect of this policy change is that enforcement would be strengthened based on less chance for equivocation with the 'illegal per se' definition of the offense. This should lead, at a minimum, to an increase in the number of traffic arrests which are more readily categorized as driving while intoxicated, since borderline cases would no longer be a matter of personal judgment. In line with this assumption of more certain arrest is the logical outcome, that there would be more DWI convictions. And then, due to the mandatory jail term, it is expected that more persons would be going to jail. The effectiveness measure (all other external forces being equal) for the above relationships would lie in the changes after January 1, 1980 in the number of alcohol-related driving accidents.

3. Analytic Approach: The time series statistical method used to assess the research hypothesis is based upon the work of James E. Ertel and Edward B. Fowlkes of Bell Laboratories (Ertel and Fowlkes, 1976). Their original program was subsequently adapted by the Statistical Analysis Center, Illinois Criminal Justice Information Authority, Illinois Law Enforcement Commission (ILEC) and, with ILEC permission, enhanced at the Computer Service Center, Washington State University. The Ertel-Fowlkes method optimizes the fit for time-series data in an iterative process. With sufficient numbers of data points, the Ertel-Fowlkes method will find the maximum possible number of statistically significant linear fits through the time series, thus depicting the significant turning points and trends in the time series. For this research, the change in direction and slope of the pre-post curves provides the evidence to test the study hypothesis. See Appendix D for a further discussion and examples of the Ertel-Fowlkes method.

In this analysis, a pre-post time period is hypothesized, i.e., the events that have occurred prior to January 1980 and those that follow. This analysis is very similar to the traditional interrupted time-series analysis, however this analysis does require the assumption that a single point in time be identified when the impact from the change in the law should start. This provides the opportunity to examine anticipatory and/or lagged system responses. The use of the Ertel-Fowlkes method is especially salutary in this regard since it provides a vivid, visual display of the statistically significant moments of change.

The extensive time series data used in this analysis (48 months pre and 36 months post) facilitate the examination of rival or alternative hypotheses (Campbell and Stanley, 1963).

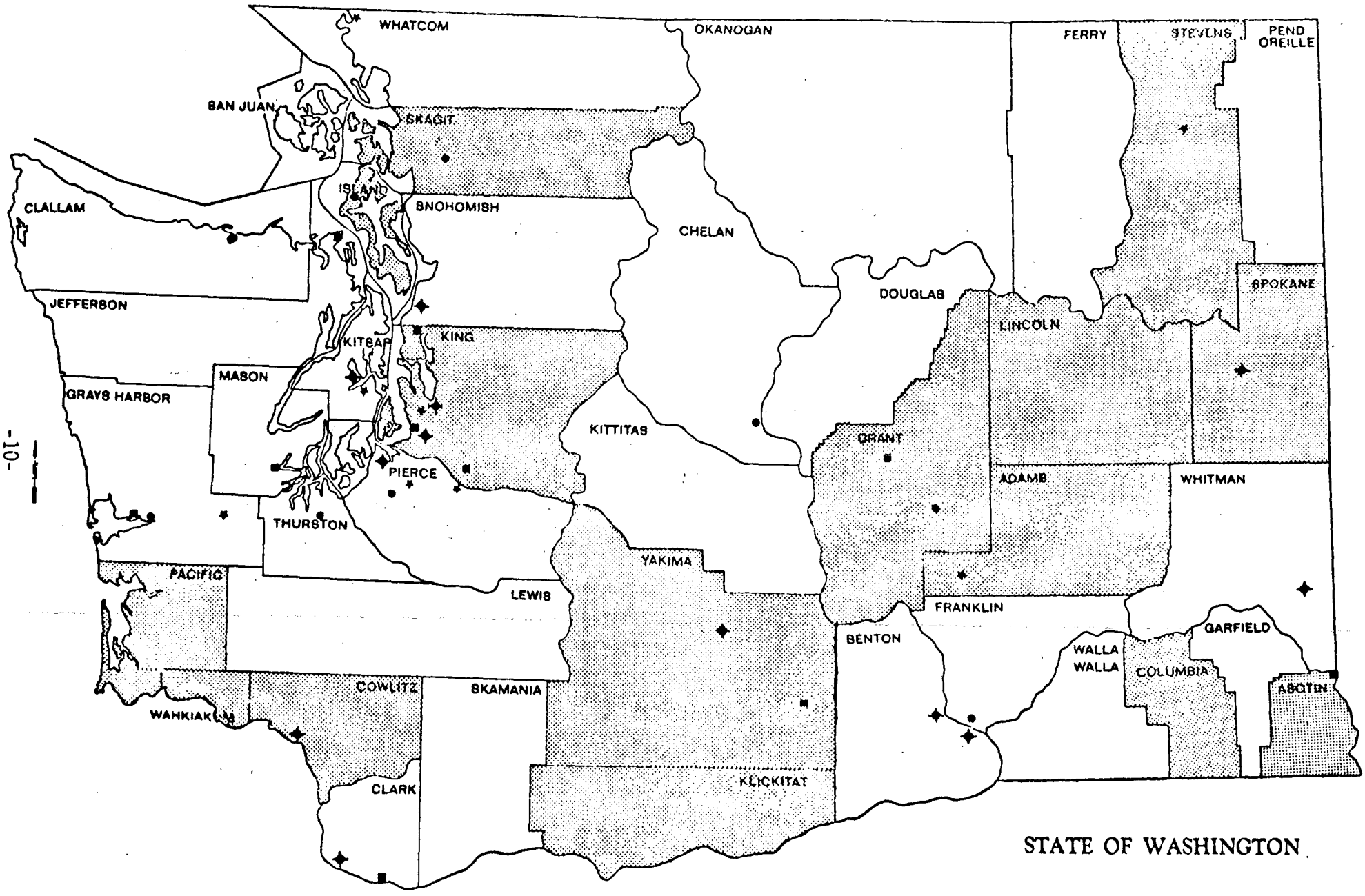
4. Sample Selection: The sites selected for examination in this study provided a serendipitous discovery. The criteria for selection was on the basis of regular monthly reporting to the Uniform Crime Reporting system between 1976 and 1982 rather than as the result of a random or other representative sampling

procedure. However, the sample proved to be both adequate and representative. The 41 cities and 15 counties (out of 39 possible) represent 44% of the State's 1980 population. Both the cities and counties offer a wide distribution of size and location in the State, thereby alleviating any concerns as to population density, resources available, and law enforcement patterns.

In the analysis, the 41 cities and 15 counties are aggregated separately. This results from the organizational differences between the city police and the sheriff's departments. They differ in resources and physical environment. In the sample cities, there are an average of 1.6 officers per 1000 persons while there are .9 deputies per 1000 persons in the representative counties. Sheriff's deputies patrol 22.8 square miles per officer on average while the city police average .3 square miles. Overall 1980 population density for the sample cities is 2,201 per square mile as opposed to 45 per square mile for the counties. The dispersion and diversity of the sample sites are illustrated on the map contained in Figure 1. Appendix E provides additional demographics specific to the sample sites.

5. Data Collection: The following data were collected to assess the validity of the research hypothesis.

a. Arrest information was examined for the four years preceding the full implementation of the new statute in 1980 and for three years following. These historical records were obtained from the U. S. Department of Justice, Federal Bureau of Investigation, for all law enforcement agencies within the State of Washington that had participated in the national Uniform Crime Reporting program. Agencies participate on a voluntary basis and report the incidence of major crime occurring within their area of responsibility. In addition, they may report the number of arrests made on a monthly basis for major and minor crimes. Data for 1982 was obtained from the Washington State Uniform Crime Reporting system under the auspices of the Washington Association of Sheriffs and Police Chiefs in lieu of the FBI. This arrest information is geographically oriented, or site specific, in that county (excluding any municipal law enforcement) activities or city



POPULATION KEY ✦ OVER 20,000 ▪ 5 to 10,000

• 10 to 20,000 * LESS THAN 5,000

FIGURE 1. LOCATION OF SAMPLE CITIES AND COUNTIES

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activities can be delineated. Preliminary analysis revealed that 41 city police departments and 15 county sheriff departments had, in fact, reported monthly arrests continuously since 1976. In addition, the sample city and county arrest information were augmented by data from the Washington State Patrol.

b. Data regarding court convictions for alcohol related driving arrests were obtained from the Drivers Record System maintained by the Washington State Department of Licensing for the years 1978 through 1982. A 50% sample was drawn for the 41 cities and 100% for the 15 counties indicated above. While this information identifies specific courts by geographic location, it does pose a problem insofar as identifying the geographic site of the arrest which led to the court appearance. For example, if a DWI offender is arrested by a State Patrol officer in a particular locale, the motorist will appear in a District court rather than a Municipal court. Manual examination of individual court records would be required to provide information as to the location of the incident. Convictions that were selected for specific sample site courts were based on the following criteria, i. e., any district, municipal or juvenile court convictions for:

(1) Driving while intoxicated with license suspension.

(2) Driving while intoxicated without license suspension.

(3) In physical control of a vehicle while under the influence.

(4) In physical control - reduced from DWI.

(5) In physical control with license suspension.

(6) In physical control with no license suspension.

(7) Reckless driving - reduced from DWI.

(8) Negligent driving - reduced from DWI.

c. Due to constraints of time and resources, new detailed data regarding incarceration in county and/or city jail facilities were not obtained. An earlier study was used as a proxy for this activity. This study, "Assessment of the Implementation and Impact of SHB-665: The New DWI Law" (OFM, 1980) examined the relationship between DWI court convictions, sentences received and the impact on jails. Although tentative in its conclusions due to the relatively short span

(1979 - 1980) between implementation and data collection, the study, nonetheless, supports the hypothesis that convictees do indeed go to jail per the mandate of the law. In addition, aggregate DWI jail population data were obtained from the State's Correction Standard Board.

d. Traffic accident data were supplied by the Department of Transportation for the years 1977 - 1982. The selection criteria limited the information to the same 41 city and 15 county sites and identified all traffic accidents in which the driver(s) were either under the influence of alcohol or not. Accidents were classified by the data element which was used to select the particular incident, viz., "Driver had been drinking." The term "alcohol-related accident" is used interchangeably with "accidents where driver had been drinking" in this report.

6. Findings: This section deals with the relationships between the independent variables that have been hypothesized to be related to changes in alcohol-related traffic accidents. The three independent variables are:

a. The number of DWI arrests within the sample cities and counties.

b. The number of alcohol-related court convictions (i.e., DWI and DWI-reduced charges) in the court jurisdictions most closely affiliated with the sample cities and counties.

c. The number of persons sentenced to jail for DWI offenses.

The combination of these three variables represents the basis for the deterrents that should lead to a reduction in alcohol-related traffic accidents after January 1980.

The deterrent effect under the new DWI law is hypothesized to be primarily related to the 'illegal per se' section and the mandatory jail section of the law. Therefore, even if the post-1980 period shows no increase in DWI arrests and convictions, the deterrent effect could be evident because of greater certainty and severity of punishment. The deterrent effect would be enhanced if there were an increased number of DWI arrests, convictions, and incarcerations in the post-legislation period and the deterrent effect would be diluted or non-existent if arrests do not lead to conviction, or convictions do not lead to incarceration.

Data is presented for the 41 sample cities, 15 sample counties and, where feasible, statewide, to examine the relationship between the independent variables and the type of deterrent effect that they present.

Figures 2 and 3 depict DWI arrests, using the Ertel-Fowlkes method, for the period 1976 through 1982 in the sample of cities and counties. The spline-regression lines through the data points vividly display the turning points in time when statistically significant changes occurred. Especially noteworthy in these graphics are the identical turning points in August 1979 for both cities and counties. The upward trend in arrests began after the new DWI law was passed into law (May 14, 1979) but before the mandatory jail feature was implemented in January 1, 1980. The turning point preceded the implementation of the "per se" section of the law by about two months. However, the new DWI law passed and was signed by the Governor in the spring of 1979, which raises the possibility of law enforcement anticipation of the implementation of the law with the turnabout in DWI arrests.

Both the cities' and the counties' arrest trends after August 1979 indicate a potentially strong deterrent effect. Prior to the new DWI law, arrest patterns were declining or unstable. In the 41 cities, an average of 474 DWI arrests were made per month at the turning point in August 1979. Since that time the number of DWI arrests has been increasing. The number of DWI arrests in the sample cities has been increasing on average (average here refers to best linear fit not arthmetic mean) of about six additional arrests each month since the new DWI law was implemented. At the beginning of the increasing trend, the police in the sample cities were making 474 DWI arrests per month. By December 1982, the same departments made an average 717 DWI arrests per month. This trend has continued for over 36 months. The 15 county sample shows a much sharper increase after the August 1979 turning point. After six months a slow but continual increase in DWI arrests occurs. In the seven month period starting in August 1979, county DWI arrests turned around from a declining trend to an increasing trend of just over eight additional DWI arrests each month. On average there were 145 DWI arrests per month just prior to the turn around and 204 DWI arrests per month by April 1980. Since April 1980, DWI arrests have continued to increase, albeit at a very slow rate--about one DWI arrest per each four months. Between the turning point and

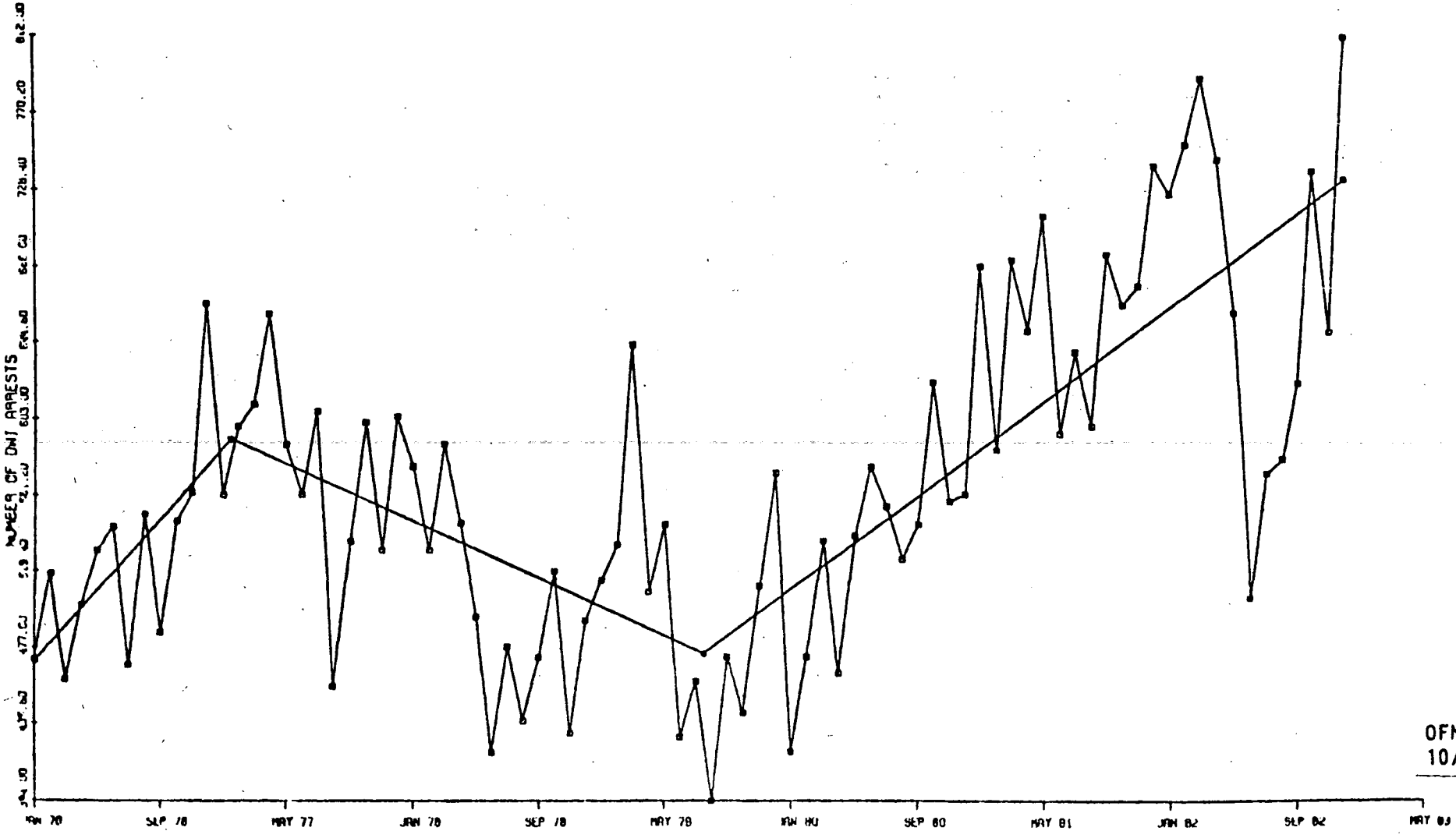
FIGURE 2.

41 WASHINGTON CITIES - DWI ARRESTS, 1976 - 1982

RAW DATA SERIES = ⊡
MULTI-SEGMENT LINE = ⊙
SOURCE: WASHINGTON UNIFORM CRIME REPORTS

FIRST SLOPE = 9.77
Y ZERO INTERCEPT = 460.20
SECOND SLOPE = -3.95
Y ZERO INTERCEPT = 645.40
THIRD SLOPE = 6.44
Y ZERO INTERCEPT = 193.40

FIRST TURNING POINT X:13.50 Y:592.13
SECOND TURNING POINT X:43.50 Y:473.73
TOTAL SSR =



MONTHS: JAN 76 TO DEC 82

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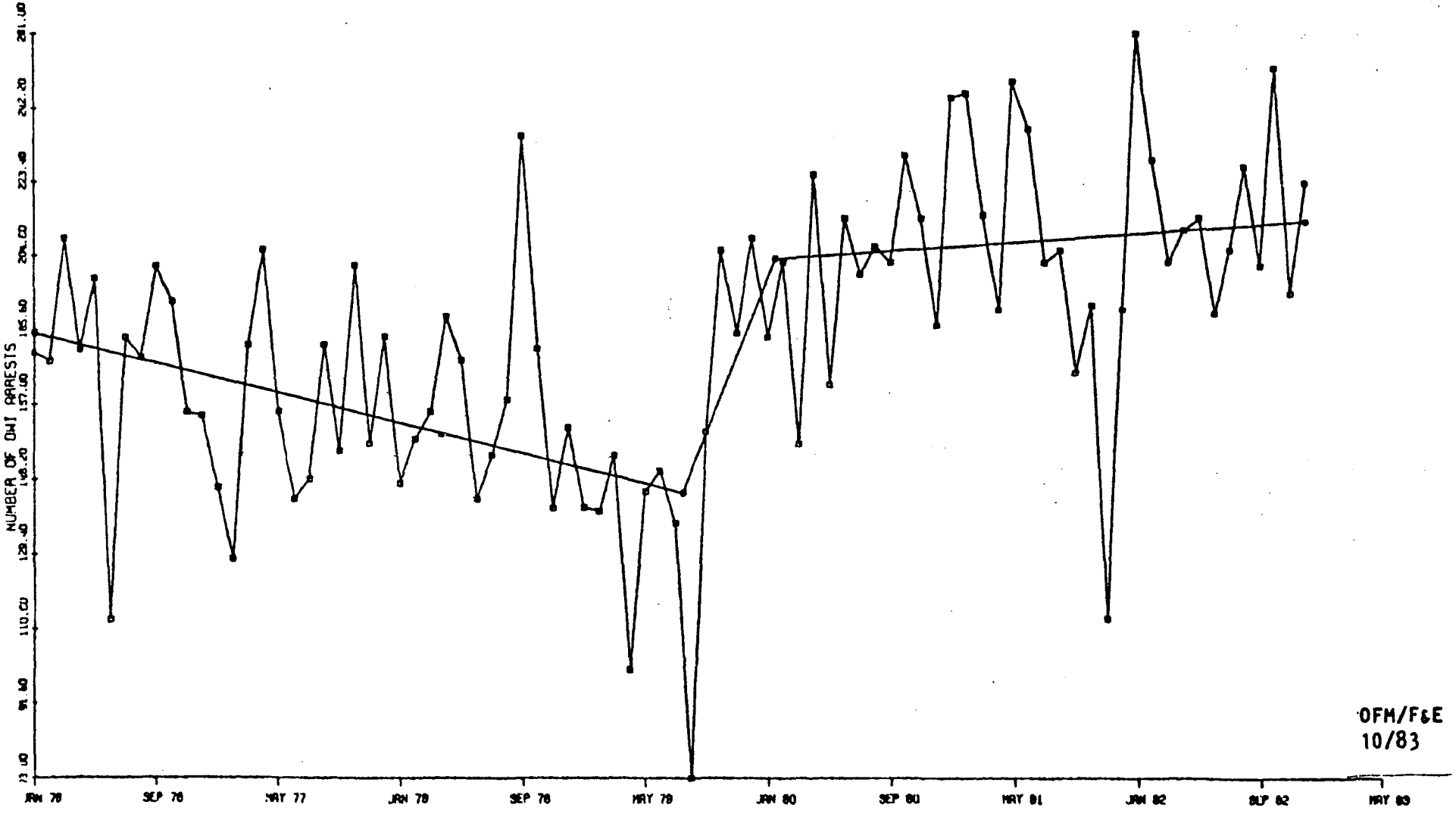
FIGURE 3.

15 WASHINGTON COUNTIES - DWI ARRESTS, 1976 - 1982

RAW DATA SERIES = ⊡
MULTI-SEGMENT LINE = ⊙
SOURCE: WASHINGTON UNIFORM CRIME REPORTS

FIRST SLOPE = -0.95
Y ZERO INTERCEPT = 185.74
SECOND SLOPE = 9.91
Y ZERO INTERCEPT = -286.42
THIRD SLOPE = 0.27
Y ZERO INTERCEPT = 190.61

FIRST TURNING POINT X:43.50 Y:144.49
SECOND TURNING POINT X:49.50 Y:203.92
TOTAL SSR = 81564.58



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MONTHS, JAN 76 TO DEC 82

ILEC CRIMINAL JUSTICE INFORMATION SYSTEMS - STATISTICAL ANALYSIS CENTER GRAPH

the first six months of the post period, the average monthly number of DWI arrests in the 15 sample counties increased from 145 arrests to 204 arrest per month. As with the sample cities, it appears that county sheriffs may have anticipated the actual start date for mandatory jail terms (January 1980) with a sharp increase in DWI arrest activity.

Has this increase in arrest activity been translated into an increase in the number of DWI convictions? Figures 4 and 5 illustrate the relationship between arrests and convictions, the second of the three independent variables to be examined. Frequency plots have been used to emphasize the similarity in the relationship between arrests and convictions.

In examining the graphs, it is important to note the pattern of change as opposed to the absolute value of the number of arrests and convictions, because, the conviction data are measures based on a mixture of city and county arrestees and are not, therefore, a completely accurate indicator. The 41 cities and 15 counties were matched as closely as possible to their respective court districts but some overlap is unavoidable. The problem of matching cities and counties to court districts is further aggravated because Washington State Patrol DWI arrests are included in the convictions but not the arrests. Therefore, convictions appear to have a greater volume than arrests. While it is difficult to determine specific points in time in this graph, it does provide dramatic evidence of a concurrent rise in DWI convictions with arrests over time.

Based on the similarities in the patterns of DWI arrests and convictions in the sample cities and counties, the assumption is made that this relationship can be extrapolated to the entire State and, therefore, statewide alcohol-related traffic convictions will fluctuate over time generally in consonance with DWI arrests. Table 1 shows that the statewide experience with alcohol-related convictions is very similar to that of the sample jurisdictions. Statewide alcohol-related traffic convictions were on a decline prior to January 1980. Thereafter, they have been increasing.

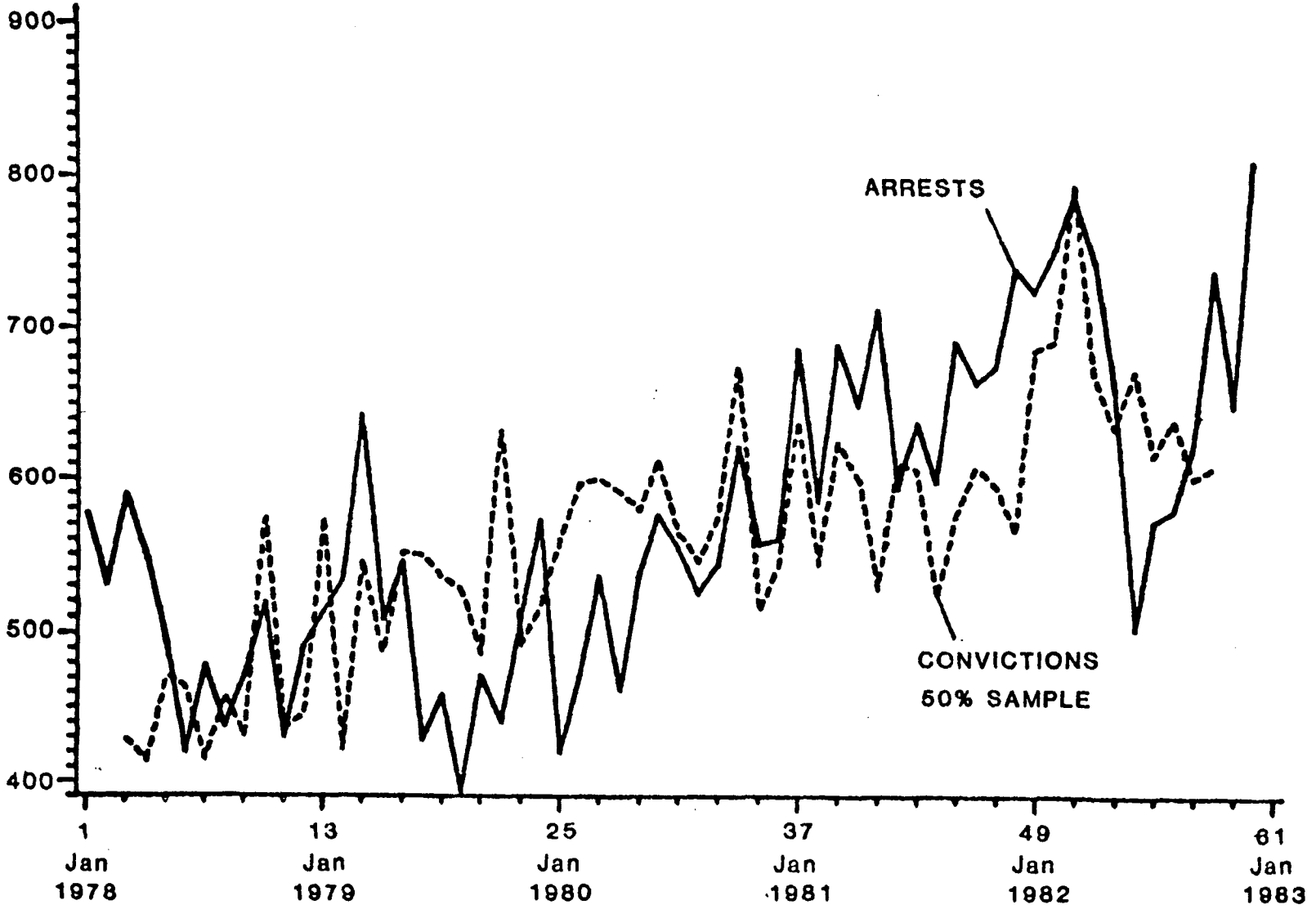

FIGURE 4. MONTHLY DWI CONVICTIONS AND ALCOHOL-RELATED ARREST FREQUENCIES FOR 41 WASHINGTON CITIES.

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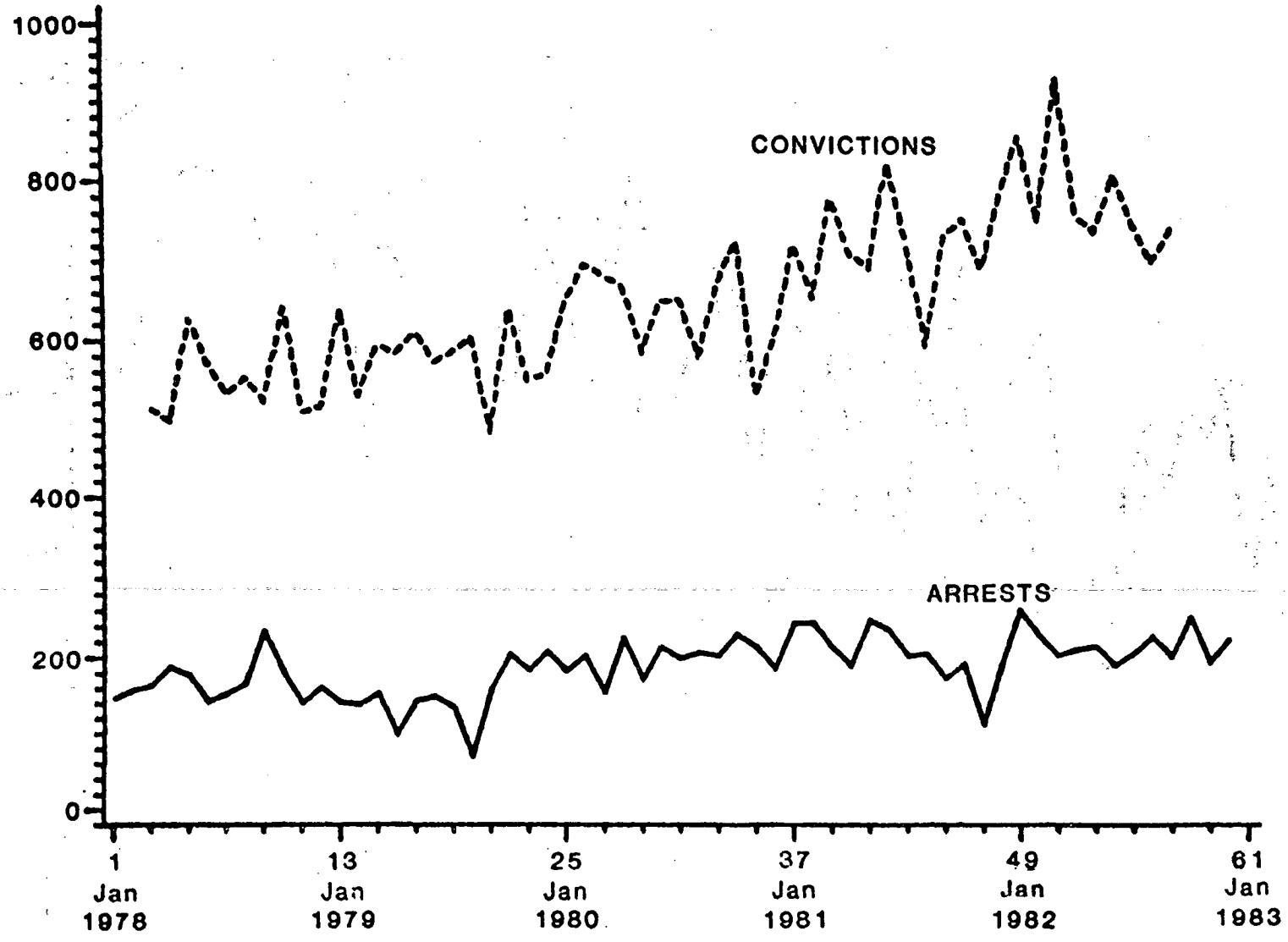

FIGURE 5. MONTHLY DWI CONVICTIONS AND ALCOHOL-RELATED ARREST FREQUENCIES FOR 15 WASHINGTON COUNTIES.

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TABLE 1. STATEWIDE ALCOHOL-RELATED CONVICTIONS

	1978	1979	1980	1981	1982
Number Convicted of DWI	26,308	25,855	30,920	32,979	38,774
Number Convicted of Physical Control	2,220	2,193	2,585	1,854	1,459
Physical Control Reduced from DWI	8,302	7,445	1,575	142	36
Negligent Driving Reduced from DWI	1,340	1,356	2,501	3,565	4,369
Reckless Driving Reduced from DWI	36	16	79	73	88
Total Alcohol-Related Convictions	38,206	36,865	37,660	38,613	44,726

Source: Washington Traffic Safety Commission, 1983

The third independent variable to be examined is the number of persons sentenced to jail for DWI offenses. This poses the most difficult measurement problem due to the expense in collecting the data. Therefore, existing data was utilized as a proxy measure of this variable, specifically, the earlier 1980 evaluation entitled, "The Implementation of SHB-665, The New DWI Law", by the Office of Financial Management. Although somewhat tentative in its conclusions due to the fairly short lapse of time from implementation to evaluation, that study concluded that DWI offenders were being sent to jail in 1980 per the mandate of the law. While detailed data has not been collected to augment the earlier study, there is supplemental information available on an aggregate statewide basis. The best consistent series that reflects jail experience subsequent to 1980 is as follows in Table 2.

TABLE 2. STATEWIDE-AVERAGE DAILY POPULATION OF INMATES INCARCERATED FOR DWI OFFENSES. (LESS KING, PIERCE AND ISLAND COUNTIES)

1981	1st 6 months	93
	2nd 6 months	103
1982	1st 6 months	135
	2nd 6 months	144
1983	1st 6 months	182

Source: Washington Corrections Standards Board, 1983

Considering the data available from the earlier study and the subsequent jail experience in Table 2 above, it appears reasonable to assume that convicted DWI offenders are going to jail in thus-far increasing numbers.

A brief summarization of the quality and quantity of data available for the three independent variables includes:

(1) DWI arrest data appear to accurately portray the activities in the sample cities and counties both prior to and after the January 1, 1980 DWI law implementation date. There is no adequate measure of DWI arrests for the entire State due to partial reporting.

(2) Court convictions for persons arrested for DWI can be measured generally for the sample but not specifically due to the mix of offenders in district courts. There is, statewide, annual conviction data available for alcohol-related traffic offenses.

(3) Jail data are not available for the sample sites or on a statewide basis without additional manual data collection. DWI jail data are available for a certain few cities in 1979 and 1980 from the earlier DWI study, and can also be obtained as an aggregate average for the period since 1981.

Despite the data incongruities, there are obvious compatible trends observed in the comparisons. For the remainder of this study it will be prudent, therefore, to use the measure of DWI arrests as a proxy for the other independent variables (convictions and incarceration). The upward trends in both DWI arrests and convictions (certainty of punishment) with the mandatory jail sentence (severity of punishment) provide support for the existence of a strong deterrent potential that should result in a reduction of alcohol-related traffic accidents.

7. Accident Deterrence: The basic question posed at the outset of this study concerns the relationships, if any, between enforcement, punishment, and alcohol-related traffic accidents. Can we expect to see a decrease in accidents by increasing enforcement and/or certainty and severity of punishment? There are, of course, additional factors to be considered such as changes in overall arrests, total accidents, and/or others that may contribute to changes in alcohol-related

accidents. These additional factors will be discussed in the section that follows. For the sake of clarity, this section will consider only the data concerning the original postulates.

The monthly number of alcohol-related accidents for 1977-1982 for the 41 sample cities is shown in Figure 6. For nearly a year following the implementation of the new DWI law, alcohol-related accidents continued on an increasing trend. Except for seasonal variation, alcohol-related accidents had been increasing at least since January 1977 on average by just over one additional accident a month. In January 1977 there were an average of 378 alcohol-related accidents occurring per month in the 41 sample cities. By December 1980 this figure had increased to 433 alcohol-related accidents per month.

In January 1981, the trend for alcohol-related accidents took a turn for the better. Between January 1981 and December 1982 alcohol-related accidents decreased by more than three alcohol-related accidents each month. By December 1982 the number of alcohol-related accidents had dropped to 354 per month in the 41 sample cities.

With all things held equal, the deterrence hypothesis is supported in the 41 sample cities, with a delay effect of one year.

The monthly number of alcohol-related accidents for the 15 sample counties is depicted in Figure 7. For about the first year and one-half after the implementation of the new DWI law, alcohol-related accidents continued on an increasing trend. Except for seasonal variation, alcohol-related accidents have been increasing at least since January 1977. In January 1977, there were an average of 360 alcohol-related accidents per month in the 15 sample counties. By June 1981 this average had increased to 401 alcohol-related accidents per month.

In July 1981, the trend for alcohol-related accidents for the 15 sample counties changed significantly. Between July 1981 and December 1982, alcohol-related accidents decreased by almost seven fewer alcohol-related accidents each month. By

FIGURE 6.

41 WASHINGTON CITIES: ALCOHOL-RELATED ACCIDENTS, 1977/1982

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: WASHINGTON DEPT. OF TRANSPORTATION

FIRST SLOPE = 1.13
Y ZERO INTERCEPT = 378.07
SECOND SLOPE = -3.31
Y ZERO INTERCEPT = 593.74

FIRST TURNING POINT
X:48.50
Y:433.10

TOTAL SSR =

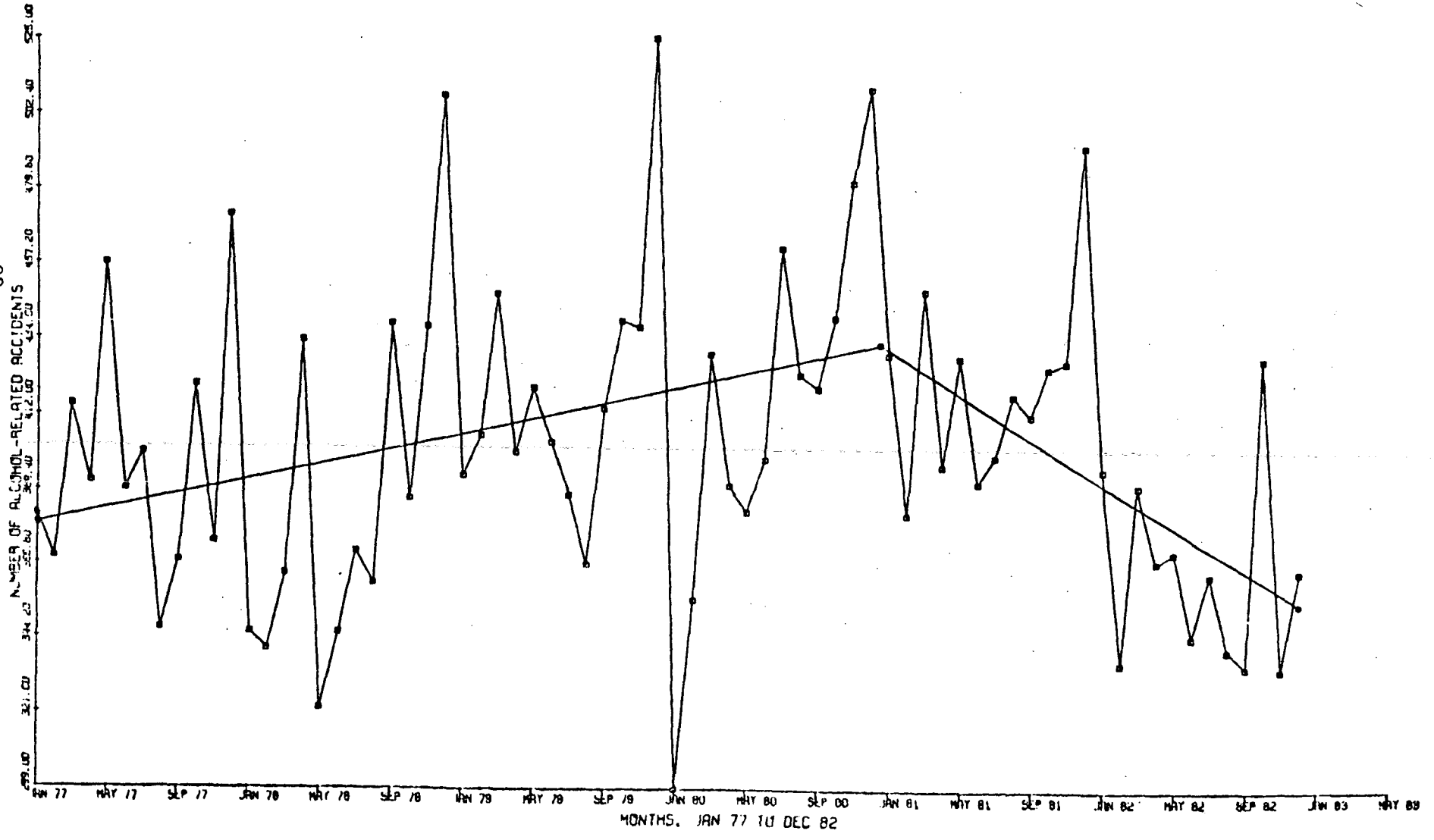

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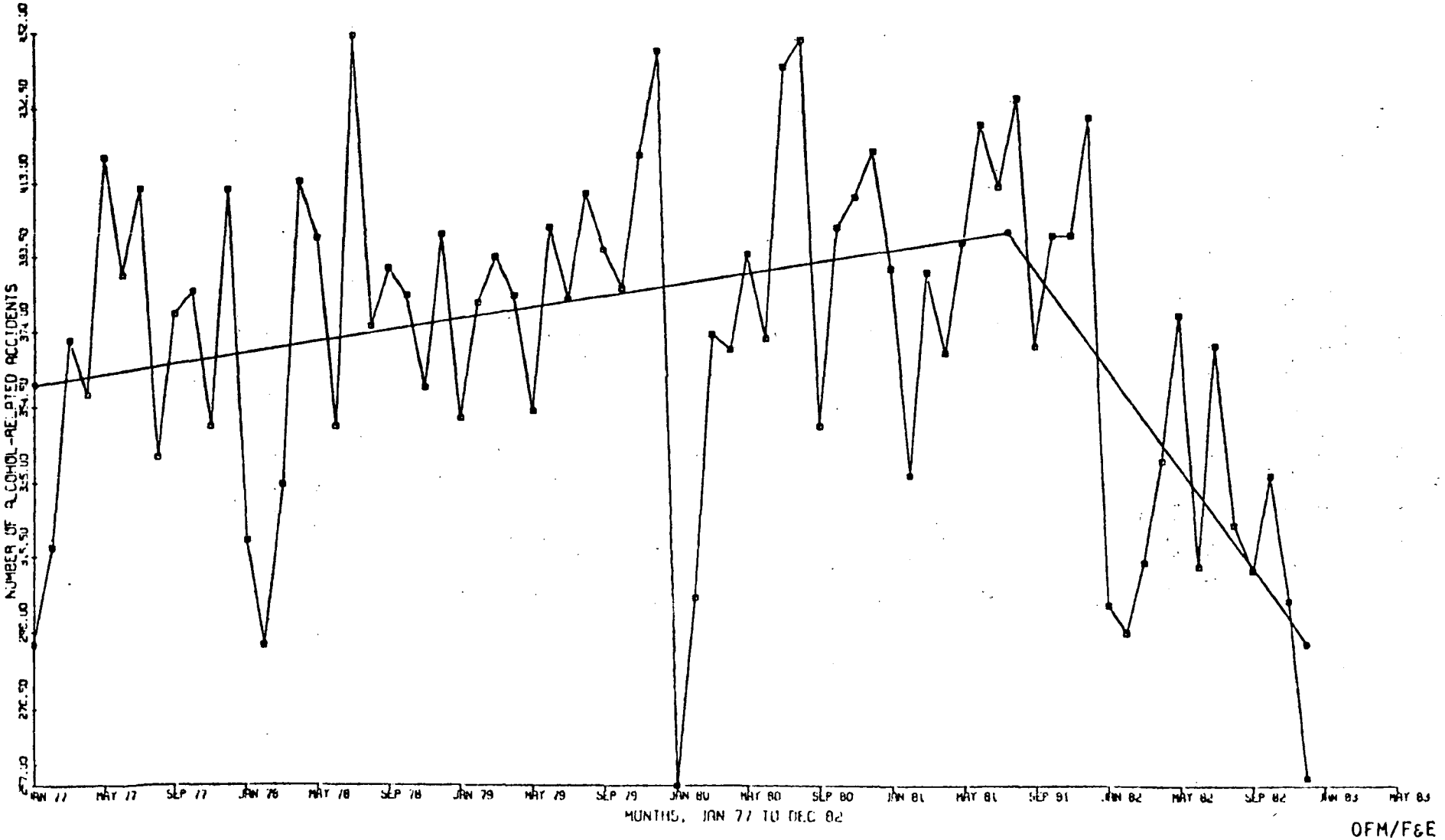
FIGURE 7.

15 WASHINGTON COUNTIES: ALCOHOL-RELATED ACCIDENTS, 1977/1982

RAW DATA SERIES = ①
MULTI-SEGMENT LINE = ⓪
SOURCE: WASHINGTON DEPT. OF TRANSPORTATION

FIRST SLOPE = 0.74
Y ZERO INTERCEPT = 359.50
SECOND SLOPE = -0.52
Y ZERO INTERCEPT = 762.39

FIRST TURNING POINT X=55.50 Y=400.74
TOTAL SSR =



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December 1982 the number of alcohol-related accidents had dropped to an average of 290 in the 15 sample counties.

With all things held equal, the deterrence hypothesis is supported in the 15 sample counties, with an 18 month delayed effect.

It should be remembered that, as discussed in the preceding section, DWI arrests increased substantially in both the sample cities and counties beginning in about August of 1979 and that the new law was signed by the Governor in the spring of 1979 and became effective September 1, 1979, except for the mandatory jail sentence portion of the bill which went into effect January 1, 1980.

Figure 8 depicts the incidents of annual statewide DWI and alcohol-related traffic offense convictions (since statewide DWI arrest data are not available) and alcohol-related accidents from 1978 through 1982. As previously shown, alcohol-related convictions closely follow changes in DWI arrests. Therefore, the statewide increase in convictions can be viewed as an enhanced deterrent.

The annual statewide alcohol-related conviction and accident data provide the same general results as were provided by the more detailed analysis of sample cities and counties. That is, prior to the implementation of the new DWI laws in 1980, alcohol-related convictions were on a decline. During the same period alcohol-related accidents increased. With the implementation of the new DWI laws, the alcohol-related convictions increased--as was the case with DWI arrests in sample cities and counties. However, the apparent impact of the deterrent effect was not evident until 1982, which may represent the amount of lag time that is necessary for the deterrent effect to actually impact the drinking/driving behavior of the general populace.

In summary it can be concluded that, with all things held equal, the data at hand appears to indicate that:

(1) The increase in DWI arrests and convictions after the implementation of the new DWI law are congruent indicators of an enhanced deterrent effect.

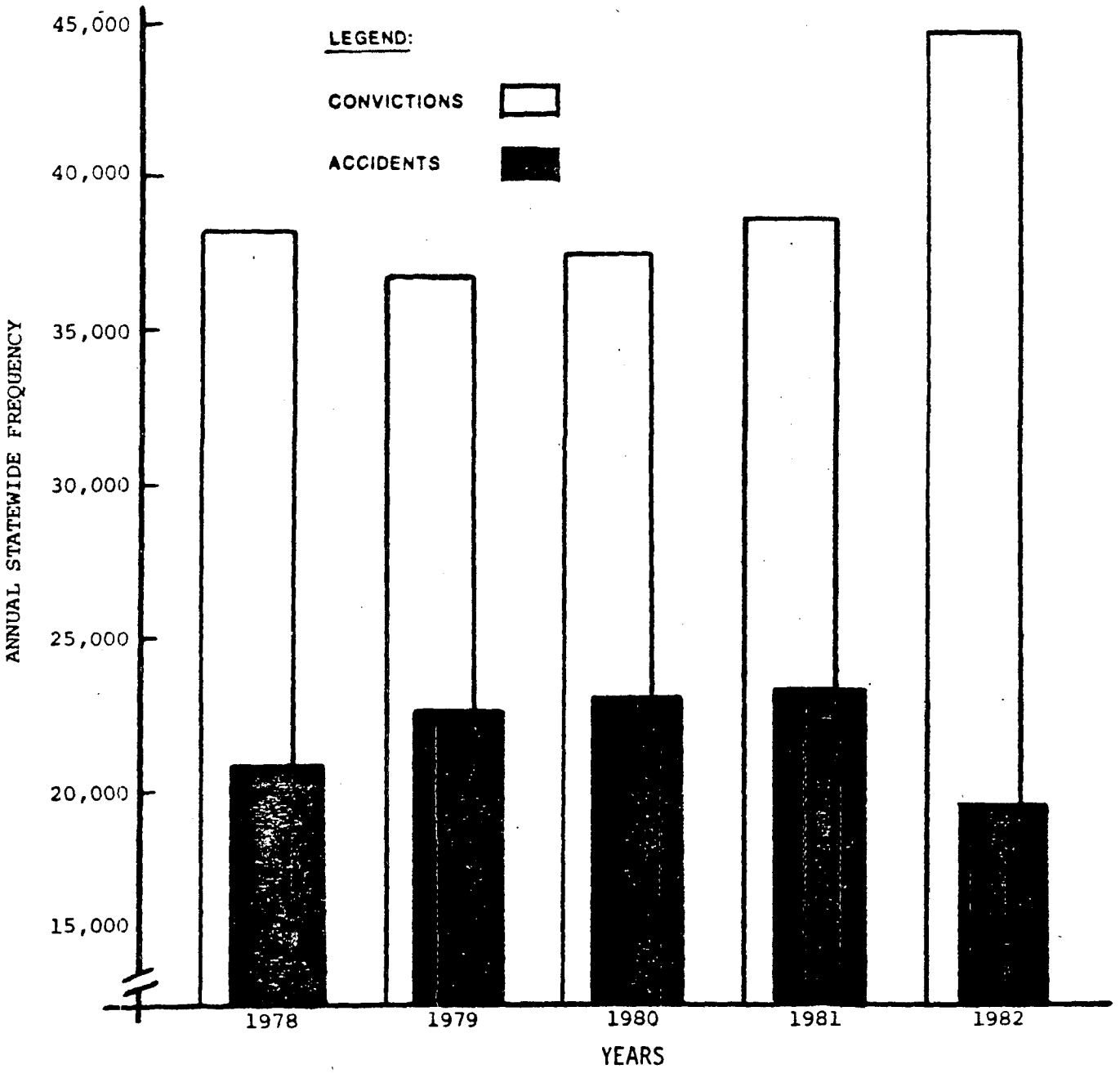

FIGURE 8. DWI CONVICTION AND ALCOHOL-RELATED ACCIDENT FREQUENCIES, 1978 - 1982.

(2) Those convicted of DWI offenses are very likely to serve the mandatory jail time. Thus, both the certainty and severity of punishment for a DWI offense has increased.

(3) After a lag of one to one and one-half years, the impact of the enhanced deterrent effect has caused the alcohol-related accidents to begin to decrease in Washington State.

(4) The nature of the deterrent is not clear, i.e., whether deterrence occurs as the result of the perception of an increased threat to arrest, conviction, and incarcerate or as a result of actually being arrested and punished. However, the year lag in realized effects possibly may be attributed to the time it has taken for DWI offenders to "understand" the full impact of the tougher DWI laws and start to change their behavior.

8. Discussion: The analysis of the impact of social programs is rarely straightforward. In many situations, evidence is only circumstantial or indirect. In this case, the results of the preceding comparison of DWI enforcement with alcohol-related traffic accidents appear positive. Regardless of how tantalizing this tentative finding may be, it assumes that all other influences were held constant.

Since these processes are not intrinsically free of external influences (rival hypotheses), we must examine potential alternative or modifying explanations for the reduction in alcohol-related accidents. It is also possible that the apparent relationship between DWI deterrence efforts and reduction in alcohol-related accidents is nonexistent or spurious. Areas to be considered are: (a) The relationship of the changes in alcohol-related accidents to other traffic accidents. (b) The relationship of the changes in DWI arrests to non-DWI arrests. (c) A comparison of resource allocation in DWI enforcement.

a. Relationship in Alcohol-Related Accidents to Non-Alcohol-Related Traffic Accidents: The possibility here is that alcohol-related traffic accidents have decreased along with a general decline in non-alcohol-related traffic accidents rather than as a result of increased DWI enforcement. If alcohol-related accidents

vary in consonance with non-alcohol-related accidents then alcohol-related accidents could be interpreted as being determined by other general highway safety efforts, such as safer automobiles and highways, the number of miles driven, and reduced speed limits.

As Table 3 shows, the number of non-alcohol-related accidents has declined annually since 1980 in the 41 sample cities and since 1977 in the 15 sample counties. It can be argued that the factors that influenced this decline in non-alcohol-related accidents may also have influenced the decline in alcohol-related accidents.

This may be the case, at least in part. The extent to which the two types of accidents are similar or dissimilar is best explored by further examination of the annual data in Table 3 and the monthly data in the Ertel-Fowlkes time-series analyses. Note in Table 3, although alcohol-related accidents declined irregularly over the 1977/1982 period, they were much more resistent to the consistent downward trend seen in non-alcohol-related accidents. The Ertel-Fowlkes examination of the

TABLE 3. ALCOHOL AND NON-ALCOHOL-RELATED ACCIDENTS FOR SAMPLE COUNTIES AND CITIES: 1977 - 1982

		1977	1978	1979	1980	1981	1982
41 City Sample							
Total drivers in non-alcohol-related accidents	Number:	22,772	21,929	22,727	20,995	20,846	18,495
	% Chg.:		-3.7	+3.6	-7.6	-0.7	-11.3
Drivers in alcohol-related accidents	Number:	4,788	4,658	5,045	4,997	5,056	4,378
	% Chg.:		-2.7	+8.3	-0.9	+1.2	-13.4
15 County Sample							
Total drivers in non-alcohol related accidents	Number:	23,642	23,314	22,612	20,745	20,280	18,520
	% Chg.:		-1.4	-3.0	-8.3	-2.2	-8.6
Drivers in alcohol-related accidents	Number	4,430	4,474	4,713	4,553	4,765	3,853
	% Chg.:		+0.1	+5.3	-3.4	+4.6	-19.1

monthly accident data supports the relative independence of non-alcohol and alcohol-related accidents. Figures 6, 7, 9, and 10 depict the relationship between alcohol and non-alcohol-related accidents for the sample cities and counties. Non-alcohol-related accidents have been on a gradual decline since 1977 in both cities and counties (with the single exception of an increase in non-alcohol-related accidents late in 1978 for the sample counties). Contrary to the non-alcohol-related accident trend is the continual increase from 1977 of alcohol-related accidents until December 1980 in the cities and July 1981 in the counties, when the first time in recent history they started on a downward trend. Overall, it appears from the time-series graphs and the annual data that alcohol-related accidents do not necessarily change in consonance with non-alcohol-related accidents.

b. Relationships in Changes in DWI Arrests to Non-DWI Arrests: In order to evaluate DWI arrest activities it was deemed advisable to also examine enforcement activities other than DWI. The purpose of this examination is to determine if DWI arrests change independently or if they change in concert with broader police criminal apprehension efforts. If DWI arrests change only in concert with other significant law enforcement activity, doubt could be raised regarding the relationship between new DWI laws and any subsequent increase in DWI arrests.

Changes in burglary and aggravated assault were selected to compare to changes in DWI arrests. Burglary represents property crime activity and aggravated assault represents violent crime activity. Tables 4 and 5 present the data for these comparisons for the same cities and counties.

FIGURE 9.

15 COUNTIES: NON-DWI TRAFFIC ACCIDENTS, 1977-1982

RAW DATA SERIES = □
MULTI-SEGMENT LINE = ⊙
SOURCE: WASHINGTON DEPT OF TRANSPORTATION

FIRST SLOPE = -15.49	FIRST TURNING POINT	X:17.50
Y ZERO INTERCEPT = 2019.28		Y:1748.15
SECOND SLOPE = 115.52	SECOND TURNING POINT	X:23.50
Y ZERO INTERCEPT = -273.40		Y:2401.26
THIRD SLOPE = -114.78	THIRD TURNING POINT	X:29.50
Y ZERO INTERCEPT = 5136.70		Y:1752.55
FOURTH SLOPE = -3.63	TOTAL SSR =	
Y ZERO INTERCEPT = 1859.63		

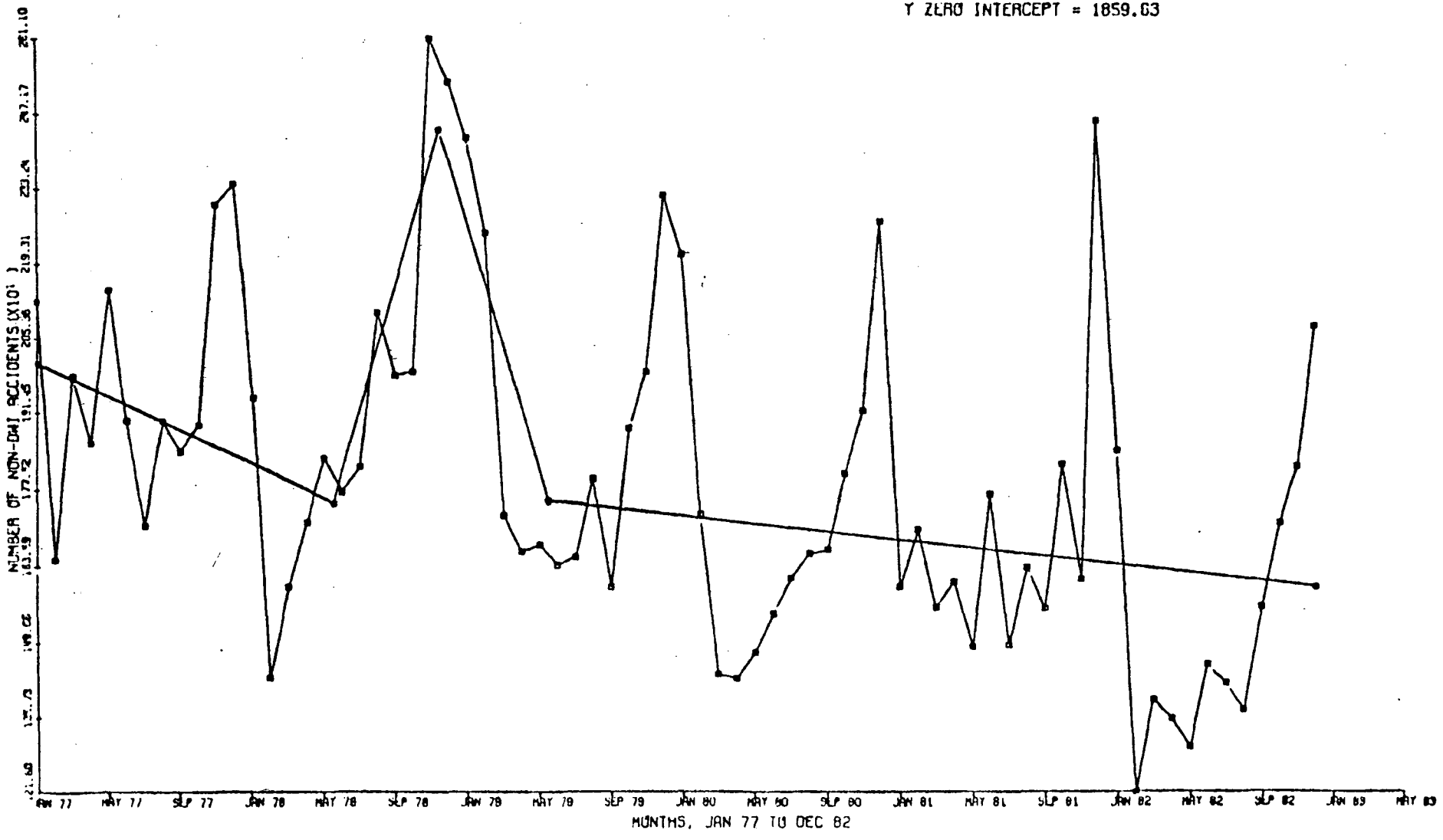

FIGURE 10.

41 CITIES: NON-DWI TRAFFIC ACCIDENTS, 1977-1982

RAW DATA SERIES = ⊡
MULTI-SEGMENT LINE = ⊙
SOURCE: WASHINGTON DEPT OF TRANSPORTATION

FIRST SLOPE = -4.19 TOTAL SSR =
Y ZERO INTERCEPT = 1927.41

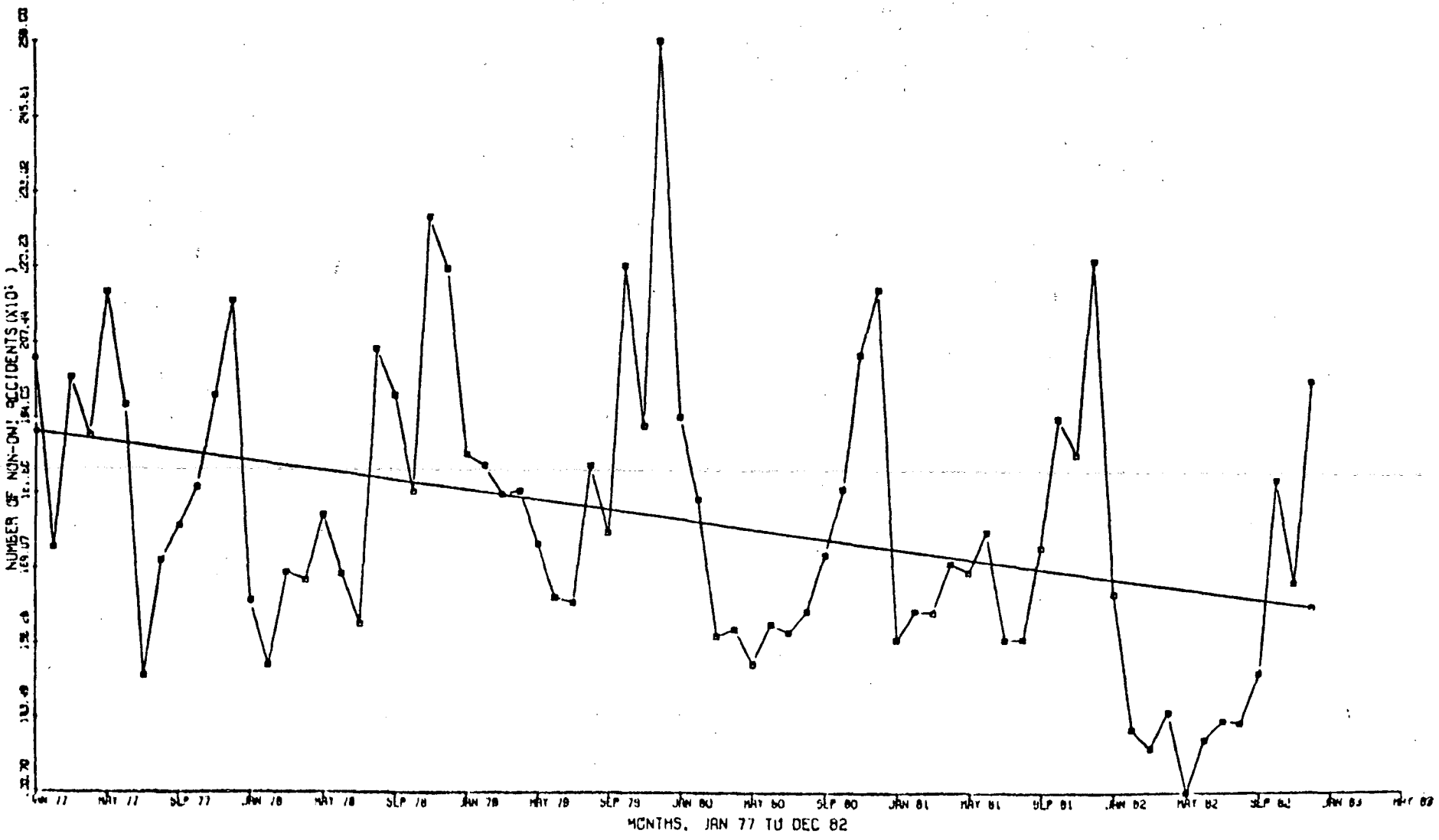

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TABLE 4. 41 CITIES ARRESTS COMPARISON

Year	DWI Arrest	Annual Change	Assault Arrest	Annual Change	Burglary Arrest	Annual Change
1976	6,306		704		2,279	
1977	6,918	+ 9.7%	690	- 2.0%	2,273	- 0.3%
1978	5,985	-13.5%	673	- 2.5%	2,700	+18.8%
1979	5,781	- 3.4%	776	+15.3%	2,788	+ 3.3%
1980	6,376	+10.3%	782	+ 0.7%	2,910	+ 4.4%
1981	7,936	+24.5%	820	+ 4.9%	2,752	- 5.4%
1982	8,157	+ 2.8%	796	- 2.9%	2,838	+ 3.1%

TABLE 5. 15 COUNTIES ARRESTS COMPARISON

Year	DWI Arrest	Annual Change	Assault Arrest	Annual Change	Burglary Arrest	Annual Change
1976	2,147		375		1,794	
1977	1,998	- 6.9%	325	-13.3%	1,851	+ 3.2%
1978	2,020	+ 1.1%	355	+ 9.2%	1,996	+ 7.8%
1979	1,778	-11.9%	472	+32.9%	1,864	- 6.6%
1980	2,396	+34.8%	402	-14.8%	1,860	- 0.2%
1981	2,463	+ 2.8%	452	+12.4%	2,206	+18.6%
1982	2,619	+ 6.3%	480	+ 6.2%	2,119	- 3.9%

Here it can be seen that DWI arrests in the sample cities and counties were either unstable or on a downward-trend prior to 1980. After 1980, DWI arrests in both cities and counties show a reasonably strong upward trend. The assault and burglary arrest patterns for the sample cities and counties suggests a general upward trend, albeit highly variable, for 1976-1982. The dissimilarity between DWI arrest trends and the broader criminal justice trends supports the argument for the independence of DWI arrest activities. This strengthens the claim that the 1979 change in the DWI laws contributed to an increase in DWI enforcement activity.

c. Comparison of Resource Allocation and DWI Enforcement: It has been surmised that the increase in DWI arrests is simply due to manpower increases. Table 6 shows the relationship between manpower, DWI arrests, and enforcement

efficiency (DWI arrests per officer-month). An examination of this table suggests an inconsistent relationship between available manpower and DWI arrests. However, the DWI arrests per officer month shows that for each enforcement agency there has been a constant increase in the DWI arrest rate since 1980. Even in 1982 when the sample cities and the Washington State Patrol experienced a decrease in manpower, law enforcement efficiency increased.

TABLE 6. LAW ENFORCEMENT MANPOWER AND EFFICIENCY

	41 CITIES			15 COUNTIES			STATE PATROL		
Year	Man Months	DWI Arrest	Arrest Per Officer Per Mo.	Man Months	DWI Arrest	Arrest Per Deputy Per Mo.	Man Months	DWI Arrest	Arrest Per Officer Per Mo.
1976	17,244	6,306	.365	9,492	2,147	.226	-	-	-
1977	16,908	6,918	.409	9,072	1,998	.110	9,432	17,879	1.896
1978	17,256	5,985	.346	9,516	2,020	.210	9,360	17,768	1.898
1979	17,208	5,781	.335	9,852	1,778	.180	9,432	16,369	1.735
1980	17,796	6,376	.358	10,764	2,396	.222	9,708	15,779	1.625
1981	17,900	7,936	.448	11,040	2,463	.223	9,732	17,556	1.804
1982	17,556	8,157	.465	11,088	2,619	.236	9,132	17,148	1.878

d. Summary: Based upon the data collected and the analyses performed, the investigators feel the following conclusions are warranted:

(1) The stringent 1979 DWI law was implemented efficiently (in the sample cities and counties) by law enforcement organizations, prosecutors, courts, and jails. Arrests for DWI started to rise dramatically in late 1979 after passage of the new DWI law (SHB-665). In the 41 sample cities there has been a steady increase of 6.5 additional arrests per month. At the end of 1979, there were 474 DWI arrests made per month in the 41 sample cities. At the end of 1982, there were 706 DWI arrests made per month in the same cities. DWI arrests in the sample counties increased by approximately 41% in the six months following the effective date of the new legislation. DWI law enforcement by cities, counties, and State Patrol has grown more efficient since 1980. That is, more DWI arrests are being made per officer or deputy. On a statewide basis DWI convictions by the courts generally kept pace with the increase in DWI arrests. Jailers continue to report

a steady influx of more DWI offenders each year since 1980. Data from the Corrections Standards Board shows that the number of DWI offenders in jail has doubled since 1981.

(2) In spite of a long-term decreasing trend in non-DWI traffic accidents, alcohol-related accidents continued to climb in the 1977 to 1981 period. However, after approximately one year of increased enforcement, prosecution, and incarceration, alcohol-related accidents showed a significant decrease. In the 41 sample cities there has been a 20 percent decrease in the number of alcohol-related accidents per month. In the 15 sample counties there has been a 28 percent decrease in the number of alcohol-related accidents per month.

(3) The one year lag in realized effects may be attributed to the time it has taken for DWI offenders to understand the full impact of the tougher DWI laws and start to change their behavior.

B. The Effect of the 1979 Washington State Driving While Intoxicated (DWI) Law on Drunk Driving Recidivism

1. Introduction: Drunk driving laws are ultimately intended to deter individuals from driving while intoxicated (DWI) and thereby reduce the deaths and injuries that result from such behavior. These laws provide for two mechanisms to accomplish their intended purpose: general deterrence and specific deterrence. General deterrence derives from the public's fear of apprehension and punishment for DWI. To the extent that the general public perceives the legal sanctions for DWI as severe and that the chances of apprehension are great, individuals presumably will avoid driving after drinking. Specific deterrence refers to the effect of the actual punishment received by those individuals who are arrested and convicted of DWI. The legal sanctions applied to the convicted offender are intended to discourage subsequent DWI incidents. It is presumed the severity of punishment will determine the degree of specific deterrence.

In 1979 a new DWI law was enacted in the State of Washington (Substitute House Bill 665). It was implemented on January 1, 1980. This law made several important changes in the definition of and the penalties for conviction of DWI.

The law required a mandatory minimum jail sentence of one day for a first conviction and seven days for a second or subsequent offense and made it illegal per se to drive when a person's blood alcohol concentration (BAC) is .10 percent or greater. Previously the law made only a presumption that a person was under the influence at a BAC of .10 percent or more. Additional features of the law were a suspended jail sentence of up to 180 days conditioned upon nonrepetition, alcohol treatment, probation, or other appropriate conditions, and a requirement for first offenders to attend alcohol information school. The law also made the penalties for physical control of a vehicle while under the influence equivalent to the penalties for DWI.

The intent of this law was to increase both the certainty of conviction (with the illegal per se provision) and the severity of punishment (with the mandatory jail requirement). It was presumed that implementation of these provisions would result in both general and specific deterrence of drunk driving.

The intent of the law (i.e., reduction of drunk driving and the accidents that result) represents a societal objective with a broad consensus. The method chosen to attain that objective places a heavy burden on the judicial system. It is important to ask whether the investment of societal resources has produced the intended outcome. The purpose of this portion is to address one facet of this question. The study is designed to examine the specific deterrence effect of the law; i.e., did the law have an impact on the rates of drunk driving and accidents of those individuals prosecuted and convicted under the new law as compared to the recidivism rates experienced under the old law? The major comparisons are among first offenders (new versus old law) and multiple offenders (new versus old law). To provide a baseline for these comparisons, a sample of drivers convicted of non-alcohol offenses during the corresponding time period of the new and old laws were also compared. These drivers provide an assessment of drunk driving convictions among drivers having no previous alcohol-related convictions on their records. The time periods examined in the study are 1978 and 1980, corresponding to the old law and new law respectively.

2. Method

a. Data Base: The data source for the study was a computer file of selected records from the Department of Licensing (DOL) driver record system. The program that created the file read the entire driver record file and selected all records having alcohol-related convictions during the time period 1978 to 1982. The program also selected every 100th record from the file to provide a sample of the general driving population.

Each record included the driver's sex, birthdate, county of residence, DOL action codes, a maximum of the 15 most recent violations, and a maximum of seven most recent accidents. These cutoff points were chosen so as to maximize the completeness of the data while minimizing computer storage requirements. Thus, a complete record was available for drivers that had fewer than 15 violations and seven accidents, while only the most recent violations and accidents were included for drivers that had more. Records that exceeded those cutoff points comprised less than two percent of the file, however. The data elements for each violation included violation date, conviction date, and violation code. Accident data consisted of accident date, injury and fatality information, and sobriety level as subjectively determined by the investigating officer.

The file was created on December 31, 1982 and included all reports of convictions and accidents received by the Department and entered on the record system as of that date. The file contained driving records covering the time period of 1977 to 1982. However, the records of 1982 were incomplete due to time lags in the reporting of convictions and accidents to the Department.

b. Subjects: The subjects selected for the study from the data base were drivers that had valid licenses. Records for drivers who had never obtained a Washington license were excluded, as were records with expired licenses. Subjects in the DWI groups (both first and multiple offenders) were selected from a 50 percent random sample of the alcohol-related offender records.

The study groups consisted of three sets of paired-comparison groups: (1) the first DWI offenders, (2) multiple DWI offenders, and (3) non-DWI offenders. DWI first offenders were subjects who committed a DWI violation and were convicted of the offense during either 1978 or 1980. A subject was selected for the study only if both the violation date and conviction date occurred during 1978 or both occurred during 1980. The driving records of these subjects had no other alcohol-related offenses prior to the conviction date. Subjects convicted in 1980 had been prosecuted under provisions of the new law and 1978 offenders had been prosecuted under the old law. Multiple offenders committed and were convicted of a DWI offense during either 1978 or 1980 and also had additional alcohol-related violations on their records during the one-year period prior to their 1978 or 1980 conviction dates. (Since the record observation time periods were limited to one year prior and one year subsequent to the subject's conviction date, any alcohol-related offenses that occurred more than one year prior created a problem in classifying a subject as a first or multiple offender. These subjects were excluded from the study.) The Non-DWI Offender (NDO) subjects were selected from the general driving population sample and consisted of subjects that had a non-alcohol-related violation and conviction during 1978 and 1980 and also had no prior alcohol-related offenses on their records.

In all groups, if a subject had more than one selectable offense during a one-year time period (e.g., two DWI convictions in 1980), the date of the first conviction was used to determine the pre- and post-conviction tracking periods. Also, any subject that had selectable convictions in both 1978 and 1980 was arbitrarily assigned to the old law group.

c. Evaluation Design: The six study groups are defined by a violation/conviction year (1978 vs 1980) and by the offense committed (first DWI, multiple DWI, or non-alcohol-related)(See Figure 11.) The sample sizes for the six groups were 3,724 for 1978 first offenders, 4,411 for 1980 first offenders, 197 for 1978 multiple offenders, 189 for 1980 multiple offenders, 2,977 for 1978 NDO subjects, and 2,254 for 1980 NDO subjects.

	Arrested and Convicted in 1978	Arrested and Convicted in 1980
First DWI Offenders	(N=3724)*	(N=4411)
Repeat DWI Offenders	(N=197)	(N=189)
Non-DWI Offenders	(N=2977)	(N=2254)

*Sample size of subjects in each Cell.

FIGURE 11. SPECIFIC DETERRENCE STUDY DESIGN (2x3 FACTORIAL).

There were two dependent variables that provided the primary assessment of the impact of the law: alcohol-related violations and total accidents (both alcohol-related and non-alcohol accidents). Alcohol-related violations consisted of reported convictions for DWI, physical control, and all convictions reduced from an original DWI charge. Accidents included reports of accident investigations conducted by law enforcement personnel and reports submitted by individual drivers. The financial responsibility law requires reporting of accidents that result in property damage exceeding $300.00 or injury or death. The variables were defined as frequency counts of violations/accidents for the one-year period subsequent to the date of the subject's conviction for DWI (or non-DWI conviction for the NDO group). Frequency counts were also made for one year prior to the conviction date to provide an assessment of the subject's previous driving record. Thus, subjects in the 1980 (new law) group had post-conviction records covering 1980 and 1981 and the prior records for 1979 and 1980. The specific time period for each subject depended upon the date of the subject's 1980 conviction. Similarly, the 1978 (old law) group was tracked during 1977 and 1978 for prior driving and 1978 and 1979 for subsequent driving performance.

Additional dependent variables were also examined. These variables were pre- and post-conviction frequency counts of moving violations (non-alcohol-related), non-moving violations, and two subsets of accidents: alcohol-related accidents and injury/fatal accidents. Alcohol-related accidents were not used as a primary

dependent measure because of reporting artifacts associated with the accuracy of police judgments of sobriety and missing data.

d. Statistical Analysis: The data were analyzed by group comparisons of 1978 offenders vs 1980 offenders. These comparisons were made separately for each offender group: first DWI, multiple DWI, and NDO. A 2 by 3 factorial analysis of variance was considered inappropriate due to the distortion of interaction effects by the unbalanced sample sizes in the six study groups.

The NDO groups provided a baseline for the comparisons of the DWI groups. Specifically, any changes in recidivism between DWI offenders convicted under the old law vs new law were assessed relative to any change in DWI violations of drivers who had not been previously convicted for an alcohol-related offense. Thus, the NDO group provided a control for the general effects of different levels of DWI enforcement and adjudication during the two time periods examined in the study.

A total of six statistical comparisons were made: the two primary dependent variables were assessed for each of the three pair-wise comparison groups. A conservative significance level of .01 was used to compensate for the effect of multiple comparisons. The binomial probability of obtaining one or more significant effects by chance out of six comparisons using alpha = .01 is .0585. Thus, the overall significance level across the six statistical tests was .0585 using a .01 level for each individual comparison. All comparisons were two-tailed. Statistical tests were not made for the secondary dependent variables in order to minimize the multiple comparisons problem. Data are reported for these variables on a descriptive level only.

3. Results

a. Post-Conviction Driving Performance: Table 7 summarizes post-conviction alcohol-related violations. The data reported are mean number of violations per 100 subjects. DWI first offenders averaged 7.44 violations under the new law as compared to 6.31 under the old law. This difference was not significant ($t = 1.88$). Multiple offenders convicted in 1980 had an alcohol-related violation rate

of 14.29 relative to 10.15 in 1978, however, this difference failed to reach significance (t = 1.04). Non-DWI offenders had a drunk driving violation rate of 1.77 in 1980 and a rate of 1.58 in 1978; also a non-significant difference (t = 0.50).

TABLE 7. POST-CONVICTION ALCOHOL-RELATED VIOLATION RATES (VIOLATION FREQUENCY PER 100 SUBJECTS).

	MEAN / COUNT / STD DEV	OLD LAW	NEW LAW	ROW TOTAL
		78	80	
GROUP				
1		6.31	7.44	6.92
1ST DWI		3724	4411	8135
		25.08	28.48	26.98
2		10.15	14.29	12.18
MULT DWI		197	189	386
		39.10	39.37	39.24
3		1.58	1.77	1.66
NDO		2977	2254	5231
		13.25	14.18	13.66
COLUMN TOTAL		4.38	5.76	5.07
		6898	6854	13752
		21.57	25.29	23.50

These comparisons do not suggest a reduction in drunk driving recidivism following implementation of the new law. All three comparisons show a trend towards increased DWI violations, a result which would be consistent with an increased level of DWI enforcement. It is possible that greater enforcement could have produced increased DWI rates among the general driving population, while the recidivism rates of 1980 DWI offenders showed a smaller percentage increase. Such a result would be consistent with the hypothesis of reduced recidivism among offenders convicted under the new law. The actual percentage increases in alcohol-related violations from 1978 to 1980 were 17.9 percent for first offenders, 40.8 percent for multiple offenders, and 12.0 percent for the NDO sample. Apparently, the recidivism rates for 1980 DWI offenders cannot be totally attributed to an increase in the general level of enforcement of DWI laws.

It is of interest to note that the recidivism rate of first offenders was roughly four times higher than the rate of initial alcohol-related offenses among the NDO

sample, and that recidivism among multiple offenders was nearly twice that of first offenders. These data suggest that the probability of alcohol-related offenses increase as a function of the number of prior alcohol offenses.

The post-conviction accident rates (per 100 subjects) did not change significantly for either first offenders (t = 0.99) or multiple offenders (t = 0.70), but did decrease significantly for the NDO group (t = 2.57). This decrease in accidents among the NDO subjects is consistent with other reports showing reductions in accidents among the general driving public (Washington Traffic Safety Commission, 1982). The fact that similar reductions did not occur among the DWI offenders suggests that the new law had no specific deterrence effect on accident involvement. In terms of percentage change from 1978 to 1980, the accident rates for first offenders increased 7.9 percent, increased 32.8 percent for multiple offenders, and decreased 20.7 percent among the NDO sample, (See Table 8.)

Comparison of the overall accident rates across the three offender groups showed that the NDO group had the highest rate (10.50), followed by first offenders (8.68), and multiple offenders had the lowest accident rate (6.48).

TABLE 8. POST-CONVICTION ACCIDENT RATES
(ACCIDENT FREQUENCY PER 100 SUBJECTS).

	MEAN / COUNT / STD DEV	OLD LAW	NEW LAW	ROW TOTAL
		78	80	
GROUP				
1		8.32	8.98	8.68
1ST DWI		3724	4411	8135
		29.05	30.80	30.01
2		5.58	7.41	6.48
MULT DWI		197	189	386
		23.02	28.21	25.68
3		11.52	9.14	10.50
NDO		2977	2254	5231
		34.56	31.19	33.17
COLUMN TOTAL		9.63	8.99	9.31
		6898	6854	13752
		31.45	30.86	31.16

Table 9 summarizes the post-conviction moving violations and non-moving violations. The overall pattern of moving violations rates was similar to the accident data. DWI offenders appear to have accumulated more moving violations following their 1980 conviction than did the 1978 DWI offenders. NDO subjects, in contrast,

TABLE 9. POST-CONVICTION MOVING VIOLATION AND NON-MOVING VIOLATION RATES (FREQUENCY PER 100 SUBJECTS).

MOVING VIOLATIONS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		28.79	32.08	30.57
1ST DWI		3724	4411	8135
		64.09	68.30	66.42
2		21.32	31.22	26.17
MULT DWI		197	189	386
		53.95	67.07	60.85
3		43.13	42.28	42.76
NDO		2977	2254	5231
		77.04	81.76	79.10
COLUMN TOTAL		34.76	35.41	35.09
		6898	6854	13752
		70.11	73.12	71.62

NON-MOVING VIOLATIONS

	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		16.14	15.89	16.00
		3724	4411	8135
		51.25	51.23	51.24
2		39.09	24.87	32.12
		197	189	386
		88.32	58.94	75.62
3		8.97	7.99	8.55
		2977	2254	5231
		36.71	38.25	37.38
TOTAL		13.70	13.54	13.62
		6898	6854	13752
		47.46	47.78	47.62

showed little difference in moving violations rates between 1978 and 1980. The rates for non-moving violations show little change for first offenders and the NDO subjects. In contrast, the data suggest a substantial decrease among multiple offenders. A large part of this change is attributable to decreased convictions for driving while suspended or revoked. Multiple offenders had a 17.26 rate of these violations in 1978 and a 11.11 rate in 1980.

The results for alcohol-related accidents and injury/fatal accidents are shown in Table 10. The alcohol-related accident rates reflect substantial under-reporting on the DOL record system. The 0.13 rate for the NDO sample when multiplied by 2.732 million licensed drivers in 1981 yields an estimate of 3,552 alcohol-

related accidents. However, WTSC records (1982) indicate that 23,228 drivers were involved in alcohol-related collisions during 1981. Thus, the present data must be interpreted with extreme caution. Assuming the reporting bias is constant from 1978 to 1980, the available data do not suggest a reduction in drunk driving accidents among 1980 DWI offenders.

TABLE 10. POST-CONVICTION ALCOHOL-RELATED ACCIDENT RATES AND INJURY/FATAL ACCIDENT RATES (FREQUENCY PER 100 SUBJECTS)

ALCOHOL-RELATED ACCIDENTS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		0.30	0.54	0.43
1ST DWI		3724	4411	8135
		5.43	7.36	6.55
2		0.0	0.53	0.26
MULT DWI		197	189	386
		0.0	7.27	5.09
3		0.13	0.13	0.13
NDO		2977	2254	5231
		3.66	3.65	3.66
COLUMN TOTAL		0.22	0.41	0.31
		6898	6854	13752
		4.66	6.38	5.58

INJURY/FATAL ACCIDENTS

	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		1.10	0.97	1.03
		3724	4411	8135
		10.44	9.83	10.11
2		1.02	0.0	0.52
		197	189	386
		10.05	0.0	7.19
3		1.85	1.24	1.59
		2977	2254	5231
		13.96	11.08	12.80
TOTAL		1.42	1.04	1.23
		6898	6854	13752
		12.08	10.13	11.15

Injury and fatal accidents show a 33.0 percent decrease for the NDO sample relative to an 11.8 percent decrease for first offenders. The sample sizes for multiple offenders are too small to permit a meaningful comparison. Although a reduction occurred for first offenders, the size of that decrease was not greater than that experienced by the NDO subjects.

b. Characteristics of the Study Groups: The mean age and percent males in each group is shown in Table 11. In general, there were minor differences in age and sex characteristics of the 1978 and 1980 offenders. In the first offender group, 1980 subjects were about a year younger than 1978 subjects, while 1980 NDO subjects averaged about one year older than 1978 NDO subjects. There was a two

year difference among multiple offenders. The NDO subjects averaged two years younger than the DWI offender groups. The percentage of males decreased for first offenders and NDO offenders while it increased for multiple offenders. There were substantially more males in the DWI of offender groups than the NDO groups.

TABLE 11. MEAN AGE AND PERCENT MALES IN THE SIX STUDY GROUPS

MEAN AGE

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1	MEAN	34.98	34.01	34.46
1ST DWI	COUNT	3724	4411	8135
	STD DEV	13.19	13.05	13.12
2	MEAN	33.64	35.55	34.58
MULT DWI	COUNT	197	189	386
	STD DEV	12.42	13.19	12.82
3	MEAN	31.95	32.94	32.37
NDO	COUNT	2977	2254	5231
	STD DEV	13.72	13.84	13.78
COLUMN TOTAL	MEAN	33.64	33.70	33.67
	COUNT	6898	6854	13752
	STD DEV	13.48	13.33	13.41

PERCENT MALES

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1	MEAN	86.44	84.52	85.40
1ST DWI	COUNT	3724	4411	8135
	STD DEV	34.24	36.18	35.32
2	MEAN	89.85	92.59	91.19
MULT DWI	COUNT	197	189	386
	STD DEV	30.28	26.26	28.38
3	MEAN	69.63	66.15	68.13
NDO	COUNT	2977	2254	5231
	STD DEV	45.99	47.33	46.60
TOTAL	MEAN	79.28	78.70	78.99
	COUNT	6898	6854	13752
	STD DEV	40.53	40.95	40.74

The prior driving records of the study groups are summarized in Table 12. In general, the 1978 and 1980 group's prior records were comparable. Prior alcohol-related violations were identical for 1978 and 1980 first offenders and for the NDO groups. Multiple offenders in 1980 had 3.2% more prior alcohol-related offenses than 1978 multiple offenders. The accident rates were higher among 1980 DWI offenders than for the 1978 groups while this difference was reversed for the NDO groups.

First offenders had more moving violations and fewer non-moving violations prior to their 1980 conviction than did 1978 first offenders. These differences were reversed for multiple offenders and the NDO groups. Alcohol-related accidents

TABLE 12. PRE-CONVICTION VIOLATION AND ACCIDENT RATES (FREQUENCY PER 100 SUBJECTS).

ALCOHOL-RELATED VIOLATIONS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		100.00	100.00	100.00
1ST DWI		3724	4411	8135
		0.0	0.0	0.0
2		201.52	207.94	204.66
MULT DWI		197	189	386
		12.28	32.46	24.53
3		0.0	0.0	0.0
NDO		2977	2254	5231
		0.0	0.0	0.0
COLUMN TOTAL		59.74	70.09	64.90
		6898	6854	13752
		54.72	52.39	53.82

ACCIDENTS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		20.89	24.53	22.86
		3724	4411	8135
		45.93	48.06	47.13
2		30.46	32.28	31.35
		197	189	386
		55.20	57.11	56.08
3		15.65	13.66	14.80
		2977	2254	5231
		39.95	36.97	38.70
TOTAL		18.90	21.17	20.03
		6898	6854	13752
		43.87	45.32	44.61

MOVING VIOLATIONS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		49.73	55.77	53.01
1ST DWI		3724	4411	8135
		82.78	90.02	86.83
2		74.11	69.84	72.02
MULT DWI		197	189	386
		102.97	91.04	97.21
3		110.04	108.61	109.42
NDO		2977	2254	5231
		58.51	56.97	57.85
COLUMN TOTAL		76.46	73.53	75.00
		6898	6854	13752
		79.69	84.37	82.06

NON-MOVING VIOLATIONS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		19.50	17.77	18.56
		3724	4411	8135
		56.64	56.11	56.36
2		37.56	40.74	39.12
		197	189	386
		89.84	86.80	88.26
3		17.16	18.28	17.64
		2977	2254	5231
		46.92	45.17	47.46
TOTAL		19.01	18.57	18.79
		6898	6854	13752
		54.06	54.86	54.46

ALCOHOL-RELATED ACCIDENTS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		5.67	5.85	5.77
1ST DWI		3724	4411	8135
		23.12	23.47	23.31
2		7.11	8.47	7.77
MULT DWI		197	189	386
		25.76	29.76	27.76
3		0.13	0.04	0.10
NDO		2977	2254	5231
		3.66	2.11	3.09
COLUMN TOTAL		3.32	4.01	3.66
		6898	6854	13752
		17.92	19.70	18.83

INJURY/FATAL ACCIDENTS

GROUP	MEAN / COUNT / STD DEV	OLD LAW 78	NEW LAW 80	ROW TOTAL
1		2.50	2.86	2.69
		3724	4411	8135
		15.61	16.66	16.19
2		4.06	2.65	3.37
		197	189	386
		19.79	16.09	18.06
3		2.82	1.77	2.37
		2977	2254	5231
		17.16	13.21	15.59
TOTAL		2.68	2.49	2.59
		6898	6854	13752
		16.42	15.60	16.02

and injury/fatal accidents showed virtually no change for 1978 and 1980 first offenders. Multiple offenders had more alcohol-related accidents and fewer injury/fatal accidents prior to their 1980 conviction than did 1978 multiple offenders. Both types of accidents tended to occur less frequently for 1980 NDO subjects as compared to the 1978 NDO group.

4. Discussion: This study was designed to examine the specific deterrence effect of the 1979 Washington DWI law. The law was intended to increase the certainty of conviction by the illegal per se provision and increase the severity of punishment by requiring jail sentences for DWI offenses. The effectiveness of the law was assessed by comparing the post-conviction driving records of persons convicted under this law with the records of individuals convicted under the previous law. The data examined in the study suggest that the law had no impact on the subsequent drunk driving and accidents of those persons prosecuted and convicted under the provisions of that law.

Although the data are consistent with the possibility that the law failed to produce a specific deterrence effect, there are alternative interpretations that should be considered. It is not known to what extent the 1980 DWI offender subjects were sentenced to jail and the amount of time actually spent in jail are unavailable. The possibility that the jail sanction may have been minimally implemented during 1980 would cast some doubt on the comparison of 1978 with 1980 offenders. It should be noted, however, that indirect evidence (Office of Financial Management, 1980) suggests that the percentage of offenders sentenced to jail increased early in 1980.

A second interpretation is that the increased level of DWI enforcement during 1980 would tend to increase the recidivism rates of first and multiple offenders. The study examined this possibility by the comparison of 1978 and 1980 samples of drivers having no previous alcohol-related convictions. The finding that percentage increases in recidivism rates were higher for the DWI offender groups than for the NDO groups argues against this explanation of the data.

Another plausible interpretation of the present data is that the type of offender convicted of DWI in 1980 may have differed qualitatively from 1978 convicted offenders. For example, reduction of DWI charges to lesser offenses occurred more frequently in 1978 than 1980. Department of Licensing records show 9,642 convictions for physical control or negligent driving reduced from DWI in 1978 as compared to 4,076 in 1980. This difference might partially account for the present recidivism results to the extent that the judiciary tends to reduce charges among high risk drivers. If this assumption was verified, it would suggest that many high risk drivers had been excluded from the 1978 sample of convicted DWI offenders, thus decreasing the 1978 recidivism rates. These speculations obviously need to be subjected to future empirical testing.

In a similar vein, it is possible that many high risk offenders were acquitted of their DWI charge in 1978. The intent of the illegal per se provision was to increase the probability of a DWI conviction. Thus, the 1980 sample may include a greater proportion of subjects that were likely to repeat the offense, irrespective of the legal sanctions applied.

The above speculations point out the need for additional research that is designed to test alternative explanations for the present data. Based upon the available evidence, however, the possibility should be considered that the 1979 DWI laws, as implemented in 1980, have failed to deter subsequent acts of drunk driving.

The findings of the present study along with those of O'Connell and Chadwick in the preceding section may suggest that deterrence of drunk driving among the general population and specific deterrence among drivers actually convicted of DWI may occur independently. The fear of apprehension and stringent legal sanctions may be sufficient to dissuade drivers in the general population from driving while under the influence. However, those same legal sanctions applied to convicted drunk drivers appear not to modify their subsequent DWI behavior.

If mandatory jail sentences fail to deter DWI recidivism, are there other legal sanctions that may produce a positive deterrence effect? It has been repeatedly shown that license suspension and revocations can be effective sanctions (Hagen, 1977; Hagen et al, 1978, 1980; Homel, 1977; Salzberg et al, 1982). These studies have found reductions in DWI recidivism and accidents for suspended/revoked drivers as compared to drivers that avoided these sanctions. It is important to note that the duration of the suspension appears to be an important factor. Short duration suspension (30 days) have been found to have relatively little effect (Salzberg and Paulsrude, 1983). Homel (1977) suggested that license denial of three to twelve months may be optimum. Long duration suspension uniformly and consistently applied in combination with other legal sanctions may be sufficient to produce both general and specific deterrence to drunk driving.

C. Implementation of Washington State's 1979 Driving While Intoxicated (DWI) Law: A System Description

1. Introduction: Although the mere passage of legislation establishing a specific act or activity as being illegal is sufficient to prompt a specific segment of the population to cease the illegal activity or to avoid engaging in it, the total reliance on "voluntary compliance" to achieve the full deterrence potential is idealistic. The research literature is replete with examples of highway safety laws and regulations which were rendered largely impotent due to the lack of appropriate punitive sanctions for their violation and/or the unenforceability of the new provisions due to financial or technical/operational constraints. A good law poorly or improperly implemented/executed can be counter productive in that it can undermine the credibility of and respect for the legal system and can result in the repeal or revision of potentially productive laws due to an inability to generate positive measures of effectiveness.

A meaningful evaluation of the effectiveness of any drinking-driver control legislation cannot be adequately performed without an accurate description of the

operational characteristics of the "system" which executes the provisions of that law. The "system" which has the responsibility for implementing and administering drinking-driver control legislation consists of a number of critical interactive components. At a minimum these components include enforcement, prosecution, adjudication, treatment/rehabilitation, licensing, and public information/education. The extent to which each of these components is discharging its responsibilities efficiently and effectively and system integration has been achieved, any subsequent evaluation should be assessing impact at or near its optimum potential.

2. Method

a. Enforcement: The role of adequate enforcement levels (or lack thereof) following the passage of highway safety laws has been graphically illustrated by the very transient impact of the British Road Safety Act of 1967, the New Zealand enforcement "blitz" experiences, and safety belt utilization rates with and without enforcement following the passage of mandatory safety belt usage legislation. The level and conspicuity of the enforcement activity are considered primary contributions to establishing the public's perception of the risk of apprehension, a critical requirement in shaping the behavior of the drinking driver. Although none of the provisions of the new legislation were specifically designed to facilitate increased enforcement efficiency or effectiveness (e.g., authorizing pre-arrest breath testing or "roadblocks"), the legislative intent and public's desire to reduce the drinking driver problem should, theoretically, have strongly suggested a need for an increased priority for more DWI apprehensions by all enforcement agencies. DWI arrest data for city police, county sheriffs, and State patrol agencies were collected from a variety of sources to reflect changes in enforcement activity.

b. Courts: For purposes of convenience, the functions of the courts in implementing and executing the provisions established by the new legislation will be considered in three parts: prosecution, adjudication, and sentencing. The prosecutorial component deals with the efforts to bring cited offenders to trial. This includes the prosecutors' activities in reducing the original charge

to lesser offenses (plea bargaining), of convincing offenders to enter a guilty plea, of using diversion programs such as Deferred Prosecution and of success in presenting the State's case in prosecuting a DWI charge. The adjudication component relates to the extent to which judges reach a guilty or not guilty finding in non-jury trial situations, dismisses the charge for some legal technicality reason, or a jury reaches a guilty or not guilty verdict in jury trials. The sentencing component deals with the extent to which the various sentencing options available to the judiciary are exercised (i.e., fines, jail sentences, probation, treatment, community service, restitution, etc.). It is readily apparent that the public's perception of the probability of being prosecuted, or being found guilty, and of receiving severe sanctions will contribute to his/her subsequent willingness to engage in a risk-taking activity.

c. Treatment: The new legislation requires that DWI offenders attend a State-approved Alcohol Information School. The extend to which convicted DWI offenders were sent to and attend these schools and the curriculum of the school is successful in dissuading the offender from repeating the activity is the measure of the effectiveness of this component. Due to the lack of complete and accurate historical recordkeeping within the public and private sectors of the alcoholism treatment community, the extent to which definitive conclusions can be drawn about the compliance with and effectiveness of the treatment component is limited.

d. Driver Licensing: In the State of Washington the suspension or revocation of the driving privilege is an administrative action which can be initiated only after the courts have notified the department of the conviction of a suspendible/revocable offense. The courts do, however, have the option to recommend that no license suspension be imposed in cases of conviction of DWI where the offense is the first of its kind and the judge considers license suspension inappropriate or unwarranted. Obviously the driving public perceives the possibility of license suspension as one of the potential consequences of being apprehended for and convicted of driving while under the influence of alcohol. To the extent that

license suspension does not follow conviction, the strength of that sanction as a deterrent may be significantly subverted.

In addition to a reinstatement fee of $20, suspended drivers are required to file proof of financial responsibility for three years with the Department of Licensing in order to reinstate their licenses following the period of suspension. This requirement typically is met by the person informing his or her insurance company of the suspension (followed by an adjustment in the person's insurance rates), and the company then files an SR-22 form with the department. Non-suspended drivers are not subject to this requirement and usually avoid insurance rate increases for a DWI conviction unless the insurance company discovers the conviction during their aperiodic record review process.

e. Others: The specific legislation passed in 1979 did not promulgate new regulations addressing issues of (a) increased or improved activities in the diagnosis and referral of DWI offenders needing more intense alcoholism treatment, (b) establishing improved statewide DWI program management or coordination, or (c) requiring the development and implementation of a systematic and concerted public information/education program to accompany the new anti-drinking driver provisions that were established. There was, however, substantial press coverage by both print and electronic media prior to and immediately following passage of SHB-665. This coverage, although unprogrammed and unmeasured, must be taken into consideration in interpreting the subsequent impact indicators since the public's perception of the risk of detection, apprehension, prosecution, conviction, and punishment is largely dependent on what the media conveys to its readers and viewers.

3. System Description

a. Enforcement: One of the necessary pre-conditions of increasing the deterrent effect of our laws (whether new or already existing) is an increased perceived probability of detection and apprehension for violating the law(s). Although the DWI laws passed in 1979 provided no new tools to aid law enforcement personnel in detecting and apprehending drinking drivers (e.g., reducing evidentiary level required to establish probable cause, authorizing pre-arrest breath

testing, authorizing "roadblocks", etc.), the message being conveyed by the legislature and the citizens of the State could not very well be denied by law enforcement policy makers. The extent to which law enforcement agencies responded positively and affirmatively to this pressure to increase DWI arrests is provided in Figures 2 and 3 for the 41 city law enforcement agencies and 15 county sheriff's offices regularly reported to the Federal Bureau of Investigation's Uniform Crime Reporting System.

The spline-regression lines through the data points vividly display the turning points in time when statistically significant changes occurred. Especially noteworthy in these graphics are the nearly identical turning points in August of 1979 for both cities and counties. The upward trend in arrests began after the new DWI law was signed into law (April 1979) but before the "illegal per se" section was implemented in September 1979. It should be remembered that the mandatory jail portion did not become effective until January 1, 1980.

Both the cities' and the counties' arrest trends after August 1979 indicate a potentially strong deterrent effect. Prior to the new DWI law, arrest patterns were declining or unstable. On average in the 41 sample cities, 474 DWI arrests were made per month at the turning point in August 1979. Since that time, the number of DWI arrests has been increasing steadily by 6.5 arrests per month. This trend has continued for over 36 months. The 15 county sample shows a much sharper increase after the turning point, but then that settles down after six months into slow but continual increase in DWI arrests. Between the turning point and the first six months of the post-period, the average monthly number of DWI arrests in the 15 sample counties increased from 145 arrests to 204 arrests per month.

The Washington State Patrol has primary responsibility for enforcing the State's motor vehicle laws on Federal, State, and Inter-State highways and providing patrol assistance on certain secondary roadways. They contribute about half of the DWI citations filed in Washington's courts every year. The DWI enforcement activities of the Washington State Patrol is shown in Table 13 for the years 1978 through 1982.

TABLE 13. WASHINGTON STATE PATROL DWI ARRESTS

Year	Man-Months of Effort	Total Arrests For Hazardous Violations	Total DWI Arrests	With a Test	Resulted from an Accident
1978	9,360	279,846	17,783	15,988	3,563
1979	9,432	237,932	16,409	14,753	3,526
1980	9,708	242,975	15,781	14,111	3,573
1981	9,732	272,824	17,567	15,566	3,993
1982	9,132	266,403	17,148	15,291	3,448

These figures reveal a decline in DWI arrests in 1979 and again in 1980 followed by an increase in 1981. Arrests dropped again, but only slightly, in 1982.

To investigate the question of whether the observed increase in DWI arrests was made at the expense of reduced enforcement efforts relating to other criminal activities, data was collected on arrests for non-DWI offenses during the same time period. The proportion of hazardous violation citations issued by the State Patrol which were DWI citations did not vary significantly over the five year period (6.4%, 6.9%, 6.5%, 6.4%, and 6.4% respectively for 1978 through 1982). Neither were there notable changes in the DWI arrests accompanied by breathalyzer tests (90%, 90%, 89%, 89%, and 89%) or the proportion of DWI citations resulting from an accident (.200, .215, .226, .227, and .201 for years 1978 through 1982, respectively).

Tables 4 and 5 provided evidence that there were no systematic decreases in assault or burglary arrests by city police and county sheriffs (in the sample) as DWI arrests increased from 1979 through 1982. Thus it can be concluded that the increased productivity in apprehending drinking drivers did not compromise law enforcement responsibilities in other enforcement areas.

It has been proposed that increases in DWI arrests often simply reflect increases in manpower. Table 6 shows the relationship between manpower, DWI arrests, and DWI arrests per officer-month. Only for the enforcement activities in the sample of counties is there a significant correlation between man-months of effort and

number of DWI arrests (r = .833, p = .02). The comparable correlation coefficients for the city police and State Patrol were non-significant (r = .474, P = .28 for city police and r = -.302, p = .56 for the State Patrol). Also from this table it can be seen that enforcement efficiency (expressed as DWI arrests per man-month of effort) has increased consistently over the past three or four years and illustrates how increased efficiency can effectively compensate for reductions in manpower. It is interesting to note that the DWI arrest rate for the county sheriffs is approximately one-half that of the city police while the city police DWI arrest rate is approximately one-fourth that of the State Patrol.

Although exact figures on the total number of DWI arrests made each year by all enforcement personnel is unavailable due to partial reporting, some estimates can be made. If one is willing, based on the court data in Table 19, to assume that, statewide over the past few years, approximately 5% of DWI arrests result in a finding of not guilty and that approximately 10% of the DWI filings are dismissed and that approximately 7% of the DWI cited offenders are diverted into a Deferred Prosecution program, then an estimate of the total number of DWI arrests can be calculated by increasing the total number of alcohol-related convictions (including charge reductions) by 22%. The results of these calculations are presented in Table 14 along with the number of licensed drivers and an estimate of the proportion of licensed drivers which are cited for DWI each year. Here it can be seen that approximately 1.7% of licensed drivers received DWI citations in 1979, 1980, and 1981 and that this proportion increased to nearly 2% in 1982. These projections do not, however, adjust for that small number who are multiple offenders repeating the offense in the same calendar year.

TABLE 14. ESTIMATED TOTAL DWI ARRESTS AND DWI ARREST RATES

Year	A/R Convictions*	Estimated DWI Arrests**	Licensed Drivers	DWI Arrests/ Licensed Driver
1978	38,206	48,904	2,485,248	.0197
1979	36,865	47,187	2,579,368	.0183
1980	37,660	48,205	2,662,659	.0181
1981	38,613	49,425	2,732,722	.0181
1982	44,726	57,249	2,774,212	.0206

* A/R - Alcohol Related
** Estimated DWI Arrests = 1.28 A/R Convictions

The Washington State Patrol also provides Breathalyzer training for law enforcement personnel throughout the State, provides maintenance and calibration services on all machines, and compiles a statewide (except for Seattle, Tacoma, and Spokane) Breathalyzer log. From their log it was determined that 95% of all Breathalyzer tests administered were for DWI offenses. To investigate whether the .10 per se provision of the new law had an effect on law enforcement apprehension practices, the distribution of BAC readings, Table 15 was constructed. Other than a small decrease in the proportion of BAC's in the .05 - .09 range and a slight increase in the proportion of BAC's in the .20 - .24 range in 1980 over those in 1979, there is no systematic indication that could be associated with changes in the amount of alcohol consumed by arrested DWI offenders before and after the passage of SHB-665. The proportion of Breathalyzer tests that were refused (expressed as a proportion of all tests offered) increased only slightly from 1979 to 1980 (.102, .114, .122, .122, and .125)for 1978 through 1982, respectively.

TABLE 15. STATEWIDE BAC LEVELS FROM WASHINGTON STATE PATROL BREATHALYZER RECORDS

Breathalyzer Readings	1978	1979	1980	1981	1982
.05 - .09	7.2%*	7.2%	6.3%	6.1%	6.6%
.10 - .14	29.1	28.5	28.1	27.2	27.8
.15 - .19	35.4	36.1	36.4	36.8	36.0
.20 - .24	18.1	18.1	19.6	20.1	19.9
.25 - .29	5.2	5.4	5.6	5.8	6.0

*Proportion of tests administered with readings in this range.

b. Courts: Shortly after the implementation of the new legislation, the media began presenting numerous "horror stoies" about the impact that increased DWI enforcement efforts were having on the court system throughout the State. Testimony before legislative committees seeking some form of judiciary relief and requests to local budgeting authorities for additional prosecutorial, judicial, and

support staff personnel became more commonplace. Those familiar with the criminal justice system predicted that a number of reactive symptoms would begin to appear. Among these were:

o Prosecutors would be more likely to initiate and accept plea bargaining, to more frequently utilize diversion programs such as Deferred Prosecution, and be required to spend more time preparing and presenting cases because of the increased likelihood of appeals and jury trials;

o The courts would experience increased backlogs of cases awaiting trial and more cases would have to be dismissed due to their inability to provide a "swift" (60 day) trial, would be more likely to accept plea bargaining, would be able to hear fewer cases per unit time because of increased requests for jury trials, would be less likely to convict, and would be less likely to impose severe sentences even if mandatory;

o Defendants would be less likely to plead guilty, be more likely to be represented by attorneys, employ more stalling tactics, and demand jury trials;

o Law enforcement personnel would be required to put in more time preparing testimony and appearing in court and would be less likely to sustain high levels of DWI apprehensions and arrests.

The extent to which these predictions have become a reality and are substantiated by available data is addressed in this section of the report.

c. Prosecution: One of the concerns expressed was that prosecutors would more frequently engage in plea bargaining with the defendants in order to better manage the increased caseload. Figure 12 depicts the charge reduction data contained in Table 16.

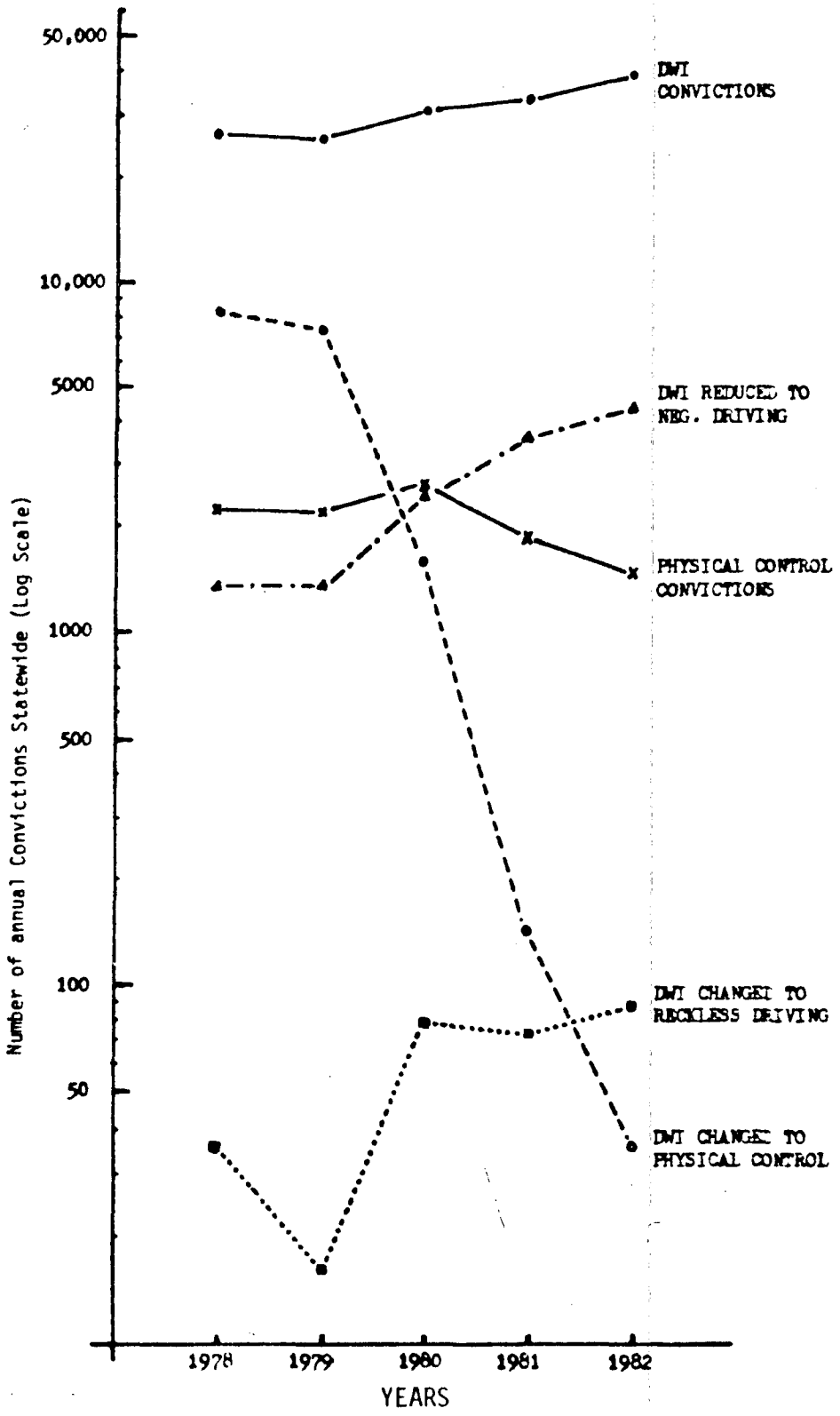


FIGURE 12. ALCOHOL-RELATED CONVICTIONS RESULTING FROM PROSECUTION ON ORIGINAL AND REDUCED CHARGES.

TABLE 16. STATEWIDE ALCOHOL-RELATED CONVICTIONS

	1978	1979	1980	1981	1982
DWI Convictions	26,303 69%	25,855 70%	30,920 82%	32,979 85%	38,774 87%
Convictions-Phys. Control	2,220 6%	2,193 6%	2,585 7%	1,854 5%	1,459 3%
Phys. Control-Reduced from DWI	8,302 22%	7,445 20%	1,575 40%	142 -	36 -
Negligent Driving - Reduced from DWI	1,340 4%	1,356 4%	2,501 7%	3,565 9%	4,369 10%
Reckless Driving - Reduced From DWI	36 -	16 -	79 -	73 -	88 -
TOTAL A/R CONVICTIONS	38,206	36,865	37,660	38,613	44,726

Source: Department of Licensing

Here it can be seen that the number of convictions on an original charge of DWI increased steadily from 1979 through 1982 while the number of convictions on an original charge of being in physical control of a motor vehicle while intoxicated decreased in 1981 and again in 1982 after achieving a high in 1980. The most pronounced change came in the reduction from an original DWI charge to one of being in physical control of a motor vehicle while intoxicated (PC). Prior to the new law (which established new sanctions for being in physical control that were equivalent to those for driving while intoxicated) seven to eight thousand of these cases were reported whereas within the three years following the frequency of this practice was steadily reduced to less than 50 per year. While reductions from DWI to physical control decreased after the new law reductions to negligent driving (a non-alcohol-related charge) increased approximately one thousand per year for each of the three post-law years. Reductions to reckless driving were so infrequent that the data here is relatively meaningless.

For those expressing concern that plea bargaining would increase to a level that would jeopardize the possible deterrent effects of the new DWI laws, the data presented in Table 17 provides little reinforcement for their concerns. Approximately 75% of drinking-driver offenders were convicted on an original alcohol-related charge prior to the passage of SHB-665 whereas 90% were convicted on the original charge in subsequent years.

TABLE 17. CONVICTION ON ORIGINAL AND REDUCED CHARGES

	1978	1979	1980	1981	1982
Convicted on Original Alcohol-Related Offense	28,528 (74.67%)	28,048 (76.08%)	33,505 (88.97%)	34,833 (90.21%)	40,233 (89.95%)
Convicted on Reduced Charge	9,678 (25.33%)	8,817 (23.92%)	4,155 (11.03%)	3,780 (9.79%)	4,493 (10.05%)
Total Convictions from Alcohol-Related Filings	38,206	36,865	37,660	38,613	44,726

Another concern expressed by those who feared that a significant increase in DWI arrests would cause major aberrations in the traditional judicial system was that prosecutors would begin using "diversion" programs in an irresponsible manner just to maintain a manageable flow of DWI offenders through the limited capacity judicial system. Table 18 presents Department of Licensing data reflecting the number of Deferred Prosecution entrants for each year from 1977 through 1982. As can be seen here, the number of DWI offenders entering a deferred prosecution program decreased by about 100 from 1978 to 1979 and by about hundred-fifty between 1979 and 1980. The number of deferred prosecutions on the DOL files then doubled between 1980 and 1981 and increased by another 35% between 1981 and 1982. The same basic relationship can be seen when comparing the number of deferred prosecution clients expressed as a proportion of the total number of drivers convicted of alcohol-related offenses in a given year. There would appear to be some justification for a concern over the extent to which the increased usage of deferred prosecution in recent years is an escalating trend which could subvert the objectives of the tougher DWI laws. It should be noted that the legislature apparently perceived this trend to be undesirable and in 1982 passed House Bill 600 which, in part, limited persons eligible for a deferred prosecution program to only <u>one</u> such participation in any five year period.

TABLE 18. USE OF DEFERRED PROSECUTION PROGRAMS FOR DWI OFFENDERS

	1977(FY)	1978(FY)	1979(CY)	1980(CY)	1981(CY)	1982(CY)
Number of Deferred Prosecution Cases Reported to DOL.	1,494	1,971	1,862	1,708	3,423	4,632
Deferred Prosecutions as a Proportion of Total Alcohol Related Convictions		.052	.051	.045	.089	.104

d. Adjudication: Substantial concern was also expressed over the possible effects that increasing the punitive sanctions associated with a DWI conviction might have on the courts' adjudication of these cases, particularly at a time when the number of these cases being filed was increasing due to enhanced enforcement efforts. As speculation would have it, as penalties become more severe, requests for jury trials will increase as will the number of appeals to higher courts, while the number of guilty pleas will diminish. All these potentialities coupled with an increase in the absolute number of filings may well lead to an unmanageable overload on the courts which could result in an increase in case dismissals (for a variety of reasons) and eventually, even a decrease in DWI arrests if law enforcement personnel do not believe their arrests will result in convictions.

Although detailed court activity records are not well organized nor readily accessible in Washington State, an effort was made to collect sufficient data to reveal the existence of any major changes in adjudication patterns. Beginning in January of 1981, all courts of limited jurisdiction were required to report court activities in a format that would permit specific identification of DWI charges to the State Administrator for the Courts in Olympia. DWI-related court activities for 1981, 1982, and the first six months of 1983, as provided by the Court Administrator's Office, is presented in Table 19. Also contained in Table 19 is comparable data extracted from the 1980 report by the Office of Financial Management

for a very limited court sampling (four months activity from courts in seven counties) in 1979 and 1980.

The data suggests that although there was a 20% increase in the number of DWI filings from 1981 to 1982, the proportion of these filings that reached disposition were essentially equivalent (69.4% as opposed to 71.9%). Of the cases reaching final disposition there would appear to be no consistent trend manifest in the proportion of guilty and not guilty verdicts reached. There is a suggestion, however, that the proportion of cases being dismissed is on the increase every year. The interpretation of the appeal and jury trial data is obscured due to the intervention of factors unrelated to the passage of SHB-665 (i.e., all courts of limited jurisdiction became courts of record in 1981 so that subsequent appeals were "on the record" rather than de novo, and a Supreme Court ruling regarding jury trials for DWI defendants issued in 1983).

TABLE 19. COURT ACTIONS ON DWI FILINGS

Year	DWI Court Filings	DWI Case Dispositions	Percent Guilty	% Not Guilty	Percent Dismissed	% Bail Forfeits & FTAs***	Appeals as % of Total Dispositions	Jury Trials as % of Dispositions
1979*	963	853	80.4	4.6	7.0	8.0	3.4	2.9
1980*	1,033	898	77.5	3.7	8.5	10.4	6.0	5.9
1981	36,385	25,441	83.5	5.7	8.8	1.8	1.8	3.3
1982	43,659	31,412	83.9	5.1	9.3	1.6	1.2	3.5
1983**	18,871	15,629	80.9	4.6	12.8	1.6	1.4	6.6

* OFM 1980 study sample of four months court activity from seven counties. (See ref., OFM, 1980)

** Statewide Jan.-June, 1983.
Source: Office of the Administrator for the Courts
Olympia, WA

*** FTAs: Failed to Appear (for arraignment, hearing, sentencing, etc.)

The other major function performed by the judiciary is determining the sentence to be imposed following a finding of guilt. One of the most highly publicized elements of SHB-665 was the mandatory (non-suspendable and non-deferrable) jail sentence of one day for the first DWI offenders and seven days for repeat offenders. The extent to which this sanction is consistently and regularly imposed by the courts is certainly instrumental in determining the public's perception of the negative consequences of being caught driving drunk. Sentencing and incarceration data of good quality is as difficult to obtain in this State as is other court activity information. As a proxy measure of the extent to which jail sentences were being imposed, data describing the proportion of inmates being held in detention/correctional institutions in the State who were being held for DWI offenses, was obtained from the Washington Corrections Standards Board. Reliable monthly data was available for 22 of Washington's 39 counties for the time period August 1980 through August 1983 (Appendix F).

Figures 13 and 14 present the data reflecting the proportion of the average daily population (ADP) being held in jails which are awaiting a hearing on a DWI charge (pre-conviction holds) and the proportion of the ADP which is being held in jail as part of the sentence for a DWI conviction (post-conviction holds). Here it can be seen that for pre-conviction DWI holds, the change in the proportions over time is relatively minor, dropping from a high of 2.7% in late 1980 to a low of about 2.4% in mid-1981 and then increasing slowly but steadily to about 2.7% again by August of 1983. Theoretically the only two factors which should be impacting this measure is the number of DWI arrests and capacity of the facilities to hold defendants pending a hearing rather than releasing them following the booking. The post-conviction holds show a sharp decline which began late in 1980 and continuing to about March of 1981. At this time the proportion of inmates being held for DWI convictions increased quite perceptibly until around September 1982 at which time the rate of increase became even more pronounced reaching nearly 10% in late 1983. (It is interesting to note that in April 1982 new legislation was passed defining "a day in jail" as meaning 24 consecutive hours in jail. This provision which became law in July 1982, apparently was felt necessary to curtail reported irregularities in incarceration practices whereby sentenced DWI offenders

FIGURE 13.

: PRE-CONVICTION DWI JAIL HOLDS(% - 1980-1983)

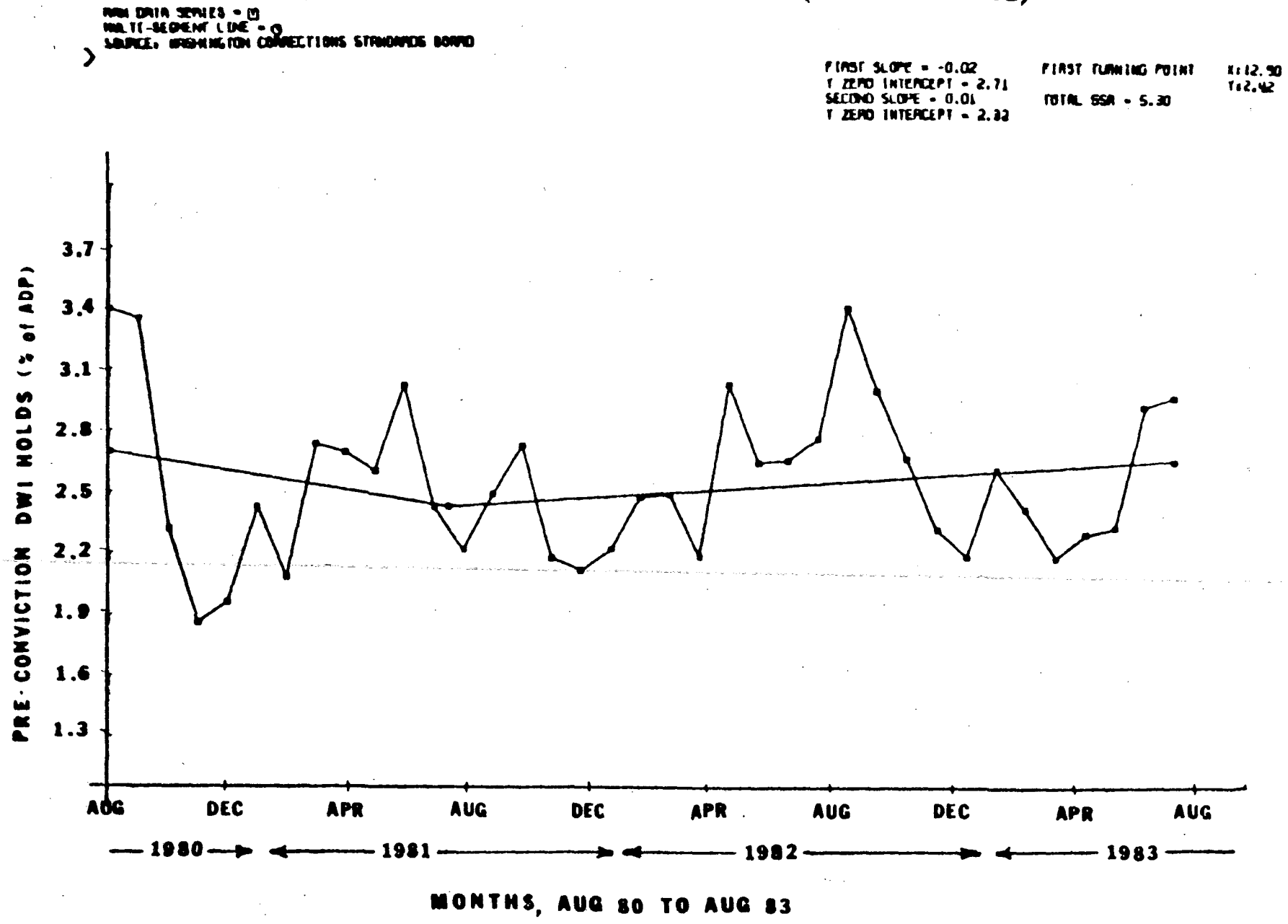
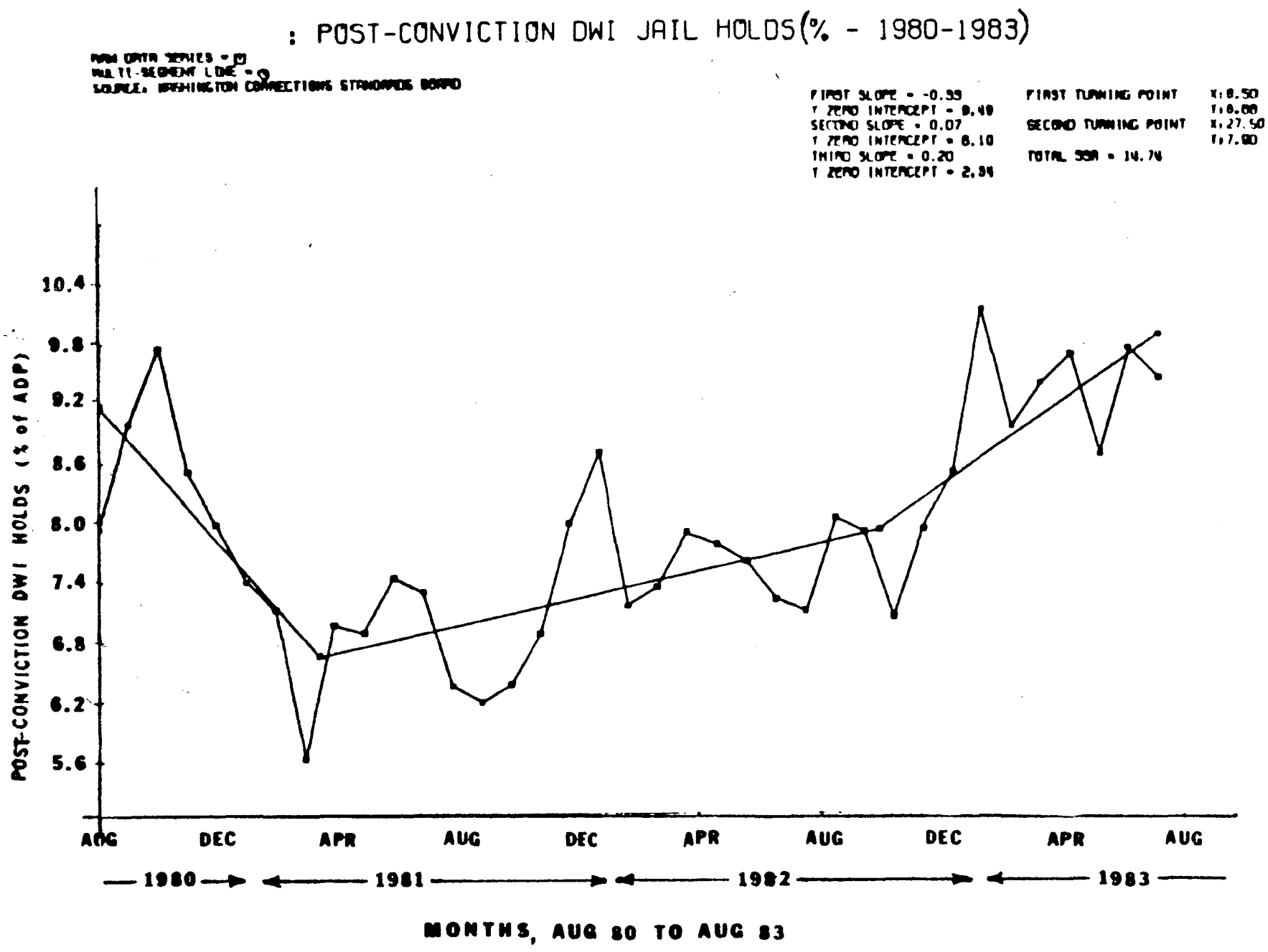


FIGURE 14.


: POST-CONVICTION DWI JAIL HOLDS(% - 1980-1983)
SOURCE: WASHINGTON CORRECTIONS STANDARDS BOARD
FIRST SLOPE = -0.33
Y ZERO INTERCEPT = 9.48
SECOND SLOPE = 0.07
Y ZERO INTERCEPT = 8.10
THIRD SLOPE = 0.20
Y ZERO INTERCEPT = 2.84
FIRST TURNING POINT X: 8.50
Y: 8.00
SECOND TURNING POINT X: 27.50
Y: 7.80
TOTAL SSR = 14.74
POST-CONVICTION DWI HOLDS (% of ADP)
10.4
9.8
9.2
8.6
8.0
7.4
6.8
6.2
5.6
AUG
DEC
APR
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AUG
1980
1981
1982
1983
MONTHS, AUG 80 TO AUG 83

were spending less than 24 hours in jail.) The increase in the DWI prison population in 1981, 1982, and 1983 is consistent with increases in DWI convictions during this period. It is unfortunate that similar data was not available for the preceding years so that changes immediately prior to and following the implementation of the mandatory jail provisions of SHB-665 could also be investigated.

e. Treatment: SHB-665 imposed a new requirement that all DWI offenders must attend an alcohol education program conducted by an approved Alcohol Information School (AIS). It would be predicted that the clientele attending Alcohol Information Schools throughout the State would increase drastically following the September 1979 implementation date of this requirement. Figure 15 reveals that only about a 10% increase was experienced between 1979 and 1980, with this number remaining fairly constant through the next two years. It should be noted that this provisions was modified by 1982 legislation to include a diagnostic assessment for alcohol abuse with diversion from the AIS into intensive treatment, where warranted. Generally speaking, it would appear that only about half of the convicted DWI offenders have been participating in the mandatory alcohol education program. Information reflecting the extent to which DWI offenders entered private in-patient or out-patient treatment programs is unavailable.

f. Driver Licensing: The final system component to be addressed in this section of the report is that of driver license suspension or revocation. In Washington State the suspension of a driver's license to operate a motor vehicle is mandatory upon notification from the court that the individual has been found guilty of driving or being in physical control of a motor vehicle: EXCEPT, the court may recommend that the license not be suspended if the conviction is the first on either charge. Since license suspension is one of the few countermeasure activities to have demonstrated a significant specific deterrent impact and is almost universally accepted as having substantial general deterrence influence, it is important to determine the extent to which license suspension regularly follows DWI convictions in our State. Unfortunately, the Department of Licensing does not regularly tabulate what proportion of their license suspension is the result of DWI convictions.

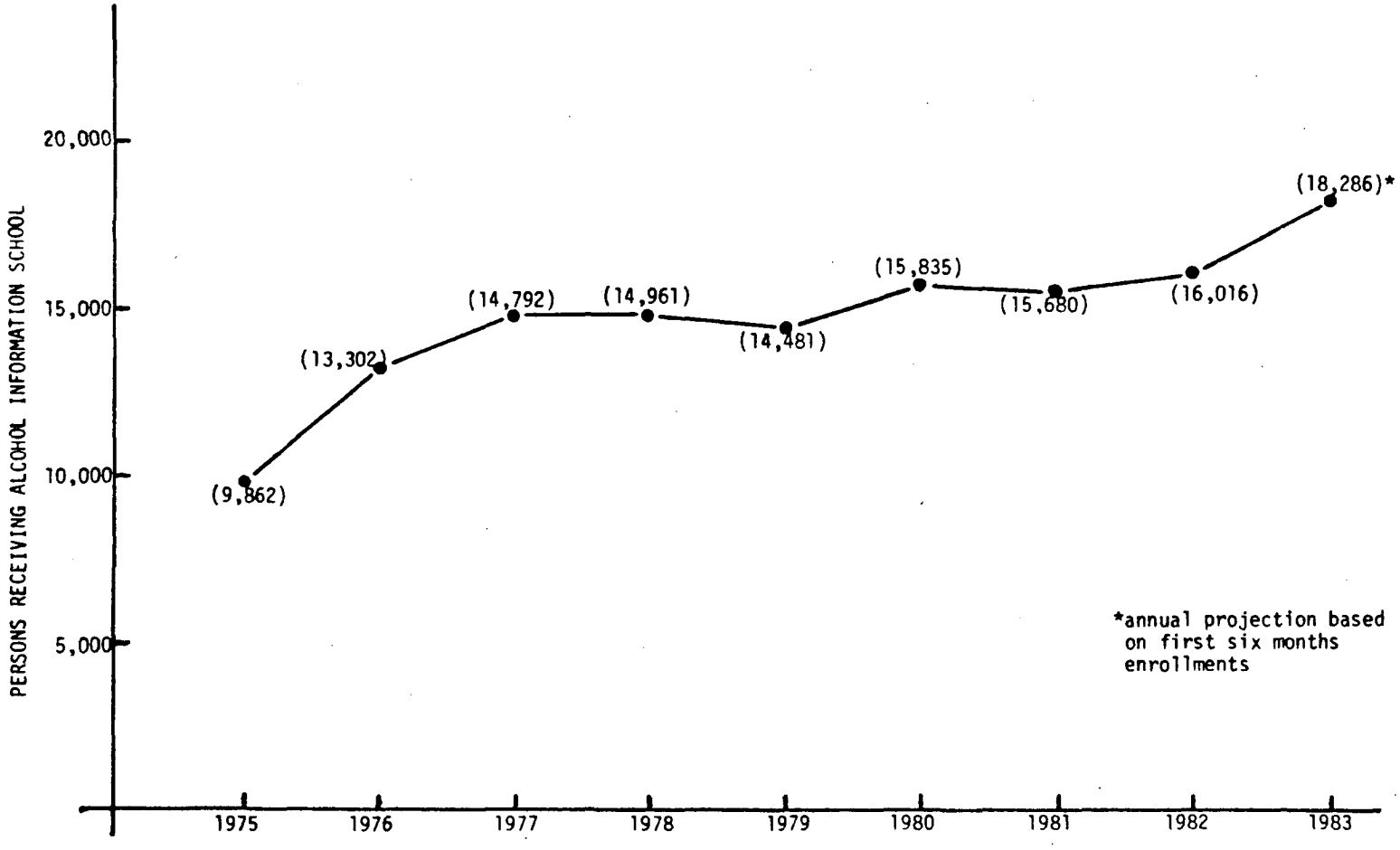

FIGURE 15. PERSONS ATTENDING ALCOHOL INFORMATION SCHOOLS.

To provide some insight into the question of certainty of license suspension, a sample of 656 DWI/PC convicted drivers from October 1980 were compared with a driver sample of 638 convicted DWI/PC drivers from October 1982 relative to the frequency with which the courts recommended no license suspension and the extent to which the Department of Licensing honored these requests. This data is presented in Table 20.

TABLE 20. COMPARISON OF NO-SUSPENSION RECOMMENDATIONS BY COURTS ON CONVICTIONS OF DWI AND PHYSICAL CONTROL

	1 Week Period October, 1980		1 Week Period October, 1982	
	Number	Percent	Number	Percent
DWI and Physical Control Convictions	656	100	638	100
"No-suspension" Recommended*	242	37	343	54
Balance Suspended	414	63	295	46

*Disposition of No-suspension Recommendations

	Number	Percent	Number	Percent
No-suspension Recommended	242	100	343	100
Recommendation Disallowed	28	11	26	8
Recommendation Followed	214	89	317	92

Here it can be seen that in 1980 approximately 37% of all DWI/PC conviction reports from the courts were accompanied by requests for no license suspension. By 1982 that proportion had increased to about 54%. By-and-large the department honored the courts' recommendations in the preponderance of the cases (88.4% in 1980 and 92.4% in 1982). The net result of this is that approximately 32.6% of first offender DWI/PC convicted drivers experienced no license suspension in 1980 and in 1982 nearly half (49.7%) of the convicted drivers had no suspension action taken against their driving privileges. From the public's point of view this may be interpreted as having an even chance of retaining one's license following an

alcohol-related conviction, hardly a coercive threat to any driver who may be considering driving after drinking.

It should also be remembered that, in addition to avoiding the hardships associated with trying to maintain a normal daily routine without driving while one's license is suspended (or coping with the anxieties and risks associated with driving while suspended), the DWI offender whose license is not suspended also realizes some very tangible material benefits. In addition to avoiding the required reinstatement fee ($20), the DWI offender who avoids getting his license suspended also (in all probability) will avoid having his or her insurance premium raised substantially and requiring this expenditure for three years.

4. Summary

a. Enforcement: The apprehension of DWI's increased following the passage of SHB-665. This increase was largely attributable to the efforts of city police and county sheriffs who registered a significant increase even before the full provisions of the law went into effect in January of 1980. The State Patrol did not increase their DWI arrests until 1981. The end product is that, statewide, the increase in DWI arrests went up only about a thousand per year from 1979 to 1980 and again from 1980 to 1981 before increasing by about seven thousand between 1981 and 1982. When the annual increase in the number of licensed drivers is taken into consideration, the DWI arrest rate per licensed driver remained constant until 1982, when it reached nearly 2%. NHTSA has estimated that on the average less than ½ of 1% of licensed drivers in any location are arrested for DWI. This ratio was increased to 1.2% of the drivers in ASAP areas in the 1970's. Currently NHTSA is proposing that communities strive for an apprehension rate of 2% of the population in order to create a significant perception of a meaningful likelihood of apprehension.

The increases in DWI apprehensions were generally achieved through increased officer efficiency rather than through added manpower and were accomplished without sacrificing enforcement effectiveness in other criminal areas.

There appeared to be no major changes in apprehension practices as reflected by the proportion of arrests that were accident related, the proportion of breathalyzer refusals, or the average BAC levels of those that were tested.

b. Courts: The courts appeared to be dealing quite effectively with the increased number of DWI filings. Convictions remained high at about 80% but dismissals showed signs of increasing as did the use of pre-trial diversion (deferred prosecution). Plea bargaining did not appear to have become a major problem during the time period investigated, but reductions from DWI to negligent driving (a non-alcohol offense) were on a substantial increase and warrants future monitoring.

Beginning early in 1981 the proportion of prison inmates that were incarcerated for DWI offenses began increasing commensurate with the increase in DWI convictions. Using the average daily population (ADP) measure as an indicator precludes determining what proportion of this increase is attributable to longer jail sentences or larger numbers of short-term sentences. No reliable information was readily available on what happened to the magnitude of fines assessed or the usage of community service, restitution, probation, or other legal sanctions following the passage of SHB-665.

c. Treatment: The data available suggests that less than half of the convicted DWI offenders participate in the mandated alcohol information school program.

d. Driver Licensing: Although the driving populace has been led to believe that a minimum 30 day license suspension accompanies a conviction of DWI, the reality appears to be that a substantial number of DWI offenders avoid this consequence due to judicial recommendations for no license suspension. Whereas about two of every three offenders experienced a suspension in 1980 that proportion had decreased to about one in every two by 1982.

IV. DISCUSSION

A. General Deterrence

H. Lawrence Ross (Ross, 1981), following an extensive survey of the international literature on drinking-and-driving laws, arrived at the following conclusions:

- "First, changes in the laws promising increased certainty or combined certainty and severity of punishment reduce the amount of drinking and driving."
- "Second, changes in behavior resulting from changes in the level of threat, on the order of those achieved by policy innovations to date, are evanescent."
- "Third, those innovations confined to manipulation of the severity of the legal punishment, without a concomitant change in its certainty, produce no effect on the apparent incidence of drinking and driving or its aftermath in crashes."
- "Fourth, in the study of the applicability of the deterrent model to drinking and driving, as with traditional criminality, there is virtually no evidence one way or the other concerning the effect of celerity."

Consistent throughout these conclusions is the emphasis on the need for certainty: certainty that punishment will always follow each commission of an illegal act. For purposes of this discussion, increased certainty is interpreted to mean an increase in the probability of detection and apprehension, of successful prosecution (resulting in a conviction), and of consistently having imposed sanctions which are sufficiently severe to constitute a meaningful personal threat. It is hypothesized that if the DWI laws passed in 1979 and the subsequent implementation and execution of these laws by the operational system component agencies was as intended, then (1) the number of DWI arrests would increase, (2) the number of drinking drivers convicted of DWI would increase, and (3) that severe punitive measures would be consistently and uniformly administered. This should lead to a reduction in the frequency with which individuals attempt to operate motor vehicles after drinking and the reduced alcohol-impaired driving exposure should ultimately be reflected in a reduction in alcohol-related collisions.

There is evidence that there was an increase in DWI arrests congruent with the September 1979 implementation date of the new Act, at least by the city police

and county sheriffs in the sample sites. The number of DWI arrests in the sample cities increased an average of about six additional arrests each month since the new DWI law was implemented. By December 1982 DWI arrests had increased by approximately 51%. The county sheriffs in the 15 sample counties also demonstrated an increase in DWI arrests such that at the end of the evaluation period they had increased DWI arrests by approximately 43%. Unfortunately, the Washington State Patrol DWI arrest figures do not reflect a similar pattern, State Patrol DWI arrests decreased annually from 1978 through 1980 before reversing the trend in 1981. The 1981 WSP DWI arrests were up 11% over 1980. Certainly by early 1981 all enforcement agencies had increased their DWI apprehensions . . . . a necessary pre-condition, if perceived by the driving public, of a positive deterrent influence. The increase, although encouraging, is not particularly large when viewed from the perspective of the increasing number of drivers in the state during this period. The proportion of licensed drivers arrested for DWI did not increase from its historical 1.7% up to 2.0% until 1982.

The ASAP literature contains numerous examples (including the Seattle/King County ASAP) of enforcement agencies easily doubling and tripling their DWI apprehensions with the infusion of additional resources (training, man-power, equipment, etc.) for implementing and operating special DWI emphasis patrols. But, as Voas (1982) points out, one of the most critical requirements for showing an impact of enforcement programs appears to be that the <u>perceived</u> risk of arrest must be elevated, as opposed to merely raising the <u>actual</u> risk of arrest. This implies the need for a strong public information effort accompanying an increase in enforcement efforts, an activity which was not present in Washington State at the time SHB-665 was being implemented. It is doubtful that, statewide, a gradual 21% increase in the number of DWI arrests between 1979 and 1982 and without the benefit of a concerted concurrent public information effort, would provide a deterrent influence sufficient to impact on the public's drinking/driving behavior. Local programs resulting in substantially greater apprehension rates and accompanied by local publicity might well have had a significant impact on local drunk driving problems but these could not be ascertained in the present analysis.

The courts have been convicting larger numbers of DWI offenders every year since 1980. In spite of some indication that DWI cases are being dismissed more frequently and that diversion into Deferred Prosecution programs is gaining in popularity the conviction rate (approximately 80%) has remained relatively constant. This constant rate coupled with an increase in DWI filings (arrests) results in higher absolute annual DWI conviction numbers. Thus, if an increased probability of conviction following arrest is another essential precondition for greater deterrence, that condition would not appear to have been significantly enhanced by the new laws as they were being administered by the existing judicial system.

The other critical responsibility falling on the courts is that of determining and imposing penalties (sentencing) on convicted DWI offenders. By far the most notable change in penalties for DWI offenders was the imposition of a mandatory one day jail term for first offenders and seven days for repeat offenders. The evaluation report released by the Division of Criminal Justice (OFM, 1980) in December of 1980 included the following conclusion: "The use of jail sentences for those found guilty has increased from levels of 10 to 50 percent before the new DWI law to nearly 100 percent following implementation." (page, vi). Assuming that the January through April 1980 sampling of sentencing practices on DWI convictions (which constituted the basis for the above conclusion) is truly representative of what was happening statewide during that time frame, then the current data indicates a disturbing decrease in the DWI inmate population in the last third of 1980 and the first quarter of 1981, a decrease in the proportion of inmates being held for DWI convictions from about 9.2% in August 1980 down to 6.7% in April of 1981. It is true however that from that point on the proportion increased steadily until in mid-1983 approximately 10% of the State's jail population were there because of a DWI convictions. It is impossible from the presently available data to compute the probability of any given DWI offender receiving and actually serving the required amount of time in jail. The perceived probability of actually experiencing incarceration, which the drinking driver uses as a basis for his decision making relative to driving after drinking, is also unknown, unfortunately.

The extent to which the mandatory one day in jail for first offenders and seven days for repeat offenders was actually served by convicted DWI offenders is not well established. There was apparently sufficient anecdotal evidence introduced in legislative testimony (alleging incarcerations lesser than that mandated) to convince the 1982 legislature to supplant the one day in jail terminology with "24 consecutive hours". The perception of certainty of punishment as a consequency of a conviction can be seriously damaged by such evidence, even if it is anecdotal.

Another mandatory component of the new law was that drivers convicted of DWI must attend an education program at an Alcohol Information School. Whether or not this type of countermeasure activity constitutes an effective countermeasure, the present data reveals that only about half of the convicted DWI offenders are ever exposed to this experience. This frequency of attendance can hardly be considered to contribute positively to an increased probability of certainty.

The countermeasure effectiveness literature (from ASAP programs and others) dealing with treatment programs, suggests that educational programs such as that offered by the Alcohol Information Schools can be effective for certain "social drinkers" but more intensive treatment efforts are required to assist the "problem drinking driver." The Washington State legislature apparently became convinced of this in 1982 since at that time new legislation was passed requiring an assessment of alcohol dependency and/or abuse and diverting "problem drinking drivers" out of the educational program and into more intensive treatment programs.

One of the provisions of SHB-665 repealed the requirement for a minimum $50 fine for first offenders and $100 for repeat offenders but retained the $500 and $1,000 maximum. No data was collected which would indicate whether the average fines imposed by the courts either increased or decreased following the passage of the new statutes. It is interesting to note that the 1983 Legislature raised the maximum fines for first and repeat offenders to $750 and $1,500, respectively, but did not re-establish any minimum mandatory fines.

Many people feel that license suspension/revocation resulting from a DWI conviction is a judicial action rather than an administrative one performed by the Department of Licensing. To a certain extent this perception is appropriate since the courts may (and frequently do) recommend that no license suspension be imposed. The present data indicates the courts make a no-suspension recommendation for nearly half of the first offenders and that the Department of Licensing honors these recommendations approximately 90% of the time. This practice certainly introduces a significant chance factor into the probability of whether or not a DWI offender's license will be suspended and must be considered as counterproductive to producing a perception of an increased certainty of experiencing negative consequences from violating the DWI laws.

Although a recent study by Salzberg and Paulsrude (1983), comparing post-conviction driving records of 3,781 first DWI offenders who were suspended for 30 days with 4,723 first offenders who were not suspended, indicated suspended drivers had significantly more post-conviction alcohol-related violations than did non-suspended drivers and an equal probability of subsequent alcohol-related accident involvement, the possible general deterrent effects of the threat of license suspension still remains a favorite among highway safety practitioners.

Given the aforementioned characteristics of the "system" responsible for the implementation and execution of the provisions of the new laws, the principal question is whether or not the "system" was successful in reducing alcohol-related collisions. Both the city sample and the county sample produced data revealing a significant downturn in the historically increasing number of alcohol-related accidents. The city sample reversal occurred early in 1981 whereas the county sample trend was not reversed until mid-1981. The statewide annual data on alcohol involvement of drivers in total collisions did not take a significant downturn ($t = 6.57$, $p = .0001$) until the 1982 annual data was tabulated (See Figure 16).

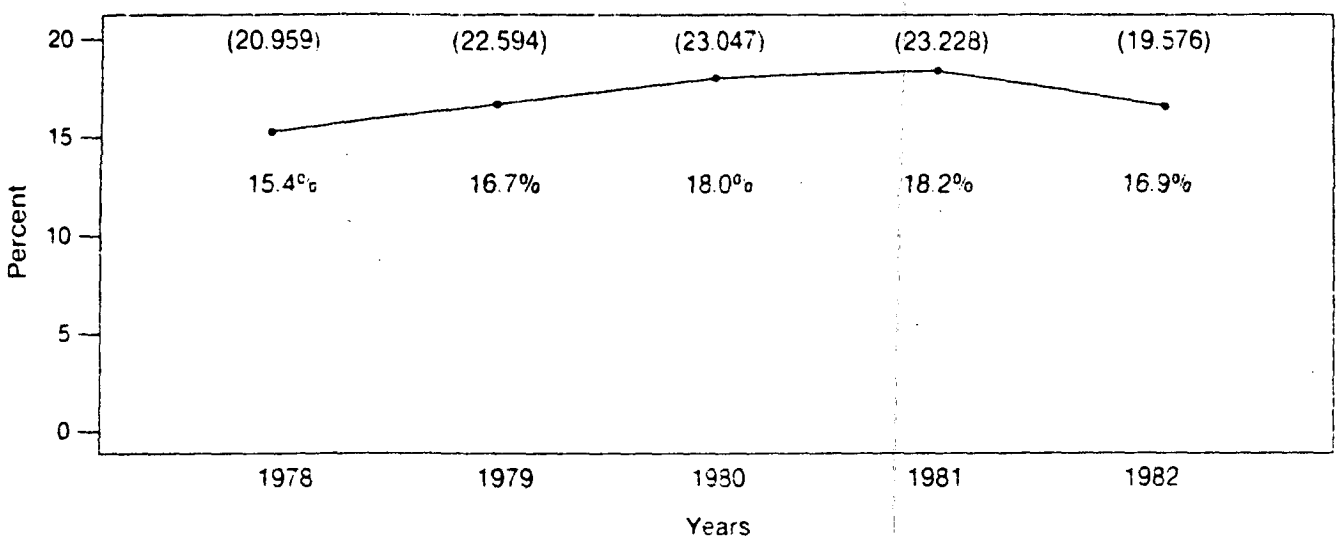

FIGURE 16. ALCOHOL INVOLVEMENT OF DRIVERS IN WASHINGTON STATE'S TOTAL ENFORCEMENT INVESTIGATED COLLISIONS

Since both alcohol and non-alcohol-involved accidents have shown a decline in recent years, it is important to determine whether the rate of decline is similar for both categories of collision. One effective method of displaying this information is to compute the proportion of each type of collision (fatal, injury and total) which are attributable to alcohol involvement. The results of this conversion is depicted in Figure 17 which shows the changes in the proportion of fatal, injury, and all collisions which are attributable to drivers who were intoxicated (DWI) and those where any level of alcohol involvement was detected (HBD). The proportion of drivers in fatal collisions involving intoxicated (DWI) and drinking drivers (HBD) took a sharp reversal in 1981 after three years of increased involvement. It was not until 1982 that any decrease (or at least arresting of a prior five or six year increase) in the proportion of alcohol-involved drivers in either injury collisions or all collisions can be detected or is suggested. Some caution should be exercised in the interpretation of the "Had Been Drinking" (HBD) data since this classification is a subjective assessment made by the law enforcement officer and as such may well be substantially influenced by the socio-political attitudes prevalent at the time.

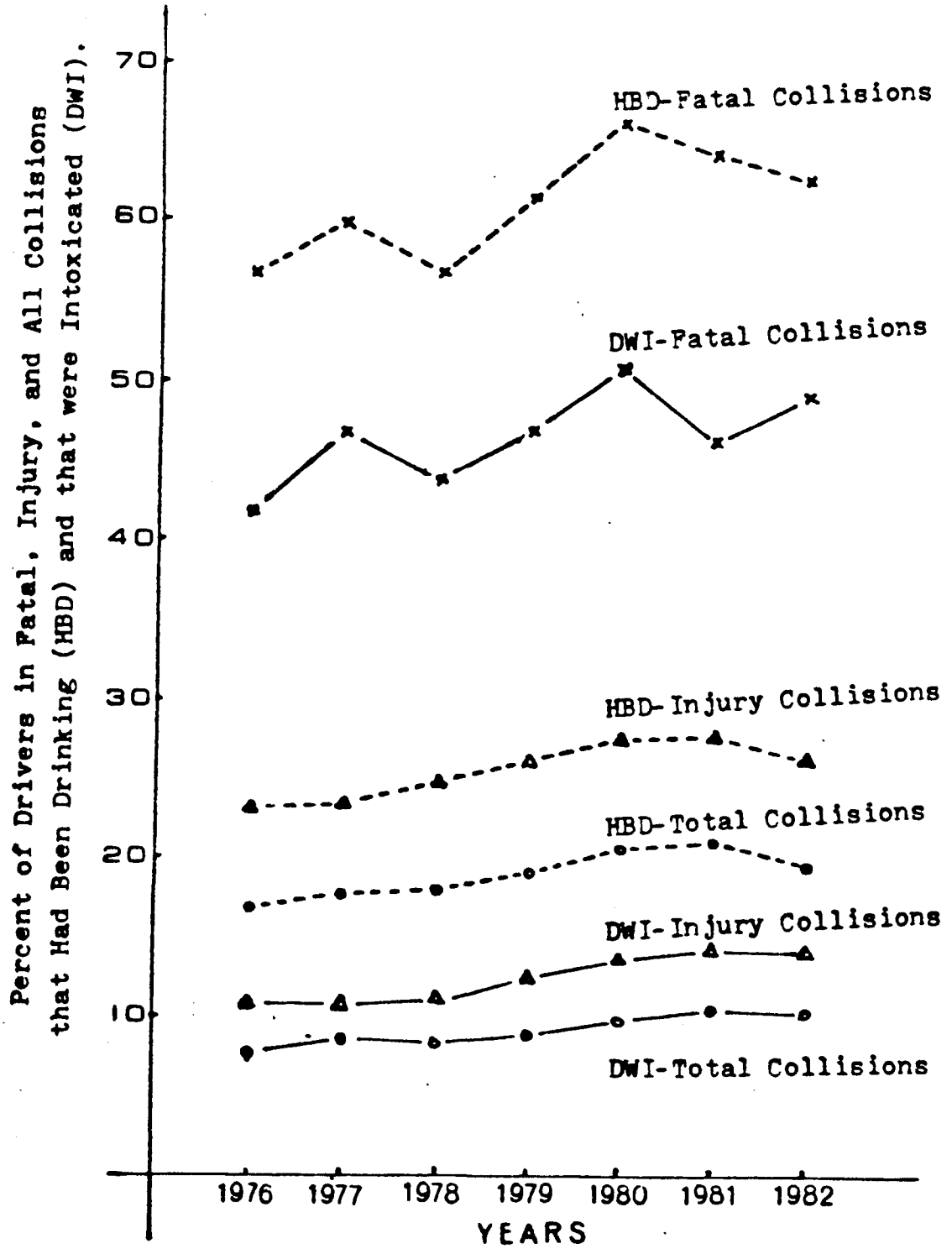

FIGURE 17. PROPORTION OF FATAL, INJURY, AND ALL WASHINGTON STATE COLLISIONS WHICH WERE REPORTED BY THE INVESTIGATING OFFICER TO BE ALCOHOL-RELATED.

An inspection of some of the traditional proxy measures associated with a high incidence of alcohol involvement, night-time collisions (Figure 18), weekend collisions (Figure 19), and weekend night-time collisions (Figure 20), failed to provide any consistent support that the 1979 DWI legislation had any immediate substantial impact on the drinking driver behavior of those on the roads at these times.

A comparison of the support for a significant deterrent impact associated with the new laws from the city and county sample with that of statewide data suggests certain differences. Whereas an increase in DWI arrests per month amounting to 49% for the city sample and 41% in the first six months for the county sample was reported, the estimates of statewide DWI arrests suggest only a total 21% increase from 1979 though 1982. Also, alcohol-related accidents decreased by 20% per month in the sample cities and 28% per month in the sample counties, after 1980. Statewide data shows no significant reduction in the alcohol involvement of drivers in total collisions until 1982 and then the decrease is approximately 21%. To help in understanding some of the potential contributors to these differences, a brief review of some of the salient characteristics of the samples may be valuable.

The criteria used to select the 15 counties (out of 39) and the 41 cities (out of 266 incorporated towns and cities) was their reliability and consistency in reporting into the Uniform Crime Reporting System between 1976 and 1983. It may be that the same characteristic(s) which distinguished these communities and enforcement agencies as being different from all the rest in the crime reporting activity also could have provided a particularly responsive environment for increases in DWI related efforts once the new law was passed. If the agency management structure and attitude is such that it diligently discharges its responsibility (even though voluntary) for good recordkeeping and reporting is also the same needed to achieve optimum implementation of the provisions of the new DWI laws, then we have a "best-case" representation in the sample. Thus it might be hypothesized that comparable performance indicators obtained from the 55% of the state not represented in the

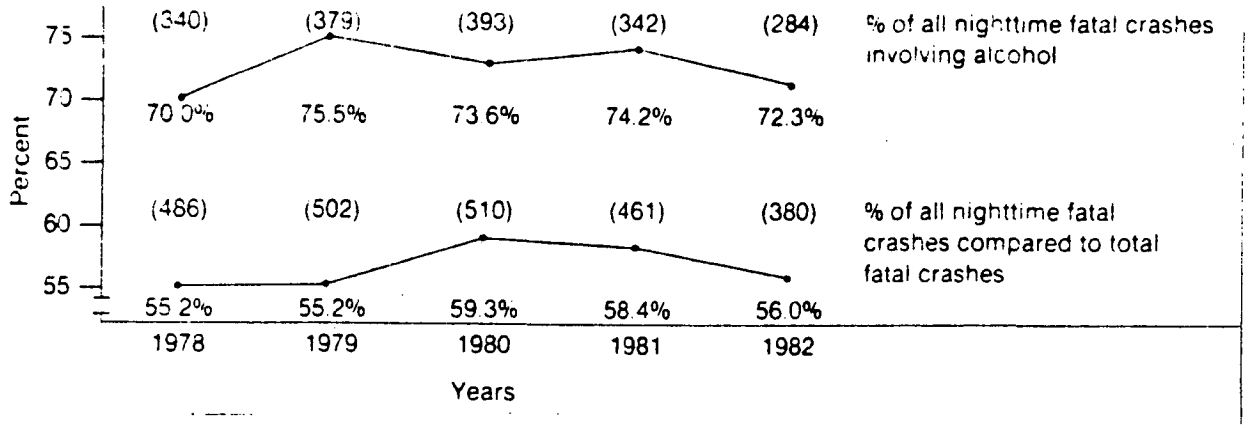

Figure 18. WASHINGTON STATE FATAL ALCOHOL-INVOLVED CRASHES OCCURRING AT NIGHT COMPARED TO THE PERCENTAGE OF ALL WASHINGTON STATE FATAL CRASHES OCCURRING AT NIGHT.

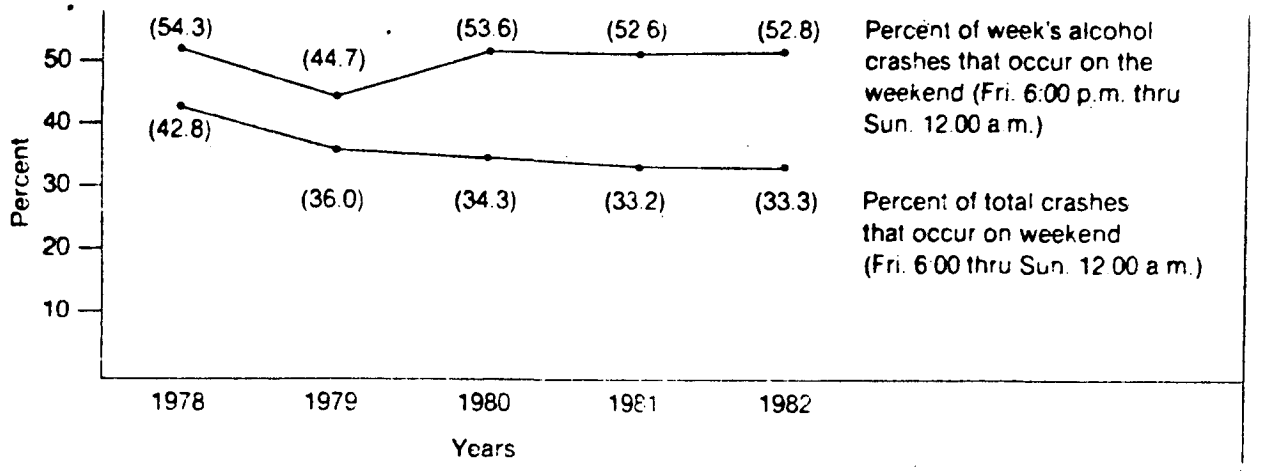

Figure 19. ALCOHOL INVOLVEMENT IN WASHINGTON STATE WEEKEND COLLISIONS COMPARED TO THE PERCENTAGE OF ALL WASHINGTON STATE WEEKEND COLLISIONS

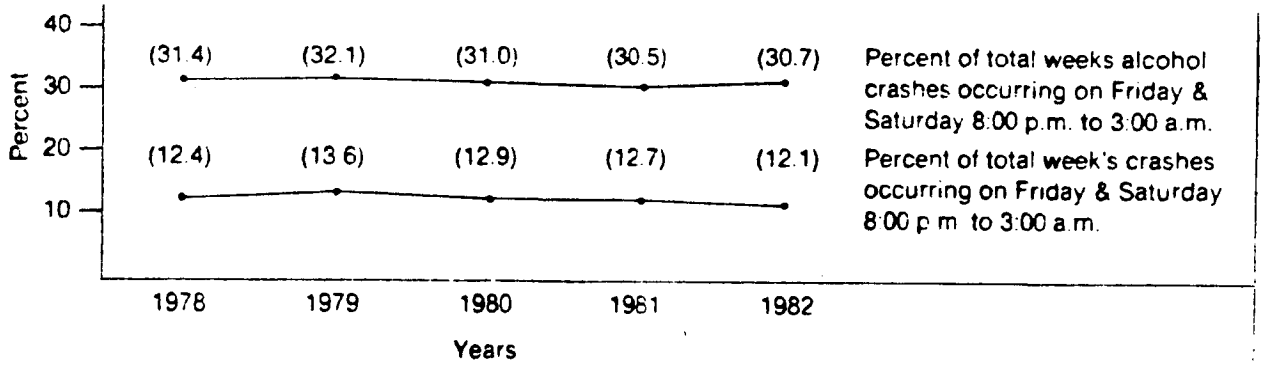

Figure 20. WASHINGTON STATE ALCOHOL-INVOLVED COLLISIONS OCCURRING FRIDAY AND SATURDAY BETWEEN 8 P.M. AND 2 A.M. AS A PERCENTAGE OF THOSE WHICH THIS TIME PERIOD CONTRIBUTES TO THE TOTAL WEEK'S COLLISIONS

sample might well be below those contributed by the sample cities and counties.

City police and particular county sheriffs are not particularly productive in making DWI arrests relative to the level achieved by the Washington State Patrol. As was indicated, State Patrol troopers make about eight DWI arrests per man-month for every one made by county sheriffs and four for every DWI arrest by the city police. As productivity per man increases, it becomes increasingly more difficult to achieve significantly higher numbers of DWI arrests without adding additional manpower. The relatively low levels of DWI arrest efficiency exhibited by county and city enforcement agencies would suggest it might be easier for them to increase their output of DWI arrests than it would be for the Washington State Patrol who have always had DWI apprehension as a priority duty. A result could be that substantial increases in DWI arrests from the cities' and counties' samples would be obscured when combined with the large State Patrol numbers.

If one accepts the assumption that the lag-time necessary for the deterrent effects of the new laws to be manifest in the alcohol-related accident data is in the neighborhood of one and one-half years, then it can be concluded that the new laws had a significant general deterrent impact. Previous efforts at evaluating the impact of new DWI legislation in Great Britain and California have suggested a relatively immediate reduction in alcohol-related driving activity followed by a gradual upward turn shortly thereafter. Both the Great Britain and California legislative actions were accompanied by a substantial positive public information/education effort however, a feature not present in Washington State in 1979. If it is assumed that following the passage of a new law, the public expects that significant enforcement (here meaning apprehension, prosecution, conviction, and punishment) will also be present, then the immediate reaction will be a reduction in the illegal activity. As individuals gain personal knowledge of the actual enforcement level (through personal experience, personal observation, and/or personal communication), they will modify their behavior to a level appropriate with their perception of the personal risk involved in committing the illegal act. The impact of a post-passage media blitz might well contribute to the individual's early perception of risk and thereby produce a more pronounced immediate reduction

and prolong this reduction for a longer period. On the other hand, if the public anticipates no or minimal enforcement activity following the passage of a new law, they will choose not to modify their behavior until such time as their personal experience convinces them that some given level (probability) of risk is involved. This process could account for impact measures showing no immediate reduction followed by a slow decline after some finite lag-period, as is characterized in the alcohol-related collision data reported in Figures 6 and 7. An effective media program initiated after the implementation of the law could contribute to the formation of the individual's perception of risk and thus accelerate the impact process.

It is interesting to note that the reversal in alcohol-related accidents occurred concurrently with the increase in DWI post-conviction jail populations. Although these may be totally independent events, it raises the speculation that as jail terms become a more certain consequence of a DWI conviction, the perception of the increased likelihood by the drinking driver sufficiently impacted his risk-taking threshold to successfully disuade him from engaging in this activity, or at least doing so less frequently. Thus, as exposure (i.e., frequency) is reduced, so is the probability of becoming involved in an alcohol-related collision.

An alternative hypothesis might be that whatever the forces and factors contributing to the reduction of <u>all</u> accidents over the past few years may be, these forces are also impacting on the drinking driver sub-population but that this group of drivers are slower (i.e. require more pressure for a longer period of time) to react in modifying their accident-causing behaviors. The possibility also exists that numerous other drinking driver specific countermeasure efforts (e.g., anti-drunk driver citizen activist group pressures, nationwide media campaigns, etc.) may have been influencing the behavior of those contemplating driving after drinking during this period and that these efforts may have had a positive impact whether or not the 1979 laws had been passed.

B. <u>Specific Deterrence</u>: In order to determine whether DWI convicted drivers who were prosecuted <u>after</u> the passage of the 1979 laws subsequently were safer drivers

than those prosecuted before this legislative action, the post-conviction driving records of three groups of drivers (first offenders, multiple offenders, and a sample of the general driving population) were compared. It was hypothesized that if the new provisions contained in SHB-665, as implemented and administered by the support system in 1980, provided an increased specific deterrent effect then those DWI convicted offenders would subsequently be detected less frequently committing unsafe driving actions and involved in less accidents than those convicted previously.

There was essentially no evidence, from any of the dependent measures obtained, that passage of the new legislation produced any deterrent effect that would significantly dissuade convicted DWI offenders from continuing the previously established errant behavior which resulted in alcohol-related driving violations and/or collisions.

Several system deficiencies were identified during the course of the investigation that, if corrected, could perhaps increase actualization of the potential specific deterrent effects. It was demonstrated for instance that the number of DWI offenders who were avoiding license suspension due to a court initiated recommendation was increasing during this period. Thus it could be that fewer of the 1980 convicted offenders actually experienced a license suspension than did those in the 1978 group. The data also indicated that, proportionately, nearly as many DWI offenders were attending Alcohol Information School before the law passage as attended after passage. Obviously this was not what was intended by the "mandatory" wording in that legislation. Even though the results of numerous ASAP projects have raised some serious questions regarding the value of an educational type approach to dealing with drinking drivers who have serious alcohol abuse or alcohol dependency problems, the damage to the credibility of a system which permits a mandatory requirement to go largely unheeded cannot be overlooked. Similarly, it is not precisely known the extent to which DWI convicted offenders received the "mandatory" jail sentence and actually spent time in jail. Although the OFM report (OFM, 1980) states that a substantial percentage of offenders were spending at least some time in jail, the current data suggests a substantial decrease in the proportion of inmates occupying detention institutions which were there for DWI

offenses in the last four months of 1980. More specifics are obviously needed to resolve and evaluate this question.

It may be tempting to speculate that it is the increase in enforcement activities in 1980 that accounted for the increase in recidivism rates for first and repeat offenders based simply on an increased probability of detection. This study investigated this possibility, however, by comparing the 1978 vs 1980 recidivism rates for drivers having no previous alcohol-related convictions. The findings that percentage increases in recidivism rates were higher for the DWI offender groups than for the NDO groups argues against this explanation of the data. Perhaps a more plausbile explanation of the present finding might be that DWI offenders in the 1980 sample were qualitatively different from the group convicted in 1979. These qualitative differences might have resulted from the observed changes in plea bargaining patterns, from the increased usage of deferred prosecution, and/or differences associated with the "illegal per se" provisions of the new law. These speculations obviously need to be subjected to empirical testing by studies specifically designed to address these issues.

If, as is suggested earlier in Section III, the effect of the 1979 legislation did not become manifest until 1981 then the comparison of a 1978 population with a 1980 population was perhaps premature. Perhaps a more critical test of the specific deterrent effects would be to compare recidivism rates of a 1979 DWI population with those of a similar group in 1981 or perhaps even 1982, when the full impact of the new laws may have had an opportunity to establish itself within the driving population.

Regardless of what specific deterrent effects are reported in this or subsequent evaluations, the fact remains that both specific and general deterrent impact evaluations are critical, since effectiveness within one population does not necessarily mean that it is equally effective for the other, nor that if it is ineffective for one group, it will not significantly impact the other. Even if a 100% successful countermeasure program could be established for convicted DWI offenders, the impact on the subsequent year's alcohol-related collision statistics would be only minimal since by far the largest proportion of alcohol-related

collisions each year are attributable to drivers without prior DWI convictions. For example, of the 688,300 alcohol-involved drivers in the 1982 National Accident Statistical Sample files, only 8.2% had prior DWI convictions. Furthermore, in the Fourth Special Report to the U. S. Congress on Alcohol and Health from the Secretary of Health and Human Services in 1981, the estimate of the crash fatality reduction associated with a 100% effective countermeasure program dealing exclusively with all apprehended drunk drivers would be somewhat less than the 5.7% projected by NHTSA.

V. CONCLUSIONS

The data collected and analyzed suggest the following conclusions:

A. There has been an increase in the number of arrests for Driving While Intoxicated since the passage of SHB-665. This increase is most directly attributable to increased apprehensions by city police and county sheriffs.

B. Court convictions of DWI offenders have kept pace with the increase in arrests, maintaining a conviction rate of just over 80% for those cases being adjudicated. There are indicators, however, that there is an increasing trend toward dismissals of DWI cases and of diverting offenders into deferred prosecution programs. There has been a significant shift in plea bargaining patterns away from reducing charges to Being in Physical Control of a Motor Vehicle while Intoxicated and toward reduction of DWI charges to Negligent Driving.

C. The jails continue to report a steady increase in the proportion of their inmates which have been incarcerated for DWI offenses, a trend which began early in 1981.

D. There is an increasing tendency for courts to recommend "no license suspension" for first DWI offenders such that by 1982 nearly half of these offenders avoided any licensing suspension action.

E. Only about half of the DWI offenders have been receiving the mandatory alcohol education program being conducted by the State's Alcohol Information Schools.

F. There are no indications that the provisions established by SHB-665 and as implemented, executed and supported by the responsible operational agencies, produces any specific deterrent effects in significantly reducing DWI recidivism.

G. Washington State has experienced a significant progressive annual decrease in fatal, injury, property damage, and total collisions, and in the annual motor vehicle death rate each year since 1979.

H. Alcohol-related collisions reversed an increasing trend (that started in 1978) in early 1981 for the city sample, in mid-1981 for the county sample and was significantly reflected in the statewide accident statistics in the 1982 yearly data. The extend to which this recent decline in alcohol-related collisions is attributable to the passage of SHB-665 is not unequivocally established. If one is willing to adopt the hypothesis that this response lag period is a necessary period for modifying and measuring a behavioral change and that no other intervening variables were impacting the dependent measures in the interim, only then can the results be exclusively attributed to the passage and subsequent implementation of SHB 665.

I. The lack of complete implementation and administration of the provisions established in SHB-665 may have seriously limited or masked the impact of the full potential deterrent effects of those provisions. Among these were relatively small increases in the arrest rates of DWI offenders, no substantial increase in the proportion of DWI offenders successfully prosecuted, failure to consistently impose and execute the full punitive sanctions (mandatory jail sentences and license suspensions), inability to mandate treatment for all convicted offenders, and the lack of a public information/education program to augment the implementation and execution efforts.

VI. RECOMMENDATIONS

A substantial number of the system deficiencies identified and quantified in this study have already been addressed by subsequent legislative action. The intent of these legislative actions is very succinctly expressed in the preamble to Substitute House Bill 289 which reads:

"The legislature find the previous attempts to curtail the incidence of driving while intoxicated have been inadequate. The legislature further finds that property loss, injury and death by drinking drivers have reached unacceptable levels. This act is intended to convey the seriousness with which the legislature seeks to insure swift and certain punishment for those who drink and drive. The legislature do not intend to discourage or deter courts and other agencies from directing or providing treatment for problem drinkers. However, it is the intent that such treatment, where appropriate, be in addition to and not in lieu of the sanctions to be applied to all those convicted of driving while intoxicated."

Among the legislative efforts to make the DWI laws more effective have been the following:

A. The definition of the mandatory one day in jail as meaning twenty-four consecutive hours (HB-600, 1982).

B. Requiring the alcohol information schools to perform an alcohol-abuse evaluation and to recommend intensive alcoholism treatment in lieu of the alcohol-abuse educational program where appropriate (HB-600, 1982).

C. Prohibiting the Department of Licensing from reissuing a suspended driver's license until they have received notification that the individual is successfully participating in an approved alcohol treatment program (HB-600, 1982).

D. Persons eligible for a deferred prosecution program may not participate in such a program more than once in any five-year period (HB-600, 1982).

E. The courts are no longer authorized to recommend that no license suspension be imposed (SHB-289, 1983).

F. No occupational licenses may be issued for the first 30 days of any suspension/revocation period (SHB-289, 1983).

G. The first 24 hours of jail sentences for first DWI offenders and first 48 hours of jail sentences for repeat offenders must be served as consecutive time (SHB-289, 1983).

H. Cities and counties cannot establish lesser penalties for DWI than those established by the State. (SHB-289, 1983).

I. The Washington Traffic Safety Commission is responsible for producing/disseminating a public information/education program regarding the DWI problem and DWI laws and penalties (SHB-289, 1983).

J. Suspension for first conviction of DWI is increased from 30 to 90 days, and from 60 days up to 1 year on a second conviction (SHB-289, 1983).

K. A refusal to take a breathalyzer test may be introduced in court testimony (SHB-289, 1983).

It is obvious that, as with all complex social systems in transition, continuous data collection and evaluation is a critical requirement in order to facilitate accurate and timely management decisions on optimal resource allocation and utilization. The need for a centralized, coordinated, and integrated record system which provides easy and immediate access to current system performance and impact measures is very apparent to all those attempting to arrive at reasonable and feasible solutions to the drinking-driver dilemma. Where data does not currently exist, such as measures of perceived probability (certainty), carefully designed and executed data generation programs need to be implemented and this information integrated with the system's description and performance criteria measures.

Only through a systematic iterative process of countermeasure development, implementation, and evaluation can significant in-roads be made toward the total control of the disastrous effects the drinking driver inflects on our society.

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APPENDIX A

JOHN SPELLMAN
Governor

WILLIAM R. LATHROP
Director

STATE OF WASHINGTON

WASHINGTON TRAFFIC SAFETY COMMISSION

1000 S Cherry St • Olympia, Washington 98504 • (206) 753-6197

May 3, 1983

M E M O R A N D U M

TO: Joe Taller, Director
Office of Financial Management

FROM: William R. Lathrop, Director
Washington Traffic Safety Commission

SUBJECT: Interagency Support Agreement

The Washington Traffic Safety Commission is interested in establishing an Interagency Agreement with your agency to obtain professional and technical support assistance for performing the activities set forth in our contract (DTNH22-82-C-05144) with the National Highway Traffic Safety Administration entitled "Analysis of Washington State Mandatory Jail Sentence Law".

This study, which is an extension and continuation of the work performed by your Division of Criminal Justice in 1980 ("Assessment of the Implementation and Impact of SHB-665: The New Driving While Intoxicated Law"), was proposed with the assistance of Mr. John P. O'Connell of your staff. Mr. O'Connell's input to the proposal included the following:

> "Study I - Impact of the DWI law on traffic accidents, arrests, and convictions. This study will examine the general deterrence effect of the law by pre-post comparisons of alcohol and non-alcohol-related injury and fatal accidents. In addition, pre-post comparisons of DWI arrests and convictions will be included. The analysis will utilize time series intervention analysis techniques for the time period 1977 to 1982 to identify changes attributable to the implementation of the law. . . . . The Office of Financial Management will have primary responsibility for the analysis of accident data and assessment of the general impact of the law."

To cover the costs incurred by OFM in providing the needed support, there is hereby authorized reimbursements of up to $15,000 (by submitting Invoice Voucher Form A-19, attached) between now and June 30, 1983. A copy of the proposed allocation distribution is attached.

I hope that you can concur with this agreement and that the resultant product will be mutually beneficial to both our agencies and to the State of Washington.

Agreed to on behalf of the
Washington Traffic Safety Commission

William R. Lathrop, Director

Agreed to on behalf of the
Office of Financial Management

Joe Taller, Director

OFM ALLOCATION

Salaries		$ 7,500
Project Staff	$5,625	
Support Staff	1,875	
Benefits (@ 20%)		1,500
Data Processing		5,000
Goods & Services (Phone, mail, printing, etc.)		1,000
Total		$15,000

FORM
A19
Rev. 4/81

STATE OF WASHINGTON
INVOICE VOUCHER

AGENCY NAME

AGENCY USE ONLY		
AGENCY NO.	LOCATION CODE	P.R. OR AUTH. NO.

INSTRUCTIONS TO VENDOR OR CLAIMANT: Submit this form in triplicate to claim payment for materials, merchandise or services. Show complete detail for each item.

VENDOR OR CLAIMANT *(Warrant is to be payable to)*

Vendor's Certificate. I hereby certify under penalty of perjury that the items and totals listed herein are proper charges for materials, merchandise or services furnished to the State of Washington, and that all goods furnished and/or services rendered have been provided without discrimination on the grounds of race, creed, color, national origin, sex, or age.

BY _____
(SIGN IN INK) (TITLE) (DATE)

FEDERAL I.D NO. OR SOCIAL SECURITY NO. (For Reporting Personal Services Contract Payments to I.R.S.

DATE	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	FOR AGENCY USE
DOCUMENT #	LIQUIDATION DATE					

Carrier	Shipping Document No	Collect	Prepaid	No. Pieces	Received By	Date Received

ACCOUNT CODE									AMOUNT	
FUND	APPROP.	PROGRAM	OBJECT						LIQUIDATION	NET INVOICE
				A-4				TOTAL		

CHECKED AND APPROVED FOR PAYMENT BY.	INVOICE DATE	INVOICE NO.	GROSS INV. AMT.	DISCOUNT IN $	NET INV. AMT.	VOUCHER NO.	WARRANT NO.

APPENDIX B

INTERAGENCY AGREEMENT

THIS INTERAGENCY AGREEMENT is entered into by and between the WASHINGTON STATE TRAFFIC SAFETY COMMISSION, hereinbelow called the "COMMISSION" and the WASHINGTON STATE DEPARTMENT OF LICENSING, hereinbelow called the "DEPARTMENT."

I

PURPOSE

The Commission has a contract with the National Highway Traffic Administration (Contract DTNH 22-82-C-05144) obligating the Commission to do a study entitled "Analysis of Washington State Mandatory Jail Sentence Law." The study, which is an extension and continuation of the work performed by the Division of Criminal Justice Office of Financial Management, in 1980 ("Assessment of the Implementation and Impact of SHB 665: The New Driving While Intoxicated Law") was proposed by Dr. Phillip Salzberg of the Department's staff.

The purpose of this agreement is to permit the Department, and its employee Dr. Salzberg and his staff, to perform the study for the Commission and to provide for the reimbursement to the Department of the actual cost thereof.

II

SCOPE OF WORK

The Department, through Dr. Salzberg and his staff, shall perform the study by doing the following:

> "Study II - Impact on the DWI law on the recidivism patterns of DWI offenders. This study will examine the specific deterrence effect of the law for individuals convicted of DWI under the new law compared to individuals convicted under the old law. The Driver Record System of the Washington State Department of Licensing will be accessed to provide a pre- and post-sample of DWI offenders. Driving records for these samples will be tracked for one year from the time of arrest. The pre-sample will consist of drivers arrested for DWI in 1978 and 1979. The post-sample will consist of individuals arrested during 1980 and 1981. As a baseline for comparison, a sample of non-DWI offenders will be compared on the following dependent variables: the number of subsequent DWI violations, the number of injury and fatal accidents, and the number of non-alcohol-related violations. In addition, the analysis will

control for the number of prior DWI offenses. Controlling for prior offenses will allow for an assessment of the possible differential impact of the law on first offenders and repeat offenders.

Specific impact of the law will be the primary responsibility of the Department of Licensing."

III

REIMBURSEMENT OF COST

The Department shall be reimbursed by the Commission for its actual direct and indirect cost of performing the study, not to exceed a total of $15,675. Both parties recognize that some work upon the study has already been done by the Department based upon preliminary discussions in order to be able to complete the study within the Commission's deadlines. Costs incurred by the Department for this preliminary work shall be included in those costs to be reimbursed by the Commission.

Requests for such reimbursement by the Department shall be submitted to the Commission on Invoice Voucher Form A-19, copy attached hereto as Exhibit A. Reimbursement by the Commission shall be made promptly to the Department following the Commission's receipt of such invoices.

The allocation of cost among specific functions is expected to be approximately as set out on Exhibit B, attached hereto. These are estimates. The parties expect there to be some variance as the study progresses.

IV

TIME FOR COMPLETION

The Department shall complete the study and deliver it to the Commission not later than September 30, 1983.

V

COMMENCEMENT AND PERIODIC REPORTS

The Department shall commence work upon the study following execution of this agreement by the parties and filing of this agreement with the Office of Financial Management. The Department shall periodically advise the Commission of the progress of the study and its estimated time of completion.

VI

PROPRIETARY INTERESTS

Neither the parties to this agreement nor the United States Government shall have exclusive proprietary interest in the final study document nor in notes and materials developed for the

study. The parties, and the United States Government, may use the study for any purpose each deems appropriate.

VII

DURATION OF AGREEMENT

This agreement shall be effective upon the date the agreement is signed by the Director of Licensing, or his designee, and shall extend to September 30, 1983 or until a final version of the study has been delivered to the Commission and all expenses of the Department have been reimbursed to it.

VIII

TERMINATION FOR CONVENIENCE

The Commission may terminate this agreement at its convenience upon five days' written notice of such termination to the Department. In the event of such termination, the Commission will reimburse the Department for all of its costs incurred to the effective day of termination, subject to the maximum limit set out in Section III above, and the Department will permit the Commission access to all of the materials developed for the study to that date.

IX

DISPUTES

If a bona fide dispute arises between the Department and the Commission and it cannot be resolved by the parties, the matter shall be referred to the respective Assistant Attorney General assigned to each agency and those persons shall attempt to resolve the dispute. In no case shall either party attempt to resolve the dispute by litigation unless such litigation has been expressly approved in advance by the Attorney General's Office. Any lawsuit brought by a party in connection with this agreement shall be brought only in the Superior Court in and for the County of Thurston, Washington.

X

MODIFICATIONS TO AGREEMENT

This written agreement contains the agreement between the parties in its entirety. Amendments or modifications thereto shall be made in writing signed by authorized representatives of both parties.

WILLIAM R. LATHROP, Director
WASHINGTON TRAFFIC SAFETY COM'N

DATE: July 5, 1983

JOHN GONSALEZ, Director
DEPARTMENT OF LICENSING

DATE: July 20, 1983

Approved as to Form:

EXHIBIT A

FORM A19 Rev. 4/81

STATE OF WASHINGTON

INVOICE VOUCHER

AGENCY NAME

AGENCY USE ONLY		
AGENCY NO.	LOCATION CODE	P.R. OR AUTH. NO

INSTRUCTIONS TO VENDOR OR CLAIMANT Submit this form in triplicate to claim payment for materials, merchandise or services. Show complete detail for each item.

VENDOR OR CLAIMANT *(Warrant is to be payable to)*

Vendor's Certificate. I hereby certify under penalty of perjury that the items and totals listed herein are proper charges for materials, merchandise or services furnished to the State of Washington, and that all goods furnished and/or services rendered have been provided without discrimination on the grounds of race, creed, color, national origin, sex, or age.

BY _____ (SIGN IN INK) _____ (DATE)

(TITLE)

FEDERAL I.D. NO. OR SOCIAL SECURITY NO. (For Reporting Personal Services Contract Payments to I.R.S.

DATE	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT	FOR AGENCY USE
DOCUMENT #	LIQUIDATION DATE					

Carrier	Shipping Document No	Collect	Prepaid	No. Pieces	Received By	Date Received

ACCOUNT CODE									AMOUNT	
FUND	APPROP	PROGRAM	OBJECT						LIQUIDATION	NET INVOICE

B-4

TOTAL

CHECKED AND APPROVED FOR PAYMENT BY	INVOICE DATE	INVOICE NO.	GROSS INV. AMT	DISCOUNT IN $	NET INV. AMT	VOUCHER NO	WARRANT NO

73

EXHIBIT B

DOL ALLOCATION

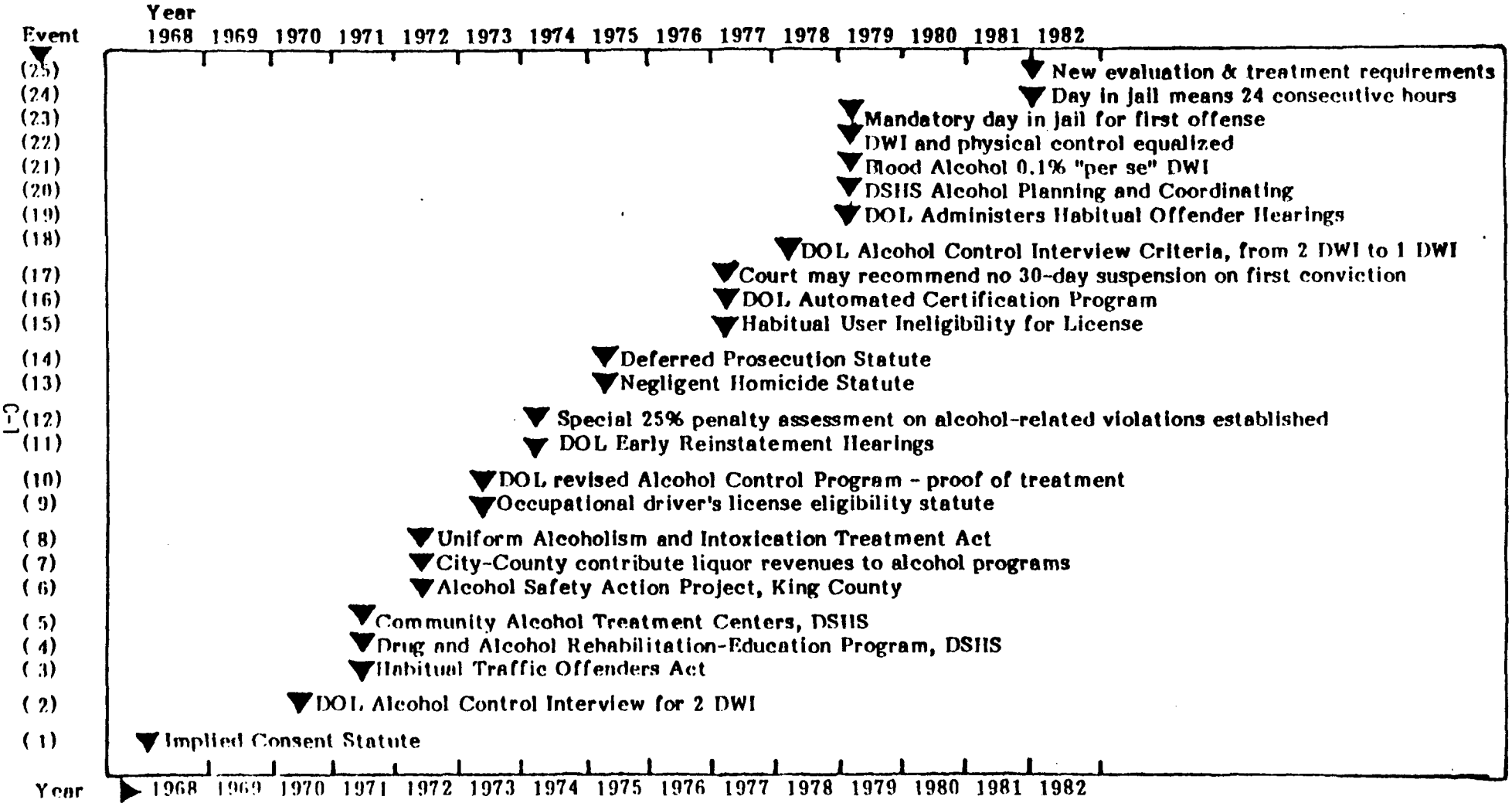
Salaries		$ 8,063
Project Staff	$6,188	
Support Staff	1,875	
Benefits (@ 20%)		1,613
Data Processing		5,000
Goods & Services (Phone, mail, printing, etc.)		1,000
Total		$15,675

APPENDIX C

DWI LEGISLATION IN WASHINGTON STATE: A CHRONOLOGY

TABLE C-1

DEPARTMENT OF LICENSING ALCOHOL/TRAFFIC SAFETY TIME-EVENT CHART



Source: Research & Technology Division, Department of Licensing (Jan. 1982)

(1)
1968 RCW 46.20.308 Implied Consent statute provided that a driver of a motor vehicle is deemed to have given his consent to a chemical test of his breath or blood to determine alcoholic content if the arresting officer has reasonable grounds to believe that he was driving or in physical control of a motor vehicle while under the influence of intoxicating liquor and that his driver's license shall be revoked for six months if he refuses to permit such chemical test.

(2)
1970 To implement RCW 46.20, Department of Licensing initiated alcohol control interview program. Drivers with alcohol related citations were placed on 24 month probation. If another alcohol related entry added to record during probation, an order suspending the driving privilege was issued.

(3)
1971 RCW 46.65 Washington Habitual Traffic Offenders Act, amended 1979 and 1981, provided for revocation of driver's license of any person defined as an habitual traffic offender, such revocation to be for five years but with opportunity to petition for reinstatement after two years, either wholly or conditionally. Definition included any person who has three or more convictions within five years of driving or operating a motor vehicle while under the influence of intoxicants or drugs. Hearings initially were conducted by superior courts, then transferred to the Department of Licensing in 1979.

(4)
1971 RCW 69.54 The Drug and Alcohol Rehabilitation Education Program provided that the Secretary, Department of Social and Health Services, shall establish a program to aid and rehabilitate persons suffering with drug or alcohol problems; and shall establish community education programs, in coordination with programs established by the state Superintendent of Public Instruction, in the schools relating to alcohol and drug use and abuse.

(5)
1971 RCW 70.96 Established community alcoholism treatment centers, funded by DSHS, provided that at least 10 percent of the cost was funded by local, public or private sources.

(6)
1971-2 Alcohol Safety Action Project (ASAP) conducted in King County is a federally funded program aimed at determining the extent of alcohol abuse among drivers. It sought to evaluate the success of a coordinated effort by enforcement, the courts, alcohol treatment facilities and the department, in detecting and treating alcohol abusive drivers.

(7)
1972 RCW 70.96 Provided that in order for a city or county to be eligible to receive its share of liquor taxes and profits it must devote no less than 2 percent of such share to support of an alcoholism program.

(8)
1972 RCW 70.96A The Uniform Alcoholism and Intoxication Treatment Act, subsequently amended, initially declared the policy that alcoholics and intoxicated persons may not be subjected to criminal prosecution solely because of their consumption of alcohol beverages but rather should be afforded treatment in order that they might lead normal, productive lives. It authorized DSHS to plan, establish and maintain alcoholism treatment programs. It established an interdepartmental coordinating committee for prevention of alcoholism and for treatment of alcoholics, persons incapacitated by alcohol, and intoxicated persons. It mandated that DSHS establish a comprehensive and coordinated program for treatment of alcoholics, persons incapacitated by alcohol, and intoxicated persons. It established standards for public and private treatment facilities. It provided for voluntary treatment of alcoholics at approved facilities, and for involuntary commitment of alcoholics who are incapacitated by alcohol.

(9)
1973 RCW 46.20.391 Amended 1979, defined eligibility for Occupational Driver's License after conviction of an offense for which license revocation is mandatory, upon approval by court and subject to statutory conditions and limitations.

(10)
1973 Department of Licensing revised Alcohol Control Program and initiated requirement that drivers who violate Alcohol Control probation must show proof of alcohol treatment before gaining reinstatement of driving privilege.

(11)
1974 Department of Licensing conducted first early reinstatement hearings for Habitual Traffic Offenders. Alcohol treatment requirement established as partial basis for showing "good cause" for license reinstatement in those cases where alcoholism was present.

(12)
1974 RCW 46.61.515 Amended to impose a special penalty assessment in the minimum amount of 25 percent of all fine or bail forfeiture on all offenses involving a violation of any state law or city or county ordinance relating to driving or being in physical control while under the influence of intoxicants. All assessments are paid into the highway safety fund for the exclusive use of the Department of Licensing for alcohol safety programs and driver services programs.

(13)
1975 RCW 46.61.520 Rules of the Road provided that any person driving a motor vehicle while under the influence of or affected by intoxicating liquor or drugs, and which driving is the cause of injury to a person who dies within three years as the proximate cause of such injury, shall be guilty of negligent homicide by motor vehicle, and provided both fines up to $1,000 and imprisonment up to ten years.

(14)
1975 RCW 10.05 Deferred prosecution statute provided that a person charged with a misdemeanor or a gross misdemeanor may petition the court for a deferred prosecution program if the wrongful conduct was the result of or caused by an alcohol, drug or mental problem for which the person is in need of treatment and unless treated such wrongful conduct will recur.

(15)
1977 RCW 46.20.031 Amended to provide that a person who is an habitual user of any drug to a degree which renders him incapable of safely driving a motor vehicle or who habitually lacks self-control as to the use of alcoholic beverages, or uses alcoholic beverages to the extent that his health is substantially impaired or endangered or his social or economic function is disrupted so as to constitute a danger to other persons or property, is ineligible for a driver's license.

(16)
1977 Department of Licensing initiated an automated certification program. This enabled continuous monitoring of success for drivers who were required to undergo alcohol treatment in order to secure license reinstatement from either an Alcohol Control Program suspension or an Habitual Traffic Offender revocations. Certification system provided for quarterly reports of progress.

(17)
1977 RCW 46.61.515 Amended to permit the court to recommend no suspension action be taken by the Department of Licensing on the first conviction (30 day suspension).

(18)
1978 DOL revised its criteria for selection of drivers for its Alcohol Interview Program from two convictions of DWI to one conviction, or two convictions of alcohol-related charges.

(19)
1979 RCW 46.65.020 Habitual Traffic Offenders Act amended to provide that DOL shall administer the license revocation hearing of the person whose record shows three or more convictions within five years of driving while under the influence of intoxicants or drugs. DOL revocation subject to person's right to appeal to superior court.

(20)
1979 RCW 70.96A Amended to mandate specific duties to DSHS in carrying out its functions as a planning and coordinating agency, including cooperating with public and private agencies in establishing and conducting programs designed to deal with the problem of persons operating motor vehicles while intoxicated.

(21)
1979 RCW 46.61 Amended to make driving while having 0.10 percent or more by weight of alcohol in the blood as shown by chemical analysis of breath, blood or other bodily substance as per se case of driving while intoxicated. The amendment eliminated earlier "presumptions" of DWI which left room for case by case adjudication.

(22)
1979 RCW 46.61.515 Rules of the Road amended to provide equal penalties for driving while under the influence of intoxicating liquor or drug and for being in actual physical control of a motor vehicle while under the influence of intoxicating liquor or drug, and amended RCW 46.61.502 and 504 to define the constitution of both offenses equally.

(23)
1979 RCW 46.61.515 Amended to require one day in jail upon first conviction for DWI or physical control. The mandatory one day in jail shall not be suspended or deferred unless the judge finds that imposition of the jail sentence will pose a risk to the defendant's physical or mental well-being. Reasons for granting suspension or deferral must be stated in writing.

(24)
1982 RCW 46.61.515 Amended to clarify that the minimum mandatory day in jail for DWI first offenses means 24 consecutive hours. (HB 600)

(25)
1982 RCW 46.61.515 Amended. If the court or alcohol information school finds that a convicted person has serious alcoholism problems, he or she may be required to participate in a more intensive alcoholism treatment program approved by DSHS. Upon a second conviction, a complete diagnostic evaluation is required. Those found to have serious alcohol or drug problems must complete an approved treatment program. DOL may not reinstate a convicted person's license until it has received a copy of the diagnostic evaluation and treatment report from the treatment agency. DOL must condition reinstatement of driving privileges on enrollment and participation in any treatment program which may be required. (HB 600)

APPENDIX D

TIME SERIES ANALYSIS DISCUSSION AND EXAMPLES

Time Series Pattern Description Method

The time series pattern description method was made available through the good offices of the Statistical Analysis Center, Criminal Justice Information Systems Division, Illinois Law Enforcement Commission in Chicago, Illinois. Dr. Carolyn R. Block of the Illinois Statistical Analysis Center is one of the primary authors of the package and was most helpful in the transfer process. The original computer programs were written in Fortran for use on a Hewlitt-Packard 3000. Doris Steingraber of the Washington State University, Computer Service Center translated the existing programs into VS Fortran for use in an Amdahl/IBM environment. The computerized method is now available at several other universities, thanks to Doris Steingraber and the ILEC.

The method is based upon a segment spline regression algorithm written by James B. Ertel and Edward E. Fowlkes of Bell Laboratories. For further information as to the source, see "Some Algorithms for Linear Spline and Piece-Wise Multiple Linear Regression", Journal of The American Statistical Association, #71, (September, 1976):640-648.

Basically, the computerized method determines the best fit for a linear spline regression line in a series of continuous segments to a time series data set. Through a series of iterative steps, the program calculates and plots a series of graphics which depict the slope turning point and length of each segment. The analyst may choose the appropriate graphic from the series which best represents the situation as interpreted by subjective or other measures. Thus, the graphics presented in this publication are each one of a series which were selected on the basis of verisimilitude.

The time series pattern description method is meant to be used as a statistically significant description of the data rather than as an explanation. Consequently, additional measures should be utilized for analysis. Extreme values will affect the position and/or turning point of a line segment. And the method ignores autocorrelation and seasonality which may also affect the turning point. The data series for the sample

sites were examined for autocorrelation and the results indicated strong seasonality in three of the six series, viz., alcohol-related convictions and alcohol-related city accidents. The convictions data series have an inherent redundancy problem due to double reporting, hence, require further refinement and additional analysis. The city accident series should provide additional beneficial insights after similar work. Smoothed data was applied to the pattern description for analysis but was not utilized in this publication since the results are basically similar.

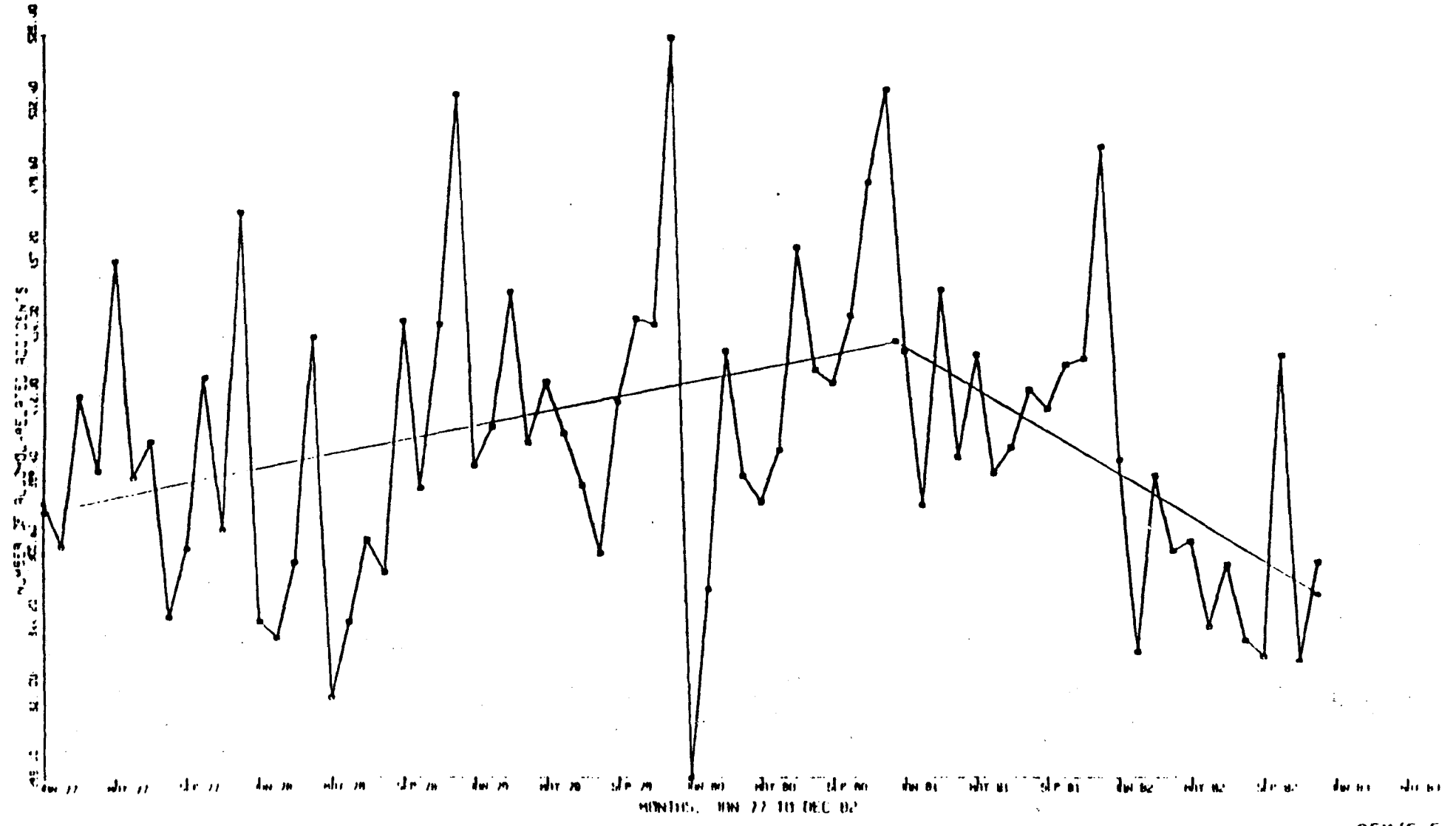
There is an alternate pattern description technique in the ILEC package known as the Hudson/Fox method, named for Derek J. Hudson and James Alan Fox. The Hudson/Fox program will find the best straight and the best two segment least square lines. The two are then superimposed on a plot. In this appendix, there are two examples of the Hudson/Fox technique, viz., the plots depicting alcohol-related traffic convictions for the cities and the counties.

11 WASHINGTON CITIES: ALCOHOL-RELATED ACCIDENTS, 1977/1982

RAW DATA SERIES = (1)
MULTI SEGMENT LINE = (2)
SOURCE: WASHINGTON DEPT. OF TRANSPORTATION

FIRST SLOPE = 1.13
Y ZERO INTERCEPT = 378.07
SECOND SLOPE = -3.31
Y ZERO INTERCEPT = 593.79

FIRST TURNING POINT X=48.50
Y=433.10
TOTAL SSR =



OFM/FEE

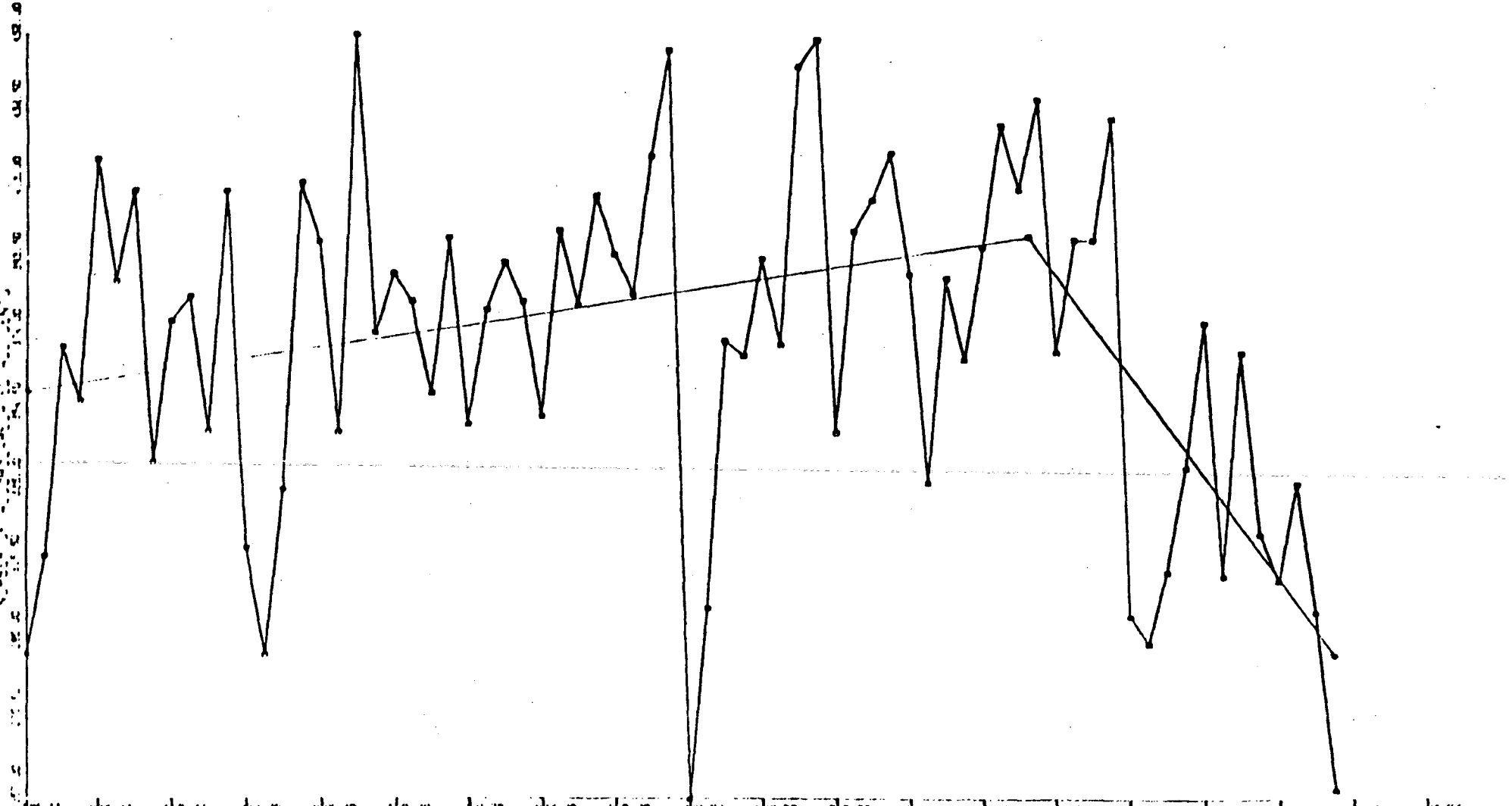
TEC COMMON DATA INFORMATION SYSTEMS STATISTICAL ANALYSIS CENTER GRAPH

15 WASHINGTON COUNTIES: ALCOHOL-RELATED ACCIDENTS, 1977/1982

RAW DATA SERIES (1)
MULTI-SEGMENT LINE (2)
SOURCE: WASHINGTON DEPT. OF TRANSPORTATION

FIRST SLOPE = 0.74
Y ZERO INTERCEPT = 359.50
SECOND SLOPE = -8.52
Y ZERO INTERCEPT = 762.39

FIRST TURNING POINT X=55.50 Y=490.74
TOTAL SSR =



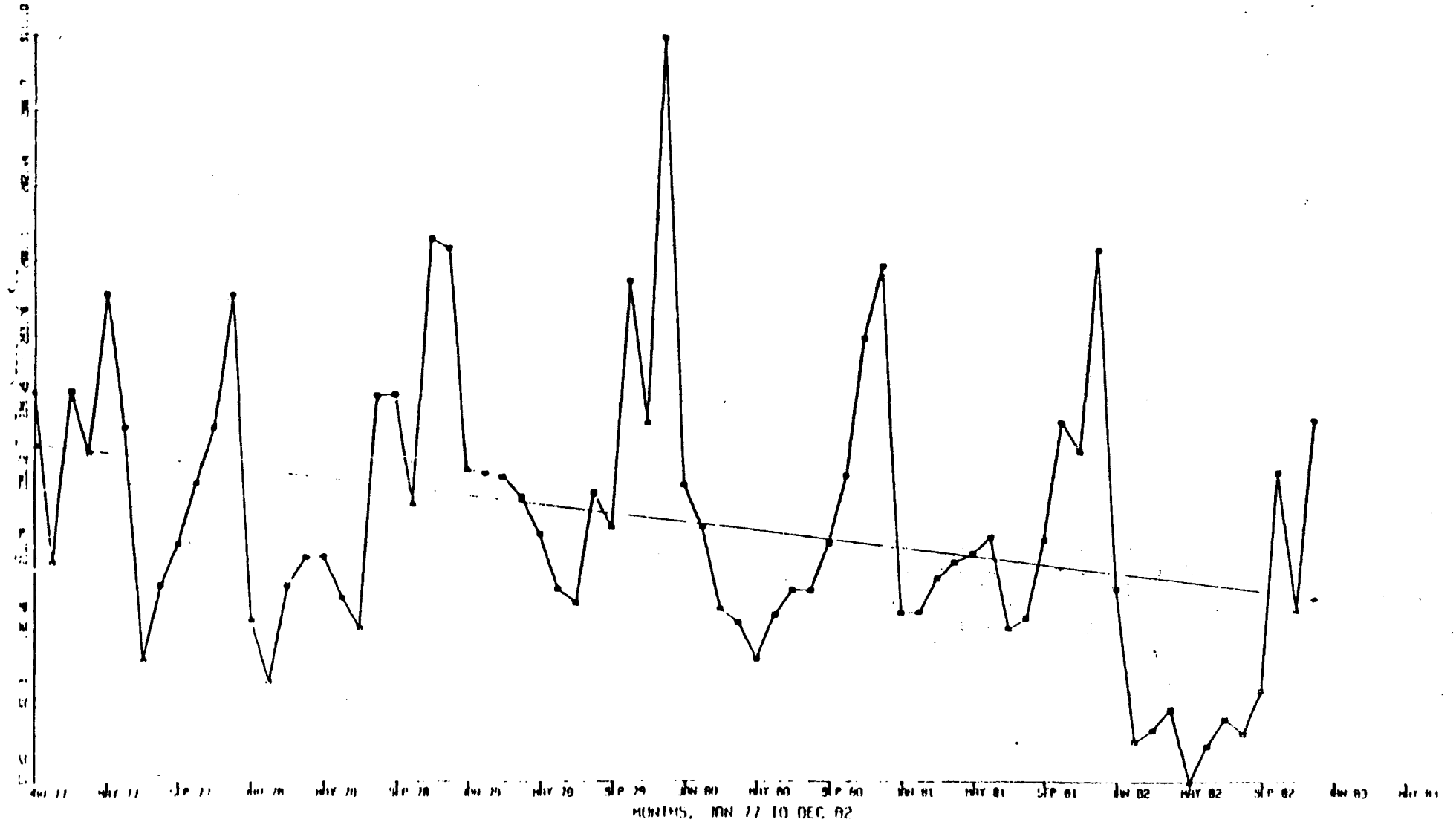
MONTHS, JAN 77 TO DEC 82

OFM/FCE

11 WASHINGTON CITIES : TOTAL AUTO ACCIDENTS, 1977 - 1982

RAW DATA SERIES = (7)
MULTI-SEGMENT LINE = (7)
SOURCE: WASHINGTON DEPT. OF TRANSPORTATION

FIRST SLOPE = -4.21 TOTAL SSR =
Y ZERO INTERCEPT = 2329.78



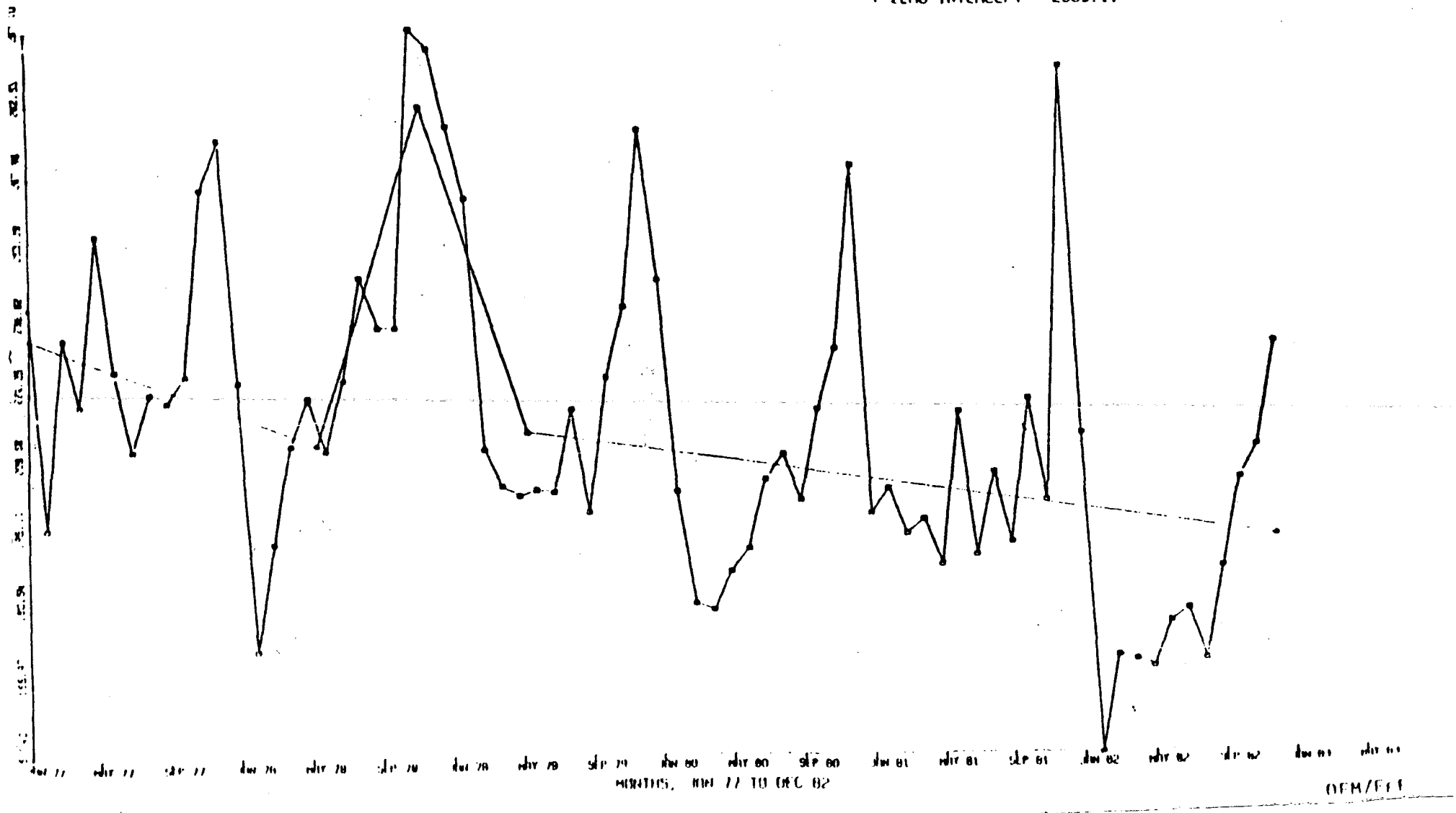
MONTHS, JAN 77 TO DEC 82

01M/1.1

15 WASHINGTON COUNTIES : TOTAL AUTO ACCIDENTS, 1977 - 1982

RAW DATA SERIES = (*)
MULTI SEGMENT LINE = (*)
SOURCE: WASHINGTON DEPT. OF TRANSPORTATION

FIRST SLOPE = -13.53	FIRST TURNING POINT	X:17.50
Y ZERO INTERCEPT = 2367.48		Y:2190.03
SECOND SLOPE = 114.31	SECOND TURNING POINT	X:23.50
Y ZERO INTERCEPT = 130.25		Y:2816.48
THIRD SLOPE = -109.98	THIRD TURNING POINT	X:29.50
Y ZERO INTERCEPT = 5100.83		Y:2156.70
FOURTH SLOPE = -5.17	TOTAL SSR =	
Y ZERO INTERCEPT = 2309.11		



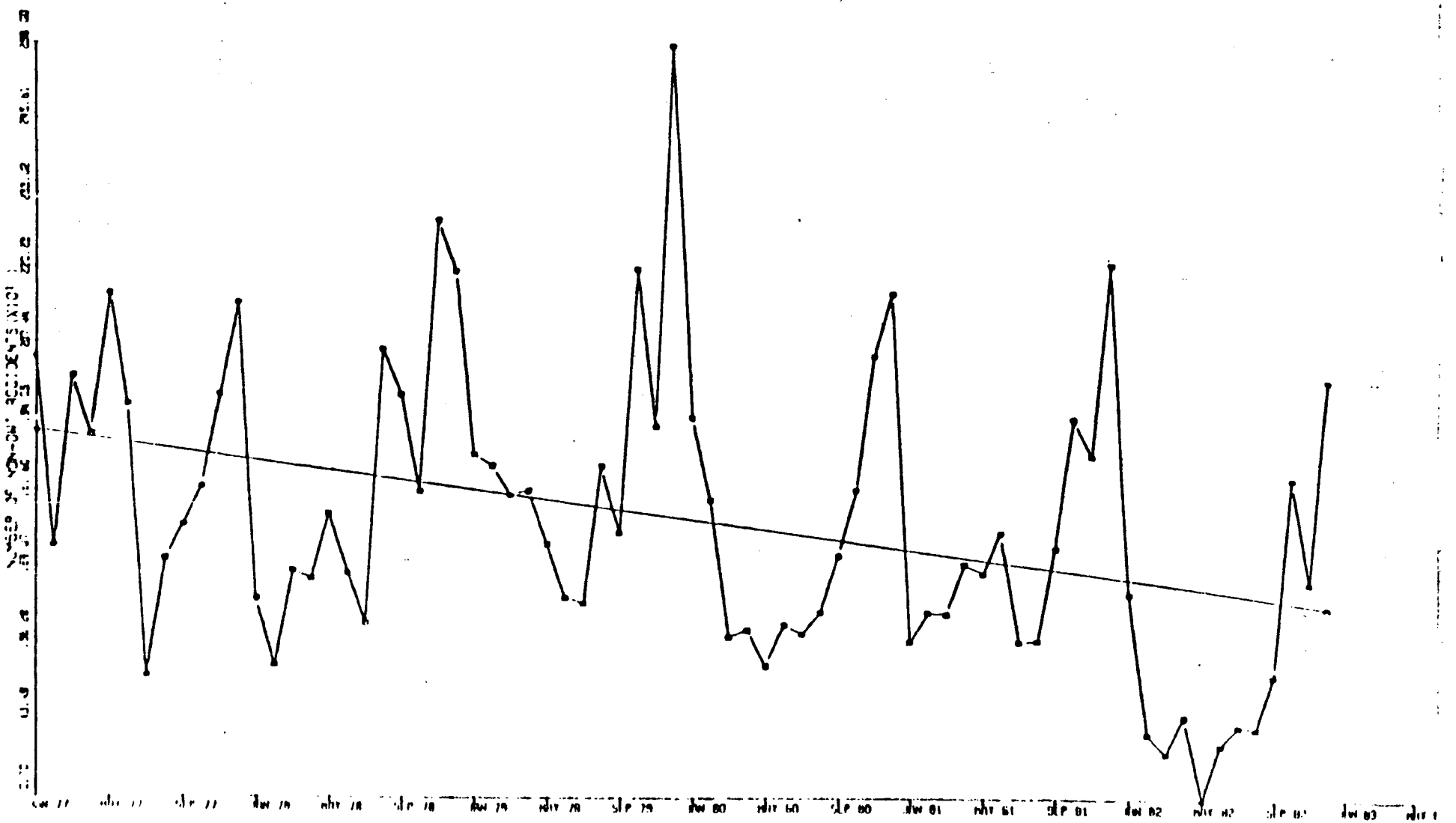
MONTHS, JAN 77 TO DEC 82

OFM/FFT

41 CITIES: NON-DWI TRAFFIC ACCIDENTS, 1977-1982

RAW DATA SERIES = (1)
MULTI SEGMENT LINE = (2)
SOURCE: WASHINGTON DEPT OF TRANSPORTATION

FIRST SLOPE = -4.19 TOTAL SSR =
Y ZERO INTERCEPT = 1927.41



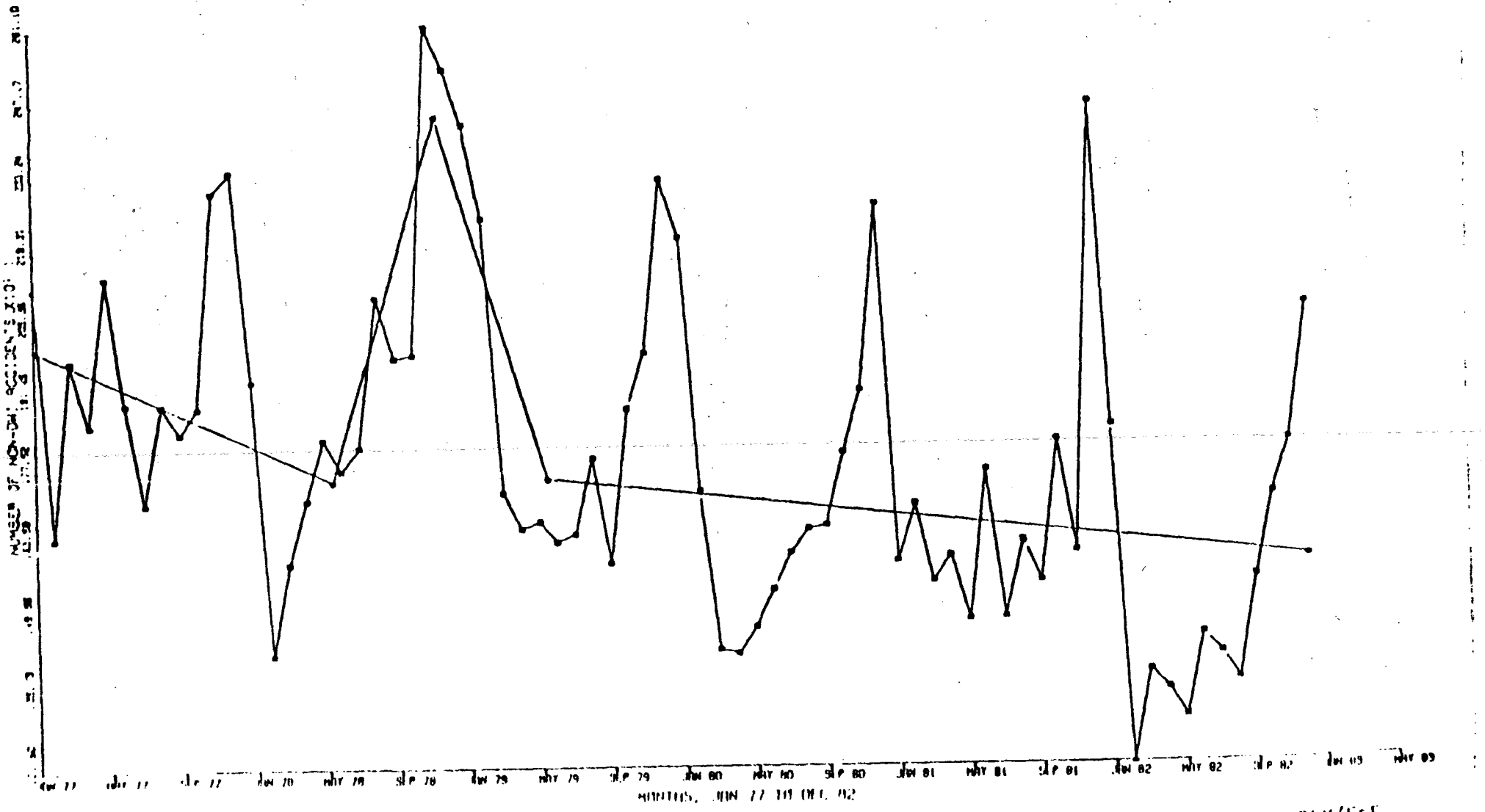
MONTHS, JAN 77 TO DEC 82

15 COUNTIES: NON-DWI TRAFFIC ACCIDENTS, 1977-1982

RAW DATA SERIES = (*)
MULTI SEGMENT LINE = (*)
SOURCE: WASHINGTON DEPT OF TRANSPORTATION

FIRST SLOPE = -15.49
Y ZERO INTERCEPT = 2019.28
SECOND SLOPE = 115.52
Y ZERO INTERCEPT = -273.40
THIRD SLOPE = -114.78
Y ZERO INTERCEPT = 5138.70
FOURTH SLOPE = -3.83
Y ZERO INTERCEPT = 1859.63

FIRST TURNING POINT X: 17.50
Y: 1748.1
SECOND TURNING POINT X: 23.50
Y: 2401.2
THIRD TURNING POINT X: 29.50
Y: 1752.5
TOTAL SSR =



D-8

OFM/TSE

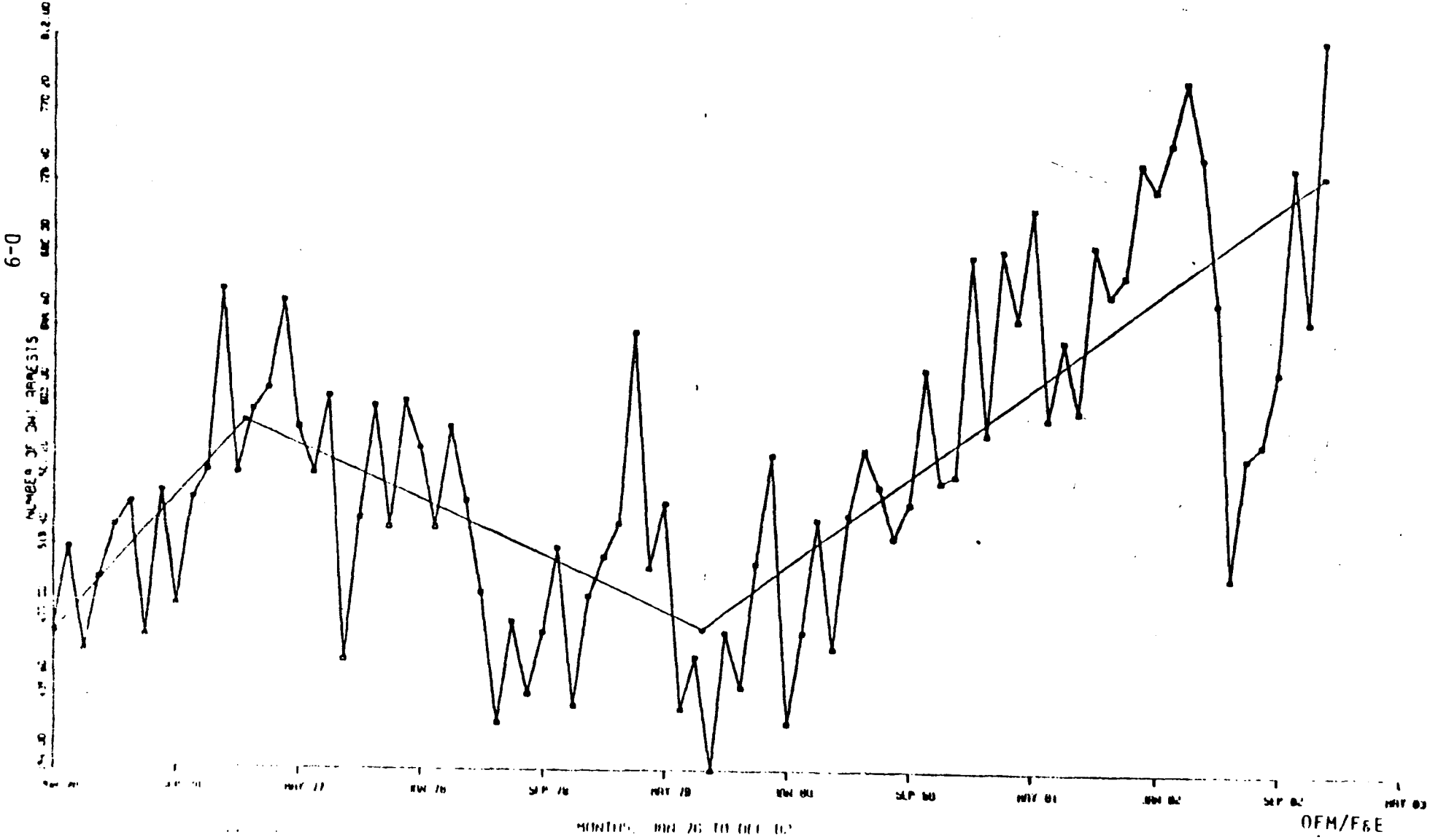
STATISTICAL ANALYSIS CENTER GROUP

41 WASHINGTON CITIES - DWI ARRESTS, 1976 - 1982

RAW DATA SERIES = ⊡
MULTI-SEGMENT LINE = ⊕
SOURCE: WASHINGTON UNIFORM CRIME REPORTS

FIRST SLOPE = 9.77
Y ZERO INTERCEPT = 480.20
SECOND SLOPE = -3.95
Y ZERO INTERCEPT = 645.40
THIRD SLOPE = 6.44
Y ZERO INTERCEPT = 193.40

FIRST TURNING POINT X:13.50 Y:592.1
SECOND TURNING POINT X:43.50 Y:473.7
TOTAL SSA =

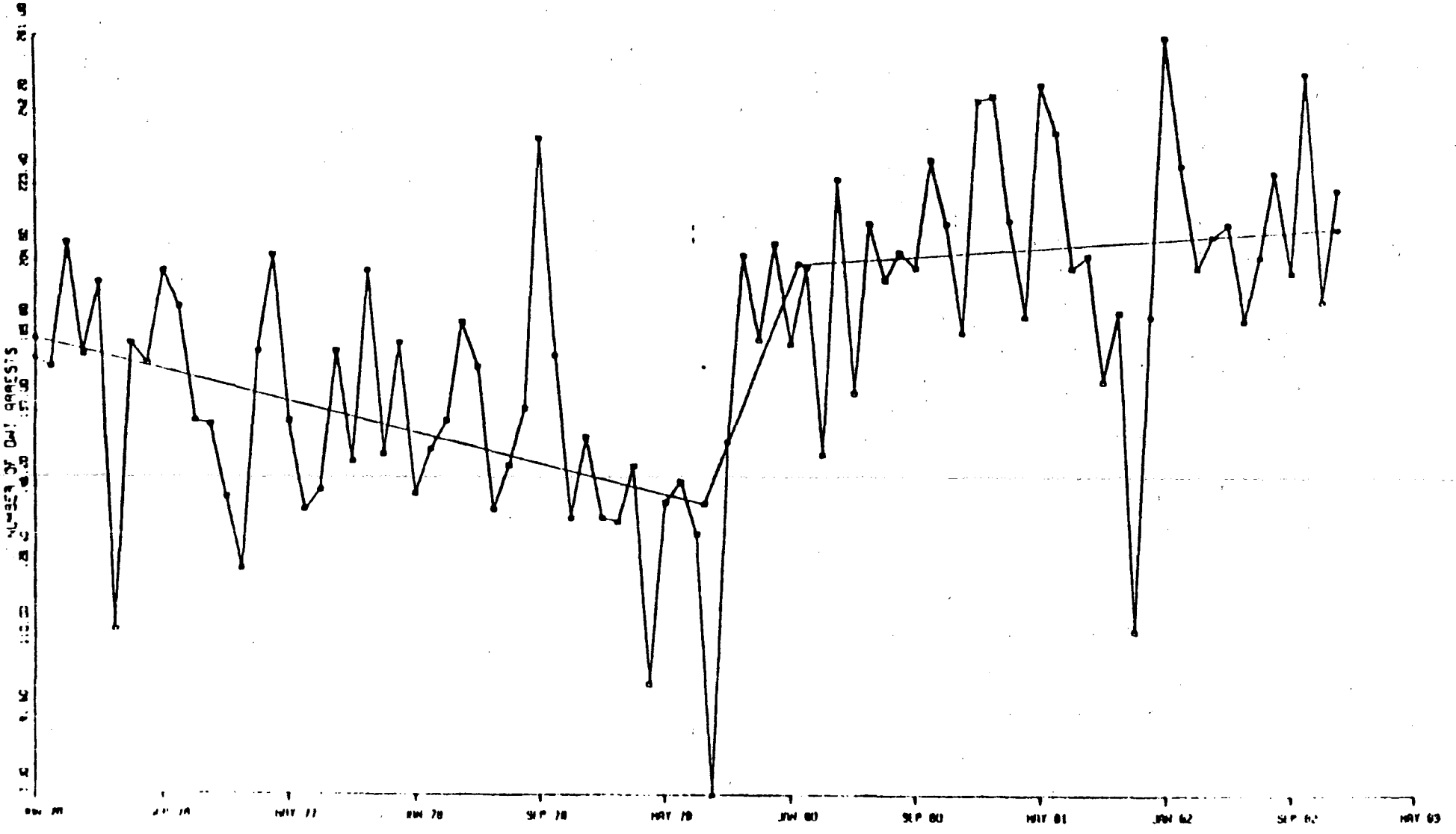


15 WASHINGTON COUNTIES - DWI ARRESTS, 1976 - 1982

RAW DATA SERIES = (1)
MULTI-SEGMENT LINE = (1)
SOURCE: WASHINGTON UNIFORM CRIME REPORTS

FIRST SLOPE = -0.95
Y ZERO INTERCEPT = 185.79
SECOND SLOPE = 9.91
Y ZERO INTERCEPT = -208.42
THIRD SLOPE = 0.27
Y ZERO INTERCEPT = 190.81

FIRST TURNING POINT X=43.
Y=194
SECOND TURNING POINT X=49.
Y=203
TOTAL SSR = 81584.58



MONTHS, JAN 76 TO DEC 82

[illegible] STATISTICAL ANALYSIS CENTER GRAPH

OEM/TEI

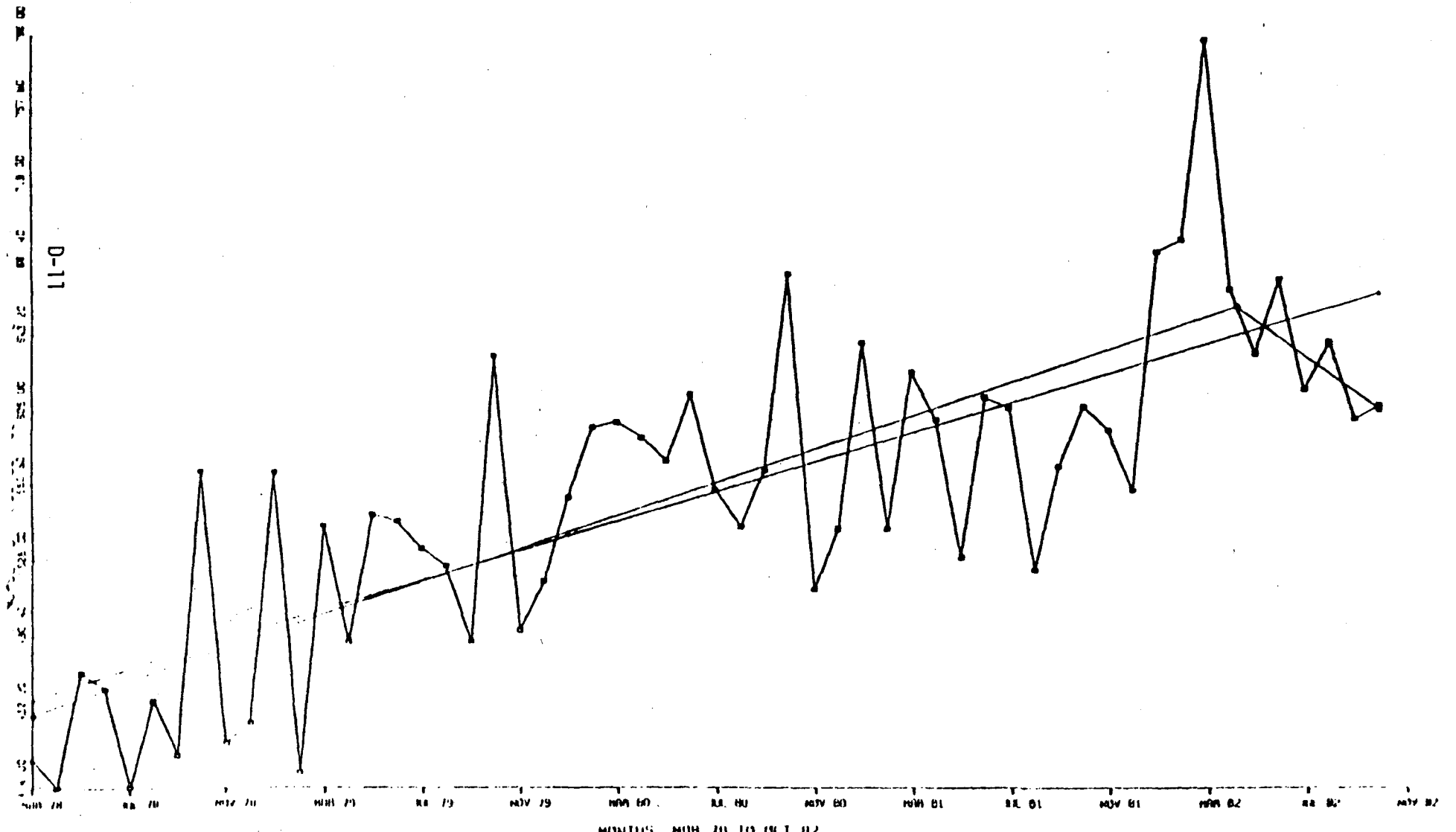
41 CITIES -50% SAMPLE: CONVICTIONS, 1978 - 1982

RAW DATA SERIES = (*)
SIMPLE REGRESSION LINE = ▲
TWO SEGMENT LINE = (*)

SIMPLE REGRESSION LINE:
SLOPE = 3.787
INTERCEPT =454.043
SUM OF SQ. RES. =

TWO-SEGMENT LINE:

TURNING POINT = 50.259
SEGMENT 1 Y-INTERCEPT = 445.574
SEGMENT 1 SLOPE = 4.247
SEGMENT 2 SLOPE = -9.114
SUM OF SQ. RES. =
F VALUE =7.043



MONTHS, MAR 78 TO OCT 82

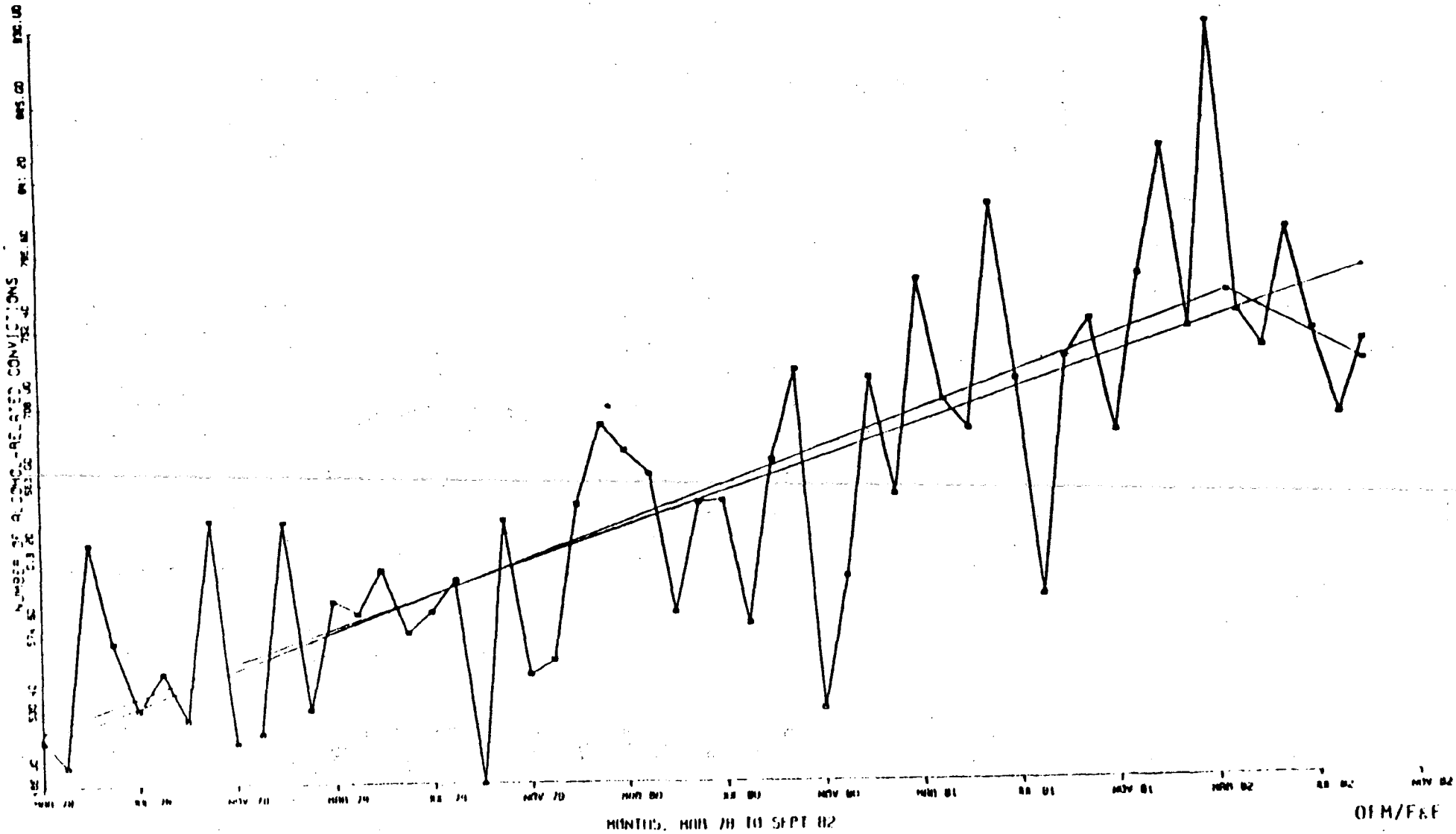
15 COUNTIES : ALCOHOL-RELATED CONVICTIONS, 1978 - 1982

RAW DATA SERIES = □
SIMPLE REGRESSION LINE = △
TWO SEGMENT LINE = ○

SIMPLE REGRESSION LINE:
SLOPE = 4.910
INTERCEPT =513.000
SUM OF SQ. RES. =

TWO-SEGMENT LINE:

TURNING POINT = 49.011
SEGMENT 1 Y-INTERCEPT = 505.548
SEGMENT 1 SLOPE = 5.352
SEGMENT 2 SLOPE = -7.571
SUM OF SQ. RES. =
F VALUE =4.204



OEM/F&E

APPENDIX E

DEMOGRAPHICS OF SAMPLE SITES

41 WASHINGTON CITIES

15 WASHINGTON COUNTIES

City	County	1980 Pop	Pop Density
Spokane	Spokane	171,000	3,260
Tacoma	Pierce	158,000	3,324
Yakima	Yakima	49,826	3,868
Vancouver	Clark	42,834	2,818
Bremerton	Kitsap	36,208	2,124
Kennewick	Benton	34,397	2,218
Richland	Benton	33,578	1,050
Longview	Cowlitz	31,052	2,486
Renton	King	30,612	2,001
Pullman	Whitman	23,579	2,996
Kent	King	23,152	1,251
Lynnwood	Snohomish	22,641	3,611
Aberdeen	Grays Harbor	18,739	1,331
Puyallup	Pierce	18,251	2,074
Pasco	Franklin	17,994	1,122
Port Angeles	Clallam	17,311	2,018
Wenatchee	Chelan	17,257	4,138
Lacey	Thurston	13,940	1,776
Mt. Vernon	Skagit	13,009	1,718
Oak Harbor	Island	12,271	1,656
Moses Lake	Grant	10,629	1,419
Hoquiam	Grays Harbor	9,719	1,331
Sunnyside	Yakima	9,225	3,237
Bothell	King	7,943	1,896
Shelton	Mason	7,629	1,620
Des Moines	King	7,378	4,032
Clarkston	Asotin	6,903	3,452
Port Townsend	Jefferson	6,067	1,011
Camas	Clark	5,681	1,479
Enumclaw	King	5,427	1,762
Ephrata	Grant	5,359	1,644
Sumner	Pierce	4,936	2,456
Port Orchard	Kitsap	4,787	1,780
Colville	Stevens	4,603	2,488
Othello	Adams	4,522	2,393
Tukwilla	King	3,578	932
Buckley	Pierce	3,143	838
Elma	Grays Harbor	2,720	1,604
Blaine	Whatcom	2,363	664
Westport	Grays Harbor	1,954	275
Ocean Shores	Grays Harbor	1,777	191

#Commissioned Law Enforcement Officers in 1980= 1483

County	Unincorp Pop 1980	Population Density
King	503,172	265
Spokane	152,164	90
Yakima	83,462	20
Cowlitz	31,654	28
Skagit	30,292	18
Island	30,117	149
Grant	22,005	8
Stevens	20,398	8
Pacific	10,713	12
Klickitat	9,876	5
Asotin	8,974	14
Adams	6,031	7
Lincoln	3,769	2
Wahkiakum	3,197	12
Columbia	1,294	2

#Commissioned Law Enforcement Officers in 1980 = 897

APPENDIX F

PERCENT OF AVERAGE DAILY PRISON POPULATION INCARCERATED FOR DWI OFFENSES (22 COUNTIES).

Data Point Number	Time Period	Pre-Conviction DWI Holds (% ADP)	Post-Conviction DWI Holds (% ADP)
1.	Aug. 1980	3.400	7.938
2.	Sep.	3.350	8.984
3.	Oct.	2.312	9.741
4.	Nov.	1.855	8.500
5.	Dec.	1.955	7.974
6.	Jan. 1981	2.422	7.400
7.	Feb.	2.080	7.122
8.	Mar.	2.724	5.630
9.	Apr.	2.686	6.965
10.	May	2.595	6.890
11.	Jun.	3.010	7.440
12.	Jul.	2.420	7.290
13.	Aug.	2.210	6.355
14.	Sep.	2.485	6.194
15.	Oct.	2.714	6.371
16.	Nov.	2.170	6.876
17.	Dec.	2.105	7.980
18.	Jan. 1982	2.210	8.676
19.	Feb.	2.464	7.154
20.	Mar.	2.475	7.338
21.	Apr.	2.174	7.883
22.	May	3.010	7.763
23.	Jun.	2.629	7.595
24.	Jul.	2.640	7.220
25.	Aug.	2.748	7.095
26.	Sep.	3.386	8.024
27.	Oct.	2.980	7.890
28.	Nov.	2.645	7.029
29.	Dec.	2.304	7.914
30.	Jan. 1983	2.167	8.476
31.	Feb.	2.590	10.090
32.	Mar.	2.395	8.914
33.	Apr.	2.154	9.350
34.	May	2.272	9.639
35.	Jun.	2.305	8.635
36.	Jul.	2.890	9.700
37.	Aug.	2.939	9.394